

DRIVERS OF AGRICULTURAL EFFICIENCY IN COMMUNAL IRRIGATION SCHEMES IN ZIMBABWE: A CASE STUDY OF INCOMES GENERATED BY FEMALE FARMERS IN NYANYADZI IRRIGATION SCHEME, MANICALAND PROVINCE, ZIMBABWE

Clemence Mucharedzeyi¹ and Elvis Munetsi²

¹ Agronomist at SEEDCO, Suit 5, David Frostway, Westgate, Harare, Zimbabwe

² Agronomist at Higherlife Foundation, Suit 5, David Frostway, Westgate, Harare, Zimbabwe

Email : elmun9@gmail.com

ABSTRACT

In Zimbabwe's irrigation schemes case of Nyanyadzi, the study examined socio-economic elements that have an impact on women's agricultural output and consequent income. A mixed method research methodology was utilized in the study to gather both qualitative and quantitative data. Sampling, questionnaires, interviews, and participant and non-participant observation were all used as research methods. Quantitative data were analyzed using a linear regression model. To analyze qualitative data, thematic analysis was used. The findings indicate that age, access to markets, and access to financing have a negative impact on women's productivity whereas marital status, land size in hectares, educational attainment, and land ownership have beneficial effects on it. The study's findings indicate that the communal irrigation system's impact on agricultural productivity depends significantly on factors such as age, education level, availability of extension services, access to credit facilities, land leasing, and markets. To establish proper land tenure arrangements, the government should put in place an appropriate regulatory framework. In order to improve the country's functioning agricultural markets, access to financing, and provision of extension services, the government should have policies to strengthen infrastructural development.

Keywords: *efficiency, gender, income, women in development*

INTRODUCTION

Zimbabwe is a landlocked country in southern Africa that became independent from British rule in 1980. Its economy is mainly agrarian with agriculture accounting for about 15 percent to 20 percent of Zimbabwe's gross domestic product (GDP) and providing the main source of livelihood for about 70 percent of the population living mostly in rural areas (Food Agriculture Organisation, 2019). The total population of Zimbabwe is approximately 13.06 million, of which 52 percent are female and 48 percent are male. About 65 percent of households in Zimbabwe are headed by males and 35 percent by females. Literacy rates are high in Zimbabwe that is 97 percent for women and 98 percent for men. Maternal mortality is at 960 per 100 000 live births (Food Agriculture Organisation, 2019).

Agriculture is the cornerstone of many African economies, especially sub-Saharan Africa. It provides a relatively large portion of the Gross Domestic Product (GDP) in sub-Saharan Africa and it is also the main source of foreign currency (Food Agriculture Organisation, 2019). Not only is agriculture key to economic growth but it is also the principal source of food and livelihood in the rural areas. Women, who form the majority of rural dwellers, play a significant role in this sector (Food Agriculture Organisation, 2019). Rural

Livelihoods Assessment Report estimates that 1.6 million people in the rural areas were in need of food assistance between January and March 2022 (Zimbabwe Vulnerability Assessment Committee, 2022). Food insecurity is most common in the low rainfall areas such as Matabeleland South, Masvingo and Matabeleland North. Poverty is also more prevalent in rural areas than in urban areas (ZIMSTAT, 2022). The most severely affected are households that depend mainly on agriculture in communal lands and resettlement areas. Communal lands are located in regions that are characterised by low annual rainfall, drought and infertile soils. Meaningful crop production in such areas is difficult without irrigation. In areas which have irrigation schemes such as Nyanyadzi, women's involvement in agriculture is not so pronounced hence, the need to assess factors affecting women's agricultural productivity in irrigation schemes in Zimbabwe.

Agriculture in general is reportedly impacted by a number of socioeconomic, technological, and environmental elements at the same time. The two main factors influencing women's agricultural productivity in the context of community irrigation are systematically examined in this thesis.

OBJECTIVES

- (1) To determine the challenges that are faced by women in Irrigation Schemes.
- (2) To explore the measures taken by governments to uplift women in irrigation schemes.
- (3) To examine the copying mechanisms adopted by women in irrigation schemes.
- (4) To explore factors affecting income received by women in irrigation schemes.

