

Impact of Smallholder Irrigation Revitalisation Programme on the Exchange Irrigation Scheme in Kwekwe District, Zimbabwe

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ABSTRACT

The Smallholder Irrigation Revitalisation Programme (SIRP), a seven-year programme which started in 2016 and ended in 2023, is one recent initiative rolled out in Zimbabwe to improve smallholder irrigation in arid to semi-arid areas. The main goal of the SIRP was to help rural households become resilient to the effects of climatic change and economic volatility while simultaneously achieving food and nutrition security. This study aimed to assess the impact of SIRP on the Exchange irrigation scheme in Kwekwe District, Zimbabwe. Quantitative and qualitative data collection instruments, namely a structured questionnaire and focus group discussions (FGDs), were used to obtain responses from the participants. A multistage cluster sampling method was used, and 134 irrigators, or 13.6% of the irrigators, were sampled from a sampling frame of 982 scheme beneficiaries. A purposive sampling method was used to select 25 critical stakeholders for FGDs. Data was processed using SPSS software. Bar charts and tables were utilised to display the frequency distributions of responses graphically. Also, frequency distributions were used to summarise the response counts and percentages for each survey question. Results obtained established that while not without difficulties, smallholder irrigation has the potential to dramatically increase the incomes and quality of life for low-income rural communities in developing countries like Zimbabwe. The study concluded that despite the current challenges, SIRP is bringing about poverty alleviation and improving the livelihoods of the Exchange irrigation scheme households and the irrigation scheme's water use efficiency and profitability.

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1. INTRODUCTION

Zimbabwe's economy is based on agriculture, which supports several industries, including manufacturing, textile and clothing, export industries and the country's population (Mutambara & Mudodawafa, 2014). According to the International Fund for Agricultural Development (IFAD, 2016), the agriculture sector in Zimbabwe employs over 70% of the country's labour force, produces 60% of the country's industry's raw materials, and generates 40% of all export revenue. According to the Ministry of Lands and Agriculture (Ministry of Lands, Agriculture and Rural Resettlement, 2018), the agriculture sector boosts Zimbabwe's GDP by 15-18%. Additionally, the nation's working population is directly reliant on agriculture to roughly 70%. The nation's economy depends heavily on the agriculture industry. According to ZIMSTAT (2017), the agricultural sector provides over 60% of the raw materials utilised by Zimbabwe's industries. The World Bank Report (2022) estimated that 60% of the working population in Zimbabwe is directly or indirectly employed in the agricultural sector or sub-sector(s). The statistics prove that agriculture is the backbone of Zimbabwe's economy and will continue to be so in the foreseeable future. As a result, the sector continues to be pivotal, and economic performance is primarily correlated with developments in the agricultural industry via value additions downstream (Research Hub by African Markets, 2023).

1.1. Definition of the Problem

Agriculture is the dominant sector of the economy in least developing countries, and Zimbabwe is no exception. It is the primary source of livelihood for rural communities in Zimbabwe, and 67% of the Zimbabwean population relies on agriculture for income and sustenance (World Bank, 2019). There is a single rainy season in Zimbabwe's sub-tropical climate, which lasts from late October to March (IFAD, 2016), and only 37% of the country receives enough rainfall to support agriculture, of which the rainfall amount is unpredictable, inconsistent, and insufficient (Mupaso *et al.* 2014). Most of the nation's wet seasons are frequently interrupted by semi-droughts, which harm crops and lead to low yields (Simba & Chiyangira, 2017). Recent research (Mwadzingeni *et al.*, 2022; Manatsa *et al.*, 2020; Benitez *et al.*, 2018; Brazier, 2015) has found that aridity expands nationwide as evaporation rises and precipitation declines. As a result of the above reasons, Zimbabwe is a hotspot for climate change (UNDP, 2017).

