Socio-economic impact of smallholder irrigation development in Zimbabwe: A case study of five successful irrigation schemes

L'impact socio-économique du développement de la petite irrigation au Zimbabwe: Une étude de cinq périmètres irrigués performants

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Abstract

An analysis is given of the impacts of five small irrigation systems in Zimbabwe. The systems range in size from 9 to 92 ha, and have fewer than 100 farmers. Most are farmer-managed, but one is managed by farmers jointly with a government agency. The assessment of impacts takes account of a broad set of aspects, including direct production benefits and various secondary benefits such as employment generation, stimulation of the local economy, and environmental protection. The performance of the systems is found satisfactory in all respects. The cost to government of providing added production capacity through smallholder irrigation is compared with the cost of government's drought relief programmes, and it is concluded that the costs (capital and operational) of providing irrigation are substantially less than the cost of providing drought relief assistance. Lists of conclusions and recommendations are provided, with the general themes that small-holder irrigation systems represent a good investment for government; that farmer-managed systems are effective and reduce pressures on government budgets; that farmers should be involved in planning new schemes; and that training packages and study tours are valuable tools to prepare new entrants to irrigated farming.

Résumé

Cet article examine les impacts de cinq petits périmètres irrigués au Zimbabwe, de 9 à 92 ha et ayant moins de 100 exploitants chacun. Quatre d'entre eux sont gérés par les exploitants eux-mêmes ; le cinquième est géré conjointement avec une organisation de l'Etat. L'analyse des impacts prendre en compte les bénéfices directs de la production ainsi que divers bénéfices secondaires tels la création d'emplois, la stimulation de l'économie locale et la protection de l'environnement. Les performances des périmètres se révèlent satisfaisantes a tous les égards. Les coûts que doit supporter le gouvernement pour augmenter la capacité de production par la promotion de la petite irrigation sont comparés aux coûts des programmes d'assistance contre la sécheresse ; on montre que les coûts (investissements initiaux et charges récurrentes) lies à l'irrigation sont beaucoup moins élevés. Des recommandations et conclusions présentées montrent que : la petite irrigation représente un bon investissement pour l'Etat ; les périmètres auto-gérés sont performants et ils réduisent les charges de l'Etat ; les exploitants doivent être impliqués dans la réalisation de nouveaux périmètres ; la formation et les voyages d'étude sont des outils précieux pour sensibiliser et préparer les exploitants pour qui l'agriculture irriguée est une nouvelle occupation.

1. Introduction

This paper summarises the results of a socio-economic impact assessment carried out on five successful smallholder irrigation schemes in Zimbabwe (FAO 2000). The paper starts by giving a very brief general overview and background on the agricultural sector of Zimbabwe to enable the discussion on smallholder irrigation which follows to be taken and understood in the right perspective. This is then followed by a summary of the findings and recommendations from the socio-economic impact evaluation.

The results of the socio-economic impact evaluation show that smallholder irrigation can certainly be economically and financially viable and can result in increased productivity, improved incomes and nutrition, employment creation, food security and drought relief savings for governments. Smallholder irrigation development can be used as a key drought mitigation measure and as a vehicle for the long-term agricultural and macro-economic development of a country.

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2. Zimbabwe: Background information

2.1 Introduction

Zimbabwe is a landlocked country in the Southern Africa region, with an area of over 390,000 km^2, bordered by Zambia, Mozambique, South Africa, Botswana and Namibia. It is situated between about 15 and 22 degrees south latitude and about 26 and 34 degrees east longitude. Climatic conditions are largely sub-tropical with one rainy season, between November and March. Rainfall reliability decreases from north to south and also from east to west. Only 37 percent of the country receives rainfall considered adequate for agriculture.

2.2 Agricultural sector

Agriculture is the mainstay of the economy of Zimbabwe. Although the agricultural sector contributes only about 18 percent of the country's Gross Domestic Product (GDP), it is the country's largest foreign currency earner and about 40 percent of the country's exports are of agricultural origin (Agritex 1999). About 70 percent of the population are directly dependent on it for formal employment and agriculture provide about 60 percent of raw materials to industry (Agritex 1999). Recent experiences, especially the periods during and immediately after the severe droughts of 1986/87, 1991/92 and 1993/94, have shown that the performance of the country's economy is directly related to the performance of the agricultural sector. The economy performs well when agriculture is thriving.

