

Full Length Research Paper

An assessment of the impact of the fast track land reform programme on the environment: The Case of Eastdale Farm in Gutu District, Masvingo

Nyashadzashe Zembe^{1*}, Edmore Mbokochena², Fungai H. Mudzengerere³ and Elizabeth Chikwiri⁴

¹Ministry of Lands and Resettlement, Harare, Zimbabwe

²Department of Psychology, Women's University in Africa, Harare, Zimbabwe

³National University of Science and Technology, Bulawayo, Zimbabwe

⁴Women's University in Africa, Harare, Zimbabwe

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Through the indigenisation programme, the government of Zimbabwe embarked on fast track land reform which to some extent had both positive and negative impacts. The aim of the programme was to empower the local Zimbabweans economically and to improve on food security. On the other hand, this initiative had negative implications to the environment. The research explored how the new farming communities endeavoured to protect the environment through their agricultural, social and cultural practises in trying to improve their sustainable livelihoods. The survey research design was adopted with questionnaires and interviews being the main data gathering tools. Simple random sampling technique was used to select a sample of 120 respondents for answering the questionnaire and also for interviewing. Data was then analysed, tabulated and inferences made about it. The research found out that the fast track land reform programme has caused environmental degradation as shown by deforestation, gullies and siltation of rivers in Eastdale A1 model farm. Poverty was highlighted as the major cause of environmental degradation in farms. In addition, bad farming practices and exploitation of natural resources as a way of surviving also impacted negatively on the environment. Although there are laws governing environmental protection, the implementation of such laws is not that effective as there is lack of consultation and participation of the local communities. The study recommends effective implementation of environmental laws in the areas where new farmers were settled. Local communities need to take active roles in matters concerning environmental protection through the introduction of freehold land tenure system in fast tracked land reform areas.

Key words: Land, farmers, environment, degradation, tenure.

INTRODUCTION AND BACKGROUND

As pointed out by the United Nations Development Programme (2003), environmental degradation is a problem that is affecting most Third World Countries in general and that is why the Millennium Summit included

environmental protection as one of the Millennium Development Goals. The environmental damage is attributed to the economic hardships which are faced by these countries which results in over exploitation of the

natural resources for survival. In Zimbabwe, the major source of livelihoods and backbone of the economy is agriculture which entails the traditional methods of cultivation which in the end affects the environment directly or indirectly. In an effort to reduce environmental damage, reduce population pressure in communal areas and empowering the local people, the government of Zimbabwe embarked on the fast track land reform programme in the year 2000. According to Harvey (1991), fast track land reform programmes are important because they relieve population pressure on overcrowded communal lands, provide people with enough land for them to farm profitably, provide a means of livelihood for the unemployed and landless and it also makes under utilised land productive. In the view of Elwell and Stocking (1976), environmental degradation in resettlement areas has been observed to be a result of overpopulation by people and livestock in these resettlement areas and an adherence to traditional systems of cultivation that are inappropriate under conditions of land shortage.

Environmental damage in resettlement areas is a result of vandalism of existing structures such as paddocks, contour ridges, abandoning of designated areas such as wetlands and stream banks which are then converted into farming units (Chigwenya, 2000). In the view of Olsson and Rapp (1991), as human population increases in the resettlement areas, more land previously earmarked for grazing is brought under the plough at the expense of livestock. The grazing land is reduced, resulting in the tragedy of the commons and environmental degradation. According to Barrow (1991), one of the major causes of environmental degradation in the communal lands of Zimbabwe is the communal land tenure system. The communal land tenure system in Zimbabwe is one in which everyone has access to common property resources such as grazing land. Communal land tenure system does not give individual responsibility or accountability to environmental damages and the local communities are not concerned about environmental conservation. There is very little research which has been done on the environmental impact of fast track land reform programme. Available information is too general and is based on agricultural production in fast track land reform areas. This research proposes to focus in detail on the impact of fast track land reform programme on the physical environment

Scope of study

The study is guided by Thomas Malthus' theory which states that population is growing at a geometric rate yet

resources are dwindling (Carr, 1997). According to Bradford and Kent (1977), production from the land, even under the most favourable circumstances, could at best increase at an arithmetic rate, therefore the capacity of the land will be exceeded by the ever growing population leading to environmental degradation. The study seeks to assess the environmental impact of fast track land reform programme at Eastdale A1 model farm in Gutu District in order to ensure sustainable agricultural development in fast track land reform areas and it was guided by the following objectives:

1. To identify trends in vegetation cover at Eastdale A1 model farm under fast track land reform programme in Gutu District.
2. To examine the major causes and extent of deforestation at Eastdale A1 model farm under fast track land reform programme.
3. To evaluate traditional conservation measures which are being practised in fast track land reform areas.
4. To assess community initiatives in conserving the environment.
5. To identify the land tenure system in fast track land reform areas.

This research is important from a policy perspective as well as from an academic perspective. The study addresses a knowledge gap on the environmental impact of fast track land reform programme. It will also yield vital information for policy makers as well as provide knowledge to local settlers, Ministry of Lands and Rural Resettlement officials, Agriculture Research and Extension Services (AREX) and officials and Environmental Management Agency (EMA) officials on sustainable agricultural production. It will encourage the government to take environmental issues in fast track land reform areas seriously and enforce environmental laws.

REVIEW OF RELATED LITERATURE

In the view of Marongwe (2002), fast track land reform programme refers to a situation whereby people are settled on compulsorily acquired farms by the government without proper planning and provision of basic infrastructure and services such as roads, clean source of water, schools, clinics, dip tanks and decent accommodation. In the opinion of Whinston (1995), land tenure system refers to the way in which land is being owned; it can be privately owned that is freehold tenure, communally owned or leasehold tenure. In most of the A1 model farms which fall under fast track land reform

*Corresponding author. E-mail: nyashazembe@gmail.com.

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programme it seems communal land tenure system is the one which dominates in this area. Harvey (1991) says one of the major causes of environmental degradation in the communal areas of Zimbabwe is the communal land tenure system. Communal land tenure system gives all members of the community access to common property resources such as grazing land. Communal land tenure system does not give individual responsibility or accountability to environmental damages. Under communal land tenure system there is tragedy of the commons since the pasture is open to all.