According to Manatsa *et al.* (2020), significant shifts in agro-ecological zones (AEZs) have negatively affected agricultural production, translating into food insecurity, increased poverty, and poor economic performance. Mbanyele *et al.* (2022) argued that 80% of Zimbabwe's rural population (of which around 70% of these are smallholder farmers) resides in Natural Regions III, IV and V, which are semi-arid regions with an annual rainfall of less than 600 mm, making dry-land cultivation a risky endeavour (IFAD, 2016). Rain-fed agriculture in Natural Regions IV and V has a success rate of one good harvest every four to five years (FAO, 2000). To deepen the crisis, the recent rainfall pattern has changed from late November to early March, shortening the cropping season even more. The World Meteorological Organisation rightly warned of El Nino conditions that affected drought-prone Sub-Saharan African countries like Zimbabwe in the 2023/24 season, impacting yields. Increased imports and decreased exports of agricultural goods indicate Zimbabwe's declining agricultural growth rates (FEWS NET, 2024).

Due to those harsh climatic conditions, as mentioned earlier, irrigation is necessary for advancing rural development and enhancing the all-year-round livelihoods of poor rural farmers (Mupaso *et al.*, 2014). Moyo *et al.* (2016) anticipated that irrigation protects against mid-season dry spells and droughts, enabling irrigators to cultivate crops year-round and boost production. Small-scale irrigation, on the other hand, is perceived to be crucial to boosting agricultural output and gradually improving the resilience of rural lives, and it is increasingly considered as a solution for minimising the consequences of climatic variability and change (Sakaki & Koga, 2011; The Montpellier Panel, 2012; Chiroro, 2015). However, Mutiro and Lautze (2015) reported that smallholder irrigation programmes in Southern Africa have mostly failed to enhance rural livelihoods and sustain crop production to alleviate poverty. In Zimbabwe, Jacobs *et al.* (2013) and Munyati and Chitongo (2017) concluded that smallholder irrigation has several difficulties, with more failures than triumphs documented.

There have been numerous research on irrigation, which include studies on sustainable irrigation in agriculture (Velasco-Munoz *et al.*, 2019), irrigation schemes performance (Redicker *et al.*, 2022), irrigation policies (Munyati & Chitongo, 2017), smallholder irrigation features (Mupaso *et al.*, 2014), benefits of an irrigation scheme (Masela *et al.*, 2018), irrigation efficacy and efficiency (Masela *et al.*, 2018) and smallholder irrigation characteristics (Moyo *et al.*, 2016), as well as evaluation of water governance and institutional arrangements and their consequences on irrigation management (Muchara *et al.*, 2016). However, there is a shortage

of literature specifically on the impact of smallholder irrigation schemes on livelihoods or the effects of irrigation revitalisation programmes. The Smallholder Irrigation Revitalisation Programme (SIRP), launched in 2016 and ended in 2023, was one recent initiative in Zimbabwe to improve smallholder irrigation. The SIRP was a Government-sponsored programme designed to strengthen the resilience of smallholder farming communities, intending to lower the farmers' susceptibility to food insecurity and the effects of climate change and economic changes (IFAD, 2016). The purpose of SIRP was to assist smallholder farmers affected by drought in enhancing their access to markets and fertilisers, as well as in implementing climate-smart agricultural methods to increase output and provide enough income to cover the expenses of running and maintaining irrigation systems (Mashange *et al.*, 2017).

The study frequently raised concerns about SIRP's impact on the sustainability of smallholder irrigation programmes. It was carried out under these presumptions to provide empirical proof of the effects of smallholder irrigation revitalisation programmes.

- Is it financially feasible to implement smallholder irrigation schemes?
- Are the schemes sustainable?
- Is it worthwhile to develop and revitalise more irrigation schemes?
- Are farmers capable of overseeing these projects?
- Are farmers providing adequate food and nutrition to their households?
- Is the intended resilience to climate change and economic shocks provided by smallholder irrigation revitalisation programmes being achieved?