The agricultural sector has a dualistic nature made up of a fairly advanced large-scale commercial sub-sector and a smallholder sub-sector which is poor, less developed and still needs a lot of support. For the purposes of relating climate, soils and topography Zimbabwe is divided into five Agro-ecological zones or Natural Regions (NRs). NRs I, II and III are areas of higher agricultural potential and cover about 35 percent of the land area. NRs IV and V comprise the remaining 65 percent of land area, and these are areas of poor soils, low and erratic rainfall and hence of poor agricultural potential. The commercial sub-sector occupies about 12 million hectares and 56 percent of this is located in NRs I, II and III. The small-scale sub-sector occupies 16.3 million hectares, 75 percent of which lies in low potential Agro-ecological zones IV and V. Therefore dryland farming in the majority of the smallholder sub-sector is unsuccessful. Experience has shown that farmers in these areas on average obtain a good harvest once every 4 to 5 years

2.3 The Zimbabwean irrigation sub sector: A brief overview

At independence in 1980 the new government of Zimbabwe recognised the role of irrigation in agricultural development, especially in improving the production of the smallholder farmers. The government increased its efforts to promote irrigation development in this sector, which had been neglected by the previous colonial government. In about 1983, steps were taken to develop new smallholder irrigation schemes and rehabilitate all the irrigation schemes, which were damaged during the Liberation War.

Zimbabwe has made tremendous strides in smallholder irrigation since 1980. From about 57 malfunctioning schemes covering 2,500 ha in 1980, over 180 formal[1] irrigation schemes have been developed over the years in communal, resettlement and smallscale purchase areas, bringing the total area under smallholder irrigation today to about 12,000 ha. In all, 155,500 ha are under irrigation, and therefore the area under smallholders is about 8.5 percent of the total irrigated area as shown in Table 1. Due to its informal nature micro-scale or garden irrigation in "dambos" or wetlands is not normally included in official estimates of the total irrigation command area. However, it is estimated that about 30,000 ha is under micro-scale irrigation in the country, mainly in the "dambos" or wetlands.

[1] That is those schemes that were initiated and financed by government.

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Table 1. Current status of irrigation development in Zimbabwe.

Sector	Area under irrigation (ha)	As % of total area under irrigation
Large-scale commercial farms	126,000	81
Government farms	13,500	8.5
Outgrower schemes[a]	3,000	2
Smallholder (including small-scale purchase areas)	13,000	8.5
Total	155,500	100

[a]Outgrower schemes refer to a group of individual plot holders adjacent and linked to a core estate. The outgrowers irrigate a crop independently but on behalf of the main estate. The plot holders depend on the main estate for provision of irrigation water, transport, managerial, technical and marketing services.

Source: AGRITEX estimates, 1999.

Smallholder irrigation schemes in Zimbabwe are of two basic categories: supplementary ("part--time" irrigation) schemes and full production ("full-time" irrigation) schemes. In the first category the irrigated plot size per household is typically 0.1–0.5 ha and the farmers combine irrigation with dryland farming activities. Income derived from irrigation is used to supplement income from dryland production. In "full-time" irrigation schemes plot sizes are typically 0.5–2 ha per household. Such plot sizes are meant to provide full-time occupation with irrigation. Irrigation farmers on such schemes are not expected to be engaged also in dryland agriculture.

The main water sources for smallholder schemes have been water stored in medium-sized and large dams. Other important sources has been river flow, deep motorised bore-holes, sand abstraction systems, shallow wells and springs. Irrigation technologies in use in this sub-sector include surface irrigation, which comprises 68 percent of the schemes, and sprinkler irrigation, which makes up 32 percent of the schemes. In terms of area, 89 percent of the area is under surface irrigation and 11 percent is sprinkler irrigated. Localised irrigation[2] is not yet in use the smallholder irrigation sub-sector.