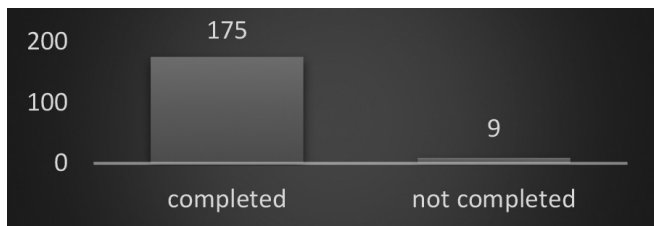
METHODOLOGY

A population of men, women, and irrigation specialists from Nyanyadzi participated in this study. A (134 ha), B (144 ha), C (65 ha), and D (65 ha) of the 412 hectares of land that make up the scheme’s 412 irrigation blocks are home to roughly 342 plot holders. The Nyanyadzi and Odzi Rivers provide irrigation water for the blocks. The population was selected on the basis that they were willing participants in the study and had a direct interest in the Nyanyadzi irrigation plan. Additionally, accessing the population may be done in a relatively brief amount of time because to this (Saunders, et al., 2019). Out of the 342 farmers in the Nyanyadzi irrigation scheme, 184 were chosen as a representative sample.

RESULTS AND DISCUSSION

Response rate

A sample of 342 respondents was sought for this study, however the researcher only succeeded in obtaining 184 of them, giving the survey a response rate of 68.3%. The sample size was accurate in reflecting the study, 98% of the 184 respondents have answered all of the required questions, while 2% have either abandoned the survey before it was halfway through or have not even tried to answer some of the questions.

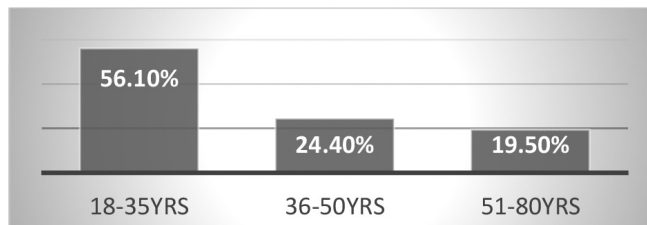


Source: Primary data (2022)

Fig. 1: Response rate

Demographic and Socio-economic Characteristics of respondents

Age

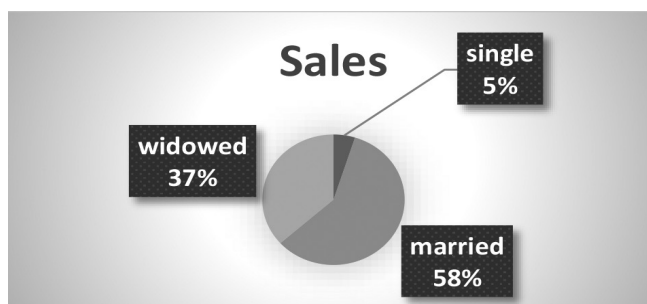


Source: Primary data

Fig. 2: Age of respondents

In this survey, the majority of the female farmers were between the ages of 18 and 35. But according to figure 2 above, there were 56.1% more people in the 18- to 35-year-old age range who participated in the research’s interviews than in the 36- to 50-year-old and 51- to 80-year-old age ranges.

Marital status

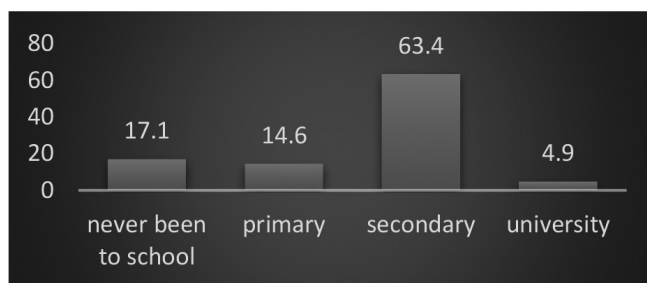


Source: Primary data

Fig. 3: Marital status

Married women made up the majority of participants in this study who successfully completed questionnaires, with a participation rate of 58.5%, compared to single women, who had only 2 4.9% participants, and widowed people, who had 36.6%.

