New Partnership for Africa's Development (NEPAD)

Comprehensive Africa Agriculture Development Programme (CAADP)

Food and Agriculture Organization of the United Nations

Investment Centre Division

GOVERNMENT OF THE REPUBLIC OF ZIMBABWE

SUPPORT TO NEPAD–CAADP IMPLEMENTATION

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Volume III of VII

BANKABLE INVESTMENT PROJECT PROFILE

Smallholder Irrigation Development

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ZIMBABWE: Support to NEPAD–CAADP Implementation

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NEPAD–CAADP BANKABLE INVESTMENT PROJECT PROFILE

Country: Zimbabwe

Sector of Activities: Agriculture

Proposed Project Name: **Smallholder Irrigation Development**

Project Location: Natural Regions IV and V

Duration of Project: 5 years

Estimated Cost: Foreign Exchange.....US$40.2 million
Local Cost.....US$26.8 million
Total..... US$67.0 million

Suggested Financing:

Source	*US$ million*	*% of total*
Government	6.7	10
Financing institution(s)	40.2	60
Beneficiaries	6.7	10
Private sector	13.4	20
Total	***67.0***	***100***

ZIMBABWE:

NEPAD–CAADP Bankable Investment Project Profile

"Smallholder Irrigation Development"

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Abbreviations

ARDA	Agriculture and Rural Development Authority
AREX	Department of Research and Extension
BIPP	Bankable Investment Project Profile
CAADP	Comprehensive Africa Agricultural Development Programme
DDF	District Development Fund
DI	Department of Irrigation
FAO	Food and Agricultural Organization of the United Nations
GDP	Gross Domestic Product
GoZ	Government of Zimbabwe
IFIs	International Financial Institutions
MARD	Ministry of Agriculture and Rural Development
MCM	Million Cubic Metres
MFPED	Ministry of Finance Planning and Economic Development
NEPAD	New Partnership for Africa's Development
NGO	Non–governmental Organization
NMTIP	National Medium–Term Investment Programme
NR	Natural Region
O&M	Operation and Maintenance
WUA	Water Users' Association
ZINWA	Zimbabwe National Water Authority

I. PROJECT BACKGROUND

A. Project Origin

I.1. The project idea originated from the *Ministry of Agriculture and Rural Developmen*t (MARD). It is one of the key strategies for overcoming the natural constraints of inadequate and unreliable rainfall in the dry areas of Zimbabwe which are restricting the potential for the development of rainfed agriculture on which the livelihoods of most smallholder farmers in communal and resettlement areas depend. The immediate origin of the project was the *National Stakeholders Workshop* held in Harare in March 2004 in support of the NEPAD–CAADP process. The workshop was convened by MARD in conjunction with FAO. The purpose of the workshop was to validate the draft *National Medium–Term Investment Programme* (NMTIP) and agree on the priority areas for investment in agriculture in which *Bankable Investment Project Profiles* (BIPPs) could be prepared. Workshop participants came from government ministries, agricultural institutions and associations, donors and the private sector. The workshop identified the rehabilitation of existing irrigation schemes and harnessing water in existing dams for irrigation purposes, particularly for smallholders, as one of the high–priority areas in which an investment project could be formulated. This project proposal focuses on harnessing water in existing dams for irrigation.

B. General Information

I.2. ***Agriculture and its Importance to the Economy of Zimbabwe***. Agriculture is the mainstay of the Zimbabwean economy, contributing on average about 18% of GDP. About 80% of the country's agricultural production is rainfed; the remaining 20% is under irrigation. The agricultural sector is a source of food security; it provides livelihoods for 70% of the population in the rural areas and employment to about 25% of the labour force in the wage economy. It also provides 60% of all raw materials to industry and contributes about 40–50% of the country's merchandise exports.

I.3. Major factors that presently constrain agricultural production include recurrent droughts and dry spells; shortages of appropriate agricultural technologies; lack of capital and poor access to credit by smallholder farmers, poor marketing and handling facilities; and pests and diseases.

I.4. ***Agro–ecological Zones***. Zimbabwe is classified into five regions of differing agro–ecological potential called "Natural Regions" (NR). NR I receives more than 1,050 mm of rainfall per year; NR II receives 700–1,050 mm; NR III receives 550–700 mm; NR IV receives 450–600 mm; and NR V receives less than 500 mm. In terms of land fertility, the areas most suitable for agriculture are located in regions I, II and III. The major characteristics of the five NRs are summarized in Appendix 1.

I.5. ***The Irrigation Subsector.*** The Government of Zimbabwe (GoZ) recognizes the role of irrigation in agricultural development. Starting in the 1930s, the government placed emphasis on water development, in particular through a dam construction programme for large–scale farmers. The water and irrigation development that resulted from this programme has been a decisive factor in the success of large–scale agriculture. Commercial farmers were able to enjoy the benefits of this strategic long–term investment, which enabled them to minimize the effects of drought and improve financial returns from high–value crops such as tobacco and horticultural crops.