Causes of environmental degradation

Chenje et al. (1998) say poverty and environmental degradation are linked in a self-destructive cycle in which people cannot afford to take proper care of the environment. This was echoed by United Nations Environment Programme (1995) and Barrow (1991) which attributed limited access to resources and poverty in developing countries as the major drive for environmental degradation. The liberation struggle in Zimbabwe also led to the crumbling of a lot of environmental conservation structures put in place during the colonial era. Soil erosion is widely spread in the communal lands of Zimbabwe. The total land degraded in Zimbabwe is 1.8 million hectares; about 83% is in the communal areas [source]. Poor farming methods, over cultivation, overgrazing and removal of ground cover are the major causes of soil erosion in Zimbabwe. Excessive tillage of fragile land such as wetlands, stream banks, marginal land as well as continuous cropping of shallow rooted crops had also contributed to soil erosion (Whitlow, 1988).

Olsson and Rapp (1991) carried out a study in Sudan and discovered that, environmental degradation was a result of a combination of low rainfall and excess exploitation of the environment through overgrazing, over cultivation of marginal land such as the Sahel region which is located on the southern part of the Sahara desert. Environmental damage in resettlement areas is a result of the following factors: overgrazing, lack of properly set up institutional structures from ward level, vandalism of existing physical structures such as paddocks, contour ridges, monoculture, abandoning of designated areas for undesignated areas such as wetlands, stream banks, and grazing areas. The common feature in resettlement areas is the rapid depletion of indigenous trees mostly through marketing it to the nearest urban centres and surrounding communal areas (Dregne, 1992; Chigwenya, 2000; Stocking, 1982).

According to SARDC (1998), in a research study carried out in Africa, land in Southern Africa is facing a lot of degradation. The chief causes of environmental degradation are poor farming methods and clearance of

vegetation for arable purposes. Fast track land reform was introduced as a solution to environmental problems which were being experienced in the communal lands of Zimbabwe.

Initiatives in conserving the environment

According to Katerere (1993), conservation programmes in the communal lands of Zimbabwe failed because of lack of consultation of local communities in decision making and management of natural resources. Some well-planned conservation programmes in Zimbabwe lack funding and the drive to implement them which in the end reduces the progress made on environmental conservation (Whitlow, 1988).

According to Mukwada (2000), in order to prevent soil erosion plant species which can easily adapt to the prevailing environmental conditions can be grown in areas that have high rates of soil erosion. Vegetation cover improves the infiltration capacity of the soil because of the bio-pores and interstices which it creates within the soil. One of the most effective biological measures of soil conservation involves the management of livestock populations. Livestock populations should be within the carrying capacity of the land. This means that the number of livestock should be kept within the limits that can be sustained by the land.

According to Barrow (1991), strip cropping and contour cropping are other biological methods of soil conservation that have become widely accepted. Strip cropping involves the planting of two or more types of crops in parallel strips and ensuring that these crops mature at different times. This ensures that the land is never left bare at any one time in the year. Contour cropping requires that crops are planted parallel to the contours. Both strip cropping and contour cropping reduce overland flow and soil erosion.

In the view of Mukwada (2000), in research study carried out in Chivi and Zaka Districts, mechanical measures of soil conservation involve the use of man-made or mechanical devices and structures which are capable of controlling the flow of water within specific areas, for instance arable areas. Storm drains are relatively wide trenches that are constructed upslope of the arable land with the intention of diverting overland flow from it. Storm drains are variable in both width and depth, depending on rainfall erosive power and other environmental conditions which prevail within an area. Contour ridges are embankments which are constructed across the slope, within the fields, in order to capture and divert any rainwater which falls above them. The number and spacing of contour ridges depend on both the size of the land to be protected as well as its morphological properties. The construction of contour ridges constituted an important component of soil conservation works which

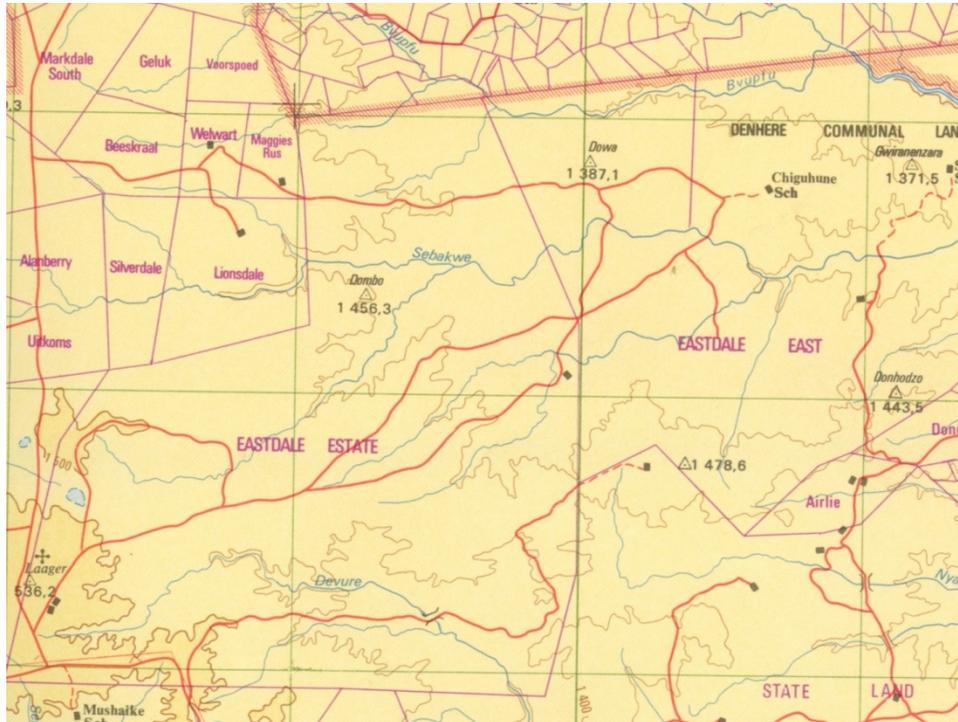


Figure 1. Topographical map showing the area of Study (Eastdale). Source: Department of the Surveyor General (2005).

were introduced in the communal areas of Zimbabwe by colonial administrators. Unfortunately, lack of enforcement has reduced the success of these conservation works during the post-independence era.