In terms of management, there are three broad types of smallholder schemes: government-managed, farmer-managed and jointly managed schemes. Government-managed schemes are developed and maintained by the Department of Agricultural Technical and Extension Services (AGRITEX). In the new schemes there tend to be a shift away from this practice and towards farmer-managed projects. Farmer-managed schemes are developed by the government but owned and managed by the farmers' Irrigation Management Committees (IMCs) with minimal government interventions in terms of management. For jointly-managed schemes the farmers and government share the financial responsibility for operation and maintenance. For such schemes, the government is usually responsible for the headworks (i.e., dam or weir, pumping station and conveyance system up to field edge), while farmers take responsibility for the infield infrastructure. In terms of scheme numbers, 50 percent of the smallholder schemes are farmer-managed, 32 percent are government-managed and 18 percent are jointly managed. However, in terms of area, the government is still managing a larger hectarage, as most of the farmer-managed schemes tend to be small.

3. Socio-economic impact of selected smallholder irrigation schemes in Zimbabwe

In an attempt to contribute to a better understanding of the smallholder irrigation sub-sector in Zimbabwe, a socio-economic performance evaluation was carried out on five selected smallholder irrigation schemes. The schemes were known to be doing well although in varying degrees. The objective of pre-selecting the good schemes was to find out what factors make good schemes perform well.

[2] Drip irrigation is being piloted in the smallholder sub-sector under the FAO Special Programme for Food Security (SPFS).

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3.1 The schemes

Table 2 presents some of the important features of the five schemes studied. The studied schemes varied in size from 9 ha to 92 ha. Three of the schemes are under sprinkler irrigation and two are under surface irrigation. Two of the schemes are located in resettlement areas and the other three are in communal areas. All schemes except Murara are within 150 km from a major town. The schemes at Murara and Mzinyathini were initiated by government in its attempts to provide the farmers with a source of self-sustenance. The farmers did not actually request this development. At Chitora, Hama Mavhaire and Wenimbi the farmers identified the project and approached the government for help. The farmers made financial contributions for the development of infield works. In the other two schemes farmers did not participate or contribute during planning and implementation. All the schemes are farmer-managed except Hama Mavhaire, which is jointly managed by government and the farmers.

Table 2. Major features of the selected schemes.

Name of scheme	District	NR	Size (ha)	Plot size (ha)	Major crops grown	Cropping intensity (%)	Type of management	Irrigation system
Chitora	Mutoko	III	9	0.5	vegetables	± 300	Farmers	Drag-hose sprinkler
Hama Mavhaire	Mvuma	IV	92	1.0	vegetables and food crops	± 200	Joint Government and Farmers	Semi-portable sprinkler
Murara	Mutoko	IV	18	0.5	vegetables	± 200	Farmers	Surface irrigation
Mzinyathini	Umzingwane	IV	32	0.4	food crops; some vegetables	± 200	Farmers	Surface irrigation
Wenimbi	Marondera	III	34	1.55	food crops; some vegetables	± 150	Farmers	Drag-hose sprinkler

The impacts of the smallholder schemes were examined in relation to several aspects, as described in the following paragraphs.

3.2 Agricultural performance

3.2.1 Crop yields

The evaluation revealed that crop yields can go up many-fold with irrigation. For example at Chitora during the 1997/98 season groundnuts yields were recorded to be 4 t/ha, as compared to 0.7–1 t/ha obtained under dryland. Maize yields were 6 t/ha in Murara, compared to l–2 t/ha obtained under dryland. Table 3 presents the yields of selected crops under irrigation as compared to dryland at the different schemes studied.

Table 3. Average yields for selected crops at the different irrigation schemes during the 1997/1998 season.