I.6. Since independence in 1980, the government has increasingly recognized the potential role of irrigation for smallholder development, particularly in the drought–prone communal areas, 75% of which lie in low–rainfall areas. The use of water from river flow, dam storage and deep motorized

boreholes has resulted in the development of 180 smallholder schemes, covering an area of about 8,130 ha on communal and resettlement areas. A further 2,000 ha have been developed on small–scale commercial farms. Thus a total of up to 10,000 ha of irrigation is available for the formal smallholder subsector to grow maize, cotton, beans, wheat, tomatoes, leafy vegetables and other horticultural crops for home consumption and markets.

I.7. This effort has assisted thousands of smallholders to increase production levels and to diversify their agricultural base into the lucrative area of horticulture for both local and export markets, or to supply produce to agro–industries under contract. Although smallholders contribute relatively insignificantly of the total agricultural activity in Zimbabwe, providing only a fraction of the total crops produced, many of the most important agricultural and rural development policy issues in Zimbabwe centre on smallholder irrigation for the following reasons:

- there is a need to generate employment in the communal areas where 70% of the country's population lives;
- there is high potential for increasing productivity in smallholder irrigation compared to rainfed cultivation, particularly in drought–prone areas; and
- there are relatively high development, operation and maintenance (O&M) costs and subsidy requirements for many of the smallholder irrigation schemes.

I.8. ***Water Resources***. Zimbabwe's potential surface water resources have been estimated at approximately 11,200 million m^3 (MCM), based on 10% risk. Of this, 8,500 MCM could be exploited. About 4,760 MCM of the exploitable water is already committed to various uses, including the irrigation of some 123,000 ha throughout the country. The remaining 3,740 MCM could be utilized to irrigate 250,000 ha, assuming that 80% of the balance is reserved for irrigation and that the average amount of water consumed by irrigation is 12,000 m^3/ha/year. An extra 80,000 ha can be irrigated from the estimated ground water available in the country. However, based on land suitability, the total potential irrigable land in Zimbabwe is 600,000 ha. Thus water — not land — is the limiting factor in irrigation expansion.

I.9. The government, in its efforts to develop irrigation, has embarked on dam construction, in which some water has been reserved for smallholder irrigation development. Up to now, enough water is available for use in smallholder irrigation development to service 6,140 ha; this water has not been used because the funds to develop the irrigation infrastructure were lacking. The state dams thus have water that could be used immediately if funds for irrigation development could be secured. Table 1 lists the dams with unutilized water and the corresponding potential irrigable land area.

I.10. ***Current Structure of the Irrigation Subsector.*** The current irrigated area totals 123,000 ha nationally, accounting for about 20% of the current total cropped area. The irrigation subsector is undergoing significant changes. There are four traditional irrigation systems in the country, namely:

- large scale commercial irrigation (predominantly large–scale commercial farms and estates);
- parastatal–managed irrigation (mainly ARDA schemes);
- small–scale commercial irrigation; and
- communal and resettlement irrigation.

I.11. New, middle–sized schemes of recently resettled farms consisting of model A1[1] and A2[2] farms have now been added to these existing schemes. As of 2002, A1 model farms accounted for 6.3% of the irrigated area; A2 model farms, 10.3%; communal and resettlement areas, 9.8%; indigenous large scale, 7.7%; large–scale commercial farmers, 6.8%; ARDA, 6.3%; and all others (e.g. sugar plantations) made up the remaining 52.8%. Average individual plot holdings range ***from*** 0.1 ha in the smallholder sector to about 100 ha in the commercial subsector.

Table 1: Zimbabwe – Dams with Water Lying Idle

Dam	Province	Potential irrigable area (ha)	Natural region
Zhove	Mat South	500	V
Muzhwi	Masvingo	680	IV
Manyuchi	Masvingo	330	V
Osborne	Manicaland	1,700	IV
Mbindangombe	Masvingo	100	V
Mtshabezi	Mat South	300	V
Tshatshani	Mat North	230	V
Mwarazi	Manicaland	400	IIB
Mwenje	Mash Central	400	IIA
Mazvikadei	Mash West	1,000	IV
Total		6,140	

I.12. ***Government Policy for the Irrigation Subsector.*** The *National Economic Recovery Programme* (NERP) document, which describes Zimbabwe's strategy for economic recovery, singles out irrigation as the most important and necessary (though not sufficient) cornerstone for agricultural development, hence the key to agriculture–led economic recovery, given the country's vulnerability to drought and the high risks associated with rainfed agriculture. The broad strategy and policy objectives of GoZ for the irrigation subsector aim to:

- contribute to poverty alleviation by targeting resource–poor smallholder farmers, with an aim to increasing farm incomes;
- increase agricultural production and enhance food security at the household level by ensuring some crop production during droughts and dry seasons;
- extend cropping opportunities and provide a wider variety of crops in both wet and dry seasons (year–round cropping) so as to improve nutritional status, especially for children and women;
- create an enabling environment for irrigated agriculture by facilitating and encouraging the private sector to invest in irrigation development, and encourage rural communities to own and manage their irrigation projects, thereby fully utilizing the irrigable land in Zimbabwe;
- enhance human capacity for irrigated agriculture in the public, parastatal and private sector; and

[1] *"Villagized"* or individual, small–scale resettlement model.
[2] Self–contained, medium– to large–sized commercial farm settlement model.