Level of education

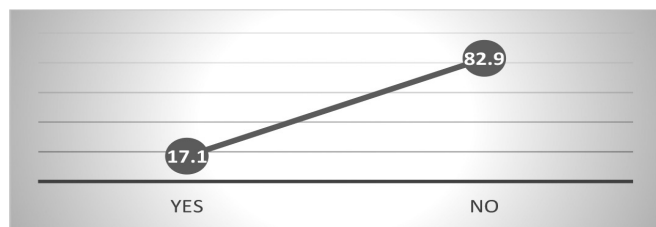


Source: Primary data

Fig. 4: Level of education

According to the study’s findings, few individuals achieved a university degree after secondary education, as shown in figure 4. According to the findings, 17.1% of the population has never attended school, followed by 14.6% for those with just a primary education, 63.4% for those with a secondary education, and 4.9% for those with only a higher degree.

Access to markets



Source: Primary data

Fig. 5: Access to markets

Another key factor affecting farm production is access to markets. In this study, 34 of the participants had access to markets, while the figure above shows that just 7 out of 41 people had no such access.

Table 1 below, which presents the model estimation results for the factors influencing women’s production in communal irrigation schemes in the Nyanyadzi Irrigation, summarizes the findings of this study.

Table 1: Coefficients

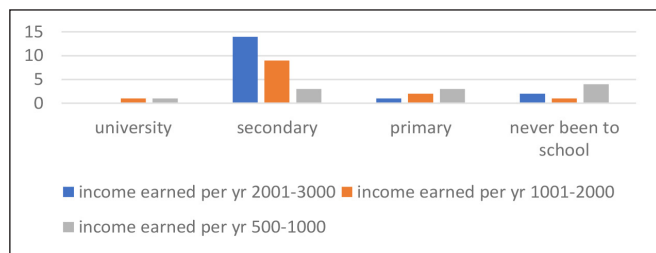
Sr. No.	Particular	Unstandardized coefficients		Standardized coefficients	t	sig	95 % confidence interval	
		B	Std Error	Beta			Lower	Upper
X ₁	Model							
X ₂	(constant)	4.018	1.162		3.456	0.002	1.644	6.392
X ₃	Land ownership	0.672	0.388	0.254	1.733	0.003	-0.120	1.463
X ₄	Availability of extension services	2.345	1.380	-0.277	-1.622	0.005	-5.058	0.580
X ₅	Level of education	0.236	0.299	0.150	0.790	0.436	-0.375	0.847
X ₆	Number of dependencies	-0.311	0.651	-0.113	-0.478	0.342	-1.639	1.018
X ₇	Size of land (ha)	0.888	0.468	0.392	1.897	0.068	-0.068	1.844
X ₈	Access to credit	-0.334	0.725	-0.106	-0.461	0.000	-1.815	1.146
X ₉	Access to markets	-0.344	0.810	-0.104	-0.425	0.001	-1.999	1.310
X ₁₀	Age	-0.707	0.323	-0.431	-2.187	0.037	-1.367	-0.047
X ₁₁	Marital status	0.201	0.437	0.089	0.460	0.649	-0.691	1.093

Source: Primary data (2022)

The findings demonstrate that the linear regression model, with a pseudo R² of 7.95%, is statistically significant at 5%. According to the findings, marital status, land size in hectares, education level, availability of extension services, and land ownership all had a favorable impact on women’s productivity in irrigation projects in the Nyanyadzi area at a 5% level of significance. However, the t values were negative, indicating that age, market access, credit availability and the number of dependents have a negative impact on the productivity of women in irrigation projects.

Level of education and productivity

According to Figure 6 of this study, the distribution of participants by educational level can be explained by the fact that those with secondary education are better able to understand the value of irrigation agriculture as a source of income. The distribution may also be explained by the fact that the majority of college and university graduates have the opportunity to look for work in other industries. People with college or university degrees earn low levels of productivity. According to the graph below, people with only a primary education or who have never attended school are less productive and earn less money.