RESEARCH METHODOLOGY

The research adopted quantitative and qualitative research design in assessing the environmental impact of fast track land reform programme in Eastdale A1 model farm. Under quantitative research design, a descriptive survey was also adopted. The descriptive survey approach utilised selected samples to make generalization possible. The descriptive survey approach also identifies current conditions and points to future needs and thus provides information that assisted in decision making or immediate interventions. Qualitative research was used to collect and analyse demographic and social data of the new farmers at the Eastdale farm. Topographical maps and aerial photographs of the area of study were used in the research. Field visits were carried out so as to confirm what was observed on topographical maps and aerial photographs. In this research study, a simple random sample size of 100 settlers was selected. Key informants were also selected from government departments, leadership from the farmers, environmentalists and educationists to give their views on policy and measures to be taken to conserve the environment. To analyse the density of vegetation cover in Eastdale A1 model farm in Gutu District simple random sampling technique was used to select quadrants in the area of study and observations were done in these quadrants. Questionnaire and interviews were used to collect data as these helps to promote confidentiality and yield information direct from the respondents (Leedy, 1989; Gwimbi and Dirwai,

2003). The research also used non participant observation and this was quite essential as the researchers benefited a great deal in research through observing what was happening in the field of study. Settlers cutting down trees as in the case of deforestation, planting trees as in the case of an effective educational campaign on the reforestation, are examples of areas that were observed during this research study. Documentary analysis was done on policy documents, vegetation maps of the area and aerial photographs. Data were presented as pie charts, tables, bar graphs sketch maps and reports. The research data were analysed through sorting, organizing and structuring. The purpose of data analysis was to quantify and qualify the information collected so as to make inferences (Punch, 1998).

Study area

The research was conducted in Gutu District of Masvingo province in Zimbabwe. It is bounded by Sebakwe River to the north and Devure River to the south. Eastdale A1 model farm receives an annual rainfall which ranges from 650 to 800mm which is typical of agro – ecological region three. Masvingo has a savanna type of climate which receives seasonal rainfall normally in summer with dry winter season which is associated with light showers. Eastdale farm is dominated with granite rock which is hard and resistant to weathering. Granite rock is impermeable which causes over flooding in the area when heavy rains are received. The area is characterised by dwalas, dome shaped inselbergs, balancing rocks, blocky inselbergs, smooth rock and granite rock outcrops which results in fertile black soils for agricultural purposes. The soils found at Eastdale A1 model farm are moderately shallow and they are sandy loamy, derived from granite rock. Figure 1 shows the map of Eastdale farm.

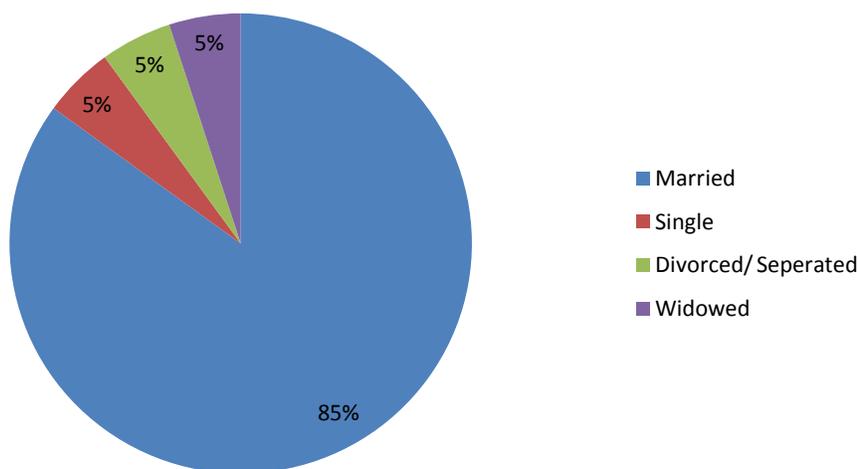


Figure 2. Demographic information.

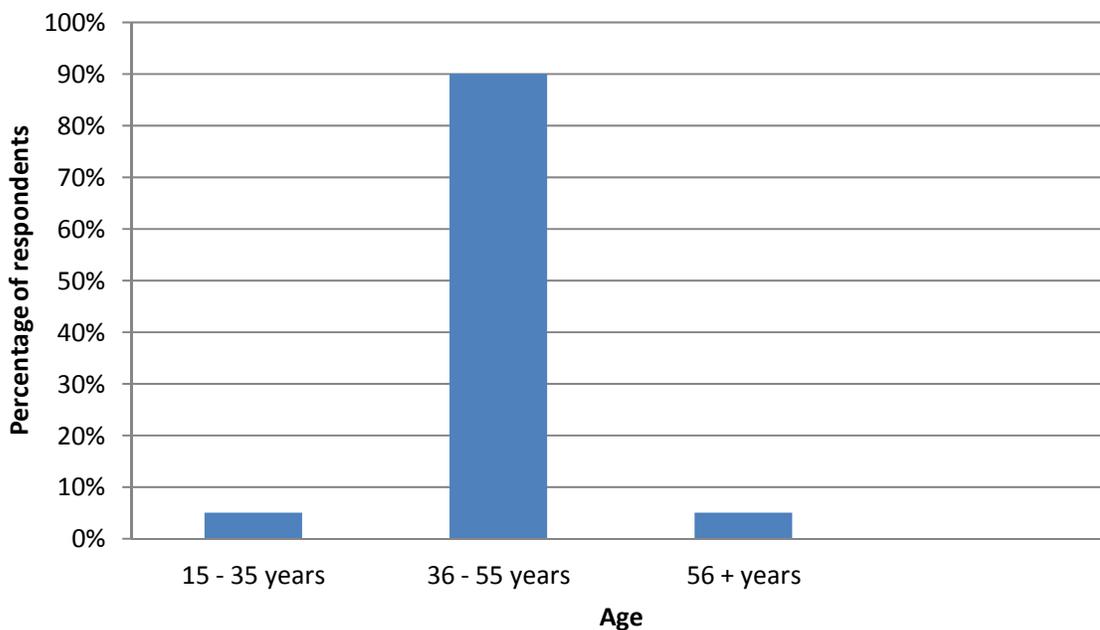


Figure 3. Age distribution of the settlers.

