

6.7 Social Issues and Risks in Project Zone

Fundamental changes in traditional livelihood and farming systems in the irrigation area can be anticipated for the whole of the project zone. Land productivity and gainful employment opportunities will be greatly increased. This may create incentives for male household members to become more active in agriculture and related rural services and processing. Income earning opportunities in Harare and other major towns, together with the tradition of male migrant labour force working in the mines, has meant that women are especially predominant in the agricultural sector. According to the 1998 Zimbabwe Human Development Report 41% of households in rural areas are effectively headed by women.

(1) Employment generation

Increased returns from agriculture with economic recession affecting formal sector employment opportunity could bring men back to their homeland areas. This could reinvigorate rural communities and at the same time relieve urban areas of the social and environmental pressures associated with increasingly poor public funding and provision for housing, sanitation and transportation services in urban areas—an indirect environmental benefit. Eventually the increased agricultural production could bring increasing off-farm opportunities for male workers in agricultural support enterprises, such as workshops and food processing industries. Improvements in economic infrastructure and services should improve “farm gate” prices, increasing productivity and in turn ancillary opportunities.

Unmarried and “under-employed” men remaining in rural areas are often involved in livestock husbandry through a variety of contractual relations. These men may be encouraged to work on the new irrigated household plot, provide ploughing services or take up wage labour on the plots of others. This could influence livestock management strategies.

(2) Plot allocation and water delivery

The key to the successful implementation of the project is in developing a system of plot allocation, or land redistribution, within affected Wards and VIDCOs which is seen to be fair by all households. There is a potential need for a massive re-allocation of land and entitlement to willing farmers on available irrigation plots. Some farmers will have to cede dryland fields to others where these fall within designated irrigation areas, and may in turn wish to acquire dryland or grazing elsewhere as a security.

The biggest negative social impacts could come from a failure of DWD and Agritex to deliver the necessary quality of technical services, management infrastructure, water supply and extension support for the new agricultural technology. For a sustainable irrigation project farmers must pay for at least the variable costs of water supply

systems to include the operation and maintenance costs of the irrigation network.

If water is not seen to be delivered equitably and reliably, experience suggests farmers will resist paying irrigation or water charges. This will in turn make it increasingly difficult in the long term to ensure irrigation water delivery in accordance with planned needs and water allocation arrangements. Farmers will also resist investing in costly inputs for the higher yields which justify the investment in irrigation.

(3) User group cohesion

Where water user groups lack mutual support and social cohesion there is potential for conflict between farmers and the break down of such user groups—especially at critical times in the agricultural calendar when water is in short supply, or, in the case of long term supply restriction. Those of influence tend to obtain water when they wish to the detriment of weaker members of the community. Men may try to influence decisions against female headed households in the allocation of water.

Over-watering and inefficient in-field water use can lead to water-logging on other fields or spillage and system losses at the bottom end of an irrigation area, a possible health hazard. It can also, under perhaps different weather conditions, lead to critical shortage at the tail-end of an irrigation system, making these farmers suffer poorer harvests for perhaps similar outlays and thus greatly reduced gross margins and fee repayment capacity. A tendency to default on water charges and social antagonism can be anticipated.

Fencing to stop trampling of crops and structures by animals along particular canal stretches may be critical to the avoidance of conflict between the interests of cattle owners or minders and farmers. Provision of cattle watering points and canal crossing points must be integrated into scheme design if there is not to be damage to irrigation infrastructure.

(4) Participation levels

A major concern is that volunteer farmers may not be sufficiently production oriented or “profit-maximising”. They will play safe with their subsistence crops and could lose faith in supplying cash crops if there is any inconsistency (or poor faith) in private sector crop purchasing. This can drastically affect the capacity of farmers to pay for inputs, water charges and/or credit. Farmers may also resist pressure for multiple cropping because leisure time is highly valued for cultural and social reasons, restricting repayment capacities and scheme operational viability.

Of some significance also are *chisi* days, when traditional culture forbids work of any kind for about a day a week. Non-observance would bring hazardous consequences, poor rainfall and even drought.

6.8 Health Risks

If the project is successful in increasing the agricultural productivity and incomes of intended beneficiaries there is an obvious welfare benefit. Nutrition will be improved especially if fishponds are developed and lake reservoir fish is available and affordable. Likewise transport to clinics and hospitals, and medicines for illnesses, will become more affordable to the beneficiary population. The project is also intended to increase availability and access to clean drinking water by borehole development because canal waters may not be potable.

A potential negative impact however will be the increased risks from waterborne diseases, especially malaria and bilharzia (or schistosomiasis), so closely associated with irrigation development in Africa. Malaria is already a very serious problem in the Sanyati and Gokwe area, particularly in the wet season, and its occurrence can only be made more pervasive throughout the year by the creation of habitats for egg laying and larvae development throughout the year.

Likewise irrigation systems and dams (storage reservoirs, canal drains, overflows or spillage ponds) provide habitats for snails, the intermediate hosts of the parasite *Schistosoma haematobium* (bladder infection) and *Schistosoma mansoni* (intestinal infection), which causes a serious debilitating, if treatable, disease. Urination or defecation by an infected person into a canal or other waterbody allows the release of eggs into the water as “miracida” which in turn infect and reproduce asexually in the snail (sp. *Bulinus physopsis* for *S.haematobium* or *Bulinus pfeifferi* for *S.mansoni*). The snails of each of these species then release “cercariae” into the water which on contact with a human—often small children—can, if within 24 hours, pass through the skin to the liver via the blood system.

In the human, as primary host, the *cercariae* develop into male and female bilharzia worms which adhere and reproduce in the liver or other organ. The disease is caused by both release of toxic waste products during the life of the worm (5-6 years on average, but up to 30 years) and especially by damage caused by trapped eggs which fail to pass out of the body causing tissue reaction and leading to organ malfunction. Re-infection can occur immediately after treatment so prevention measures may be more cost-effective than treatment.

7. Environmental Management and Mitigation Plans

7.1 Environmental Management Plan: Responsibilities, Organisation and Policy

7.1.1 Proposed Administration Structure

The Lower Munyati Dam and Agricultural Development Project is a very large project. In order for it to be successful the issues raised in Section 6: Potential Impacts need to

be managed very sensitively and carefully. It is important to try to pre-empt potential problems by having appropriate management structures with clear areas of responsibility already in place at the beginning of the project. Good communications and information dissemination are important especially where sensitive issues like resettlement and land re-allocation are involved.

It is proposed that within the project implementation management structure a resettlement and environment unit should be created to supervise such matters and work closely with other project divisions and Agritex, also with other district and national authorities, including DERUDE and DDF. This unit would be called the "Resettlement, Community Participation and Environmental Management Division". It will have the same status as the "Engineering Division", "Agricultural Division" and "Administration and Finance Division". Its head will be answerable to the overall Project Manager and will attend all important project management meetings.

