Government of the Republic of Malawi

Ministry of Agriculture and Food Security
Irrigation, Rural Livelihoods and Agricultural Development Project

Final Environmental Report for Usowoya Small Scale Irrigation Scheme

May 2009
USOWOYA SMALL SCALE IRRIGATION IRRIGATION SCHEME

1.0 Executive summary

An Initial Environmental Assessment on the establishment and operation of Usowoya Small Scale Irrigation scheme was carried out to determine its impacts. Project activities and their likely impacts on the biophysical and social economic components of the environment were predicted through consultations with communities and professional judgment. Based on the size of the scheme, nature of operations and its environmental setting, it was found out that the impacts of the scheme will be less significant, site specific and can be mitigated easily.

Activities on the establishment and operation of the irrigation scheme include laying of a piped canal, construction of feeder canals and distribution of water into irrigated plots, application of fertilizers, use of pesticides and clearing of virgin land downstream.

In Usowoya irrigation scheme it is the network of feeder canals that will introduce surface water over large areas creating favourable habitats for water borne and water washed disease. Such diseases include malaria, schistosomiasis, filariasis, onchocerciasis, diarrhea and dysentery. The diseases make people sick reducing their work time in the field and consequently their productivity. Effects of the diseases can be reduced through chemotherapy, interrupting the life cycle of the vectors killing adult vectors with insecticides, health education and environmental management that creates unfavourable conditions for the vectors. Construction and use of toilets, use of water guard and boiling drinking water are effective in reducing negative impacts of diarrhea and dysentery. The mitigation measures can be achieved by the communities themselves with assistance from Ministries of Health, agriculture, Irrigation and Water development and Non governmental organizations.
Malaria, dysentery and diarrhea are common in Usowoya while Schistosomiasis, filariasis and oncocerciasis are not because of the cold weather. However, their likelihood of getting into the scheme as a result of the creation of good habitat and the warming up climate is very high.

Use of child labour should not be permitted in the scheme. Everybody men and women should be given equal employment opportunity during laying of the piped canal.

Despite the negative impacts cited above, irrigation brings in a lot of good things such as food security, improved diets, cash income and generally improved living standards. With irrigation people can crop three times a year making them food secure. The surplus produce is sold for cash enabling farmers to obtain goods and services not available in the scheme.

Benefits provided by irrigation can be enhanced through use of high yielding seed, proper application of fertilizers both organic and inorganic, regular maintenance of canals to prevent interruptions on irrigation activities and identification of sustainable markets.
### ENVIRONMENTAL MANAGEMENT PLAN – EMP

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ACRONYMS

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<th>Abbreviation</th>
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<td>ADD</td>
<td>Agriculture Development Division</td>
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<td>EIA</td>
<td>Environmental Impact Assessment</td>
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<td>EPA</td>
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<td>EMA</td>
<td>Environmental Management Act</td>
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<td>National Environmental Action Plan</td>
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<td>NEP</td>
<td>National Environmental Policy</td>
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<td>IEA</td>
<td>Initial Environmental Assessment</td>
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<td>NIPDS</td>
<td>National Irrigation Policy Development Strategy</td>
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1.0 INTRODUCTION

The Government of Malawi through Ministry of Agriculture and Food security and the IRLAD project intends to raise peoples’ living standards in Usowoya by enabling them to attaining food security and cash income through irrigation. The Usowoya Irrigation Scheme is one of the twelve small scale irrigation schemes to be established in the northern region.

The proposed Usowoya irrigation scheme is within the Usowoya section of the Mphompha extension Planning Area (EPA) of Rumphi district in Mzuzu ADD. It is in the area of principal Group village headman Chivwenene. It is proposed that the scheme will draw its water from the perennial Luwatizi River.

Environmental impacts Usowoya Irrigation scheme will bring about are site specific and can be mitigated easily. As a result the scheme only needed an Initial Environmental Assessment and not a full fledged Environmental Impact Assessment (EIA).