RESULTS AND DISCUSSION

Demographic data

The demographic data of the respondents is shown in Figures 2 and 3 below. Since the core business of fast track resettlement is food production and improving livelihoods, 85% of the respondents are married and are family people while 25% include the single, widowed and the divorced.

90% of the respondents are aged between 36 to 55 years, while 5% have 15 to 35years and the remaining 5% have over 56 years as shown in Figure 3. It is the economically active and the able bodied who were resettled in the farms so that they can improve on food security and that’s why the 36 to 55 years age group is dominating. Out of these settlers, 70% of the settlers found in Eastdale A1 model farm under fast track land reform programme in Gutu District come from the surrounding communal lands such as Serima, Gutu and

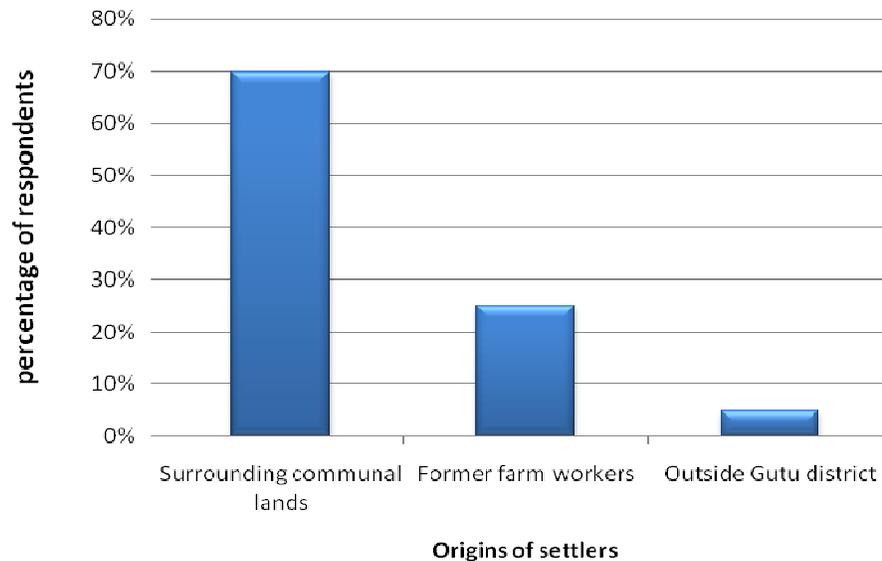


Figure 4. The origins of the settlers found in Eastdale farm.

Denhere (Figure 4). These people have the same cultural beliefs, taboos and customs. Control mechanisms of natural resources exploitation are found in traditional taboos, totems and customs. About 25% were former farm workers who also benefitted from the fast track land reform programme.

Changes in vegetation cover in Eastdale A1 model farm

The aerial photographs of early 1980s and late 1990s as well as vegetation maps of the early 1980s and late 1990s clearly show that at the initial stages of fast track land reform programme, there was thick dense vegetation cover in Eastdale A1 model farm with minimal disturbance of the natural ecosystems. Research results have shown that during the beginning of the fast track land reform programme, Eastdale farm was dominated by various types of vegetation species and a typical savanna woodland ecosystem was thriving.

A sketch map of Eastdale A1 model farm showing a high density of vegetation cover and the small area under cultivation at the initial stages of fast track land reform programme

The research results have shown that, currently there is a sharp decrease of vegetation cover in Eastdale A1 model farm now under fast track land reform programme (Figure 5). This is mainly because of high population growth in the fast track land reform areas which is causing a high demand for firewood and arable land. This is causing destruction of thick dense forests which were initially dominating the area of study. Key informants from the Environmental Management Agency (EMA) in the

district confirmed this development and attributed this development to some of the activities of the newly settled farmers for causing desertification in the area.

As shown on Figure 6, there is a decrease of vegetation cover in Eastdale A1 model farm after the fast track land reform programme. This is attributed to the rapid population growth at the farm and hence too much pressure on the resources Carr (1997). Thick and dense vegetation cover has been destroyed in preparation for arable land as well as due to high demand for firewood by the ever increasing population in fast track land reform areas. Currently, sparse vegetation cover remains in Eastdale A1 model farm due to human activity which destroys the environment. Some of the areas that still exhibit some form of vegetation are those reserved for cattle grazing and where land clearing is yet to be done.

Causes of deforestation in Eastdale A1 model farm

The research found out that there is rampant cutting down of trees in Eastdale A1 model farm under fast track land reform programme with areas adjacent to Serima, Gutu and Denhere communal lands almost devoid of trees. Observations done and focus group discussions revealed that the major causes of vegetation depletion are firewood collection, the need to open up more land for arable purposes due to ever increasing population in fast track land reform areas, tobacco curing, furniture making and the need for fencing poles. Figure 7 shows firewood collected for tobacco curing.

The widespread poaching of firewood and timber for furniture in Eastdale A1 model farm by people from the surrounding communal lands such as Serima, Denhere



Key:

Land under cultivation



Sparse vegetation cover



Thick, dense vegetation cover



Figure 5. Vegetation Map of Eastdale. Source: Department of the Surveyor General (2005).



Key

Land under cultivation



Sparse vegetation cover



Figure 6. Land use Map of Eastdale after Fast Track Land Reform. Source: Department of the Surveyor General (2005).

and Gutu is on the increase hence contributing to deforestation. The mostly cut down indigenous trees include Mukwa, Mususu and Mopane and these are

strong, burn slowly and big in size. Local Environmentalists said that, firewood meets 51% of Zimbabwe's total household and industrial energy demand. The



Figure 7. Firewood cut down for tobacco curing in Eastdale A1 model farm.