Under the head of this Division will be three Sections:

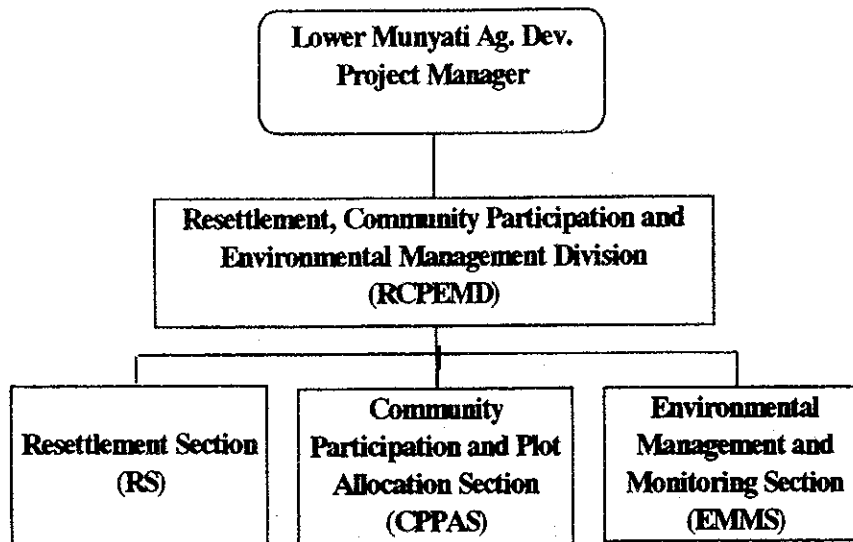
Resettlement, Community Participation and Environmental Management Division (RCPEMD)

- Resettlement Section (RS) : two year mandate***
- Community Participation and Plot Allocation Section (CPPAS) : 5 years***
- Environmental Management and Monitoring Section (EMS)***

7.1.2 Activities of RCPEM Division and Sections

Clearly the extent of involvement or importance of assigned individual tasks will change over time. The organisational structure is suggested /as follows:

- Organigram for Management of Social and Environmental Components -



During the various implementation phases of the project the Sections will have the following responsibilities:

Resettlement Section (RS)

- Resettlement policy and programming
- Implementation of final Resettlement Action Plan
- Liaison with NGOs, Agritex and DAs offices

Community Participation and Plot Allocation Section (CPPAS)

- Defining land re-allocation policy and modalities
- Planning land re-allocation
- Managing NGO involvement in facilitation
- Receiving appeals and assisting in arbitration of disputes

Environmental Management and Monitoring Section (EMMS)

- Reservoir area environmental management
- Construction site impact mitigation, health and safety
- Defining conservation zone plan with National Parks (NPWD)
- Implementing buffer zone land use plan, recreation and fisheries promotion
- Monitoring project social and environmental parameters and communicating to project management and the public

It is proposed that an internationally recruited head of the RCPEM Division be in post from the beginning of dam construction with a qualified assistant and three support staff and two vehicles. The head needs to have extensive experience in Africa (10 years) and in environmental management and monitoring of large projects. He needs excellent work planning, staff management and communication skills. The functions can after full implementation be merged with those of the ongoing Environmental Management and Monitoring unit. His assistant or deputy will have a similar profile, but could be recruited regionally.

The **Resettlement Section** will need to be functional from the end of the detailed design phase when the Resettlement Action Plan will be established. The resettlement should take place from the beginning of dam construction activities which would continue from about 2003 until 2007. It is tentatively suggested that there might be a staff of six professional persons and six support staff, including drivers and secretarial assistance. It should be headed by an internationally recruited person or highly experienced and respected regional person (10 years), having recent project management experience. His assistant will have 5-10 years experience of a similar project management nature.

The **Community Participation and Plot Allocation Section** would be required to be functional from the beginning of irrigation area development, currently programmed from 2007-2010. It would probably need to be functional for some five years from about 2006. It might contain as many as 6 professional staff with social and rural development experience in managing community involvement and participation. Reputable NGO background with project management and team leadership experience will be appropriate. The head of Section should have 10 years experience in Zimbabwe or neighbouring African countries and his assistant 5-10 years.

The **Environmental Management and Monitoring Section** will need to be functional from the same time as the Division itself and continue beyond the life of the implementation management structure. There might be a staff of four and the head (10 years experience) could possibly be recruited regionally along with his assistant (5-10 years experience). The head and probably two other members of the professionally qualified section team will need a scientific background covering water quality monitoring, use of chemicals in agriculture and health programmes and environmental conservation. A fourth member of the team will be a social scientist with experience in rural development.

A total of about 10 vehicles for the various sections (including senior staff) and 10 motorbicycles are required.

7.2 Construction Phase

7.2.1 Employment Generation and Social Issues

Construction will bring employment benefits to many. There will be a large influx of skilled and semi-skilled persons living in camps near to the dam construction site and in the area of major works for irrigation scheme construction. The vast majority will be men. Housing, sanitation, medical and recreational facilities must be planned to mitigate the indirect impacts of impermanent construction camp settlement, including waste disposal, disease transmission and local social disruption.

In the construction period as many as 200 skilled Zimbabwean engineers (30-50 foreign personnel) could be engaged, together with some 1,000–1,500 during the 5–7 year dam construction period. In the downstream irrigation area as many as 1,000 men and women might be engaged in temporary construction works while the main and secondary irrigation canals are constructed. The employment policy should not discriminate against women when presenting themselves for work on the project. It may be appropriate to consult VIDCOs and kraal-heads to determine a consensually agreed recruitment policy.

Codes of conduct in respect of national and international occupational health and safety standards will be respected. Facilities for labour camps should include health services and recreational facilities. Environmental criteria need to be incorporated into siting of accommodation and office units, including sanitation and waste disposal. There must also be respect for any possible archaeological artefacts, including human remains, which might come to light in excavations. The policy will be that these must be reported immediately to the *Environmental Monitoring and Management (EMM) Section* and the Project Manager.

7.2.2 Pollution and Erosion Management

To ensure the integrity of watercourse systems a policy of pollution and siltation control needs to be adopted. Oil changes for mechanical equipment should be made at designated workshop sites and a policy of re-utilisation of used oil for timber preservation can be incorporated. Waste oil will be offered for use to the local communities.

Vehicle access routes should be constructed to minimise possible erosion and runoff into river courses. Around construction sites and quarries the excavation of siltation traps should be undertaken in line with normal good engineering practice. In the downstream area similar principles of good practice should apply in the construction of irrigation systems, including canals and other structures.

All these aspects will be monitored by the *EMM Section (EMMS)*.

7.2.3 Borrow Pits

Examination of project engineering plans shows that all fill materials will be sourced from within the inundated area. Therefore there will be no important implication for landscaping of borrow areas. *EMMS* will advise and monitor as necessary.

7.3 Resettlement Plans

7.3.1 Planning Principles: Participation and Equity

In line with government policy, laid down in EIA Regulations 1994, there will be as many settlement options as feasible presented to those who must be moved from the submerged area. It is tentatively proposed with the agreement of the Chief of Sumambwa that communities would be moved *en masse*, as a collection of VIDCO area kraals to resettlement villages.

These resettlement villages will either be on acquired dry land with equivalent or better water and grazing provision or, if kraal populations wish to be irrigation farmers, in the block of in-command irrigable land south of the Chemvuri tributary of the Munyati, this might also be possible. The recommendation, however, is not to move groups from one area into another, for example from one chieftaincy to another, nor too distant from original places of habitation.

Those not being resettled and still living in the local area of the dam should be allowed as much access as possible so they can benefit from the new resource created. The *EMMS* will be responsible for setting up a management plan for the reservoir zone and managing appropriate access

7.3.2 Issues Affecting Extent of Required Resettlement

There are three Wards which will be directly affected by the dam construction and the creation the supply reservoir. In order of potential impact they are: Mabura Ward and Sidikeni Ward in Kwekwe District and, to a lesser extent, Ward 17 (a resettlement scheme) in Kadoma District. The actual numbers to be affected will depend on three factors: a) the height of the dam and the impounded reservoir, b) the resettlement policy, and c) the extent of any possible protection or buffer zone around the dam.

Height of the dam : The dam height adopted implies a reservoir with full supply level on the 950 metre contour line. Alternative project scenarios involving a less ambitious project in terms of extent of main canal and command area size were examined in the initial appraisal to see the different effect of a 940 metre contour. The figure above shows that the comparative resettlement implication is not large in terms of kraals and land which would be physically submerged. More significant are agreed resettlement policies and decisions about the value of imposition or otherwise of a protection zone.

Project resettlement policy : The issue is how people should be moved and compensated for loss of agricultural fields, houses, grazing and water sources. As a matter of principle, it is felt that it is much better to move whole communities affected by loss of livelihood resources than lists of individuals. Almost all the inhabitants of two VIDCOs (Batanai and Kubatana) on the south side of the Munyati would be affected and it is tentatively suggested that complete kraals and entire VIDCOs might be resettled.