1.1 Objective Of Initial Environmental Assessment (IEA)

The objective of the IEA is to identify and come up with mitigation measures for negative impacts and enhance positive ones. This is with reference to the biophysical and social economic components of the environment such as health, cultural heritage, water quality, food security, soil erosion catchment conservation, air pollution and local economy. The
base line information generated in the exercise is essential for making informed decisions during the process of integrating environmental considerations in the planning, construction and operation phases of the scheme.

1.2. Methodology

The exercise was carried out through consultations with the beneficiaries during a visit to the scheme. Physical checks on the prevailing biological, physical and social status in the scheme were also undertaken through observations. Literature review particularly focused but not limited to the various government policies and acts that make EIA a requirement for irrigation projects as outlined below.

1.2.1 The National Environmental Action plan (NEAP)

NEAP outlines environmental problems such as soil erosion, deforestation, water resources degradation and depletion, depletion of water resources and air pollution that are closely connected to irrigation and goes on to suggest how adequate environmental protection can be attained.

1.2.2 The National Environmental Policy (NEP) 1996

The irrigation sector of the NEAP aims to promote environmental sound agricultural development by ensuring sustainable crop and livestock production through sustainable environmental management techniques; it also provides pertinent guiding principles on how to increase crop production without compromising environmental quality.
1.2.3 Malawi Environmental Impact Assessment Guidelines (1997)

The Malawi Environmental assessment Guidelines together with the EIA guidelines for Irrigation and Drainage Project were reviewed as they provide important background information on how to conduct EIA.

1.2.4 The National Irrigation Policy and Development Strategy NIPSDS (2000)

The policy was also drawn upon since it clearly spells out the vision of the Department of Irrigation that is to achieve prosperity through irrigation by 2020 and provides guidelines on appropriate environmental management techniques that will sustain the desired production and prosperity.

1.2.5 The Environmental Management Act EMA (1996)

This is the major national environmental legislation that provides important generic guidelines on environmental management as well as conservation and sustainable utilization of natural resources.
2.0 ENVIRONMENTAL SETTING

The Irrigation Scheme is about forty hectares. It is among the few big irrigation schemes. The proposed scheme will be on virgin land that is on a narrow strip of wetland along a river which is the potential source of water for irrigation. The wetland vegetation is generally intact with only a small section downstream which is cultivated. Maize is currently the major crop grown in the cultivated section with farmers taking advantage of residual moisture. There is also sand mining going on in the area where maize is grown.
3.0 CURRENT AND FUTURE ACTIVITIES ON THE SCHEME

3.1 Laying A Conveyance Pipeline

Scheme members will be involved in digging and laying a pipeline

3.2 Construction of feeder canals

A network of feeder canals will be constructed to transform the area into an irrigation scheme. A considerable amount of water will be distributed to irrigated plots through the canals increasing the surface area of wetland.

3.3 Distribution Of Water Into Plots

People will be standing in water (canals) when directing water to where they want it.

3.4 Drinking/Washing From Feeder Canals

While irrigating their plots those who are tired and thirsty will probably drink water straight from canals as is the case with other schemes. People will also wash and bath in canals further contaminating the already unsafe water for domestic use.

3.5 Vandalism Of Pipes

Pipes especially steel pipes are likely to be vandalized because they are made into axes, panga knives and pots.

3.6 Vandalism of Hydrants

Individuals in the scheme might attempt to get water from the hydrants damaging them in the process.
4.0 ENVIRONMENTAL IMPACTS OF THE ACTIVITIES AND THEIR MITIGATION/ENHANCEMENT MEASURES

4.1 Water Borne Diseases

4.1.1 Introduction Of Network Of Feeder Canals – Malaria

A network of feeder canals and sand pits with stagnant water will create good breeding grounds for mosquitoes,

Malaria patients were reported to be very common in Usowoya especially in the wet season when it is warmer than usual. The disease was reported to cause a lot of suffering among both children and adults. Mortality rate from the disease was reported highest among children. Loss of capacity to work in their irrigation plots and a general reduction in the quality of life were among significant impacts among adults. The problem is widespread and severe with a significant rating of -2

4.1.1.1 Mitigation Measures

Mitigation measures for malaria include interrupting the lifecycle of the mosquitoes (larviciding), Killing adult mosquitoes (adultciding), medical treatment and creating unfavourable environmental conditions for the mosquito (environmental management)

1. Treatment – the negative impacts of malaria can be reduced or eliminated through chemotherapy. A number of drugs used to treat malaria are available in hospitals drug stores and groceries. The problem is that treatment is becoming difficult as the parasites have developed resistance to most commonly used drugs. Caution
needs to be taken on the kind of drug to be used and how it should be used. Government and private hospitals provide pieces of advice on correct treatment of malaria.