Scheme	Maize	Green maize[a]	Wheat	Tomatoes	Beans	Groundnuts
Chitora	–	40,000	–	40	–	4
Hama Mavhaire	7	35,000	–	–	3	3
Murara	6	35,000	–	28	2	–
Mzinyathini	7	–	–	20	–	2
Wenimbi	7	37,000	–	30	–	–
Average dryland yields	1.5	–	–	–	–	0.7 – 1

[a] Yield for green maize is given in cobs.
Note: — crop not grown on this scheme.
Source: AGRITEX and farmers' estimates, 1999.

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3.2.2 Cropping patterns

The evaluation of the successful irrigation schemes showed that under irrigation high cropping intensities are practised (Table 2). Table 4 indicates the general cropping patterns practised at the five schemes. Crops unknown to communal farmers, like baby corn, cucumbers, carrots, butternuts, green pepper, peas and potatoes can now be grown. The cropping pattern is normally dominated by vegetables and high-value crops, so that the farmers can generate enough income to operate and maintain the irrigation schemes. The production of high-value crops for both local and export markets by some of these schemes means that they are now participating in the mainstream economy. The cropping pattern in most cases is a compromise between subsistence requirements, availability of sound agronomic rotations, roads infrastructure, proximity to markets and marketing demand.

Table 4. Crops grown at the different schemes.

Scheme	Crops
Chitora	Cucumber, green mealies, potatoes, beans, green pepper, butternut, groundnuts, onion, rape, carrots, tomatoes.
Hama Mavhaire	Green mealies, peas, beans, groundnuts, grain maize.
Murara	Tomatoes, potatoes, green mealies, beans, onion, rape.
Mzinyathini	Maize, groundnuts, sugar beans, wheat, cabbage, rape, tomatoes
Wenimbi	Tomatoes, green maize, grain maize, leafy vegetables

Source: AGRITEX 1999.

3.3 Incomes derived from the irrigation schemes

The evaluation of the case studies has indicated that smallholder irrigation schemes can be reliable sources of income. Farmer incomes derived from the schemes are shown in Table 5. At the time of study individual farmers in these schemes were getting monthly incomes as high as Z$5,833 per farmer per month from plots of just 1 ha, while dryland incomes can be as low as Z$1,000 per month per farmer from an average 6 ha plot size. The incomes were higher than the minimum wage of Z$1,400 per month which is paid for unskilled labour in the Zimbabwean industry and the minimum wage of Z$600 per month which is paid for unskilled labour in the agricultural industry of Zimbabwe. From a social point of view a farmer in an irrigation scheme is certainly much better off than labourers in urban industries who are faced with a lot of other demands like rent, water and electricity charges on their incomes. This gives every reason for the government to channel more resources to small-holder irrigation development.

Table 5. Net incomes derived from the irrigation schemes during the 1997/1998 season.

Scheme	Plot size (ha)	Average annual family income (Z$)	Income per ha (Z$)	Average income per farmer per month (Z$)
Chitora	0.5	60,000	120,000	5,000
Hama Mavhaire	1.0	70,000	70,000	5,833
Murara	0.5	25,000	50,000	2,083
Mzinyathini	0.4	20,000	50,000	1,667
Wenimbi	1.55	79,000	50,968	6,583

Note: US$1= Z$33 (December 1998).
Source: AGRITEX extension staff and farmers. 1999.

3.4 Financial and economic analysis

To evaluate further the viability of the irrigation schemes, a financial and economic analysis was conducted on all five projects to judge their impacts on the farmers and the government in addition to their impact from the point of view of society. The analysis follows the “time adjusted cash flow

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approach" which assumes that every transaction falls at the end of the accounting period (end of year in this case). This means the initial investment is considered to have taken place during the first year of the project. A constant price approach was also adopted, thus expressing the costs and benefits in real terms. The results of the analysis are shown in Table 6 where the Financial Internal Rate of Return (FIRR), Net Present Value (NPV) and Economic Internal Rate of Return (EIRR) are used as the financial and economic indicators. From Table 6 it transpires that all the irrigation schemes studied are financially and economically viable based solely on the indicators. The viability of these schemes can be attributed to the high incomes derived by the farmers who grow high-value horticultural crops.

Table 6. Results of the financial and economic analyses of the irrigation schemes.