Respondents' Views on Environmental Change

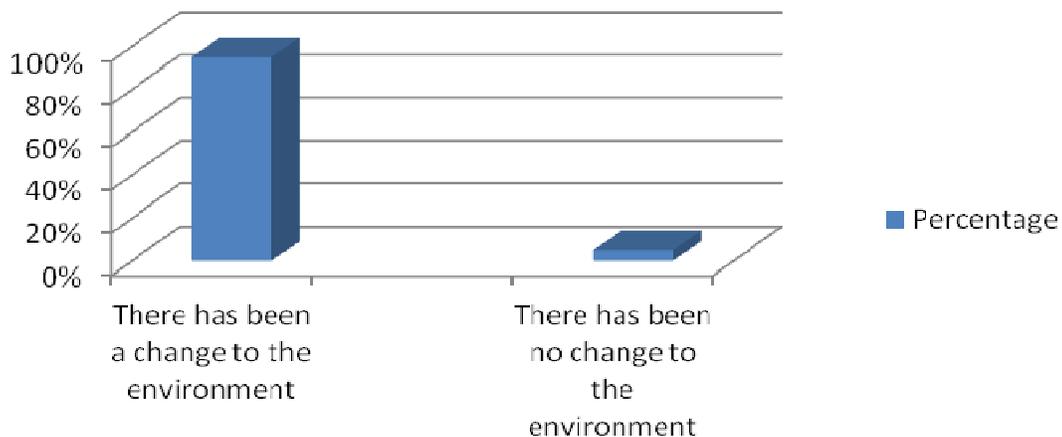


Figure 8. Respondents' views on environmental change as a result of the fast track land reform programme.

resettled demand. The resettled farmers get 90% of their energy for domestic and agricultural purposes from firewood as electricity tariffs are beyond the reach of the rural folk. Agriculture, Research and Extension services personnel interviewed said, on average, a farmer with

1 hectare of tobacco crop require 2.2 tonnes of firewood to cure his tobacco. With an ever increasing number of settler farmers in Eastdale A1 model farm under fast track land reform programme who are venturing into tobacco growing most of the forests are under threat due

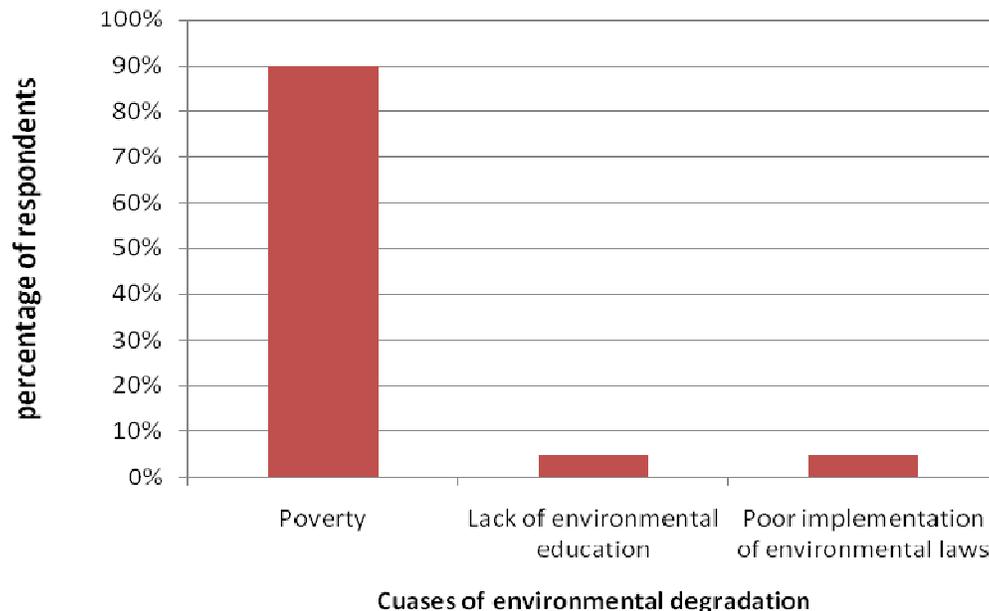


Figure 9. Causes of environmental degradation in Eastdale A1 model farm.

to a high demand for firewood for tobacco curing. 95% of the respondents indicated that there has been a negative change which has occurred to the physical environment in Eastdale A1 model farm as a result fast track land reform programme. This is shown by Figure 8.

Research results revealed that, the highest concentration of trees is found on mountain tops and steep slopes which are less accessible. However, the trees found on mountain tops and steep slopes are also under threat from the ever increasing population in Eastdale A1 model farm.

Respondents' perception on causes of environmental degradation

Research results indicated that the need to improve livelihoods is the major cause of environmental degradation in Eastdale A1 model farm under fast track land reform programme, as shown in Figure 9. These findings confirm the observations by Katerere (1993), in a research study carried out in the communal lands of Zimbabwe when he stated that, limited access to resources may leave the poor in situations in which they have limited choices and in which they are more preoccupied with immediate survival needs than in conserving resources for long term sustainability. This creates pressure for impoverished groups to exploit increasingly marginal environments to meet immediate survival needs and this leads to environmental degradation and even deeper conditions of poverty in the long

run.

As pointed out by Stocking (1982) and Elwell (1972), large numbers of livestock cause hardening of soil due to soil compaction, leading to rapid surface run-off. During the rainy season, rainfall intensity will exceed the infiltration capacity of the soil leading to high volumes of surface run-off. Excessive surface run-off causes soil erosion, development of gullies and a consequent drying of rangelands which then lead to shortage of water supplies and pastures (Muvadi, 1987). According to IUCN (1998), in a research study carried out in Zimbabwe, woodlands in resettlement areas are undergoing rapid depletion. The chief cause of woodland depletion are rural based industries such as brick moulding, beer brewing, tobacco curing, art and craft, curios, medicinal value of certain trees, firewood, construction and furniture. Tobacco curing is causing much of the environmental damages in resettlement areas (Harvey, 1991).

Family size per settler

Research results indicates that most of the A1 model settler farmers in Eastdale farm are having over 5 children as shown in Figure 10.

As shown in Figure 10, 85% of the respondents have over five children per family. This contributes to high population growth in Eastdale A1 model farm under fast track land reform programme. The carrying capacity of the fast track land reform area is being exceeded by the ever increasing population and this cause environmental

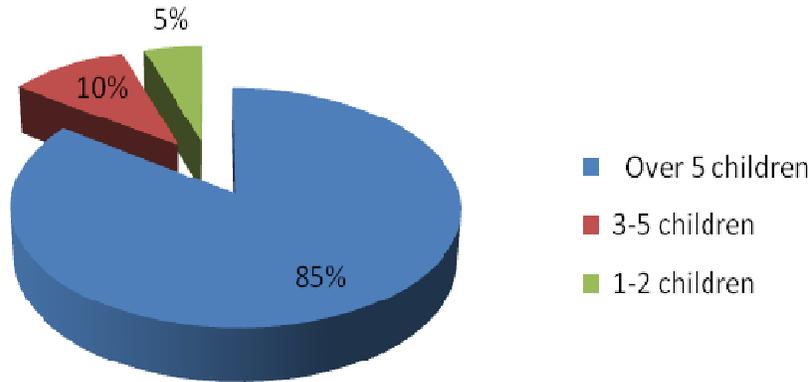


Figure 10. Family size per A1 model settler in Eastdale farm.