2. **Larviciding** – this is a mitigation measure that aims to reduce vector populations through the interruption of their life cycle by killing larvae. Larvae can be killed through use of environmentally friendly chemicals that are biodegradable or use of biological enemies such as fish that feed on mosquitoes. Fish ponds in area which are likely breeding grounds for mosquitoes could be ideal places for the introduction of fish that eat mosquito larvae.

3. **Adultciding** – this a mitigation measure is about killing adult vectors and mostly depends on use of chemicals sprayed on the internal walls of houses with residual DDT or spraying the inside of houses with insecticides such as doom that have a knock down effect. It should be noted that DDT is a long time banned chemical though its use in control of malaria is now allowed under strict supervision.

4. **Health Education** – the method promotes improved sanitation at household level in order to reduce human/pathogen contact. An example is sleeping in mosquito nets with mosquito repelling chemicals. Such mosquito nets provide personal protection and reduce chances of people contracting malaria. Usowoya community members need to be encouraged to acquire “Chitetezo nets” dispensed by local health centers for free or at subsidized prices.

5. **Environmental Management** - Environmental management prevents, eliminates and reduces vector habitats. The strategy creates unfavourable conditions for the breeding and existence of mosquitoes. This can be attained through good designs and construction of irrigation canals and lay out of irrigation plots that do not create pools and provide attractive breeding sites for mosquitoes. Draining pools and cutting off water from canals when
it is not needed for irrigation are among ways that can be used to create hostile conditions for the mosquitoes. Environmental management will significantly reduce incidences of malaria attacks in Usowoya. This could be the most effective way of controlling malaria.

4.1.2 People Standing In Water While Irrigating - (Schistosomiasis)

Schistosomiasis is currently not present in the area but may be introduced with creation of favourable habits for water snails through irrigation. Should it be introduced into the area, the disease will be common among children and adults that play or spend sometime in stagnant water. The likelihood of the disease getting introduced into the area is high and the suffering it may cause is rated at a significance of -3

Schistosomiasis does not cause immediate death but if infection is not treated for a long time, the bilharzia parasites migrate from the bladder to live in organs such as the liver, reproductive organs, the bladder and kidneys damaging them in the process. It is normally the damage of organs that may later cause death of the victim.

4.1.2.1 Possible Mitigation Measures

Possible mitigation measures include reduction of parasite populations through use of fish that prey on water snails or use of prescribed drugs available in hospitals. Environmental education that equips people with the knowledge and skills to avoid/reduce contact with the parasites is encouraged.
4.1.3 Increased Water Surfaces Area – Effect On Filariasis (Elephantiasis)

Filariasis is caused by parasitic filarial worms which live in lymph vessels. The worms block the vessels leading to swelling of limbs (elephantiasis), and enlargement of the stomach and male genital organs. Swollen organs reduce the working capacity of the patients in the field.

The worms are commonly transmitted by the culicine (culex) mosquito although the anopheles does transmit the worms in rare cases.

The disease does not exist in the area at present. Its non-existence is attributed to the generally hostile cool weather in the area.

Considering the current trend on global warming and its consequent climate change, it may not be very long before the area warms up sufficiently to create good habitat for vectors of the three diseases described above. It is therefore wise to have mitigation measures in place just incase environmental conditions change in favour of the vectors. The problem will be localized with a magnitude rating of -2.