- create a spirit of business culture in the smallholder sector by promoting and providing competitive financing of irrigation projects and improving the produce–marketing system at national and international levels.

C. Main Institutions Involved in the Irrigation Subsector

I.13. The various institutions involved irrigation activities in Zimbabwe and their current respective roles are summarized in Table 2.

Table 2: Zimbabwe – Institutions Involved in Irrigation Development

Institution	Responsibility
Zimbabwe National Water Authority (ZNWA)	Allocation of water for agriculture and construction of dams
Department of Irrigation, MARD	Procurement of equipment; supervision of construction and coordinating programmes; providing extension support to farmers
Department of Research and Extension (AREX)	Identification of potential beneficiaries, supervision of construction
Department of Agricultural Engineering	Supervision of construction
District Development Fund (DDF)	Transportation of equipment
Reserve Bank of Zimbabwe	Funding
Agricultural and Rural Development Authority (ARDA)	Transportation and storage of equipment, supervision of construction
Private sector	Manufacturing, sale and installation of equipment; financing of irrigation estate development
NGOs	Input and equipment supply and training

D. Constraints to and Opportunities in Smallholder Irrigation Development

I.14. The main ***constraints*** include the following:

- The macroeconomic environment is difficult, which is a disincentive to long–term investments like irrigation infrastructure.
- Establishing and managing irrigation works are expensive activities, particularly when farmers' low resources are taken into account. As a result, an over–dependency on the government for planning and managing smallholder irrigation schemes has developed in the country, but this is not a sustainable solution for the long term.
- Lack of secure land–tenure arrangements prohibits farmers with more resources and other entrepreneurs interested in joining farming from making long–term investments in irrigation. This factor also undermines easy access to credit as banks prefer to lend money against collateral such as title deeds.
- The relatively high prevalence of HIV/AIDS among the rural population and service providers is adversely affecting both the agricultural labour force and the government's extension delivery.
- A lack of cooperation among farmers in the newly resettled areas prevents them from sharing water, irrigation infrastructure and operational costs like water and electricity bills. Some irrigators are denied servitude to convey water across other people's fields, a problem that has been compounded by lack of experience in utilizing and managing water at both the field and catchment level.
- There is no appropriate irrigation technology for smallholder farmers.

- Poor agronomic practices are utilized in small–scale irrigation, including planting low–yielding crop varieties and not sufficiently using fertilizers.
- Not enough research has been carried out on appropriate irrigation systems, equipment and farm management for smallholder farmers.
- There is inadequate human resources development at both technician and farmer level.
- Rural infrastructure, e.g. roads, telecommunication and electricity, for facilitating the delivery of inputs to farmers or produce to markets is not well developed.
- Transport is either unavailable or very expensive..
- Poor catchment management is provoking siltation in some bodies of water.
- Decentralized irrigation services are lacking in rural areas.
- Rural credit facilities for both capital and recurrent expenditures are lacking.
- Infrastructure is used under unclear arrangements. In the newly resettled areas, plot allocation did not necessarily take into account the design of irrigation schemes/facilities, resulting in severe management problems.
- Policy incentives to invest in water–saving technologies are lacking. There are no incentives to improve the local irrigation industry with a view to making irrigation cheaper by, for example, facilitating local manufacture of some irrigation equipment or components.

I.15. Major ***opportunities*** include the following.

- GoZ continues to show a keen interest in irrigation development.
- A high potential exists for increasing smallholder crop yields — hence production and productivity through.
- There exists a potential for farmers to venture into high–value diversified crops such as vegetables (not possible under rainfed cultivation).
- There are local and export markets for irrigated agricultural produce.
- There is unexploited irrigation potential in the form of water and land.

E. Ongoing and Planned Irrigation Programmes

I.16. GoZ is spearheading irrigation development by targeting 100,000 ha for the production of winter wheat in 2004 to meet the country's wheat requirements. Some 33,000 ha of the targeted area requires rehabilitation and Z$85 billion have been allocated by the Reserve Bank of Zimbabwe for this purpose.