Scheme	Financial analysis[1]		Economic analysis[2]
	FIRR(%)	NPV (Z$)	EIRR(%)
Chitora	85[3]	230,947	90
Hama Mavhaire	17	1,985,548	17
Murara	45[3]	635,058	50
Mzinyathini	24	62,524	19
Wenimbi	68[3]	410,965	71

[1]The discount rate used for the financial analysis was 9.75 percent.
[2]The opportunity cost of capital used for the economic analysis was 8.5 percent.
[3]The very high FIRR is attributed to the negligible cost of head works (because of either direct abstraction from a river or already existing dam), and high percentage of horticultural crops in the cropping programme. The schemes have a reasonable access to markets.

Care should be taken in the interpretation of the financial and economic analysis figures presented in Table 6. The results reveal very useful information on the performance of the individual irrigation schemes but a direct comparison cannot be made between the schemes due to the different conditions on each scheme.

3.5 Employment generation

Irrigation is one way of generating employment in rural areas. All the five schemes studied were found to hire labour additional to that provided by the irrigating households to assist in land preparation, planting, weeding and harvesting. For example, at a typical viable small-holder irrigation scheme 1 ha of irrigated tomatoes will require 120 labour days for planting, weeding, harvesting and marketing over a period of three months. At a rate of Z$30 per labour day, this translates into Z$3,600 per hectare for one crop only. Successful schemes can practise a cropping intensity as high as 250 percent. This means in one year a 1-ha plot will require Z$9,000 for hired labour. Taking, for example, a successful scheme like Hama Mavhaire (92 ha), this scheme will employ about 115 people permanently for one year at the agricultural minimum wage of Z$600 per month. Payment is normally in kind and cash. For example at Chitora it was found that a labourer hired in the scheme was paid Z$20 per day plus vegetables to take home. The irrigation schemes which grow high-value horticultural crops employ much more labour than the schemes which concentrate on grain crops.

The availability of employment in the irrigation schemes is also important in terms of reduction of rural to urban migration. It is important to appreciate that a reduction in migration is in fact a saving for the urban municipalities in terms of an avoided cost of providing services like housing, water, sewerage, education and health to potential migrants.

3.6 Food security

According to the findings of FAO (1997) Zimbabwe's food situation is characterised by food security at national level but food insecurity at micro level. The major area of concern is the availability of food at household level. The five irrigation schemes were found to act as sources of food security for the participants and the surrounding communities through increased productivity, stable production and increased incomes. Some of the schemes like Murara and Hama Mavhaire are located in harsh climatic regions where people cannot grow enough to feed themselves because of unfavourable weather conditions. The farmers participating in the irrigation schemes never run out of food,

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unlike their dryland counterparts. The payment of hired labour in kind by most schemes also ensures food security and better nutrition.

3.7 Drought relief savings

The Government of Zimbabwe (GOZ) has spent large amounts of money since 1980 on drought relief. Irrigation development can contribute towards drought savings. The importance of irrigation in drought relief savings can be better illustrated by a comparative analysis of the cost of a drought relief programme and the investment required in irrigation to obtain a similar relief.

Consider 1,000 families living in NR V, where rainfall is erratic, unreliable and inadequate for any meaningful dryland cultivation. The aim of the drought relief programme is to supply at least 550 kg annually to each family of six persons. If these families were placed on a drought relief programme they would require 550 tonnes of maize per annum. The government expenditure in 1998 to purchase this quantity of maize, at Z$2,400 per tonne, would be Z$1.32 million. The estimated transport cost would be Z$110,000 and the administrative cost would amount to another Z$200,000, making a total annual drought relief cost of Z$1.63 million.

The question now is, can small-holder irrigation schemes produce the equivalent of drought relief and at what cost? If an average yield of 6 t/ha is assumed for maize in the smallholder schemes, 92 ha would be needed to produce 550 tonnes annually. The total cost of developing 92 ha at Z$70,000 per hectare in 1998 was Z$6.44 million. The annual financial equivalent (which is obtained by multiplying the investment cost by the capital recovery factor for 20 years at a 9.75% discount rate) is Z$0.74 million. The production cost for maize produced on 92 ha is about Z$0.37 million. This means the total annual cost of producing maize is Z$1.11 million.