1.2. Objectives of the Study

The overall objective of this research was to evaluate the impact of the Smallholder Irrigation Revitalisation Programme on the Exchange irrigation scheme in Kwekwe District, Zimbabwe. The specific sub-objectives of this research study were to:

- I. Determine the challenges that influence the Exchange irrigation scheme and identify the extension systems and communication channels employed by the SIRP to deliver services to farmers.
- II. Assess the contribution of the SIRP to the livelihood of smallholder farmers.
- III. Determine improvement in water use efficiency and farm profitability since the inception of SIRP.

2. METHODOLOGY

2.1. Research Design

The study employed a cross-sectional data collection method because it is a better and more effective method for obtaining information about the current status or the immediate past of the case under study. According to Maier *et al.* (2023), the cross-sectional data collection method is a research design that involves the collection of data from a sample of a population at a single point in time. Cross-sectional studies provide a snapshot of the target population's characteristics, attitudes or behaviours (Zangirolami-Raimundo *et al.*, 2018). Using data collection tools such as questionnaires, interviews, focus group discussions (FGDs), field observations, and document analyses is also appropriate and suitable. Additionally, the cross-sectional method was considered adequate for obtaining timely, up-to-date information about the current status of the case being studied, as it does not require following subjects over an extended period like longitudinal studies.

2.2. Research Approach

Data gathering techniques included quantitative (questionnaires) and qualitative (FGDs, key informant interviews and field observations) methods. The questionnaire obtained data on demographics, observed crop improvements, and increased farmer profitability. The provided data was then used to create graphs and tables that provided a more comprehensive analysis of the findings.

2.3. Sampling Method and Size

The study employed a multistage cluster and purposive sampling technique to select the participants. Kwekwe District was purposively chosen as the study area in the first stage. Next, the Exchange irrigation scheme within the district was selected. Finally, a random sample of 134 irrigators from the Exchange irrigation scheme was drawn. The sample size of 134 irrigators was determined based on Krejcie and Morgan's (1970) sample size determination formula, which provides a guideline for selecting an appropriate sample size given a known population size. The multistage cluster sampling method was used to sample 134 irrigators, or 13.6% of the irrigators, from a sampling frame of 982 scheme beneficiaries (Table 1).

In contrast, purposive sampling was used to identify 25 key stakeholders by referral for focus group discussions (FGDs). The researchers then used a referral or snowball sampling technique

to identify specific individuals within these stakeholder categories (Naderifar *et al.*, 2017). This involved initially contacting a few key informants who were knowledgeable about the irrigation scheme and the SIRP programme. These initial contacts were asked to recommend other relevant stakeholders who could provide critical perspectives and information. The Exchange irrigation scheme is divided into four (4) blocks (clusters), i.e. Blocks 1-8 (D-block), Blocks B & C (Clinic block), Blocks A & V (Tsoko block) and Block Chomupamba. The sample was taken across all four blocks emphasising gender balance.

Six families randomly chosen from irrigators participated in a pilot study to examine the reliability of the questionnaire. In response to the comments expressed, several alterations and adjustments were made. Before data collection, the University of Pretoria's ethics committee issued a certificate of ethical approval. NAS170/2021 is the protocol reference number. The research process addressed ethical considerations based on Babbie and Mouton's (2001) suggestions.

TABLE 1: Sample Size Per Irrigation Block in the Exchange Irrigation Scheme

Block Name	Sample Irrigators		Total Sample
	Females	Males	
Block 1-8	30	34	64
Block B&C	11	13	24
Block A&V	11	12	23
Block Chomupamba	10	13	23
Total	62	72	134

Qualitative methodologies were used to analyse the data from focus group discussions. The qualitative analysis supplied key informants and participants' detailed narrative descriptions and assertions. In the quantitative analysis, graphs, frequency counts, and percentages were the key instruments used. The information gathered from the surveys was analysed using the Statistical Package for Social Sciences (SPSS) programme. Bar charts and tables were utilised to graphically display the frequency distributions of responses. Also, frequency distributions were used to summarise the response counts and percentages for each survey question.