Protection/recreational area : Even more critical than the height of the dam is the adopted policy regarding the need, or otherwise, of a lakeshore or localised protection area around the dam and its various inlets. For example if this were to trace a 2 km exclusion zone around the reservoir, as has been suggested, this would have drastic consequences for the number of people requiring resettlement or being affected by denied access to agricultural land, grazing and dry season water sources.

There is a good argument for taking only conservation/recreation areas that are useful for these purposes and to allow as much controlled local access as possible. In many cases about 75-100 metres around the lake shore.

7.3.3 Alternative Inundation Area Resettlement Scenarios

Table 2 presents various different scenarios for resettlement with their implications. The two preferred resettlement options are "Resettlement Scenario 1" and "Resettlement Scenario 2".

Resettlement Option 1

The first of the options is the creation of a buffer zone of 2-3 km around the dam, with a recreation area and limited access rights to local people.

Resettlement Option 2

"Resettlement Scenario 1" assumes the evacuation of three VIDCOs, necessitating only limited additional compensatory measures for those affected by loss of grazing and water access. Indirectly affected persons will benefit from access and employment.

Resettlement Option 3

A third scenario, "Resettlement Scenario 2", is for evacuation of two VIDCOs (Batanai and Kubatana). This may require some additional ad hoc resettlement of households especially with a reservoir extending to the 950 metre contour.

Resettlement Option 4

A fourth scenario, for comparative purposes, assumes minimal resettlement to cover only households submerged and those very close to the dam reservoir.

A proposal to develop an extensive buffer zone around the dam would necessitate either much local dislocation (physical, social and psychological) or alternatively very complicated and potentially unmanageable requirements for fair compensation. Nor does there appear any technical justification. There may also be considerable local resentment if a generous policy of access were not entered into. As much access should be accorded as possible so long as there is no conflict with sustainable natural resource management.

On the north side, the existing Resettlement Scheme (Ward 17) should protect the lake and land management can to a substantial degree be controlled by government. Technical arguments suggest that siltation risks are low and will be greater from upstream catchment areas covering many hundreds of square kilometres rather than the 20-25 sq. kms in a 2-3 km zone around the dam.

7.3.4 Proposed Resettlement Modalities: "Complementary Approaches"

It is estimated that about 500 farm families will require resettlement. Zimbabwe and Agritex have mixed experience regarding resettlement. The project must take full responsibility for managing its own resettlement requirement in liaison with the District Administrators office. The project can then be sure that successful resettlement is achieved and no negative publicity is attached to the project at the start so that all affected persons are fairly treated. Project affected persons and their representatives will need to be involved in decision-making.

It is strongly recommended that a reliable NGO preferably with international accreditation is employed to "facilitate" the resettlement process. The financial resource requirements for this will be very small and their involvement will ensure there is no bad feeling towards the government and project implementation management.

7.4 Land Re-Allocation in Irrigation Areas

7.4.1 Project Policy and Approach

(1) Principles

The adopted approach for much smaller schemes so far developed has been for local leadership (DA's office, councillors and traditional leaders) to draw up lists of interested farmers from the vicinity of a project and select farmers on a more or less consensual basis. Depending on the size of plot allocated beneficiaries have in some cases been restricted to the existing dryland farmers, on other schemes where the plot allocation has been smaller, and there is greater demand, selection is said to have been by drawing lots.

Those living closest to their fields will likely produce the best crops. To live close-by

is to "be involved"—it enables greater labour time input, with reduced costs in transport and storage of inputs and harvests, and regular presence guards from intrusion and theft. Distant farmers cannot render the same care and attention. Where new houses and settlements need to be built the traditional and local representative leadership must be consulted on matters of location and acceptability.

Women must not be excluded as potential plotters nor as plotters be allowed to become "vulnerable to the whims of the menfolk, whether they be husbands or male government officials" (Vijfhuizen in Manzungu and van der Zaag eds. 1996). The participation of women and their work may arguably be more critical to the implementation success of the project than the involvement of men.

Project transparency in plot allocation is critical for this project. It is suggested that within each Ward plot allocation be determined by the members of the Ward themselves and that as far as possible each Ward consider its new irrigable land as a new resource to be shared within its Ward. Only in special cases of insufficient interested farmers should offers of irrigated land be made across Wards. It is believed that a top-down or "over-rationalised" approach is sure to fail and create a plethora of minor conflicts.

(2) Selection Criteria and Method

Naturally those women and men who are cultivating in new irrigation areas should be given an automatic right to be allocated a plot. After this, Agritex, with NGO assistance, should have lists drawn up of willing irrigators in the local kraals. In cases where there is excess local demand additional selection criteria must be brought to bear. NGO personnel will be involved in organising this process under contract to the *Community Participation and Plot Allocation Section (CPPAS)*.

These criteria must include reasonably close access, experience with cash crops and, if possible, evidence of commitment and capability (Master-farmer certificates are rare in the area and not necessarily appropriate as selection criteria). Government servants and their households are said to be barred from plots. Whether new settlements might need to be constructed close by isolated irrigation tracts needs to be established.

Before lots are drawn a list should be made public by the NGO organisation with opportunity for complaint against those who do not fulfil the criteria. It is proposed by the project that the project office in the form of the *CPPAS* of the *RCPEMD* can act as independent 'counsel' and be responsible for the drawing of lots after the local participative process of self-selection for the lists has been undertaken. Agritex will facilitate the planning process and draw plot maps.

It will be through local consensus who gets which plot so that those living on one side of a scheme do not have to travel unnecessarily to the other side and *vice versa*.

Planning and allocation of plots must be by mutual agreement of interested farmers.

7.5 Multi-Purpose Reservoir Area Management

7.5.1 Access and Community Involvement

It has been proposed that there should be as little disruption to local people's use of resources as possible commensurate with sustainable use of these natural resources. Prioritising local employment in the facilities developed should be a guiding principle. The initial desire to create a wide buffer zone around the lake has little justification on technical and economic grounds. An inherited and unwritten colonial policy of a wide and exclusive buffer zone to keep out local people around dams will have very low social acceptability. This does not mean that there be no control or management of access to the lake.

7.5.2 Protection Area Planning and Recreation

Following the initial consultations undertaken National Parks (DNPWM) will be consulted to develop an appropriate management plan for the reservoir area, subject to agreement taken concerning resettlement policy and community access. Fisheries development and appropriate stocking need to be undertaken in a scientific manner during the course of project implementation and afterwards. The quality of the water in the lake could change drastically over the decade after construction, supporting different commercial and non-commercial species.

An outline of a possible recreational plan can be prepared. There might be opportunities for developing a boating and lakeside resort on the south or north shore allowing possibilities of a conservation and tourist type experience. In the residual non-inundated area of Batanai and Kubatana VIDCO areas cattle should be excluded by fencing. There will then be an opportunity for vegetation to regrow and stocking with small species of buck.

It must be said however that the potential clientele or market for a "tourist experience" is very limited in the geographical context. The lake is far from Harare (three hours drive) and not located on a tourist circuit. Conference centres and hotels are oversupplied in Zimbabwe. Its potential is in terms of a recreational and study centre for the local district. As such it is recommended that it be managed by the Kadoma District Council using revenues to pay for upkeep. Local control of bilharzia snails is recommended on the lake shore around lodges.

A wildlife protection area on the wooded north side of the reservoir could be created with minimal movement of existing settlers and a moratorium on further resettlement in an area demarcated for these purposes, around Kudu River Ranch and Mari Mari Ranch. The policy regarding lakeshore protection and local access requirements will

also need to be articulated. The NPWD has been consulted in accordance also with recommendations of the Director of the Natural Resources Board (NRB), but they prefer to be involved only in the case that the dam lake is gazetted by DWD.

7.5.3 Fisheries Development

Investigations must be done by the Fisheries Department to see how the project can capitalise on the potential economic value of the fisheries resource. If the fisheries approach the value of that at Lake Chivero this will be a major economic benefit. The potential royalties for commercial fishing licenses which have been under-exploited at Chivero could fund conservation management at the Kudu Dam. There should be a dual approach to exploitation with small local artisanal fisheries in certain zones of the lake to supply local villages and markets and a commercial operation with freezing facilities as warranted.