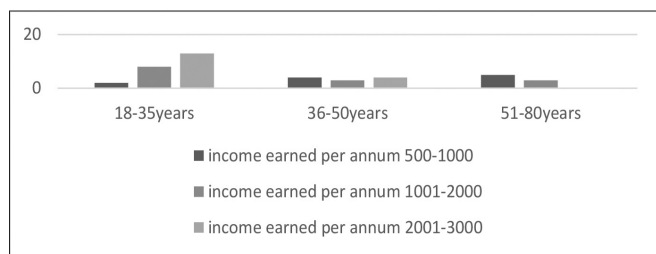


Source: Primary data

Fig. 6 : Bar chart showing level of education and income earned per annum

Age and problems faced by farmers

The results of the data analysis suggest that the 18–35 age group, which makes up the majority of participants, had a higher level of agricultural income than the other age groups. This explains why the age range of 18 to 35 accounts for the majority of the decline in agricultural productivity. The agricultural income or production was poor among the 36–50 age group. Due to their advanced age, it was determined that people in the 51–80 age range had the lowest agricultural productivity. They are therefore mostly dependent on their more successful progeny, as shown in figure 6 below.



Source: Primary data

Fig. 7: Age and Income earned by farmers

Marital status

Marital status was found to be a significant factor. The married had the best agricultural productivity or income, whereas the widowed, who only make up 36.6 percent of the total respondents, are clearly suffering. The link between marital status and annual income is seen in Figure 7. According to the chart below, marital status has a significant impact on agricultural productivity and income.



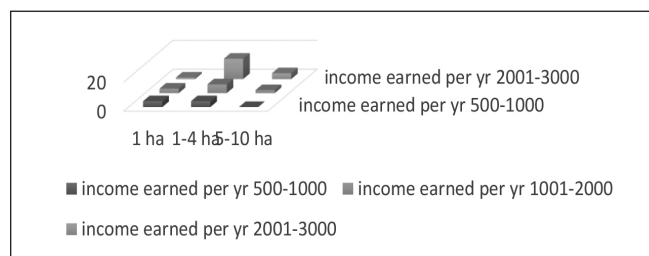
Source: Primary data

Fig. 8: Marital status and income earned per annum.

Married women are primarily found in the 2001–3000 annual income range and are dispersed across all groups, according to the bar graph above. Married women were discovered to have an edge over their male counterparts in terms of receiving assistance from them in marketing and financial access, enhancing their agricultural productivity. Because they are less productive, single women make less money annually. Married women lead all other categories, with widowed women coming in second.

Size of land and women’s agricultural productivity

One of the most important elements determining women’s production in communal irrigation systems has been found to be the size of the land in hectares. Below are graphs of land size and agricultural productivity expressed as annual income.



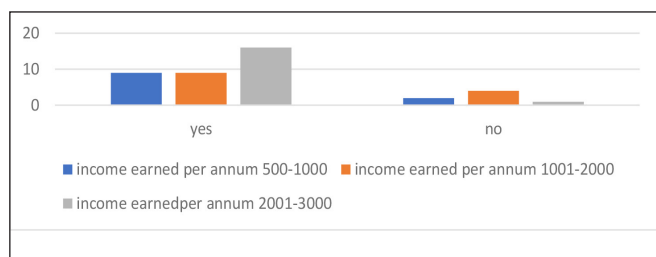
Source: Primary data

Fig. 9: Size of land as a factor affecting women’s income earned per annum

In this study, productivity was found to be influenced by land size. Women with small plots of land, less than one hectare, were found to be less productive than those with plots between four and one hectares, while those with large plots were also found to be underproductive and earn low yearly incomes. However, as the graph above illustrates, a significant factor in determining agricultural output is the area of the land.

Access to markets and income

According to the results of this study, access to markets is a significant factor that influences women’s income in agriculture. According to data analysis, most farmers have access to markets, and those who do have that access have been more productive than farmers who have less market access. The chart below and Table 1 above illustrate the importance of women’s productivity in agriculture as measured by income earned annually and access to markets, and they both demonstrate how access to markets significantly affects agricultural productivity in communal irrigation schemes.