3. RESULTS AND DISCUSSION

3.1. Challenges Facing the Exchange Irrigation Scheme

Respondents listed several challenges and needs at the Exchange irrigation scheme, and the major challenges highlighted are summarised in Table 2 below:

TABLE 2: Challenges Facing the Exchange Irrigation Scheme

Challenge highlighted	Percentage (%)
Access to markets and market information	90.30
Lack of funding	79.58
Pumping of irrigation water when there is no electricity	76.30
Lack/shortage/late distribution of agricultural inputs	75.00
Crop damage by pests and diseases	74.10
Damaged and leaking irrigation canals	60.42
Destruction of crops by wild animals especially monkeys	59.79
Unavailability of land preparation facilities	56.90
Lack of manpower	43.80

The results showed that the Exchange irrigation scheme faces diverse challenges, which are complex issues of variable severity that typically accompany the advantages of irrigated agriculture for smallholder farmers. The issues raised by the Exchange irrigation scheme extend from skewed perceptions in individual homes to institutional setups of the relevant entities.

While 90.3% of the respondents highlighted that they have excess produce to sell, the same number (90.3%) also highlighted access to markets and market information as their major challenge, meaning that while they have excess to sell, they are not getting the value that commensurates with the market value of their produce. Poor road networks and inadequate infrastructure at the irrigation scheme, such as store rooms or cold rooms, also exacerbate farmers' market challenges. The findings are consistent with those of Moyo *et al.* (2016), who found that the main obstacles were low soil fertility and infrastructure and limited access to agricultural expertise, functional markets, and farm inputs and equipment. These led to low yields, food insecurity, and poor farm revenue. Most irrigated land is underutilised, and produce is poorly coordinated and marketed.

Approximately 79.58% of the respondents cited a lack of funding as a major challenge. The funding needed includes financing for agricultural inputs, repairing and maintaining infrastructure, and conducting training without donors' assistance. Market research also requires funding, but that funding was not easily accessible. Similarly, a study by Afful and Lategan (2014) and Loki *et al.* (2020) showed that the agriculture sector had been compounded by the restricted funding for extension, which has resulted in subpar service delivery, directly affecting smallholder farmers' performance. This aligns with Munyati and Chitongo's study (2017), which found several problems with irrigation systems, such as inadequate marketing efforts, limited water availability, inability to pay operational costs due to insufficient pricing structures, practical financial difficulties and inadequate oversight.

Irrigators faced challenges of power cuts, indicating 76.30% due to load shedding and/or electrical faults during the irrigation period, resulting in disrupted irrigation cycles. There was no backup power source for pumping irrigation water, and they lacked the resources to fund any alternative power source. The findings are consistent with those of Munyati and Chitongo (2017), who argued that many irrigation systems have failed due to bad governance resulting from inadequate maintenance and a lack of practical oversight over irrigation systems. Although there was such a crisis and irrigators knew that they needed an alternative supplementary power source in case of power cuts, the lack of funds was the major factor influencing the unavailability of the alternative power source.

Lack/shortage of delays in inputs supply was indicated by 75% of the respondents as affecting crop production operations in the Exchange irrigation scheme. The irrigators indicated that they are predominantly self-funded, so they buy their inputs. Due to the unavailability of inputs, some farmers reduce their hectareage or give up farming altogether. Thus, some farmers said they were not using all their irrigation plots to full capacity. Similarly, research in Ethiopia found that 48% of irrigators cited rising input costs for herbicides, insecticides, and fertilisers and the unavailability of the commodities when farmers needed them as key obstacles to crop productivity (Mengistie & Kidane, 2016).