7.6 Catchment Management: Soil Erosion and Water Quality

There are few serious concerns about excessive siltation affecting the life of the dam. However silt loads should be subject to monitoring by the *EMM Section* and river and lake siltation processes observed on a periodic basis in case action becomes necessary. It is therefore not suggested that at present any check dams are necessary in the upper catchment to reinforce the sustainability of the dam reservoir capacity. Check dams and structures are not always very successful over the long term.

The Claw Dam on the Umsweswe River and Lower Zivagwe Dam on the Sebakwe River effectively provide siltation protection from two of the three major inflowing rivers. The Claw dam (and Lake John Mack) on the Umsweswe is 50 km upstream of the Kudu dam site and will trap silt from this major inflowing river. The Zivagwe Dam, on the Sebakwe River is close to the town of Kwekwe, some 80 km upstream of the new dam site. There are other small dams on a large number of the smaller tributaries and a weir at the town of Munyati on the Munyati River.

Clearance of vegetation on the dam reservoir site must be attempted and firewood or timber values designated to benefit local communities. Free access to licensed District fellers within the defined maximum supply line might be the best way to encourage clearance of vegetation from the inundation area. This would have the effect of maximizing economic benefit from otherwise wasted wood and timber materials and minimizing ecological damage in deoxygenation of the new lake.

Land clearance in the downstream area may occur but much of the irrigation zones have already been cut over, but woodlots are being proposed in the agricultural plan. Trees may have to be cleared for new settlements, roads and possibly even irrigation area development. Soil erosion should be more restricted on newly irrigated land which was formerly grazed or farmed as dryland. Increased intensity of agriculture on

irrigated lands will be accompanied by increased use of organic fertilisers and pesticides. There is therefore a risk from poor and wasteful practices in chemical use which could lead to downstream pollution of the Munyati and ultimately Lake Kariba into which it drains.

Water quality monitoring will continue to be important but special project components in the area of catchment management other than normal monitoring are probably not warranted. One exception might be in grazing areas around irrigation blocks where some agreements about permissible grazing may need to be established. Certain fencing around irrigation blocks and main canals and, also, near watering troughs will be required—on the edge of the scheme and near pasture areas for draft animals within the irrigation areas.

7.7 Health Programme

It is the responsibility of the project to allocate resources to mitigate the impacts of waterborne disease, particularly malaria and bilharzia to the extent that the project will otherwise be seen to be seriously aggravating and spreading existing and already important health problems affecting people in the project area. Boreholes are to be developed and sanitation facilities around irrigation areas can be incorporated.

A vector control and educational programme based on prevention and regular funded treatment for bilharzia (schistosomiasis) and malaria needs to be programmed and costed. Co-operative links can be established with local hospitals and medical centres. Kadoma District clinics in the project area are Sanyati Mission Hospital, Sanyati Clinic, Jompani Clinic, Chirikiti. Near to the project zone are Chakari Mine Clinic and Venice Mine Clinic. Baseline and ongoing health monitoring for disease occurrence reported at these clinics is in order.

Control measures to break the bilharzia cycle including educational programmes will help counteract the spread of bilharzia. Negative consequences could otherwise affect child mortality, agricultural labour productivity, personal wellbeing and children's educational performance. Re-infection can occur immediately after treatment so prevention measures may in certain circumstances be more cost-effective than treatment. These include health education, engineering design (water-flow speeds, structures), effective water management and/or efficient use of molluscicides.

In the case of malaria, use of bednets and the spraying of buildings are also to be recommended. There is already regular government insecticide spraying activity in the project area by the District Department of Environmental Health

8. Environmental Monitoring Proposals

8.1 Project Environmental Monitoring and Control

During implementation of an environmentally sound project the project management should undertake environmental monitoring of all project activities with negative implications whether impacts be temporary in duration or long term impacts. This will be the responsibility of the *Environmental Management and Monitoring Section* of the *RCPEMD*.

It is proposed that there should be an independent system of recourse for all persons with grievances concerning compensation for land-take, trees, crops etc, and any environmental damage being inflicted unreasonably by the project. Indeed there may be Zimbabwe conservation groups with particular concerns, and possibly some international issues. This will be a central area of responsibility for the *Community Participation and Plot Allotment Section*.

The head of the *EMM Section* will be at first under the head of the *RCPEM Division* but as construction and implementation are completed the *EMM* will take over all environmental responsibilities. From the beginning the *EMM* will make a regular monthly internal report to the project manager alerting him to emerging and unresolved environmental matters. He will also produce a quarterly report for general and wide circulation which will help build awareness of environmental, social, health and project welfare issues.

There will be a formal long term environmental record keeping programme established. This will be based on decision-relevant parameters among those listed below. The *EMM/RCPEM* will keep the Project Manager informed at all times, formally and informally, of important environmental and social concerns and will be pro-active in seeking to resolve emerging problems.

8.2 Post-Implementation Monitoring

On-going monitoring for appropriate corrective responses would involve continuous surveillance of a range of parameters. A complete checklist of monitoring and associated evaluation areas is presented below.

Water quality and ecology

- Changes in water quality through measurement of salinity, pH water temperature, oxygen levels, and nutrient levels in the lake, upstream and downstream
- Hydrogen sulphide and methane generation from submerged vegetation
- Limnological sampling of microflora, aquatic weeds and benthic organisms
- Occurrence of snails in the dam and downstream in the command area

- Surveys of fish catches, species and populations
- Observations of wildlife in the area around the lake

Land and reservoir resource management

- Strategic assessment of possible vegetation changes in the upper watershed and downstream project area — both in command and the surrounding area
- Usage and handling of agro-chemicals in the irrigation areas and extension programme
- Livestock changes in the project area
- Recreational use and accommodation
- Appropriateness and success of access agreements with local communities
- Irrigation area and canal water quality

Beneficiary health programmes and welfare status

- Health status of intended beneficiary groups in the project area
- Success of vector control programme, including malaria and bilharzia occurrence
- Quality and quantity of borehole drinking water supplies
- Women's welfare and access to land

9. Cost Estimates for Resettlement/Environment Plans

9.1 Resettlement Plans: Land Acquisition and TA Support

Programming and Cost Implications

The cost of buying dryland for resettlement of those to be moved from the reserved area is a function of the resettlement policy agreed. Based on current government resettlement planning estimates from the Inception Phase Framework Plan (1999-2000) of the Land Reform and Resettlement Plan—Phase 2 an appropriate cost in land acquisition and infrastructure development might be of the order of 12,000 \$US per resettler household. Cost estimates in this document vary between 5,300 \$US and 21,000 \$US based on a number of different criteria developed over recent years.

The following table applies the 12,000 \$US to the estimate of households based on the number of persons requiring resettlement which is derived from Table 2. The survey of the households in the dam reservoir (submerged) area VIDCOs, showed an average family size of approximately 5 individuals (Batanai 4.26, Koronika 4.81 and Kubatana 5.08). These figures are from the VIDCO and kraalhead records examined during the village inventory survey.

Resettlement Cost Estimates

Resettlement Options	950 metre contour		940 metre contour	
	HHs	Cost \$US	HHs	Cost \$US
1. Full Buffer: Scenario	720	8,640,000	720	8,640,000
2. Resettlement Scenario 1	640	7,680,000	630	7,560,000
3. Resettlement Scenario 2	470	5,640,000	460	5,520,000
4. Minimal Land-Take	370	4,440,000	160	1,920,000

Additional potential compensation costs for those not requiring resettlement, for instance in alternative borehole construction costs and in watering and grazing losses, would be very insignificant. Positive impacts in new income sources for those remaining in the vicinity of the dam can be assumed to be potentially much greater (see last column “positive impacts” in Table 2).

Additional budget requirement for facilitators

Costs of planning and technical assistance are factored into the calculation of 10,000 USD per settler household, but local consultants or NGO involvement in the resettlement facilitation process requires a small additional budget. This is an essential component for implementation success.