From the above analysis the cost of irrigation is Z$0.52 million less than the cost of drought relief. Furthermore, the experience with drought relief is that it does not get to people who need it most. In fact, under normal circumstances, a complete drought relief package includes other commodities such as beans which if included can double the cost of drought relief, thereby making irrigation much more attractive.

Clearly smallholder irrigation is important as a development strategy since it results in government savings and ensures access to food by smallholder farmers. Farmers enjoy the human dignity of producing their own food instead of continuous food hand-outs from the government.

3.8 Acquisition of assets

The evaluation of the schemes showed that their participants acquired various assets. This was clearly illustrated by Chitora irrigation scheme. The participants who used to live with their parents before the scheme now have brick walled houses of their own. They are all married and own various household assets, electrical goods and farm implements. The farmers confirmed that their standard of living had indeed improved. At Hama Mavhaire about 29 percent of the plot holders were reported to have bought between one and four head of cattle from the proceeds of the scheme. About 65 had bought at least a donkey, 13 percent had put a brick under asbestos or corrugated iron sheet house, and 105 had installed a solar panel (Agritex 1999). At Wenimbi, farmers have managed to buy a second-hand five tonne truck to transport their produce to the market. Three farmers on this scheme had managed each to buy a small car. The conclusion that can be drawn from these observations on the five schemes is that well performing smallholder irrigation schemes can permit accumulation of wealth by the participants.

3.9 Entrepreneurial skills

The irrigation schemes have afforded the farmers an opportunity to operate on a commercial basis. Most of the schemes have had their participants acquiring entrepreneurial skills. This is evidenced by the ability of the farmers to do their own budgeting, keep record books and manage their own affairs. These skills are most evident in farmer-managed schemes. Farmers have to search for marketing information, organise cropping programmes which fit the markets, and organise transport to such markets. They are also capable of negotiating contracts, although they still need assistance in this aspect.

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3.10 Backward and forward linkages

The increased demand for inputs from local dealers, necessitated by the growing of horticultural crops in most schemes is an example of the backward linkages offered by the smallholder irrigation schemes. All the five schemes studied provide some degree of demand for inputs in their areas. Transport, which is hired for marketing by schemes such as Chitora, Hama Mavhaire and Murara is another example. The fact that most schemes go for more than 150 percent cropping intensity means that most input suppliers and transporters are in business all year around. This is different from input suppliers and transporters who service dryland farmers, who experience brisk business only in summer.

The demand for scheme produce by some vegetable canning and grain processing private companies in Zimbabwe such as National Foods, Hortico, Olivine and Interfresh is an example of the forward linkages offered by irrigation schemes. By offering such produce, the schemes create businesses and employment in the companies they supply and contribute to increased labour

The establishment of the irrigation schemes has resulted in the provision of infrastructure around which other economic activities take effect. The electrification of the pumping station at Hama Mavhaire, for example, has resulted in the nearby shopping centre being also electrified. A study of the scheme found that before the scheme there was only one general dealer shop, one bottle store and one diesel-powered grinding mill. Now there are four general dealer shops, two bottle stores, one hardware store, one butchery and five electrically driven grinding mills. At Chitora before the scheme the nearest shopping centre was at Mutoko, 60 km away. However after the establishment of Chitora irrigation scheme and two other adjacent schemes, a vibrant business centre namely Corner store was established only 16 km from the scheme as a result of the increased economic activities brought about by the irrigation schemes.

3.11 Conservation of natural resources

The irrigation schemes evaluated were seen to contribute in a way to the conservation of natural resources. While the dryland farmers adjacent to Murara irrigation scheme were engaged in gold panning to earn a living, the irrigators were not. Irrigation offers full-time employment such that the farmers are distracted from engaging in environmentally destructive activities like gold panning.[3] The irrigation farmers also use the irrigation schemes as sources of income for further investment in resource management. This was clearly illustrated again by the farmers from Murara, who are planting trees and woodlots making use of extra income derived from irrigation.