It was revealed by 74.10% of the respondents that crop production operations are affected by pests and diseases in the Exchange irrigation scheme. Special mention has been made of the Fall Army Worm, a notorious pest in maize. Poor weed, pest and disease management ensues when agrochemicals are not applied in time, lowering yields. According to Mengistie and

Kidane (2016), a substantial threat to agricultural productivity might come from pests and diseases. Weeds were also noted by Mnkeni *et al.* (2010) as considerably lowering yield in the Tugela Ferry irrigation network in South Africa. However, the Exchange irrigation scheme did not mention weeds, which may indicate that the irrigators have effective weed management techniques. Other challenges highlighted by the respondents included leaking and damaged irrigation canals (60.42%), destruction of crops by wild animals (59.79%), unavailability of land preparation facilities in the form of tractors and tillage implements (56.90%), as well as lack of manpower (43.80%).

3.2. Extension Systems Employed by the SIRP to Deliver Services to Farmers

At its inception, SIRP employed the Participatory Rural Appraisal (PRA) approach as a diagnostic exercise to quickly appreciate the challenges, basic needs, and requirements for scheme rehabilitation and performance enhancement. The project was then designed to address the needs presented in the PRA report for the Exchange irrigation system. The proposed project cycle can be summarised as shown in Figure 1 below.

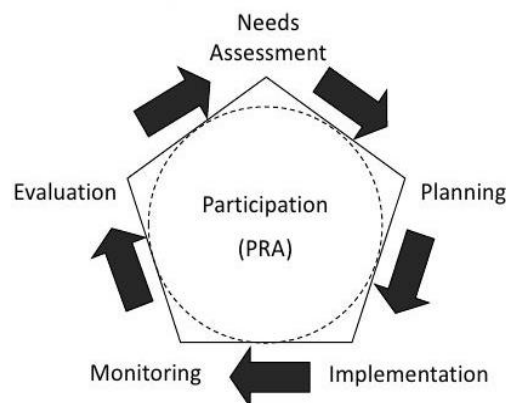


FIGURE 1: SIRP Project Cycle at the Exchange Irrigation Scheme

3.3. Use of Farmer Groups

In addition to the participatory strategy outlined above, SIRP formed farmer groups for simple coordination using the four existing blocks at the Exchange irrigation scheme. Effective farmer groups, according to Stevens and Terblanche (2004), are the "vehicle" to work collaboratively towards change at the farm level and can aid in the empowerment of farmers. Farmers' organisations, according to the same authors, are necessary for quicker agricultural development. The Farmer Field School (FFS) methodology was applied as a participative educational strategy for creating and diffusing new technologies. In the FFS, the extension

officials serve more as facilitators while the farmers meet in small groups to discuss and come up with solutions for various issues that concern them. In his study, Chocholata (2020) concluded that farmers taking part in FFSs develop the skills and knowledge necessary to adapt to change and make the right decisions in a dynamic environment. Farmers in Uganda who participated in FFSs claimed that the FFS technique strengthened their capacity to make appropriate, informed, and information-based decisions by helping them develop analytical skills, learn more effectively, address knowledge gaps, and adapt to their needs (Chocholata, 2020).

Communication between SIRP and the farmers is mainly through the AGRITEX Kwekwe District officers and AGRITEX officers stationed at the Exchange irrigation scheme. SIRP employs a dialogic communication approach, a participatory two-way process whereby information is shared between the sender and receiver and vice versa. In SIRP terms, information is passed from the bottom level (irrigators). It is transmitted through the IMC to the AGRITEX officers, who then send the information to the district AGRITEX officer, who will, in turn, send the information to the provincial office so that the information eventually gets to IFAD and the AGRITEX and Department of Irrigation (DoI) national office.