Using “Resettlement Scenario 1” of approximately 500 households to be moved (“Resettlement Scenario 2” will involve 20% fewer households, about 400 farm families):

Requirement of 1 x NGO person (women favoured) full time for 50 households (250 persons) to guide, advise and generally facilitate, including all liaison with Agritex and DA resettlement officers. Two years is necessary because need to be involved in period before during and after resettlement.

Therefore total requirement is estimated as 10 facilitators (/animators) for 2 years.

10 x 10,000 USD x 2 years = 200,000 USD

Therefore Total Resettlement Facilitation Cost: 200,000 USD

9.2 Facilitation for Community Participation in Land Re-Allocation

Resource requirements for irrigation areas have been calculated as follows:

1 x NGO “*facilitator agent*” for total of one month per year for 100 ha unit of irrigation land over a period of 2 years, includes inception and establishment.

Assuming 10 working months in year, 1 NGO facilitator agent can cover 10 x 100 ha. Therefore 1,000 ha of irrigation land can be “planned” in participative way and fairly re-allotted, with necessary support continuing through second year.

For 15,000 ha need total of 15 NGO facilitator agents for 2 year period.

Assume 10,000 USD per year for qualified facilitators (experienced with personal characteristics necessary, women favoured).

Approximate contract cost is therefore 15 x 10,000 USD x 2 years = 300,000 USD

Therefore Total Irrigation Area Facilitation Cost: 300,000 USD

9.3 Reservoir and Protection Area Management

Planning costs for Protection and Recreation Zone estimate: 50,000 USD

Protection fencing around wildlife area (including old VIDCO boundaries from which all kraals moved) estimate made of 40 km @ 500 USD per km = 20,000 USD

Restocking of small wildlife species and conservation work estimate: 10,000 USD

Conservation planning contingency for additional items: 20,000 USD

Therefore Total Reservoir Conservation Cost: 100,000 USD

9.4 Summary of Project Resettlement and Environmental Costs

<u>Summary Table</u>	
<u>Resettlement and Environmental Management Costs</u>	
Environmental Staff	3,300,000
Transport/Vehicles	660,000
Resettlement Costs (submerged aea)	6,500,000
Resettlement Facilitation	200,000
Land Re-Allocation Facilitation	300,000
Conservation Planning	100,000
Health Component Contingency	<u>200,000</u>
	11,260,000 USD

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TABLES

Table 1 Potential Positive and Negative Social and Environmental Impacts

Phase	Location		Activities/Components and Effects	Potential Significance of Impact	Outcome: Environmental and social risk
Construction Period	Dam Wall (constr.)	Upstream	Borrow pit excavation	xx	low
			Access road creation	x	low
			Earth moving /machinery use	xx	medium
			Construction/labour camps	xx	medium
	Irrigation Scheme (constr.)	Downstream	Main canals built	xx	low
			Access roads	x	low
			Social infrastructure	x	low
			Machinery use	x	low
			Labour camps	x	low
Implementation Process	Dam Wall and Reservoir (creation)	Upstream	Employment and income	***	low
			Construction worker health	x	medium
			Relocation and resettlement	xxxxx	high
			Tech'cal training and facilitation	***	low
	Irrigation Area (development)	Downstream	Employment and income	***	low
			Environmental health	x	medium
			Re-allocation of land	xxxx	high
			Facilitation and farmer training	****	medium
Project Operational Period	Dam and Reservoir	Upstream	Irrigation water supply	*****	medium
			Urban water supply	***	low
			New conservation area/habitat	**	low
			Local recreation area	x	low
			Fisheries development	***	low
	Project Zone	Downstream	New livelihoods creation	*****	high
			Agricultural production	****	high
			Improved access/infrastructure	***	low
			Local business development	**	medium
			Agri-chemicals/machinery use	x	low
			Landscape/env'ronmental change	x	low
			Communal Areas decongestion	***	medium
			Gender effects	**	low
			Traditional cultural impacts	xx	low

Note: Significance: Refers to the potential magnitude of positive or negative impacts in relation to the receiving environment

Outcome: Refers to the risk of a negative eventuality despite mitigation attempts

Key: Potentially significant negative impacts
x (least), x, xx, xxx, xxxx, xxxxx (greatest)

Potentially significant positive impacts
* (least), **, ***, ****, ***** (greatest)

Table 1 (continued)

Explanation of Potential Environmental Impacts Matrix (Table 1)

Construction Period

Dam wall construction – earth fill dam created built over duration 1.5 years

Borrow pit excavation: disruption and landscape impacts of transport and excavation of earth fill materials for construction

Access road creation: to construction sites, for earth moving, etc

Earth moving/machinery use: siltation and erosion effects

Construction camp: building of (temporary) new housing and sanitation

Irrigation scheme -- construction of canal and irrigation system

Main supply canals: construction of water supply canal from dam to irrigation area

Access roads: improvements in access roads in project area

Social infrastructure: improvements to extension centres, bore holes, etc

Machinery use: soil erosion risks during construction of irrigation system

Labour camps: any requirement for housing, etc during construction

Implementation Process

Dam wall and reservoir creation – technical assistance and development process

Employment and income: direct and indirect employment over construction period

Occupational health: possible spread of disease (malaria and STDs) between local and skilled external workers, dangers relating to accidents and safety

Relocation and resettlement: major issue with potential issue with potential social impacts

Technical training and facilitation: beneficial “know how” spin-off from external assistance

Irrigation area development – technical assistance in development process

Employment and income: temporary job creation effects

Environmental health: possible disease spread effects, accidents and safety

Re-allocation of land: depends on policy and determination of government to subdivide irrigation plots to achieve new household livelihood units in line with resettlement project policy (1 ha irrigation land)

Facilitation and farmer training: training and extension benefit

Project Operational Period

Dam and reservoir – new natural resource and change in environmental conditions

Irrigation water supply: maintenance of canal and assurance of water supply from catchment and dam reservoir through drought years

Urban water supply: considerable additional benefits

New conservation area/habitat: environmental values maintained

Local recreation area: community value of new resource

Fisheries development: productive and nutritional values

Project zone – agricultural development

New livelihoods creation: viable new household production units

Agricultural production: increased yields and assured production of higher value crops
Improved access/infrastructure: road and communications improvements
Local business development: direct and indirect benefit to sustainable commercial and service support for local economy
Agri-chemicals/machinery use: water contamination, health and safety in handling chemicals and machinery
Landscape/environmental change: extent of vegetation cover and erosion protection
Communal Areas decongestion: indirect environmental benefit from relief on over-exploited land resources
Gender effects: indirect benefit to attitudes, empowerment of women
Traditional cultural impacts: loss of traditional values

Table 2 Resettlement Scenarios

	FSL dam res ht.	Number VIDCOs affected ¹	Number requiring resett ² m ² (persons) ²	Negative impacts additional to resettlement requirements indicated in previous col (VIDCOs/HHs)	Positive impacts from potential employment ³
1. Full Buffer Zone extended natural and recreation area 2-3 km surrounding dam reservoir with limited access rights	950m	(8)	>3,500 ⁴ [+100]	Grazing/watering losses: Ny, Ba, Ko, Ku, Mu, Ka (dam access loss), G; Vil.16	Mu, SiI
	940m	(8)	>3,500+ [+50]	Grazing/watering losses: Ny, Ba, Ko, Ku, Mu, Ka, Gw; Vil.16	Mu, SiI
2. Resettlement Scenario I with natural area creation 3 evacuated VIDCOs (Ba, Ku, Ko) normal access rights, minimal requirement for ad hoc compensation	950m	3	3,100 [+100]	Arable and gr. losses: ?Mu <10 HHs	Ny, Ch, Mu, S1
	940m	3	3,100 [+50]	Arable and gr. losses: ?Mu ?5 HHs	Ny, Ch, Mu, SiI, Vil.16
3. Resettlement Scenario II with minimal natural area creation 2 evacuated VIDCOs (Ba and Ku) , normal access, additional ad hoc compensation	950m	2	2,250 [+100]	Arable and gr. losses: ?Mu ?<10 HHs Move/compensate: Ko ?10 HHs	Ko, Ny, Ch, Mu, S1, Vil.16
	940m	2	2,250 [+50]	Arable losses: ?Mu ?5 HHs Move/compensate: Ko ?no HHs	Ko, Ny, (Ch), Mu, (S1), Vil.16
4. Restricted or Minimal Resettlement normal access and appropriate ad hoc compensation	950m	(2)	1,750 [+100]	(factored into resettlement requirement)	Ny, Ku Ch, Mu, SiI, Vil.16
	940m	(1)	750 [+50]	(factored into resettlement requirement)	Ny, (Ch), Mu, SiI, Vil.16; Ny ⁵

¹ Affected VIDCOs are: Ba=Batanai, Ku=Kubatana, Ko=Koronika, Ny=Nyikyavateama, Mu=Muchakata, Ka=Kasawi, Gw=Gwanzura, Vil.16=Muzveve I (Ward 17).