Source: Primary data

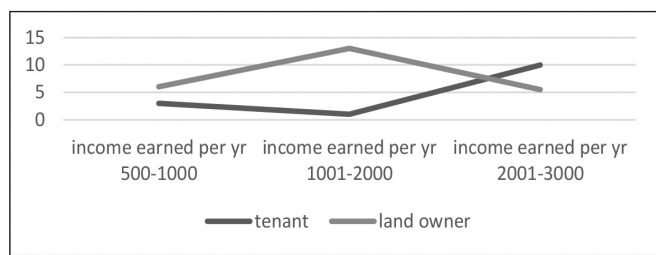
Fig. 10: Access to market and income earned per annum

Land ownership and income

The study found that the productivity and income of agriculture were mostly unaffected by access to land. In the Nyanyadzi communal irrigation plan, the majority of women lack access to land because it is government-owned, meaning that no one actually owned the land. However, despite their lack of land ownership, the female farmers were giving it their all. As a result, productivity is not greatly influenced by property ownership because even individuals who were renting still had higher yearly incomes. This can be as a result of the type. According to the report, most farmers depend on rented irrigation property. The chart below illustrates the connection between land ownership and productivity. All married, single, and widowed women rented land, according to the key informant interviews on the problem of women owning land. This seemed to imply that the government owns the system and that people, primarily men, are renting agricultural plots. The majority of the women in this area rent land, however some use it on behalf of their male counterparts. This land is held by the Zimbabwean government, according to another significant informant.

A distinct perspective on women’s access to land was noted:

“Very few women have actually succeeded in owning land, through methods like inheritance.”



Source: Primary data

Fig.11: Land ownership and income earned per annum

Emerging themes

Interviews with important informants revealed that the majority of women still experience difficulties in their daily lives, despite taking part in irrigation initiatives. According to the key informant interviews, these difficulties included: financial and societal challenges below

Lack of credit

Key Informant Interviews (KIIs) revealed that lines of credit were lacking for Nyanyadzi irrigation scheme women, preventing them from working more productively. For the reason that they lacked collateral, the organizations like banks that are in charge of providing credit to women in agriculture were unable to assist them. For women to receive finance, they primarily need land rights as collateral; the majority of female irrigation farmers lack assets like cattle. According to a key informant, “a few women match the requirements that the creditors want for someone to be able to access a loan, such as collateral in the form of land ownership certificates.” Because they lack the collateral necessary to obtain credit in order to increase their production, women lack credit facilities or lending packages.

Lack of opportunities

This study has amply demonstrated that the majority of the main interviewees thought that women’s decision-making participation in communal irrigation systems is constrained. Due to patriarchy, there are very few, if any, female farmers in positions of authority. Still prevalent is the idea that women should be restricted to the home, only permitted to work in agriculture, and not permitted to hold positions of leadership since they feel they belong to men. Regarding women’s lack of participation in irrigation systems, a key source stated that: “Most women are not given so much possibilities to participate in this irrigation program. Because of this, the majority of decisions on what, how to farm, and where to sell are made by their husbands or male relatives. However, because to their underrepresentation, it is particularly challenging for women to completely benefit from community irrigation.

Lack of expertise

The study found that women participating in communal irrigation schemes lacked the expertise and information necessary for them to be more productive. The majority of female farmers reported receiving very little instruction from agricultural extension personnel. Several important informants made note of this. “Technical expert is another issue women lack due to their hectic schedules at homes and in the fields, we discover that they do not go to

these trainings,” one of them stated.

From the viewpoint of a separate key informant, The majority of married women in irrigation projects desire to go to these instructional meetings, but typically their husbands go instead. Since the spouses are not free to share the information, it will not change the situation for these women; instead, they will remain in it.

CONCLUSION

The study identified a wide range of issues that women in irrigation projects encountered and how they affected their ability to produce agriculturally in Zimbabwe. The study found that in order for Zimbabwe’s support of women’s agricultural productivity to be successful, these variables that have a negative impact on women’s agricultural production have been tried to be addressed using a multi-sectorial strategy. These ladies used a variety of coping techniques in spite of difficulties and government attempts. These have been discovered to be helpful in attempting to lessen the marital, social, and financial challenges faced by women in farming in Zimbabwe. Due to a lack of collateral security, women were most frequently faced with financial difficulties.

In order to boost their self-sustaining initiatives, the government should implement measures that assist every woman working in irrigation agriculture productivity to own land. To improve the coping skills of young women who will be farmers in the near future, professional agriculturalists must regularly teach agricultural skills in schools. Encourage women to participate in all areas, including decision-making.

