

# Role of Water Users Organizations on Success of Irrigation Projects in Rwanda

MBYUKANSENGA Antoine  
Msc. Project Management, University of Kigali  
Kigali \_Rwanda

## Abstract

The role of Water Users Organizations on success of irrigation projects in Rwanda was elaborate as 100% of respondents agreed that there is success in easily getting equal irrigation water because of continuous maintenance of irrigation infrastructures, above 99.4% of respondents agreed that there is success in being organized into groups because it facilitates them in water distribution, above 99.4% of the respondents agreed that there is success in paying water fees because it help them to improve irrigation system. The results show that rice productivity increases as activities of water users' organization increased. For this model regression coefficient R of .924 indicates that as the value of water users' organization activities increase, the mean of the Rice production also tends to increase. R-squared indicates variability of 85.4% explained by the model; it means changes in the independent are associated with changes in the dependent variable at the rate of 85.4%. As the p-value associated with the F-statistic is less than significance level (0.05) means there is significance between independents and dependant variable. As the p-value that corresponds to t (0.00) is less than significance level (0.05) means that there is a statistically significant relationship between the independent variables and dependant variable.

**Keywords:** water users' organization, water fees collection, maintenance of irrigation infrastructures.

## 1. Background of the study

Water scarcity is one of the major challenges of the 21st century. The most common and severe drought affects agricultural production, and rising temperatures are leading to increased demand for plant water. Farming in Rwanda depends on rainfall with two rainy seasons and intermittent dry seasons. Plant and livestock production is at risk of water-related stress leading to significant loss of productivity - crops may suffer from insufficient rainfall or rainfall at the wrong time (MINAGRI, 2017). In Rwanda to overcome that problem of water scarcity; physical investments goes alongside support for diversification into high-value crops among irrigation beneficiaries. Water users' organizations were established to manage irrigation infrastructures established in developed irrigation schemes. The irrigation water users' organization is the sole user organization in charge of water fee collection. (Ministerial Order N°001/11.30 of 23/11/2011). These collected water fees help the farmers (water users) to help in success of irrigation projects because collected money helps in maintaining or putting in action other activities to make an organization functional. The objective of this study was to evaluate the role of water users' organizations in success of irrigation projects in Rwanda.

## 2. Methods

Rwamamba irrigation scheme located in Tumba and Ngoma sector in Huye District and it has 364 water users who were study population, after using Slovin formula random

sample was 190 water users. To collect data 190 questionnaires were used in February, 2022.

### 3. Results

Table 1. Gender

	Frequency	Percent	Valid Percent	Cumulative Percent
Valid Male	85	44.7	44.7	44.7
Female	105	55.3	55.3	100.0
Total	190	100.0	100.0	

The sample consisted of 85 male (44.7%) and 105 female (55.3%) respondents (N=190).

Table 2. Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.924 <sup>a</sup>	.854	.852	.189

For this model regression coefficient R of .924 indicates that as the value of water users' organization activities increase, the mean of the Rice production also tends to increase. R-squared indicates variability of 85.4% explained by the model.

Table 3. ANOVA<sup>b</sup>

Model	Sum of Squares	Df	Mean Square	F	Sig.
1 Regression	39.124	3	13.041	363.640	.000 <sup>a</sup>
Residual	6.671	186	.036		
Total	45.795	189			

As the p-value associated with the F-statistic (0.00) is less than significance level (0.05) means there is significance between independents and dependant variable.

Table 4. Coefficients<sup>a</sup>

Model	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error			
1 (Constant).	.310	.132		2.356	.020
Maintenance & rehabilitation is done through water users participatory in community works.	.443	.073	.447	6.102	.000
All water users are grouped into groups for better organization.	.108	.052	.111	2.074	.039
Collected water fees are used to maintain & rehabilitate/improve irrigation infrastructures.	.389	.066	.401	5.911	.000

As the p-value that corresponds to t (0.00) is less than significance level (0.05) means that there is a statistically significant relationship between the independent variables and dependant variable.

### 4. Discussions

Data were collected by using questionnaires where sample of 190 was water users responded to the questions. Slovin formula was used to find that sample size. The results show that productivity increased due to improved irrigation where all plots get equal and required water. 100% of respondents agreed that there is success in easily getting equal irrigation water because of continuous maintenance of irrigation infrastructures, above 99.4% of respondents agreed that there is success in being organized into groups

because it facilitates them in water distribution, and the above 99.4% of the respondents agreed that there is success in paying water fees because it helps them to improve irrigation system. The results show that rice productivity increases as activities of water users' organization increased. For this model regression coefficient R of .924 indicates that as the value of water users' organization activities increase, the mean of the Rice production also tends to increase. R-squared indicates variability of 85.4% explained by the model; it means changes in the independent are associated with changes in the dependent variable at the rate of 85.4%. As the p-value associated with the F-statistic is less than significance level (0.05) means there is significance between independents and dependant variable. As the p-value that corresponds to t (0.00) is less than significance level (0.05) means that there is a statistically significant relationship between the independent variables and dependant variable.

## 5. Conclusion

As water users' organizations keep improving and performing their activities that will keep increasing Rice productivity which is the success of irrigation projects in Rwanda.

## Acknowledgement

My acknowledgement goes to my supervisor Dr. Kwena Ronald, (PhD), my Lovely wife and children and also to almighty God who made this work possible.

## References

Éva, P. (2019). Assessing the Effect of Farmer Participation in Irrigation Management on Farm Production and Profit in the Mubuku Irrigation Program, Uganda. Accepted: 14 October 2019 / Revised: 14 November 2019 / Accepted: 15 November 2019 / Published: 17 November 2019

Qiao, G., Zhao, L., & Klein, K. (2009). Water user associations in Inner Mongolia. *Agricultural Water Management* (96), 822-830.

Renault, D. (1999). Offtake sensitivity, operation effectiveness, and performance of irrigation system sensitivity. *Journal of Irrigation and Drainage Engineering*, 125(3): 137-147.

Renault, D., Facon, T., Wahaj, R. (2007). Modernizing irrigation management: The MASSCOTE approach - Mapping System and Services for Canal Operation Techniques. *Irrigation and Drainage Paper*, 63. FAO, Rome. pp. 1-150.

Sultan, K., B. Ozekici. Atef, H. (2006). *Problems And Solutions For Water User Associations In The Gediz Basin*.

Tanzania Water Resources Management. (2009). *Roles and responsibilities of water users' associations (WUAs) in Tanzania*

The Government of Rwanda, Ministry of Agriculture & Animal Resources, Ebony Enterprises Ltd and The World Agroforestry Centre. (2010). *Rwanda Irrigation Master Plan*.