² Ward population or in the case of "Restricted Resettlement" actual estimated numbers; figure below "[+(no.)]" is estimate for Ward 17, Kadoma.

³ Bold indicates more significant likely beneficiary VIDCO communities.

⁴ There will probably be an additional number from Muchakata.

⁵ Indicates land conceded by those resettled from Batanai.

Table 3 Environmental Management Personnel (and Vehicle) Costs

Project Personnel	No staff	Unit cost pa (USD)	Total pa (000 USD)	Qualifications/Experience
Head RCPAMD	1	150,000	150	International/Zimbabwe
National Specialist	1	20,000	20	Assistant to above (10 years)
RCPAMD add staff	3	2,000	6	Support staff, incl 2 drivers
Head RS Section	1	20,000	20	Well qualified National (10yrs)
National Specialist	1	15,000	15	Assistant to above (5-10 yrs)
Qualified RS staff	4	10,000	40	Graduate
RS general staff	6	3,000	18	Incl. 2 drivers
Head CPPAS Section	1	20,000	20	Well qualified National (10 yrs)
National Specialist	1	15,000	15	Assistant to above (5-10 yrs)
Qualified CPPA staff	4	10,000	40	Graduate
CPPA general staff	8	3,000	24	Incl. 4 drivers
Head EMM Section	1	20,000	20	Well qualified National (10 yrs)
National Specialist	1	15,000	15	Assistant to above (5-10 yrs)
Qualified EMM Staff	2	10,000	20	Graduate
EMM staff	2	3,000	6	Incl. 1 driver
				Add 10 vehicles = 600,000 \$US
				+ 10 motorcycles= 60,000 \$US

**Table 4 Staffing Costs for Resettlement, Community Participation and Env. Management Division
RCPEM Division Draft Staffing Plan**

Position	no.	unit cost	p.a. cost	Year												Yr 11-15	000 US\$		
				Year 1	Year 2	Year 3	Year 4	Year 5	Year 6	Year 7	Year 8	Year 9	Year 10						
Head RCPEMD	1	150	150	150	150	150	150	150	150	150	150	150	150	150	150	150			
National specialist	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20			
Additional staff	3	3	9	9	9	9	9	9	9	9	9	9	9	9	9	9			
Head RS Section	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20			
National specialist	1	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15			
Qualified RS staff	4	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0			
RS General staff	6	3	18	18	18	18	18	18	18	18	18	18	18	18	18	18			
Head CPPA Section	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20			
National specialist	1	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15			
Qualified CPPA staff	4	10	40	40	40	40	40	40	40	40	40	40	40	40	40	40			
CPPA General staff	8	3	24	24	24	24	24	24	24	24	24	24	24	24	24	24			
Head EMM Section	1	20	20	20	20	20	20	20	20	20	20	20	20	20	20	20			
National specialist	1	15	15	15	15	15	15	15	15	15	15	15	15	15	15	15			
Qualified EMM staff	2	10	20	20	20	20	20	20	20	20	20	20	20	20	20	20			
RS General staff	2	3	6	6	6	6	6	6	6	6	6	6	6	6	6	6			
All costs in USD	000	\$US	392	293	293	240	240	240	240	339	339	339	339	339	339	339	240	305	3306

2003 2006 2009 2012

Vehicle costs 10 60 USD
 Motorcycles 10 6 USD
 600 (000) USD
 60 (000) USD
 660 (000) USD

FIGURES

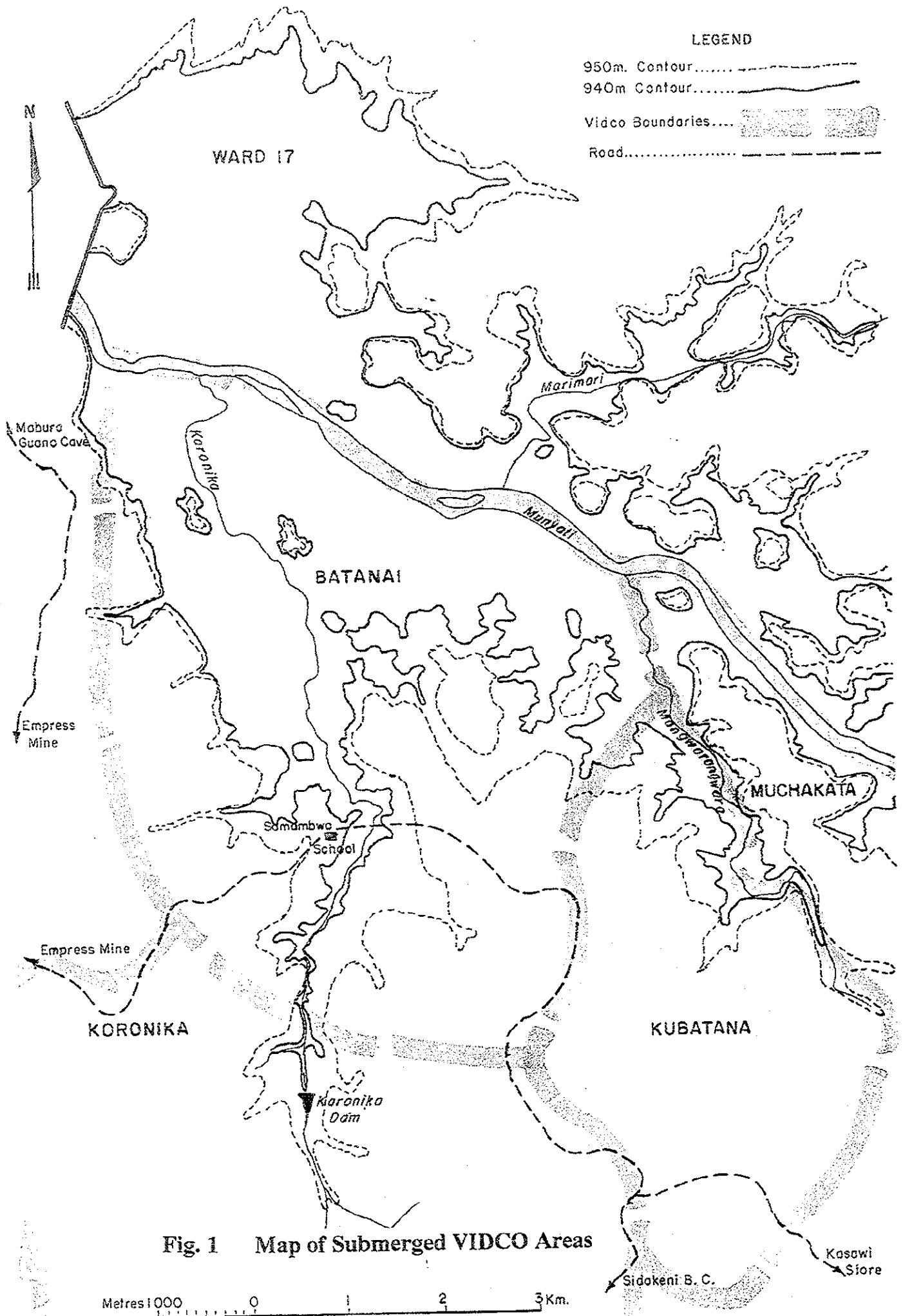


Fig. 1 Map of Submerged VIDCO Areas

ATTACHNMENTS

ORGANISATIONS AND INDIVIDUALS CONSULTED

Government Departments

National Level

Ministry of Lands and Agriculture (MoLA)