CONFLICT OF INTEREST

This is to declare that there is “No conflict of interest” among researcher.

REFERENCES

Adigbli, W. (2020). Framework for collaboration in guaranteeing project sustainability. *J. of Agril. Sust.*, 63-66.

African Union. (2017). *Human rights and the people’s rights on the rights of women in Africa*. Addis Ababa: African Union.

Ahmed, A. E., Imam, N. A., Siddig, K. H., Smith, L., Morgan, H., & Williamson, O. P. (2018). Women as a key to agriculture and food security in Sudan: The case of Northern Cordovan State. *J. of Agril. Sci. and Tech.*, 614-620.

Ayoande, S. S. (2020). Women participation in agricultural

activities in Oyo state, Nigeria. *J. of Agril. Sci.*, 72-74.

Babbie, E., & Mouton, J. (2019). *The practice of social research*. London: Oxford Press.

Bhatasara, S. (2020). Women, Land and poverty in Zimbabwe: deconstructing the impacts of the fast track land reform program. *J. of Sust. Dev. in Africa*, 316-330.

Bindura University College of science Education. (2019). *Population studies*. Bindura: Bindura University.

COMESA. (2018). *Gender policy and development in Africa*. Addis Ababa: Common Market for Eastern and Southern Africa.

Development, I. F. (2019). *Smallholder irrigation revitalisation programme*. Harare: International fund for agricultural development.

DFID. (2018). *Global agricultural workforce*. London: Department for International Development.

Food Agriculture Organisation. (2019). The state of food insecurity in the world 2019. *J. of Agril. & food Security*, 45-46.

Human Development Report. (2019). *Gender Inequality in Zimbabwe*. Human development report.

Ibrahim, H., Kenneth, H., Smith, F., Peterson, D., Morgan, G., & Howard, S. (2021). Determinants of crop diversification in Nigeria. *J. of Agril. Sci.*, 66.

International Fund For Agricultural Development. (2019). *Smallholder irrigation revitalisation programme*. Harare: IFAD.

Mazhawidza, P., & Manjengwa, J. (2020). The social, political and economic transformative impact of the fast track land reform on the lives of women farmers in Goromonzi and Vungu-Gweru districts of Zimbabwe. Harare: Research report.

Mehra, I. O., & Rojas, F. J. (2020). Agricultural production culminating in low income. *Journal of Agricultural Sciences*, 75.

Moyo, H. (2019). Smallholder irrigation schemes in Southern Africa. *J. of Agril. Sci.*, 89.

Mudukuti, D., & Miller, H. (2020). Women’s perceived obstacles to extension participation. *J. of Agril. Productivity*, 85-89.

Mujere, K., & Mazvimavi, J. (2020). Poor water management

- by farmers. *J. of Agril. Sci.*, 89-96.
- Mutiro, D., & Lautze, F. (2020). Agriculture dependability of women in Africa. *Journal of agricultural sciences*, 456-457.
- Nagarajan, R. G. (2021). Determinants of household and community level millet variety diversification. *J. of Agril. Sci.*, 56.
- National Gender Policy. (2017). *National Blueprint on Gender policy*. Harare: National Gender Policy.
- Olawepo, T. K., & Fatulu, D. Y. (2020). Women and access to land. *J. of Agril. Sci.*, 75-76.
- Pazvakavambwa, K., & Van Der Zaag, O. P. (2020). Irrigation schemes in Zimbabwe. *J. of Agril.*, 56-58.
- United Nations. (2019). *Women and food insecurity in Africa*. Geneva: United Nations.
- USAID. (2020). *Promoting women in cooperatives in Ethiopia for agricultural value chains development*. Addis Ababa: USAID.
- Weiss, U., & Briglauer, M. (2021). Significant determinants of farm diversification. *J. of Agril. Sci.*, 74.
- World Bank. (2019). *Gender in agriculture sourcebook*. Geneva: Agriculture and rural development.
- Zimbabwe Vulnerability Assessment Committee. (2022). *Rural livelihoods assessment report*. Harare: Zimbabwe Vulnerability Assessment Committee.
- ZIMSTAT. (2022). *Food Insecurity in Zimbabwe*. Harare: ZIMSTAT.

Received : February 2023 : Accepted : April 2023