I.17. In addition, the *Department of Irrigation* (DI) of MARD is increasing the area of smallholder irrigation through the development and rehabilitation of 46 smallholder schemes with a total irrigated area of 5,200 ha. For these projects, GoZ has allocated Z$70 billion this year.

I.18. A number of other donor–supported development projects were halted following suspension of disbursements by some donors/lenders for non–payment of arrears or, for some, because of political differences with the government. There are thus no significant ongoing or planned donor–funded programmes in the subsector.

II. PROJECT AREA

II.1. The project would be located in five administrative provinces of Zimbabwe, namely Manicaland, Mashonaland West, Masvingo, Matebeleland North and Matebeleland South where there are existing dams with unutilized water.

II.2. The project area is located in Natural Regions IV and V where rainfall is the lowest, the need for irrigation is greatest and rainfed agriculture is a very risky exercise. The two Natural Regions together constitute 65% of Zimbabwe's land area, with 75% of the country's communal and resettlement land area. The regions comprise low–lying plains and valleys with altitudes ranging from 600 m–1,000 m. Rainfall is scarce and erratic and the climate is characterized by very high temperatures and a high rate of evapotranspiration. There are periodic droughts and dry spells; annual rainfall is less than 600 mm/year, which is too little to practice reliable rainfed agriculture of even drought–resistant crops and fodder. Farmers practice extensive or semi–extensive farming, planting drought–resistant cereal crops such as millet and sorghum and raising livestock.. Crop yields are low, largely because of low and erratic rainfall and few inputs. Average yields for maize and sorghum are 1,000 kg/ha and 500 kg/ha, respectively.

II.3. As was indicated in Table 1 above, there are currently ten dams in the country with idle water. However, the project will, as a first phase, concentrate on developing smallholder irrigation schemes in six of these dams, which were selected because they are located in areas with:

- a greater need for irrigation, because they are in the drought–prone areas with the highest potential for rapid impact on increasing farm production and productivity;
- relatively higher levels of poverty among the farmers;
- higher potential to boost farm income levels and enhance food security; and
- more opportunities for potential crops for irrigation and available markets in the neighbouring communities.

Table 3: Zimbabwe – Dams Selected for Irrigation Scheme Development

Dam	Natural region	Province	Irrigable area (ha)	Target number of farmers
Zhove	V	Matabeleland South	500	1,000
Osborne	IV	Manicaland	1,700	3,400
Muzhwi	V	Masvingo	680	1,360
Mtshabezi	V	Matabeleland North	300	600
Mbindangombe	V	Masvingo	100	200
Mazvikadei	IV	Mash West	1,000	2,000
Total			4,280	8,560

II.4. The selected dams for scheme development and some key information about them are shown in Table 3. The six schemes would target a total of 8,560 farmers, including men, women and youths, and would cover an irrigable area totalling 4,280 ha.

III. PROJECT RATIONALE

III.1. Zimbabwe is predominantly an agrarian country that relies heavily on agriculture for food security, economic growth and development. Growth in agriculture is necessary for macroeconomic stability, broad–based economic development, poverty reduction and food security. Inadequate and unreliable rainfall in the dry areas of Zimbabwe restricts the potential for development of rainfed agriculture, upon which the livelihoods of most smallholder farmers in communal and resettlement areas depend.

III.2. The NERP strategy document highlights the fact that Zimbabwe has in the past suffered from the vagaries of droughts although it has vast bodies of water in the form of dams and river systems that remain unutilized to benefit the local community and the nation at large. It highlights irrigation as the one single most important cornerstone for agricultural development, hence the key to an agriculture–led economic recovery, given the country's vulnerability to droughts and the high risks of rainfed agriculture.

III.3. The proposed project would thus constitute a major step in the country's efforts to optimize utilization of available water resources to resuscitate the agricultural sector and address the problem of food insecurity, poverty, hunger and malnutrition. The project will address the problem of low agricultural land and labour productivity. In addition to increasing yields and improving the quality of produce, irrigation would lengthen the production season, thus enabling intensification and diversification of agricultural production. This would mean a reliable national food supply, increased rural incomes, greater contribution to GDP, improved foreign currency earning capacity, a constant supply of raw materials to industry and more jobs for the Zimbabwean population.

III.4. The information compiled by AGRITEX (the precursor of AREX) shows that smallholder irrigated agriculture can be profitable if appropriate water management techniques are followed, proper farmers' participatory management methods are pursued and appropriate agronomic practices are implemented. The low yields of some irrigation schemes result from unreliable water supplies, caused partly by infrastructure deterioration, lack of participatory scheme management and other social factors. If these issues were properly addressed, the irrigation potential could fully and gainfully be exploited.

III.5. The available data show that smallholder farmers have not yet utilized their water allocations from all the dams shown in Table 1 above. This was and still is because of the lack of funds needed to develop an irrigation infrastructure. This project would establish the required infrastructure, and thus enable the smallholder farmers to utilize their allocated share of the available water for irrigation, thereby increasing their production and yields. The infrastructure would be complemented by the promotion of suitable water management and agronomic techniques, input supplies and correct training, all of which would be essential elements for realizing the full benefits from irrigated agriculture.