4.1.3.1 Possible Mitigation Measures

Bilharzia, River blindness, and elephantiasis are vector borne diseases. The risk of contracting the diseases can be reduced through use of one or a combination of the following techniques; mosquito proofing of houses, sleeping in a mosquito nets and health education. Environmental modification and/environmental manipulation that destroy or reduce vector habitat are also recommended. Environmental modification involves strategies such as draining swamps, distributing just sufficient water for irrigation in order to prevent formation of pools of water, checking weeds.
from the canals and cutting off water from canals after irrigation to avoid creating breeding grounds for vectors.

Vector population can further be reduced by killing adult vectors with insecticides that have a knock down effect such as doom and interrupting the life cycle of vectors.

4.1.4 People Drinking From Canals - Diarrhoeal Diseases

Diarrhoeal diseases were reported to be very common in the area during wet seasons. Pools of water formed in the wet season were said to be breeding grounds of mosquitoes.

Diarrhoeal patients open bowels and lose a lot of body fluids in the process. Loss of body fluids can cause death particularly among children. Causative agents of the disease are transmitted through contaminated food and drinking water. Drinking contaminated water and eating contaminated food were blamed to be major causes of the outbreak of diarrhoeal diseases in the area. Generally people do not have the habit of washing their hands before eating snacks. Coincidentally the consultancy team picked a patient with severe diarrhoeal problem from the chief’s house to Mphompha Health Centre about 10km away.

4.1.4.1 Possible Mitigation Measures

1. Education - The disease can be controlled through education where people are taught how to observe hygienic practices such as
washing hands after using the toilet, washing fruits before eating, washing hands before preparing food or feed someone and boiling drinking water to kill germs.

2. **Proper use of fertilizer** - People should be trained on how to use right amounts of fertilizers and prevent the applied fertilizer from washing away into and contaminating canals and streams which are sources of drinking water.

3. **Improved sanitation** - People should be encouraged to construct and use toilets and observe general cleanliness at the household level.

4. **Water supplies** - Community members in the irrigation schemes should be provided with safe drinking water sources such as protected shallow wells and gravity fed piped water. No borehole was seen in the area. Gravity fed piped water developments would be a problem in the area because the potential river is located lower than residential houses.

4.2 **Soil Erosion and Sedimentation in the Catchment Areas**

4.2.1 **Catchment Conservation**

The catchment area for Usowoya is within easy reach of people. As a result there are a lot of activities taking place in the area such as collecting firewood, cutting poles and opening up new gardens. For sustainability, the catchment needs to be protected or conserved in an integrated manner.
4.2.1.1 Possible Mitigation Measures

Considering the fundamental hydrological functions of catchments as regulators of water regimes, ground water recharge, water quality improvement, and flood control, it will be necessary to conserve the areas using the integrated approach. Integrated catchment management is based on the understanding that water is an integral part of the ecosystem, a natural resource, and a social and economic good whose quantity and quality determine the nature of its use.

The approach requires that all the stakeholders should be involved in the planning, and implementation of conservation activities. There is need for effective coordination and collaboration among all stakeholders, full awareness and understanding of environmental problems that come with poorly managed catchments and rules and regulations (by-laws) that support catchment conservation.

Establish a multi stakeholder team of experts that should be charged with the responsibility of managing the catchment. Experts should come from the community, NGOs and government departments. These should be trained members or should be provided training where necessary to build their capacity. The existing Water Users Association with experts from agriculture and forestry could make such a team.

The team of experts should, through a consultative process involving community members, and different sectors, identify problems in the catchment that are interfering or likely to interfere with the hydrology of the
area and formulate workable solutions to the problems. Planting trees, letting the indigenous trees regenerate, and promoting ridging on contour where there are gardens are some of the many solutions work in catchment conservation.

Active and Effective participation of the entire community and relevant sectors should be encouraged in all catchment management activities. Naturally good collaboration between various sectors and local people increases the chances of success in achieving natural resources conservation at the community level.

Implementation of the integrated catchment management requires the support of appropriate rules and regulations (by-laws) that are formulated by community members themselves. Preventing people from opening up new gardens in the catchment, requiring those that have gardens in the catchment to ridge on contour and preventing people from cutting down trees in the catchment are some of the possible by-laws.