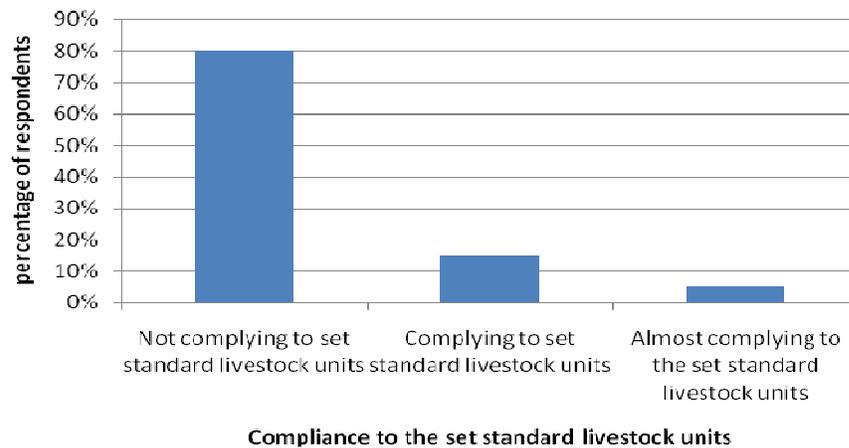


Figure 11. Compliance to the set standard livestock units in Eastdale A1 model farm by settlers

degradation. The findings go hand in hand with the views of Rapetto and Holmes (1983), in a research study carried out in Botswana, in which they stated that, the land hunger problem has caused an increasing occupation of much of the traditional grazing lands, thus encroaching more and more into marginal lands as the population continue to grow at a faster rate as compared to the available developed resources such as arable land. In the view of Chapayema (1987), in a research study carried out in Manicaland Province, there is a strong positive correlation between population growth and environmental degradation. This trend manifests itself in fast track land reform areas. Environmental degradation has been observed to be a result of overpopulation by people and their livestock, as well as adherence to traditional systems of cultivation that are inappropriate under conditions of land shortage (Mukwada, 2000).

According to Muvadi (1987), in a research study carried out in Zimbabwe, declining productivity of existing croplands has promoted extension of cultivation into more marginal terrain in order to accommodate the increasing

human demand for arable land. The opening up of land for cultivation in resettlement areas is chaotically done with no respect of the ecological interrelationships that have sustained life for so long. In the view of Rapetto and Holmes (1983), in a research study carried out in Botswana, the land hunger problem has caused an increasing occupation of much of the traditional grazing lands, thus encroaching more and more into marginal lands as the population continue to grow at a faster rate as compared to the available developed resources such as arable land.

Livestock units per family

Since there are bigger families of the occupants at the farm, their livestock units plays a crucial role in determining whether there is a balance between grazing areas and the livestock units.

As shown in Figure 11, 80% of the settlers are no longer complying with the set standard of livestock units

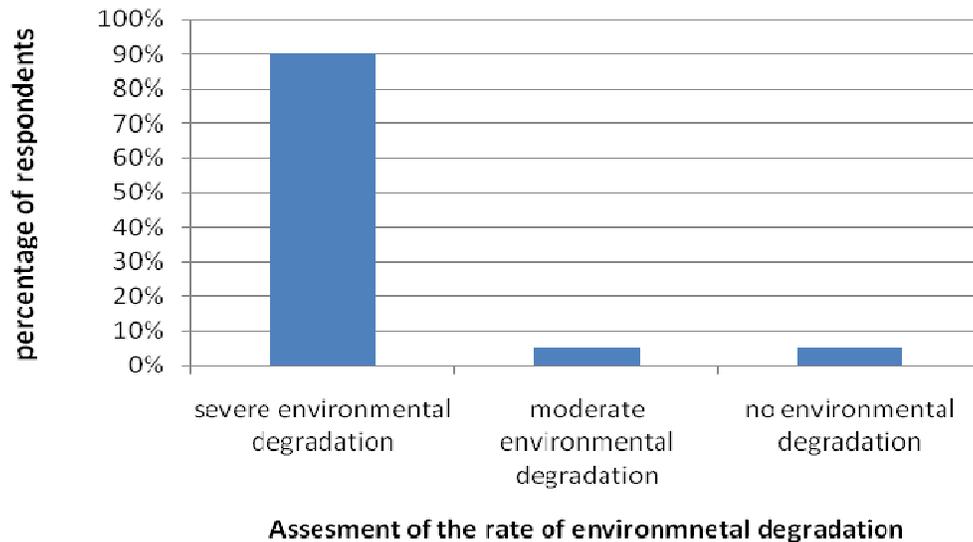


Figure 12. Assessment of the rate of environmental degradation in Eastdale A1 model farm.

in fast track land reform areas. Some of the settler farmers are now keeping between 15-20 herds of cattle instead of the set standard for A1 model settlers which is 8 livestock units per settler. The increasing number of livestock in the fast track land reform areas is causing overgrazing. These research findings differ from Stocking (1982), in a research study carried out in Zimbabwe who pointed out that in the early 1980s A1 model resettlement schemes were well planned and there were set standard of livestock units per settler. Research results show that the number of livestock in Eastdale A1 model farm has far exceeded the required carrying capacity of the area thereby leading to overgrazing and other forms of environmental degradation. In the view of Stocking (1972), in a research study carried out in Zambia, land degradation is a man induced process and a product of the nature of the physical or natural environment being exploited.

As shown in Figure 12, 90% of the respondents indicated that the rate of environmental degradation in Eastdale A1 model farm under fast track land reform programme is severe. Most of the respondents attributed environmental degradation in fast track land reform areas to high population growth and cultivation of marginal land. Research results indicated that veld fires are usually started by poachers of wild animals, which is another cause of environmental degradation.