IV. PROJECT OBJECTIVES

IV.1. The ***overall objective*** of the project is to improve food security and incomes among rural communities through the rapid increase of agricultural production and productivity by reducing the high risks associated with over–dependency on rainfed agriculture. The project would achieve this objective by developing smallholder irrigation schemes for which water is currently available in existing dams.

IV.2. The ***specific objectives*** are to:

- enhance household food security and self–sufficiency at both national and household levels through increased agricultural production and productivity, particularly for smallholder farmers in drought–prone areas;
- create employment opportunities for rural people by promoting agricultural production and agro–industrial growth and development in the rural areas of the country; and
- build up farmer capacity through training in the efficient planning and O&M of the irrigation systems, including on–farm water management.

IV.3. The above objectives would be achieved by:

- developing 4,280 ha for which water is available in existing dams.
- improving farmers' access to agricultural inputs and support services; and
- enhancing the capacity of smallholder farmers to operate and manage productive irrigation schemes on a sustainable basis.

V. PROJECT DESCRIPTION

V.1. The project will run for five years; it is composed of four components: Smallholder Irrigation Infrastructure Development, Input Supply, Agricultural Support Services and Capacity Building.

<u>Component 1:</u> Smallholder Irrigation Infrastructure Development

V.2. This component will target the development of six irrigation schemes to provide smallholder farmers with supplementary irrigation in summer and full irrigation in the dry winter months, thus affording them the capacity to grow crops during these periods and increase crop output in the process. At total of 4,280 ha of irrigable land will be developed; some 8,650 farmers will be given plots averaging 0.5 ha each. Under this component, the project will establish the required physical infrastructure as necessary, including pumping units, canals, night–storage reservoirs, water delivery pipes and sprinklers.

V.3. The major project interventions under this component are discussed below for each proposed scheme.

- ***Zhove Dam Irrigation Scheme (500 ha).*** Zhove dam was constructed to irrigate land in the commercial, communal and resettlement areas of the drought–stricken Beit Bridge district. Up to now commercial farmers have utilized their water allocation from the dam,

whereas smallholder farmers have not utilized their share of the water because of funding problems to develop the necessary infrastructure. This project will construct the required infrastructure to benefit about 1,000 families on 500 ha of irrigated land.

- ***Osborne Dam Irrigation Scheme (1,700 ha).*** Irrigation infrastructure will be developed for 3,400 smallholder farmers.

- ***Muzhwi Dam Irrigation Scheme (680 ha).*** Muzhwi dam was constructed primarily to augment water supplies to the sugar production estates as well as irrigate land in the communal and resettlement areas along the Triangle Canal. Up to now the sugar estates have opened up land to utilize their quota of the irrigation water. However, funds have not been available to construct smallholder irrigation schemes to enable smallholders to utilize their share of the water. This project will construct the required irrigation infrastructure to benefit 1,360 farmers.

- ***Mwarazi Dam Irrigation Scheme (300 ha).*** The 6.4 MCM Mwarazi dam was built in 1971 to supply domestic and industrial water to the now defunct Inyati Mine. The water in the dam has not been used since the mine shut down. Under the project, irrigation infrastructure would be constructed and water harnessed for irrigation for 600 farmers.

- ***Mbindangombe Irrigation Scheme (100 ha).*** The Mbindangombe irrigation dam has sufficient water allocated for smallholder farming to handle 100 ha of irrigation. This allocation has never been tapped. The project would develop irrigation infrastructure for 200 farmers.

- ***Mazvikadei Irrigation Scheme (1,000 ha).*** Mazvikadei Dam has 15 MCM of water allocated for smallholder irrigation development, enough to irrigate an area of 1,000 ha. This project will construct the required irrigation infrastructure to benefit about 2,000 farmers.

V.4. The major crops that will be irrigated in all schemes include maize, cotton, beans, wheat, tomatoes and other horticultural crops. The irrigation technologies that will be used in these schemes cannot be specified at this stage because the irrigable lands have not yet been determined.

<u>Component 2:</u> Input Supplies

V.5. In order to fully exploit the irrigation potential, farmers in the developed schemes will be required to apply the appropriate agricultural inputs such as seeds, fertilizer and chemicals. The project will assess the input needs of the farmers and make a line of credit available to them from which they can borrow to finance their input requirements through the appropriate financial institutions like AGRI Bank and interested commercial banks. The line of credit will also help them finance the land preparation requirements like hiring tractors or acquiring draught oxen.

<u>Component 3:</u> Agricultural Support Services

V.6. The farmers would require support from the national extension service institution (AREX) concerning various aspects of irrigated crop production. The project will facilitate the delivery of such services through the provision of logistics and staff allowances.