There are a lot of activities in the catchment of Usowoya such as cultivation, footpaths, homes and a school. All these can degrade a catchment within a few years. It is therefore recommended that suggestions on integrated catchment outlined above should be implemented immediately.

4.2.2 Soil Erosion Control

The upper part of the irrigation scheme near the source of water is steep and vulnerable to severe erosion with a significance rating of -3.
4.2.2.1 Possible Mitigation/Enhancement Measures

Land under irrigation in this section will need closely spaced physical structures to check erosion. Spacing between the structures can get wider further down stream where it gets gentle.

4.2.3 Flooding And Water Logging

Usowoya scheme is very close to the source of the main river and its catchment is small. This means that chances of sufficient water collecting to flood the scheme are not there. Floods can however occur down stream after a number of tributaries. Soil and vegetation types indicated the area gets water logged.

4.2.3.1 Possible Mitigation Measure

Water logged areas down stream should be left undisturbed because they provide vital ecosystem services and perform important ecological functions such as purification of water and regulation of water flows.

4.2.4 Use Of Fertilizers And Pesticides

Not much is happening in Usowoya in terms of agricultural production and use of pesticides/fertilizers. There is only one family owning a small plot of maize in the scheme. The owner does not use fertilizer but depends on nutrients that come with runoff.

4.2.4.1 Possible Mitigation Measure

Wetland vegetation down stream is established well enough to control flooding and purify water flowing down stream.
5.0 BENEFITS THAT COME WITH IRRIGATION

5.1 Production And Sale Of Crops -Benefits Of Irrigation

Individuals from two families that are already growing maize in the scheme cited food security, and cash income realized from sale of surplus produce as the significant positive impacts of irrigation. The cash enables them access goods and services not available at the scheme. The result is that they are leading better and more comfortable lives now that they are food secure and have money – with a significance rating of (+4)
6.0 IMPACT ASSESSMENT OF A PIPELINE

At present earth canals are used to distribute irrigation water to various plots in the scheme. It is, however, proposed that within the near future, the main canal should be piped. Impacts of a piped lined are provided below.

A buried piped main canal has been recommended for Usowoya irrigation scheme based on its gentle slopes and clayish soils that are not easily washed away.

The buried pipeline canal represents a technology a step ahead of the brick lined canal in terms of saving water as well as eliminating some health risks. Normally piped canals are expensive to by and maintain in the long run. Their use in irrigation schemes is better justified by production of high value crops such as tomatoes and vegetables that will quickly bring returns and pay for the pipes. Maize the main crop in the scheme may not be the right crop to contribute towards the pay back of the cost of the pipe.

Types of pipes that can be used in irrigation include plastic, galvanized and steel pipes. The pipes have advantages and disadvantages as outlined below.
6.1 Use Of Plastic Pipes

Plastic pipes are cheap and easy to install in irrigation canals. Their major weakness is that they are easily punctured or broken by vandals. They also break if there is excess water pressure in the pipe. If not buried deep enough the pipes are cut by hoes of farmers working in their gardens and at times pieces of the pipe get removed by vandals. In such circumstances irrigation work in the field gets interrupted and production goes down. Replacement of stolen sections of the pipes is expensive with a significance rating of -3.

6.1.1. Possible Mitigation And Enhancement Measures

High density pipes with a reasonable thickness that will resist puncture by hoes and breaking under water pressure should be used. Pipes should be buried deep enough to prevent people from accidentally breaking them as they work in their gardens and to make it difficult for thieves to steal them.

Preventing people from settling or opening up gardens where the pipe line passes is another good method for safeguarding the pipes. Plastic pipes do not rust and this makes them very suitable for irrigation.

6.2. Use Of Galvanized/Steel Pipes

Galvanized/Steel pipes are expensive but have the advantage that they are protected with a coating that makes them last long before rusting, they are not easily punctured and can withstand intense water pressure. Despite the protective coating, galvanized/steel pipes eventually rust. The rusting is faster if the pipes are placed in acidic soils or soils that have significant variations between aerobic and anaerobic conditions that will
promote oxidation of the pipes. With time water may also cause rust and erode the weakened rusty parts of the pipe.