Soil erosion at Eastdale farm

The research study clearly showed signs of severe soil erosion at Eastdale farm under fast track land reform programme. The chief cause of soil erosion is overgrazing

by livestock which has left the ground surface bare, exposed to all the agents of erosion such as wind and run – off water.

As shown in Figure 13, those areas affected by gully erosion are difficult to reclaim for agricultural purposes. According to Chenje et al. (1998), the following quote from a gold panner in Zimbabwe can best express what the disadvantaged feel about the environment over their survival: “I can’t help it if future generations find rivers silted. People are more important than the environment”.

Siltation at Eastdale farm

Research results revealed that, most of the rivers in Eastdale A1 model farm are now silted. Major rivers found in the area of study include Devure and Sebakwe which were once perennial, but now they are seasonal due to siltation which part of it is caused by lack of conservation and bad farming practices done at Eastdale farm. The settlers are extending their fields into marginal areas which are not suitable for cultivation. Some of the settlers have extended cultivation inside the stipulated 30 metres away from river banks.

As shown on Figure 14, 95% of the respondents are aware of the environmental problems associated with practicing stream bank cultivation but they continue doing it. Lack of environmental education on the part of the settlers as shown in Figure 15 has also contributed to environmental degradation in Eastdale A1 model farm under fast track land reform programme.

As shown in Figure 15, 80% of the respondents are not receiving environmental education and a result of that,



Figure 13. An illustration of gully erosion at Eastdale farm.

environmental degradation is very common in Eastdale A1 model farm under fast track land reform programme. Only 5% of the respondents indicated that they are receiving adequate environmental education from agricultural extension workers and other organisations on environmental protection.

Other environmental hazards at Eastdale farm

The focus group discussions held with the respondents showed that veld fires often break-out in the farm especially during the winter season. These fires are started by the new farmers who will be clearing their fields in preparation of the new farming season to come as well as hunting and clearing forests. Veld fires destroy both flora and fauna which then lead to serious disturbance of natural ecosystems.

There is also rampant illegal gold panning taking place at Eastdale farm with some farmers having abandoned agricultural activities as they want quick cash from gold sells. It has also emerged during the research that the former white commercial farmers in the area were also engaged in illegal gold mining activities before the fast track land reform programme as this was shown by gold mill behind the homestead of the former white commercial farmer for processing the gold. In some of the areas used as pastures, there are also gullies which are evident of gold panning activities which were done by the former owners of the farm. Mine dumps generated during the illegal gold mining process have caused land pollution cultivation of the land ended up being difficult.

Land tenure system at Eastdale farm

Communal land tenure system is the predominant system of land ownership at Eastdale farm whereby grazing land

is communally owned and farming units are individually owned. Under communal land tenure system, tragedy of the commons develops as there is no one wholly responsible for the common land. According to Chenje et al. (1998), in Kenya, one of the major causes of environmental degradation in fast track land reform areas is the land tenure system, which is mostly communal land tenure. Communal land tenure reduces the individual responsibility or accountability to environmental degradation taking place in fast track land reform areas though some cultivation areas which are individually owned remain protected. In 1985, before the fast track land reform programme in Kenya, there was freehold land tenure system which ensures private ownership of land and most farmers were properly managing natural resources in the farms because there was individual responsibility and accountability for environmental degradation taking place in these farms. Therefore, fast track land reform programme relaxed freehold land tenure system and promoted communal land tenure system which led to environmental (Barrow, 1991). Nhapi (2000) says in Namibia and Kenya, fast track land reform areas are facing a lot of environmental degradation, resulting in shortage of arable land, and people end up encroaching into the grazing land for crop farming purposes.

Conservation of the environment at Eastdale farm

The local communities are using some plant species which can easily establish themselves such as sisals, alfalfa and star grass along mechanical structures such as contour ridges and storm drains in order to strengthen these structures through soil anchorage. Some gum tree plantations are also being established in an effort to reduce soil erosion. According to Mukwada (2000)

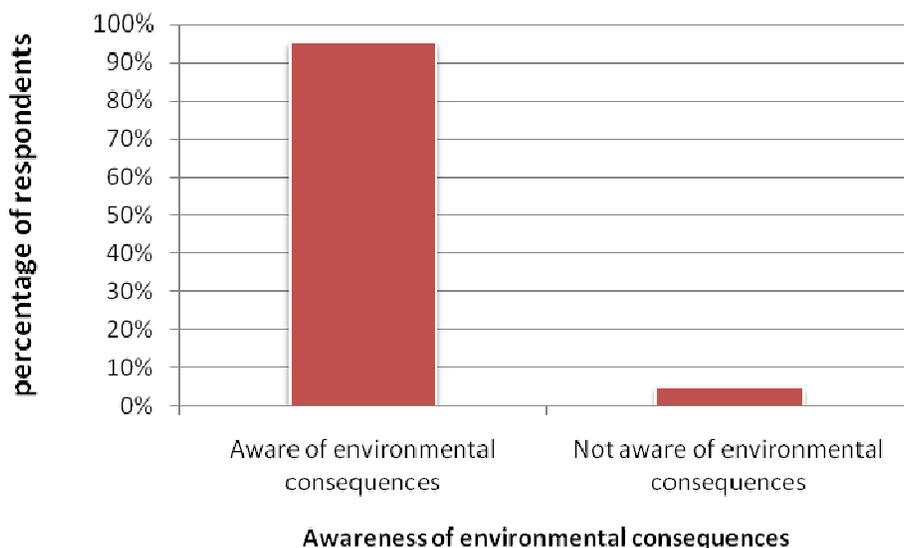


Figure 14. Awareness of environmental consequences of stream bank cultivation.