3.12 Economic development

The fact that the irrigation schemes result in the increase in incomes for the farmers means that the schemes are promoting economic development of the nation, which is measured by the well-being of the people. The changes which occur to the people, such as improved houses for farmers, better nutrition, self-reliance, improved assets etc., are part of economic development. The high Economic Rates of Return obtained for Chitora (90%), Murara (50 percent), and Wenimbi (71 percent) show that some irrigation projects can significantly contribute towards increasing national income.

4. Summary of findings

The successes of smallholder irrigation development are many and varied. Some of these are quantifiable while others are not. The major findings of the socio-economic evaluation of the five successful irrigation schemes can be summarised as follows:

[3] Gold panning is a process whereby people illegally dig deeper channels on the river banks. The process is very dangerous for both people and the environment. During the digging process the channels usually collapse resulting in injuries or even deaths of the panners. The process also results in the formation of gullies, soil degradation and subsequent siltation of rivers.

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- Smallholder irrigation can be indeed financially and economically viable if it is planned, implemented and managed in the right way. The major determining factors for viability in small-holder irrigation include planning and construction, type of scheme management, type of technology, appropriateness of design, institutional support, cropping programmes, availability of markets, marketing strategies, and commitment of the farmers.
- Crop yields and farmer incomes under small-holder irrigation can increase many fold with irrigation.
- Crops hitherto unknown to communal farmers, e.g., baby corn, peas, potatoes, okra, paprika etc., can now be grown under irrigation.
- Smallholder irrigators are now able to grow high-value crops both for the local and export markets, thus effectively participating in the main stream economy.
- In times of severe droughts smallholder irrigation schemes act as a source of food security at the household level.
- In areas of very low rainfall farmers practising irrigation enjoy the human dignity of producing their own food instead of depending on continuous drought relief hand-outs from the government. In addition drought relief programmes are difficult and expensive for the government to implement, in terms of both logistics and resources.
- Smallholder irrigation development has made it possible for other rural infrastructure to be developed in areas which would otherwise have remained without roads, telephones, electricity, schools, or shops.
- Smallholder irrigators have developed a commercial mentality and acquired various entrepreneurial skills.
- Farmers in successful irrigation schemes have acquired personal assets (improved housing, farm implements, furniture, electrical appliances) and their standard of living has improved substantially.
- Irrigation schemes provide an alternative source of employment to the rural people, thereby discouraging rural to urban migration.

5. Recommendations

Smallholder irrigation should be expanded through the construction of new schemes and the rehabilitation of existing ones. The evaluation of existing viable smallholder irrigation schemes in Zimbabwe led to the following recommendations:

- Develop farmer-managed irrigation schemes. In addition to being more successful, they remove the financial burden of operation and maintenance from government.
- Farmers should participate in all project phases from planning to implementation, management and evaluation.
- A bottom-up approach should be followed in smallholder irrigation development, treating farmers as “owners” rather than “beneficiaries” of a project.
- If farmers are expected to participate in the development of a project they should be in a position to make well-informed decisions. They should be informed from the beginning of what is expected of them and what impact this development will have on their lives. Training, including tours of schemes in operation and discussions with the users of these schemes on the different aspects of irrigation development, is indispensable.

- Government should find a way to transfer gradually the management of irrigation schemes to the farmers. Only technically sound schemes should be transferred and farmers should be trained and supported to overcome the transitional period.
- Training of farmers in water management, irrigated crop production, and marketing as well as general management and operation and maintenance are considered as necessary.
- In the absence of credit for inputs, it is important to help farmers with inputs during the first season so that they can build a cash flow base.
- Institutional support through technical and extension services should be strengthened to support the farmers effectively.
- Continuous monitoring and evaluation of irrigation schemes jointly with farmers is necessary, to provide feedback to the planners and to assist the farmers to improve their performance.
- An integrated rural development approach should be followed for any irrigation development.

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