Replacement of rusty pipes is expensive. Rusty and leaky pipes seriously interfere with operations of the scheme reducing its productivity. The pipes may also get blocked, preventing and removing blockages is often labour intensive and time consuming with an importance rating of -3

6.2.1 Possible Mitigation & Enhancement Measures

Install pipes with gauges corresponding to the intended purposes. Right diameters should be used to avoid the pipe line from being blocked by small objects. Debris and staff that can block the pipes should be kept away from the inlet. The pipe should be buried deep enough to protect it from theft or accidental damage. Project managers should avoid placing galvanized/steel pipes in acidic soils if the pipes are to last long.

6.3. Vandalism of Pipes

Irresponsible people will break or steal the pipes regardless of whether they are plastic, galvanized or steel. Galvanized and steel pipes are the more vulnerable to vandalism because they are good raw material for making hoes, axes and cook stoves and other farm implements. Replacement of destroyed and stolen pipes is expensive and could be beyond smallholder farmer’s capability. If nobody assists with the replacements, loss of a pipe would mark the end of irrigation. This problem will need replacement of pipes and rate at -3.
6.3.1 Possible Mitigation & Enhancement Measures

People should be educated that the pipes are intended to benefit all scheme members and not individuals and therefore they are better left untouched. Pipes should be buried deep enough to make it difficult for thieves to steal. Frequent patrol of the pipeline will help keep away vandals. The pipes should be on stable slope to prevent them from sinking and bending.

6.4. Water saving by pipes

When in good condition water in the irrigation pipe is not lost through evaporation or seepage increasing the efficiency of water utilization in the scheme. But if the pipes are broken and leaking a lot of water is lost into the soil unnoticed with very little getting to irrigation plots.

6.4.1 Possible Mitigation & Enhancement Measures

Patrols of the pipeline to check leakages should be done regularly to facilitate quick and timely correction of problems before they get unmanageable. Sections of the canal with green vegetation when it is dry all around would be a good indicator of a leaky pipe. Repairs should be done immediately to maintain and enhance the productivity of the scheme.

6.5. Vandalism Of Hydrants

Hydrants represent good outlets of irrigation water from the pipeline canal. Their positioning should be well thought of before fixing them because changes could can be time consuming and expensive. Those that want to use hydrants as taps will be there in the community.
6.5.1 Possible Mitigation & Enhancement Measures

Their performance can be enhanced if the project can train a few specific people to operate the hydrants to ensure proper use and prevent damage. Abuse of hydrants as taps for drinking and washing should be discouraged. Survey of the piped canal route should be accurate enough to prevent shifting the pipes that might end up damaging them. Education on use and care of the hydrants would be the most effective.
## ENVIRONMENTAL MANAGEMENT PLAN – EMP