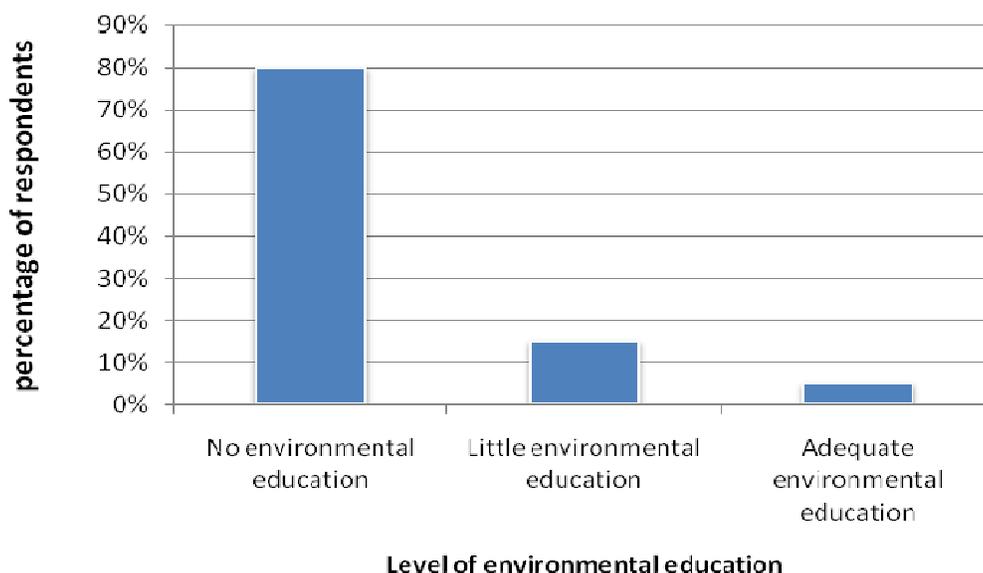


Figure 15. Level of Environmental Education in Eastdale A1 model farm.

effective biological measures of soil conservation involve the management of livestock populations and planting trees and grass to reduce the effect of running water. Livestock populations should be kept within the carrying capacity of the land. This means that the number of livestock should be kept within the limits that can be sustained by the land as shown in Figure 16.

The technical staff at Agricultural Research and Extension Services (AREX) and Environmental Management

Authority in the district is also encouraging local communities to make use of weirs in gully reclamation. Weirs are created when stone walls are constructed across gullies in order to dam any water which might be flowing in them. This raises the base level of the gullies, thereby encouraging deposition within the weir. The raising of the base level of a channel has the effect of reducing erosion while promoting deposition. Thus the newly resettled farmers are engaging in community development projects



Figure 16. Minimal cattle herds at Eastdale Farm



Figure 17. Coal used as alternative energy source for tobacco curing.

which also involve construction of the weirs. Plant communities establish themselves in the filled weirs, leading to the ultimate restoration of the gully (Whitlow, 1988).

In an interview with local traditional leaders, they indicated that traditional beliefs, taboos and customs limit people's access to natural resources in some sacred places in the area which limit people from cutting down certain trees. Indigenous Knowledge Systems (IKS) are also used to conserve natural resources in the area through traditional beliefs taboos and customs. These include punishing of offenders found cutting down trees in

undesignated areas and also those who pull sledges along roads which lead to erosion.

The settlers are also trying to use alternative sources of energy apart from firewood, for example solar energy through small solar panels for light and use on radios and other small electricity gadgets. Other sources of energy being used at the farm include, paraffin, biogas and tsotso stove as this will reduce the problem of deforestation. Coal is also used as alternative to firewood for tobacco curing as shown in Figure 17.

Key informants interviews with the EMA officials and AGRITEX officials revealed that the fast track land reform

programme was a failure in addressing the problem of overcrowding and environmental problems in the new resettled farms. The same environmental problems which were characteristic of the communal areas of Zimbabwe are also emerging in the fast track land reform areas. According to the research findings, the overall picture is that the fast track land reform programme has failed to address environmental problems in Eastdale A1 model farm.

CONCLUSION AND RECOMMENDATIONS

The researcher concluded that the government embarked on fast track land reform without seriously considering its implications to the environment. Little is being done on environmental awareness to the new farmers so as to promote sustainable development. There is also lack of environmental education among the settlers with limited approaches to solve environmental problems at the farm. The new settlers mainly rely on firewood as source of energy and tobacco curing which results in deforestation. Communal land tenure system in the newly resettled farms promotes serious environmental degradation as this gives all members of the community access to common property resources such as grazing land and it does not give individual responsibility or accountability to environmental damages. The environmental degradation is exacerbated by bigger families as well as huge livestock ownership which in the end exert more pressure on the limited resources by exceeding the carrying capacity. A1 model settler farmers are no longer complying with the set standard livestock units per settler which is eight herd of cattle of which most of the farmers have between fifteen to twenty beasts. Deforestation, overgrazing and cultivation of marginal land such as stream banks have promoted soil erosion and siltation of major sources of water in fast track land reform areas. Soil erosion is seriously experienced along roads to dip tanks, water points, areas around gates and access ways to the fields. Siltation is occurring in major rivers such as Sebakwe and Devure which have since been changed to seasonal and this seriously affected aquatic the ecosystems found in the area. Environmental Management Agency (EMA) has been trying to reduce all these forms of environmental degradation in Eastdale farm through gully reclamation, establishment of gum tree plantations and changing of gate positions in the paddocks but this has faced some resistance since the majority still do gold panning and rely on the natural environment for survival. There are also traditional conservation methods which are being used by settlers to conserve natural resources but these are not that effective as they lack enforcement. The research has the following recommendations in order to protect the environment in the newly resettled farms:

1. The government should seriously implement environmental protection laws and capacity building programmes to the communities.
2. Financial support need to be availed to the local communities through Environmental Management Agency (EMA) and Forestry Commission for conserving finite natural resources found in these farms.
3. Local communities should also be encouraged to start afforestation and reforestation programmes so as to maintain the aesthetic value or natural state of the environment.
4. Land tenure system need to be addressed so that newly resettled farmers are given title deeds and they will own the land as well as the natural resources through the freehold land tenure system which will promote environmental conservation.
5. Stakeholder participation and consultation of local communities in solving environmental problems is very important. Local communities are well endowed with Indigenous Knowledge Systems (IKS) which they have acquired for a long time due to their life time experience with their local environment. Thus these communities must be empowered and supported in implementing such initiatives to conserve the environment.
6. Good agricultural practices must be done in these farms through the help of environmentalists and the agriculture extension services. These include strip cropping and contour cropping among others.
7. Gully reclamation and other measures to control and reduce erosion need to be exercised in already affected areas so as to reduce the damage.

Conflict of Interests

The author has not declared any conflict of interests.

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