Agritex: Eric Chidenga (Head, Technical Services Division); Mrs Chasi (Head, Agricultural Planning Division), Mrs Chimbira (Rural Sociologist), Simon Madyiwa and Lee Trivamve (Senior Irrigation Specialists), Ms Berengera

Ministry of Water and Rural Resources

T.C. Kabell (Design), Department of Water Development
Jabalani Gumbo and Dr Jackman, National Water Analytical Laboratory

Ministry of Mines, Environment and Tourism (MMET)

I.D. Kunene (Director, Chief Ecologist), Naome Chimbete and J. Jamare, Department of Natural Resources (DNR)

Willas.A. Makombe (Director), Richard Gurure (Asst. Director, Research); T.N. Gotosa; Sohpie Mutsekwe, Department of National Parks and Wildlife Management (DNPWM)
Simbarashe Mandinyena (Manager Research and Product Development), Zimbabwe Tourism Authority

Ministry of Local Government and National Housing (MLGNH)

Mrs Susan Musungwa, Under Secretary—Resettlement

Ministry of Health and Child Welfare

Dr Moses Chimbari and Dr. Patricia Ndhlovu (Director), Blair Institute for Research
Prof. Toshiro Shibuya (Director) and Dr Kamei, Dr Wagatsuma, ZICA (Infectious Diseases Control Project) Department of Epidemiology and Disease Control

Mashonaland West Province

Provincial Officers

S. Muvhunzi (SAES—Soils and Water Conservation), Agritex

Kadoma District Officers

Mrs E.R.Ndoro (DAEO), C. Mushonga (AEW, Muzvezve Resettlement 1), Mr MacLeod (AEW) Sanyati Ward. Agritex

Mr Mundeyiri (Health Information Officer), Kadoma District Hospital

C. Devere /and Garth Parsons, (Director) and Rex Matova (Principal Environmental Health Technician) District Environmental Health Office

B. Manyange (Mining Commissioner), Department of Mines

Ms Mvuramanzi, Natural Resources Officer; Ms Mavis Sibanda, Forestry Officer

Chegutu District Officers

Bob Mubayi, SAEO, Agritex

Manuel Chidziva (Co-ordinator), Water Resources Management Strategy
—WRMS and Mupfure/Sanyati Catchment Councils

Midlands Province

Mr A. Dube (P

T. Kacote, Ecologist, Provincial Natural Resources Officer

Kwekwe District Officers

Mr Hudson Mabika (SAEO), Agritex

Nurse (F), Samambwa Clinic, Mabura Ward

Doctor (M), Sidikeni Clinic, Sidikeni Ward

Water Bailiff (F), Ngondoma Irrigation Scheme

Gokwe District Officers

Mr Mbire, local CAMPFIRE Co-ordinator

Mr Mantabo, Gokwe North/South Natural Resources Officer

Mr Sibanda, Gokwe South Forestry Officer

Mrs T. Mnkandhla and Mrs C. Mhlanga, Mtanke Clinic

Agritex Officer, Nyarupakwe Councillor

Manicaland Province

Mr Murinye (Provincial Water Engineer) Mutare Office

Nyanga District Officers

Nicholas Sikume, AEO, Agritex Nyamaropa, Irrigation Scheme

Mrs Ptitsoro (Nurse), Nyamaropa Clinic

Chipinge District Officers

Mr Chimuti DAEO; Mr Dunira SAEO, Agritex

Mr Chimanda, AES, Chibuwe/Musikawane Irrigation Scheme

NGO Organisations/Individuals**Individuals**

Dr Alois Hungwe, Director, Soils Incorporated

Dr/Mrs Linds, Linds Agricultural Services

Private Companies

Evison Musanjeya, Business Unit Manager (Sanyati), The Cotton Company of Z. (CotCo)

Mrs Martha Mpisaunga, Community Health Division, Zeneca

Dr Roaland Jooste, Manager, Animal and Environmental Health, Bayer Zimbabwe (Pvt.)

University/Research

Dr Emmanuel Manzungu, Zimwesi Project Co-ordinator, Dept of Soil Sci and Ag Eng, UZ

Dr Pieter van der Zaag, Dept of Civil Engineering, University of Zimbabwe (Institute of Hydraulics, Delft, Netherlands)

Dr Aidan Senzanji and Professor Ken Giller, Dept of Soil Science and Ag Eng, UZ

Dr P. Mugabe, Centre for Applied Social Studies (CASS), University of Zimbabwe

A.R. Maclaurin, Department of Crop Science, University of Zimbabwe

Other Institute

Professo S. Moyo (Director), Southern African Political Economy Series (SAPES)

Elias Madzuzo, Institute of Environmental Studies, University of Zimbabwe

Professor Linden Vincent, Irrigation Engineering and Water Development, Wageningen, Netherlands (ZIMWESI Project)

Dr Steve Twomlow, (Soil and Water Engineer), Jim Ellis Jones (Farming Systems Economist) Silsoe Research Institute, UK; Dr F. Chancellor, Hydraulics Research Institute, UK

NGOs

Mrs Carmel Lue Mbizo (Institutional Development Programme Co-ordinator), IUCN Regional Office for Southern Africa

Gledman Kundhlande, SAFIRE

Dennis O'Brien (Country Director), CARE Zimbabwe

Ms Ina Dube, ITDG

All communications
should be addressed to
The Director of Natural
Resources

Telephone: 705661 705671
Telegrams: RESOURCES



ZIMBABWE

Ref.:

DEPARTMENT OF NATURAL RESOURCES
MAKOMBE COMPLEX, BLOCK 1
Harare Street/Herbert Chitepo Avenue
P.O. Box 8070, Causeway
Harare

Reference: 17/1/1/14

November 20, 1992

The Permanent Secretary
Ministry of Environment and Tourism

Attention: Mr. Devious Marongwe

Re: EIA of the Proposed Kudu Dam

We have reviewed the "Environmental Impact Assessment Report, October 1992" of the proposed Kudu Dam prepared for the Department of Water Development, Ministry of Lands, Agriculture and Water (MLAW). We also conducted a one-day reconnaissance of the project area on November 18.

The proposed dam was the subject of feasibility studies in 1987 and funding is now being sought for both detailed engineering design and construction. In this context, the subject report is an acceptable preliminary EIA. It quite adequately scopes the environmental issues associated with the dam and suggests measures needed to both mitigate adverse impacts and capture potential benefits. Based on the report and our field examination, we see no compelling reason why the project should be shelved or altered.

At the same time, there are two significant issues which our Ministry and MLAW should ensure are adequately dealt with. Since the dam is in the early planning stages and both the project scope and budget have yet to be finalised, there is a real opportunity to implement this project in a way which demonstrates best-practice in integrated management of natural resources. We strongly recommend that the opportunity should not be missed. The two issues are:

- 1) Resettlement. The report estimates that some 500 families and infrastructure to support them will need to be relocated. A thorough survey of the families involved is required, and a detailed resettlement and compensation plan must be prepared, as an integral part of detailed project planning. The plan should not just encompass the families in the flooded area. Families in any buffer zone or new national park around the reservoir, as well as families who live outside these areas yet depend on the resources of the flooded area, must also be included.

The report's recommendation that entire communities be resettled should be followed.