<table>
<thead>
<tr>
<th>Activity</th>
<th>Impact identified</th>
<th>Mitigation measures</th>
<th>Time target</th>
<th>Who implements</th>
<th>Partner Institution</th>
<th>Resources</th>
</tr>
</thead>
</table>
| 1        | Introduction of a network of canals  
Distribution of water. | People suffering & dying of malaria, loss of productivity and income | Kill mosquito larvae and adults. Health education.  
Environmental management | Construction on | Community members | Min of Health Communities  
Min. of Agric  
IRLAD | Chemicals and teaching/learning materials  
K65,000 |
| 2        | People standing in water when irrigating | People suffering from bilharzia | Medical treatment  
Interruption of parasite life cycle, Environmental management  
Health Education | Planning to operation phases | Communities  
IRLAD | Min of Health  
Dept. of Fisheries  
Min of Agric. | Drugs  
Teaching/learning materials  
K34000 |
| 3        | Increased area under surface water due to irrigation  
Creation of mosquito breeding grounds  
People suffering from elephantiasis | | Environmental mgt.  
Medical treatment  
Surgery to remove fluids  
Sleep in mosquito nets | Planning to operation phases | Min of Health Communities  
IRLAD | Min. of agric.  
Min of Irrigation  
Min of Health | Personnel  
Medical drugs  
K34,000 |
| 4        | Increased area under surface water due to irrigation  
Community members suffering from river blindness. (Onchocerciasis) | | Environmental management  
Treatment with eye drops | Planning stage  
As required | Community members  
Min. of Health | Min of Agric  
Min of Irrigation  
Community Welfare | Trained personnel  
Medical drugs |
|   | People drinking from canals  
(feeder canals) | People suffering from diarrhoea and dysentry | Construction and use of latrines  
Health Education  
Production and administration of oral re-hydration fluids | Operations | Community members  
Min of Health  
IRLAD | Dept of Social welfare  
IRLAD | Health trained personnel  
Drugs availability in hospitals and Health centers  
K24,000 |
|---|---|---|---|---|---|---|---|
| 5 | Installation of piped canal | Surface area under water minimal  
Disease breeding ground reduced. | Choose pipe with good strength  
Use pipe with right diameter  
Replace broken pipes | Installation and operation phases | Communities  
Min. of Health  
IRLAD | Min. of Agric  
Brick makers  
IRLAD  
NGOs in the area | Trained personnel  
Medical drugs  
K8000 |
| 6 | Vandalism of pipe and hydrants | Interruptions in irrigation  
Loss of productivity  
Expensive to maintain  
Leakages | Regular patrols of pipe line by communities  
Prosecute vandals | Construction to operation phases | Community members | IRLAD  
Min. of Agric  
Min. of Irrigation | Tree seedlings  
Labour contribution from community  
K100,000 |
| 7 | Vandalism of hydrant | Broken hydrant  
Interrupted irrigation  
Reduced production | Teach people how to use hydrant  
Have by-laws on use of hydrant | Installation and operation phases | Community members  
Min of Agric  
IRLAD | IRLAD  
Min. of Agric  
Min. of Irrigation | K10,000 |
| 8 | Provision of equal employment opportunities | Men and women given equal employment opportunities | Advertise jobs and encourage women to apply | During pipe installation. | Contractors  
Communities | IRLAD  
Min. of Agric  
Min. of irrigation | Funds for wages  
K85,000 |
7.0 CONCLUSION

The Initial Environmental Assessment has established that environmental impacts the irrigation project will bring in Usowoya are insignificant, site specific and can be migrated or reversed easily. This means that the project will bring more benefits to community members in Usowoya than negative impacts. Some of the benefits include food security, cash income generated by sale of produce and a general improvement in the living standards of the people.

The negative ratings in the impact assessments are not a reflection of the current situation on the ground. They are based on the likelihood of the problems being introduced into the scheme with changes in circumstances as explained in the text. Even if introduced, their mitigation measures will be attained easily as detailed in the EMP.

The report meets government standards and requirements in carrying out an EIA by following procedures and guidelines provided in various policies and acts.
References


Environmental Affairs Department, 1997, Guidelines for Environmental Impact Assessment in Malawi, Lilongwe


Malawi Government, 1996, Environmental Management Act

Malawi Government, 1996, National Environmental Policy

Malawi Government, 2000, National Irrigation Policy and Development Strategies
Terms of Reference for Environmental Impact Assessment and Environmental Management Plan of the proposed Irrigation Scheme.

From an environmental and social safeguard point of view IRLADP is classified as Category B project. That is, the environmental and social impacts of the project are expected to be minimal, site specific and manageable to an expected level. Therefore, a preliminary environmental assessment for each proposed small-scale irrigation site shall be produced. Issues to be addressed will include but not limited to:

- Soil erosion and sedimentation in the catchment areas where the project site are located;
- Flooding and water logging;
- Water borne diseases (malaria, onchocerciasis, schistosomiasis, etc);
- Fertilizer and pesticide application;
- Effects on quality of water in downstream receptors; and
- Re-settlement of affected population if needed.

The Consultant will prepare an environmental management plan (EMP) – and incorporate its elements fully into detailed design of the scheme. Both the environmental EMP will be submitted as a part of the Feasibility Report.
BENEFICIARIES INTERVIEWED

1. Nextone Ndala
2. Brenda Msowoya
3. Joseph Matchere
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6. Eddens Msowoya
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