Component 4: Capacity Building in Irrigation Development and Management

V.7. This project will be managed by the farmers themselves. The capacity of the 20 field MARD technicians and the some 8,560 farmers involved in the project will need to be strengthened by providing technical training in implementing irrigation agriculture operations, including agronomic aspects and marketing. They will receive on–the–job training from trainers experienced in planning and implementing smallholder irrigation systems and technologies. A marketing intelligence and information dissemination system will be established in all of the schemes. To improve the farmers' participatory scheme management capacities, they will be assisted in setting up and managing Water Users' Associations (WUAs).

VI. INDICATIVE COSTS

VI.1. The project will cost about US$67 million over a five–year implementation period. Table 4 shows the indicative estimated costs per component. About 60% (US$40m) will be in local costs and 40% (US$27m) will be in foreign exchange. The costs have been derived from reports and experiences of MARD's Department of Irrigation which has already designed and implemented such projects in the past. Where information is limited and/or lacking, professional estimations have been used, based on prevailing market prices.

Table 4: Project Cost Summary per Component

Component	Cost (US$ million)					
	Year 1	Year 2	Year 3	Year 4	Year 5	Total
1. Irrigation infrastructure development						
– Zhove	2.0	0.5	0.5	0.5	0.5	4.0
– Osborne	6.9	1.7	1.7	1.7	1.7	13.6
– Muzhwi	1.8	0.9	0.9	0.9	0.9	5.4
– Mtshabezi	0.8	0.4	0.4	0.4	0.4	2.4
– Mbindangombe	–	–	0.4	0.2	0.2	0.8
– Mazvikadei	1.6	1.6	1.6	1.6	1.6	8.0
Sub–total	13.1	5.1	5.5	5.3	5.3	34.3
2. Input supply	3.5	3.5	3.5	3.5	3.5	17.5
3. Capacity building	0.4	0.4	0.4	0.4	0.4	2.0
Total base cost	17.0	9.0	9.4	9.2	9.2	53.8
Physical contingencies	1.7	0.9	0.9	0.9	0.9	5.3
Price contingencies	2.5	1.3	1.4	1.3	1.4	7.9
Total	21.2	11.2	11.7	11.4	11.5	67.0

VII. PROPOSED SOURCES OF FUNDING

VII.1. GoZ, international and domestic financial institutions, NGOs, the private sector and beneficiaries will finance the project. GoZ will provide US$6.7m (10%) of total project financing; donors/IFIs will provide US$40.2m (60%); beneficiaries will provide US$6.7m (10%); and the private sector will contribute US$13.4m (20%) of total funding.

VII.2. IFIs/donors such as IFAD, the World Bank, Japan International Cooperation Agency and the European Union have supported irrigation activities in the past and they will likely be interested in contributing to the funding for this project.

VII.3. Irrigation development requires unskilled labour to carry out work such as digging pipe trenches and building canals and fences and this work will be carried out by the beneficiary farmers as their contribution towards project costs. Neighbouring communities could be mobilized to provide labour and be paid in food rations. For O&M, farmers should meet running costs in full or in part, provided a proper system is set up for that purpose. Establishing maintenance procedures by farmers after establishing the schemes will be essential to retain effective and sustainable operations of the schemes.

VIII. PROJECT BENEFITS

VIII.1. The following main benefits are expected from the project:

- increased agricultural production and productivity because of a substantial reduction in the risks associated with rainfed agriculture;
- boost farmer ability to grow a diversified range of crops all year–round;
- improved food security and nutrition;
- boosting rural incomes and reducing poverty among the participating farmers;
- increased rural agricultural trade and commerce;
- inclusion of communal farmers in the mainstream of irrigated agriculture;
- increased agricultural exports; and
- increased agro–processing activities because of higher volumes of raw materials from farmers.

IX. IMPLEMENTATION ARRANGEMENTS

IX.1. The project will be located at MARD, which will have overall responsibility, in collaboration with the private sector and farmer organizations, for planning, coordinating, monitoring and evaluating the project. An interministerial committee chaired by a senior official from MARD would have oversight responsibility for the project.

IX.2. The *Zimbabwe National Water Authority* (ZINWA), which is mandated with the construction of major dams and allocation of water for agricultural purposes, will offer technical guidance and supervision to the project as regards water rights and the design and construction of pumping stations and water delivery lines to field edge.

IX.3. The *Agricultural and Rural Development Authority* (ARDA) will spearhead the mobilization of smallholder farmers to engage in irrigated agriculture through development outgrower schemes that ARDA will help to establish.