3.4. Impact on Crop Yields and Livelihood

About 91% of the irrigators highlighted that they have been experiencing improved production yields in the past three agricultural seasons because of SIRP intervention. The increase in production yields has also enabled farmers to have more produce to sell for income, and the results showed that most farmers sell between 31-50% of their total production. This demonstrates that SIRP's overall goal to ensure that rural residents achieve food and nutrition security while being robust to climate change and economic shocks has been achieved. SIRP has greatly boosted household food security, supporting this claim. The availability of training and the effective extension services provided by on-site AGRITEX extension officers at the Exchange irrigation scheme were cited as the major contributors to improving production yields. According to Loki *et al.* (2021), findings from a different study conducted in the Eastern Cape of South Africa show that farmers' yields significantly increase when they have access to extension services compared to when they do not.

3.5. Average Household Income

Most (76%) of the irrigators confirmed that SIRP had improved their household income since the SIRP inception, while another 14% thought otherwise. The most significant percentage rise was between 21 and 50% of the respondent's household income, which they said had increased since SIRP's inception. Notably, the rise in income for the 14.9% of farmers was greater than 50%. These results support the assertions made by Mashange *et al.* (2017) and Hiekal (2020) that irrigation has been recognised as an important factor in increasing agricultural output and household income and reducing rural poverty. The study's results, however, counter Mutiro and Lautze's (2015) assertion that irrigation initiatives for smallholder farmers in Southern Africa have failed to enhance livelihoods and produce sustained crop production to accomplish food security and the reduction of poverty.

3.6. Improvement in Water Efficiency

About 95% of the irrigators agreed that there was infrastructure revitalisation at the Exchange irrigation scheme since the introduction of the SIRP programme. The major infrastructure repairs and revitalisation were done on canals, irrigation pumps, fences around the plots, dams and toilets. Before 2016, the irrigation scheme had only one running pump, which was causing problems due to breakdowns, but now the scheme has two new pumps supplied through SIRP. This has brought about a significant improvement in the efficiency of pumping water from the dam. Repairs on the canals have improved the water flow within the irrigation plots; however, some irrigation canals still need attention to reduce water losses.

It can be noted that the current infrastructure development activities done by SIRP have, to a greater extent, improved water efficiency at the Exchange irrigation scheme. Combined with Good Agricultural Practices (GAP), water productivity has increased (Mashange *et al.*, 2017). The Smallholder Irrigation Revitalisation Programme (SIRP) engaged in approximately 125 smallholder irrigation schemes (6,100 ha) in Manicaland, Masvingo, Matabeleland South and Midlands provinces. According to the SIRP Annual Report (2018), the programme benefitted a large number of poor smallholder farmers and poor members of communities in the schemes and the surrounding rainfed areas, including approximately 15,000 households with an average of 0.4 ha in target irrigation schemes, 12,500 households with no access to irrigation in the adjacent rain-fed areas, 2,000 youth and 500 extension and technical service providers. SIRP

implemented an inclusive targeting strategy to ensure that the benefits were distributed to many smallholder poor farmers and poor members of communities in SIRP operational areas.

Molden and Oweis (2007) suggest that one way to increase water productivity is by decreasing losses during water conveyance and irrigation practices in several ways or increasing crop economic output by using effective water management strategies. Hiekal (2020) states that the design and nature of a water conveyance system, the type of soil, the degree of field preparation and grading, the choice of irrigation technologies and irrigator skills are the main elements that affect water losses and production in a command area. To that purpose, the current study can conclude that SIRP irrigation revitalisation efforts, such as fixing fences, irrigation pumps and canals, increased the water productivity of the Exchange irrigation scheme. It is crucial to remember that the irrigation scheme uses flooded irrigation, which uses a lot of water, and that some of the canals are still not entirely mended. As a result, the existing level of water efficiency can be increased even further if other less water-intensive techniques, like the usage of centre pivots, can be adopted.