Most importantly, it is imperative that an information and consultation programme be launched in the near future to ensure that local people have accurate information about the project and are able to contribute meaningfully to the development of the resettlement and compensation plan. At minimum, resettled families must be at least as well off as they are now. If, through resettlement, their general well-being can be improved, even marginally, local resentment such as has been experienced at the Osborne and Mazvikadei dams will be avoided and the support for future projects will be enhanced. The criterion for the success of resettlement should be the opinions of the families themselves.

- 2) Reservoir management. The creation of the reservoir will create new opportunities for the use of natural resources in the project area such as tourism, stock watering and pump irrigation. At the same time, if buffer zones and a national park are established on the reservoir margins, communal area residents may also experience problems with access to water which they have so far enjoyed. It is crucial that a comprehensive plan for managing the lands surrounding the new reservoir be prepared, funded and implemented so that opportunities rather than problems are created and surrounding land use does not negatively impact the long-term viability of the dam. The plan should guarantee access to the reservoir for legitimate use by communal area residents.

Both resettlement and reservoir management will require the coordinated efforts of several government ministries. Our Ministry and MLAW should ensure that the appropriate mechanisms are established to achieve this coordinated effort. For example, both the Department of National Parks and Wild Life Management and the Zimbabwe Tourist Development Corporation should be involved in the development of a reservoir management plan. Unquestionably, the costs of planning and executing the needed resettlement and compensation must be part of the project budget. We also recommend that funds for planning the management of the new reservoir area, and for some initial capital and operating costs, also be included in the project budget. While the dam has been proposed primarily for irrigation purposes, it can generate other benefits only if it is conceived, planned and implemented in an integrated fashion.

In the course of detailed planning for the project, we recommend that a specific plan for monitoring and managing both the anticipated negative impacts and potential benefits of the project be prepared and included in the project budget. This plan would provide the means for adjusting the implementation of the project to minimise impacts and maximise benefits. It would also specify the responsibilities of various national and local government agencies in executing

the plan. Our Ministry should require an annual progress report on the execution of the plan from the monitoring team.

We recommend that a detailed environmental management plan be prepared by MLAW and reviewed by our Ministry to fulfil the EIA studies required by the current five-year plan. This plan would encompass (1) the impact monitoring and management plan, (2) the resettlement and compensation plan and (3) the reservoir management plan.

Finally, we recommend that MLAW arrange for clearing of the larger trees from the flooded area to both reduce the amount of decomposing biomass in the new reservoir and to provide fuelwood. The fuelwood could be given to local residents and/or sold in nearby towns.



Mr. S. Chaibva

for: Director of Natural Resources

cc. Director of Water Development ;
PNRO, Midlands
Ecologist, Midlands
PNRO, Mashonaland West

23 November 1998
Rural District Councils of Kadoma, Kwekwe, Gokwe North and Gokwe South
(Provincial Offices of Mashonaland West and Midlands)

PUBLIC INFORMATION SHEET

“Kudu Dam Irrigation Project”: Feasibility Study

What is the “Kudu dam irrigation project”?

The project plan is to build a rock fill dam across the Munyati River, near Samambwa. This will create a reservoir which could allow the irrigation of about 25,000 ha of land. The project proposes to construct an irrigation system to distribute water by gravity to about 15,000 ha in communal and resettlement areas by means of two large primary canals and smaller feeder canals.

We have heard about a project since 1990 and before. Why is the dam and irrigation scheme not built already?

Large projects of this scale require a lot of planning. They are very expensive and studies are required to ensure that the costs of the scheme are not going to be greater than the benefits. It is important to find out what the impact on the people who will be affected will be.

There will be a requirement for relocation of people from the site of the reservoir (Karonika and Mangwarangwara valleys) and re-allocation of land in the irrigation area and around it so as many people as possible can have some land with irrigation, perhaps 1 ha each. Not all land is suitable for irrigation. It is important to know whether people like yourselves would like to participate in such a project before starting.

The first studies suggested the project might be too costly, but economic conditions are changing and continue to change. New investigations may result in a different more economical design. The full name of the present study is: “Lower Munyati River Basin Agricultural Development Project: Feasibility Study”

Who is responsible for the project? Who will pay for the project?

The Government of Zimbabwe and its two technical departments for Water Development and Agritex are responsible. The planning (feasibility) studies are being paid for as a grant (gift) from the Japanese government (through the Japanese International Co-operation Agency or JICA). The plan is for the Government of Zimbabwe to pay the cost of investment in the project with an international loan. The investment must therefore make a sound economic return for the country.

Do farmers have to pay any costs?

The people who will benefit from the investment must contribute to the cost of operation and maintenance of the scheme which should be perhaps 20% of their increased gross margin (profit/returns) from better yields of irrigated cash crops like cotton or vegetables. If they are not ready to do this the project will not succeed.

When will a decision be made to build the dam and irrigation system?

The project can only be build after the government of Zimbabwe has decided the project is worthwhile and it has the money to invest in the project. It needs to be sure the project is a good investment before borrowing money for dam construction and irrigation system development.

The elected representatives in the project area would also like to know that the people intended to benefit do indeed wish to have the project and are ready to accept the re-allocation of land and a changed farming system which will be necessary in order to achieve the rewards to farmers from the investment.

If the project seems to be too expensive in relation to the benefits or costs of management and resettlement then it is better for Zimbabweans if the government uses available funds on different projects or programmes, for example on roads, schools or health services.

How long will it take to complete the project?

The feasibility study will take two years to complete from now, until October 2000. After this a decision will be made whether to go ahead with the project as designed. If there is a decision to proceed the implementation of the agricultural development and irrigation programme may still not be finally completed before another 15 years.

How can we be sure that we can all benefit from the project?

The Government of Zimbabwe has a procedure for consultation and compensation. There is a commitment that none should be made worse off than previously and many will be made better off directly or indirectly because of the higher yields and security that irrigated farming should bring. However irrigated agriculture from large schemes requires much management from DWD and support from Agritex and, especially, co-operation between groups of farmers to share water fairly between both men and women farmers.

What rights and obligations will we have in the future if we participate?

On Agritex schemes, you or members of your household will be expected to farm irrigated land allocated to you. You are not allowed to rent it out. Land will be allocated and registered in your name or jointly for married persons. You may be expected to grow particular cash crops on a proportion of your land. You may do this through contracts with for example Cotco or other horticultural companies.

It is intended to arrange similar access to dryland and grazing as previously. Livestock will not be allowed to wander in the irrigation areas.

Those who live in the potentially submerged area, or conservation/protection area (2-3 km) around the dam reservoir (eg in villages near Kasawi), will have to move and be offered irrigation land or equivalent dryland as they wish.

Alternative water supplies for livestock and domestic use will be supplied. Irrigation water should not be used. Agricultural chemicals will be used in conformity with the law and Agritex recommendations on handling, disposal and use. For your own safety, and to mitigate the risk of increased occurrence of malaria or bilharzia (and other waterborne diseases) your household must adopt safety measures and warnings.

Who can we discuss this with?

Your VIDCO representatives or District Councillors. The local government (Ministry of Local Government and Public Housing) at District level has ultimate responsibility for all resettlement and land re-allocation matters. However, as stressed before, the project is not approved and although implementation difficulties need to be understood now, it is much too early for details of implementation to be discussed and decided.

Why are we suddenly being contacted now and what will happen in the next months?

There is an international (JICA) team from a Japanese Company (Nippon Koei) who are undertaking the detailed feasibility study. They will be staying in the area initially for five months and coming again at the end of 1999.

The JICA team have contracted a Zimbabwean company (Scott Wilson) who are using researchers from the University of Zimbabwe to assist in undertaking a survey of affected people. There will also be a soil survey requiring samples of soil quality to be taken in many different places.

The social survey consultants will need to visit your villages and may need to ask questions of you and members of your household. Not everyone needs to be interviewed but enough to understand the social and economic conditions in your villages and a representation of your opinions. What you say to interviewers is confidential and not attributed to your name.

At the dam reservoir site, villages will be surveyed to understand the cost of replacing the buildings and community services.

We hope this information is useful to you.

*Chairmen,
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