IX.4. Responsibilities of other ministries and government agencies involved in the water sector will be as follows:

- *Ministry of Finance, Planning and Economic Development* (MFPED) will be responsible for the mobilization of resources for the project and will coordinate donor inputs.
- *Department of Research and Extension* of MARD will be responsible for providing extension services to the farmers on various aspects of irrigated farming including pest control, input procurement and marketing of produce.
- The private sector will be service providers in terms of contracts, manufacture and supply and installation of irrigation equipment and other farm inputs.
- Local authorities will facilitate the selection of project beneficiaries.

IX.5. Non–governmental organizations (NGOs) will be brought on board as and when their mandates relate and contribute to the effective design and implementation of the project. In many areas they will be able to help organize farmers to work in groups and carry out training.

X. TECHNICAL ASSISTANCE REQUIREMENTS

X.1. Based on the envisaged scope of project activities, technical assistance will be needed to carry out in–depth studies and guide the design and implementation of the project. Technical input requirements will be of a short– to medium–term duration in the following areas:

- socio–economic evaluation of the proposed schemes;
- detailed topographical surveys of the land to be used for the project activities;
- detailed technical designs of irrigation systems including pumping units, infield works and bills of quantities;
- environmental impact assessments of the proposed schemes; and
- training programme for farmers, to be carried out in their plot holdings.

XI. ISSUES AND PROPOSED ACTIONS

XI.1. ***Difficulties with donor funding.*** Donor funding might not be forthcoming in the short term, which could delay project implementation. However, the GoZ has recently resumed negotiations with the IMF and World Bank. This is an indication that donors have not closed the doors completely and is a hopeful sign for this and other projects.

XI.2. ***Land tenure.*** The farmers in the communal and resettled areas do not own title to the land they farm. Even the farmers who were recently resettled under the fast–track land reform programme do not have clear assurance about the ownership of the land they were allocated. Without certainty of ownership, farmers will have no incentive to invest in long–term irrigation infrastructure or crops, like trees/agro–forestry, the gestation period of which is very long. They will also tend to over–exploit soil resources. Lack of clear ownership of the land is also quoted as the major reason why smallholder

farmers have been locked out of the formal lending sector – they have no title deeds to secure their borrowings from the financial institutions.

XI.3. ***Inadequate farmer participation.*** Smallholder farmers have no local, regional and national organizations to represent them and participate in the initial identification of irrigation schemes, to liaise with technical officers in the planning and design of schemes or to participate in the implementation of schemes. This has resulted in the top–down development of irrigation schemes, quoted as one of the main reasons why they have not been sustainable. Under this project, potential beneficiary farmers will be encouraged to take over greater responsibility for all stages of project development from the design stage to O&M of the newly developed schemes. In particular, they will be sensitized about the desirability for the community to meet the finance costs of O&M of their schemes and also to reorganize their village operations to enable them to take over greater responsibilities. To that end, the extension service will initiate modalities for community organizations, such as the WUAs, through which greater community participation and autonomy will be achieved.

XI.4. ***Poor planning, design and construction quality control.*** At present, any entrepreneur/farmer can establish and implement irrigation schemes without heeding even minimum standards. Some projects have been implemented using poor design and poor–quality materials. These crumbled after operating for only a short period of time, thus disappointing the hopes of the farmers. Mechanisms must be set up, through legal instruments such as an Irrigation Act, to ensure that irrigation schemes meet minimum standards regarding design, quality of construction and management. Likewise the supply of irrigation equipment to the market has not been regulated in the past. There is a need to test equipment for standards compliance before sale to consumers.

XI.5. ***Uneconomic irrigable plot sizes.*** In smallholder irrigation schemes, plot holdings vary in size from about 0.1–2.0 ha. Considering the government's drive to commercialize irrigation development, and the fact that some plot holdings may be too small to provide any meaningful financial returns to the farmers, a position must be decided and guidelines issued regarding the minimum economically viable individual plot sizes in the irrigation schemes. To mitigate this problem, the project is proposing a minimum size of 0.5 ha plot size per farmer.

XI.6. ***Gender and youth issues.*** Women and youth tend mostly to provide unremunerated labour without deriving any benefits. This is because owners' and users' rights of the plots are usually vested in male–heads of households. The rights to irrigated land for women and children are secured through marriage and parentage. Part of the problem lies in the official discourse that land is allocated to families. It should also be further noted that there are inheritance issues, where — in some cases — sons inherit land and dispossess their own mothers. It has also been observed that polygamy is used to disadvantage not only the wife who has fallen out of favour, but also her children. Only a few women manage to hold on to the ownership of their own plots. Cultural considerations exacerbate this situation. The few women who may be able to hold their positions often do not exercise their full mandate as do their male colleagues. For example, in several schemes, women who are part of the marketing committee are discouraged from travelling away from the schemes to source for markets on the grounds that married women are not allowed to sleep away from their own home. The youth in smallholder irrigation schemes do not hold any rights. This project proposes to mitigate this problem by encouraging equal opportunity to both sexes and youths in selecting the direct project beneficiary farmers.