3.7. Improvement in Farm Profitability

The study's findings suggest that the Smallholder Irrigation Revitalisation Programme (SIRP) has positively impacted the Exchange irrigation scheme in Kwekwe District, Zimbabwe. Most irrigators (87.31%) reported that SIRP has increased the profitability of their farms since its inception, corroborating their assertion that SIRP has improved their household incomes. This does not agree with the existing literature, as Munyati and Chitongo (2017) have noted the common challenges facing irrigation systems, such as inadequate marketing efforts, limited water availability, inability to cover operational costs due to pricing structures, financial difficulties and insufficient oversight. However, the study also found that a minority of irrigators (12.69%) did not perceive increased farm profitability since the SIRP intervention. This suggests that while the programme has generally been successful, some persistent challenges remain. Munyati and Chitongo (2017) have argued that many irrigation systems fail due to poor governance, including inadequate maintenance and oversight. Figure 2 below shows the approximation of profitability levels of those who experienced profitability improvement.

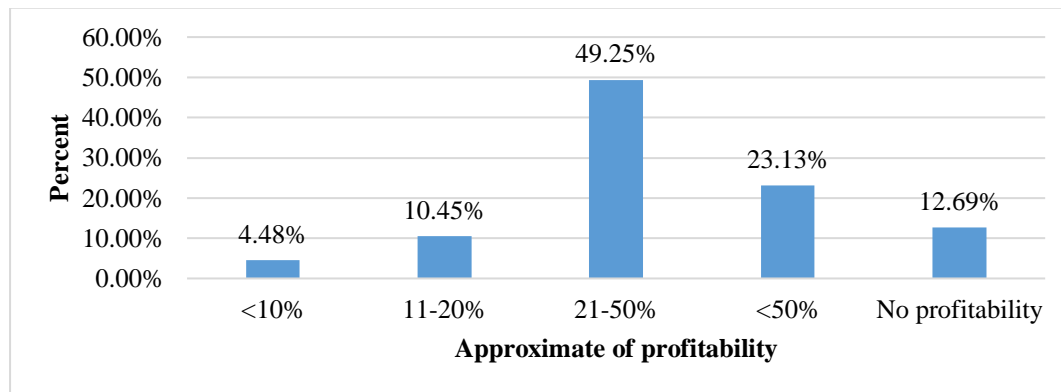


FIGURE 2: Profitability Improvement at the Exchange Since SIRP Inception

Then, 49.25% of the irrigators confirmed that profitability in their farming activities has improved by between 21 and 50%, followed by those who confirmed an improvement in profitability by over 50% (23.13%). These are followed by the irrigators, who confirmed that their profitability increased between 11 and 20% (10.45%). Lastly, there are those with less than 10% profitability improvement (4.48%). However, other irrigators also confirmed that no profitability was experienced (12.69%). The findings of this study provide a nuanced understanding of the impact of the Smallholder Irrigation Revitalisation Programme (SIRP) on the profitability of the Exchange irrigation scheme in Kwekwe District, Zimbabwe. Building on the existing literature; however, Hiekal (2020) and the SIRP annual report (2018) highlighted that factors such as water conveyance and distribution infrastructure and operational and governance issues can act as barriers to realising the full potential of irrigation schemes. Therefore, the findings underscore the need for continued efforts to address the persistent structural and management challenges, even as the SIRP programme has delivered significant positive impacts for most irrigators in the Exchange irrigation scheme.

During focus group discussions (FDGs), irrigators indicated that increased profitability is partly attributable to the fact that after getting SIRP training, irrigators now consider farming as a business (FAAB). They estimate their expenses and prospective earnings while working on additional revenue-generating initiatives. The study's findings directly oppose other research claims that smallholder irrigation schemes have failed to improve rural livelihoods and generate sustained crop production to accomplish food security and poverty alleviation (Mutiro & Lautze, 2015). Therefore, irrigation for smallholder farmers is one of the best methods for enhancing rural livelihoods and boosting the profitability of agricultural enterprises.