XI.7. ***Environmental impact.*** Irrigation schemes are notorious for increasing soil salinity and water–logging and for raising incidence of malaria and other waterborne diseases. In the 1980s efforts were made to design and construct free–drainage structures that would facilitate easy flow of water

and reduce the incidence of water–related diseases. However, such structures have not been widely implemented. There has also been an attempt to raise local awareness about management of catchment of the water source, thereby minimizing siltation in dams. To reduce potential adverse effects such as those mentioned here, the project proposes to carry out an environmental impact assessment study for each irrigation scheme before construction work begins.

XII. POSSIBLE RISKS

XII.1. The major risks identified at this stage are as follows:

- ***Persistence of macroeconomic difficulties*.** Zimbabwe's present difficult macroeconomic environment may not improve as fast as is hoped, and this will prevent donors and the private sector from investing in irrigation development.

- ***Government counterpart funding*.** Although government support to and interest in irrigation development is a certainty, the government is currently experiencing severe budgetary constraints in meeting commitments. There may therefore not be available, in the short run, the required levels of public financing required for this project.

- ***Inadequate advisory services*.** Irrigated farming is quite complex, requiring prompt decision–making and timely action in order to reap the full potential benefits. However, the Department of Irrigation in MARD, the agency responsible for developing irrigation infrastructure and extending advisory services to farmers, is not yet fully staffed at provincial and district levels and this is a potential risk to the success of the project.

- ***Limited farmer capacity in irrigation*.** Limited farmer managerial capacity may result in poor management of the resources and infrastructure. However, the intensive training proposed under this project should help mitigate this risk.

- ***Farmer participation and interest*.** The long–term success of this project depends on the level of farmer involvement in all stages of development and implementation. Farmers should be made aware of the benefits associated with optimum performance of their irrigation systems; they should participate fully in project implementation. Because farmers have been accustomed to receiving free handouts from the government and donors for various reasons, there is a potential danger that farmers might not fully understand participation in project implementation, and thus project sustainability will be jeopardized as a result.

- ***Project implementation delays*.** For various reasons, particularly slowness in executing legal covenants, delays in the release of project funding by government or donors or both, and bureaucratic delays within government, the project may encounter lags and delays in start–up operations. Experience has shown that farmers lose interest in projects because of the time taken to start physical implementation after their enthusiasm has been raised. Project design will ensure that there are built–in checks and balances to avoid unnecessary start–up delays.

Appendix: Major Characteristics of the Natural Regions of Zimbabwe

Natural region	Altitude & topography	Climate	Details on the agricultural season	Recommended farming system	Need for irrigation
I	Mostly high veld, alt. 2,000 m	Over 1,000 mm rainfall per year; precipitation every month; low temperatures	Rainfall is highly effective; frost–free valleys	Specialized, diversified farming; high–value crops: coffee, tea, deciduous fruit, forest products for paper and timber	Low need: irrigation supplements minor variations in rainfall
II(a)	Mostly high veld and plateau, alt. to 1,800 m	750–1,000 mm rainfall; 18 rainy pentads* per season; very reliable rainfall	Rainfall limited to summer; rarely dry spells in summer.	Intensive farming system; major crops: maize, soybeans, tobacco, groundnuts, wheat and cotton	Low need: irrigation reduces effects of mid–season dry spells; also lengthens growing season for many crops; wheat is fully irrigated.
II(b)		16–18 rainy pentads* per season	Susceptible to severe dry spells during the rainy season		
III	Middle veld, alt. 1,000–1,600 m; open and undulating terrain.	Moderate rainfall: 650–800 mm per year in infrequent, heavy falls; 14–16 rainy pentads*; unreliable start of rainy season	Subject to severe mid–season spells and periodic droughts; marginal for major crops, i.e. maize, soybeans and tobacco	Semi–intensive farming under good management; maize, cotton, groundnuts under irrigation only; suited to livestock production	Irrigation sustains crop production
IV	Low–lying plains, alt. 600–1,000 m	Fairly low rainfall: 450–600 mm/year; high temperatures; high evapotranspiration	Subject to periodic seasonal droughts and dry spells during the rainy season; uncertain rainfall for cash crops	Semi–extensive farming; suited to livestock production and drought–resistant crops	Great need: Irrigation greatly enhances reliability of food crop production
V	Low–lying valleys: below 600 m	Low and erratic rainfall; very high temperatures and evapotranspiration	Rainfall too low and erratic for reliable production of even drought–resistant fodder and grain crops	Extensive farming system; suitable for utilization of the veld alone, i.e. cattle and/or game ranching	Need for irrigation is greatest; No production of crops is possible without irrigation

* Rainfall pentad: five–day period with more than 40 mm rainfall, two days of which should receive at least 8 mm of rainfall.
Adapted from various sources