4. CONCLUSIONS AND RECOMMENDATIONS

The study aimed to investigate the impact of the smallholder irrigation revitalisation programme on the Exchange irrigation scheme in Kwekwe District, Zimbabwe. Three objectives guided this research, and the following conclusions were drawn for each objective. The results demonstrate that challenges the Exchange irrigation scheme raises vary from skewed perceptions in individual households to institutional setups of the relevant institutions. These challenges include power outages, a lack of funds, a lack of/shortage of or delays in inputs supply and pests and diseases. The irrigation system's users are grateful for SIRP's work in rehabilitating irrigation canals. However, there are still leaks, and weeds cover some canals due to incomplete repairs. Land preparation and subsequent planting operations have been delayed because of the unavailability of tillage facilities. Notably, respondents noted difficulties with marketing, such as improper market structure, a lack of liquidity leading to barter transactions, loss of produce owing to markets' inaccessibility, and a lack of market information. The study established that SIRP used a variety of extension strategies to reach the target audiences. The project, however, primarily employed bottom-up strategies, such as the farmer field schools, the visit-and-learn tours, the participatory rural appraisal approach, and the project-based extension strategy. The study's findings revealed that most respondents belonged to at least one farmer group, making it easy for extension officers to disseminate information.

According to the study, most irrigators agreed that SIRP has increased their household's access to food and nutritional security. On the other hand, a small percentage of respondents stated that the SIRP programme had not yet improved the household's status regarding food and nutrition security. It is also interesting to observe that many irrigators mentioned improved output yields over the previous three agricultural seasons, significantly improving their livelihoods. Many irrigators who responded to the survey concurred that since the implementation of the SIRP, the infrastructure of the Exchange irrigation scheme has been revitalised, which has greatly improved operations in the irrigation scheme. Large-scale renovations and repairs were made to toilets, irrigation pumps, fences around the plots, dams and canals. It turned out that the irrigation canals' repairs have improved water flow within the irrigation plots, although certain irrigation canals still require maintenance to cut down on water losses. It can be concluded that SIRP has significantly improved water-use efficiency at the Exchange irrigation scheme. The irrigators attested that since SIRP's beginning, their

household income has increased. Additionally, the profitability improvement was evaluated, and the vast majority of irrigators agreed that the SIRP boosted farm profitability. At the same time, a minority claimed that the SIRP had not caused an increase in farm profitability since its beginning.

The study recommends that:

- To increase the effectiveness of smallholder irrigation schemes, smallholder irrigation revitalisation programmes should prioritise capacity building in fundamental crop and irrigation management techniques and strengthen institutional and organisational arrangements.
- It is important to establish a monitoring and evaluation system that will be applied to all revitalisation projects to determine whether the revitalisation plan is progressing as planned and whether the expected goals are being met. The goal should be to correct any errors in time so that the irrigation scheme's intended objective will be met.
- As done at the Exchange irrigation scheme, the farmers' involvement from the very early stages of the project is key to ensuring farmer ownership. This will, in turn, ensure sustainability since the farmers will have a sense of belonging, and the project will address the real issues that matter to the community.
- More studies are needed on how market-related challenges can be addressed to improve the venture's profitability. Properly coordinated market linkages will improve farmers' income from selling their produce. Exploring the export market can also be sought, and this will require the expertise of an export consultant.
- While the flooding irrigation method has been working well for now, there are modern ways of irrigation that conserve water while being more efficient, such as drip irrigation or centre pivots. Therefore, the Exchange irrigation scheme should investigate this option, which will further increase productivity in their irrigation plots.

5. SUMMARY

The study concluded that while not without difficulties, smallholder irrigation has the potential to significantly increase the incomes and quality of life for low-income rural communities in developing nations like Zimbabwe. Involving stakeholders from the grassroots level is important for the project's sustainability because there is a sense of ownership from the community. The dialogic communication approach is crucial in allowing all parties to express

their views. From the research study results, it can be concluded that smallholder irrigation is one of the ways to improve livelihoods, ensure food and nutritional security at the household level and is a good source of income and a profitable business if run properly. SIRP's contribution to infrastructure repairs has significantly contributed to water use productivity at the Exchange irrigation scheme, thereby improving yields.

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