Contribution of NGOs' Projects to Livelihoods Improvement in Rwanda

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ABSTRACT: The aim of this study was to assess the contribution of NGO's projects to household livelihood improvement, a case of World Vision funded project in Kiziguro Sector, Gatsibo District (2017-2021) as the case of interest. The authors used a sample of 85 respondents sampled from the total population of 720 beneficiaries. Structured questionnaires helped to collect data and Descriptive statistics, multiple linear regression and Pearson correlation of STATA 13.0 analyzed the collected data. The results showed that key WVIR services which contributed to livelihoods improvements were trainings on modern farming and animal rearing practices, business management, Orchard management, creation of other income generating activities and provision of agricultural inputs, support in agroforestry trees planting. A total of 7,695,300 trees are planted to address climate change and improve livelihoods. The statistical analysis revealed that the employed predictors led to households' livelihoods improvement by 90.74% corresponding to R-square (R^2) is 0.9074 or 90.74% due to interventions of World Vision International in Kiziguro sector and the remaining of 9.26% is due to unpredicted factors. The results of this research rejected the proposed hypothesis (H_0) that the intervention of the World Vision has not improved household livelihood in Kiziguro Sector. However, based on the research results, the hypothesis (H_1) the intervention of the World Vision has improved household livelihood in Kiziguro Sector was accepted. The results of this research are useful to policy makers in understanding how NGOs contribute to the community livelihoods and the interventions can be extended to similar areas.
Key words: Livelihoods, Non-governmental Organization (NGO), Multiple Linear Regression, Rwanda.

I. INTRODUCTION

Non-governmental organizations (NGOs) are playing a significant role in the development of rural and marginalized farming areas where many governments of developing countries have been and are failing to cater for due to meagre financial resources and chronic budget deficits which leave less than enough for the rural populace hence national cake is skewed towards the urban populace(Matsvai, 2018). The secret behind the success of NGO interventions is their direct involvement in projects and activities together with close monitoring and evaluation which lacks much on state interventions in many developing economies. NGOs have direct contact with the local population leading to better knowledge of local people's circumstances and needs; which enables them to always better reach the poor more effectively and efficiently than state interventions(Bebbington et al., 2005).

The World vision program began working in Rwanda after the 1994 Genocide against Tutsi to provide emergency relief and assistance to the displaced population and reunite children with their family. (AIMABLE, 2014).World vision Rwanda carries out its transformational development work through Area Development Programs (ADPs) which are geographically focused, integrated programs with long-term programmatic interventions that work closely with communities to identify and resolve developmental issues(AIMABLE, 2014).

In Rwanda, an higher number of its regions witnesses improved food security, according to the third Comprehensive Food Security and Vulnerability Analysis and Nutrition Survey (CFSVA) that highlights challenges related to population growth, widespread poverty and high levels of chronic malnutrition (Harelimana, 2021). Nongovernmental organizations may play the main role in socio-economic development of the community; most of them have the common purpose of existence which is the promotion of social welfare, development, charity, etc.

The World Vision Rwanda has administered its intervention in Gatsibo District

from 1994 till now with objectives to improve community welfare and sustainable household livelihood. As reported by the Rwandan Poverty Profile Report 2016/2017(NISR, 2014), Gatsibo District is classified with 18.8% of extreme poverty incidence and 42.5% of poverty incidence with more influence in rural area. Hence, livelihood challenges still persist among the community of Gatsibo District in general and Kiziguro Sector specifically.Therefore, it is good to assess the impacts of World Vision Rwanda inimproving household livelihood in Gatsibo District with emphasis on its intervention area Kiziguro Sector.

II.   METHODS AND MATERIALS
2.1 Description of study area
The WVR is one of the biggest organization that operating in 27 district in the country and which has the mission of working with poor and oppressed people in order to help them to achieve the sustainable development.In 1994, World Vision began working in Rwanda in response to the genocide's extraordinary instability. For the first six years, our efforts were primarily focused on providing relief and rehabilitation to the over 3 million individuals who were displaced as a result of the disaster. It started long-term, child-focused area development programs in various parts of the country in the year 2000, focusing on vulnerable children and their families with interventions in the areas of education and child sponsorship, health and nutrition, water, sanitation, and hygiene, and household economic empowerment.

WVR workforce of over 300 people operate in 24 of the country's 30 districts, assisting over 1.2 million people, mostly children, through 27 area development initiatives distributed over the "land of a thousand hills".This study considered World Vision Rwanda, mainly its hub in Kiziguro sector (Figure 1), one of the 14th sectors that comprises Gatsibo district. This District is one of the seven Districts making the Eastern Province.
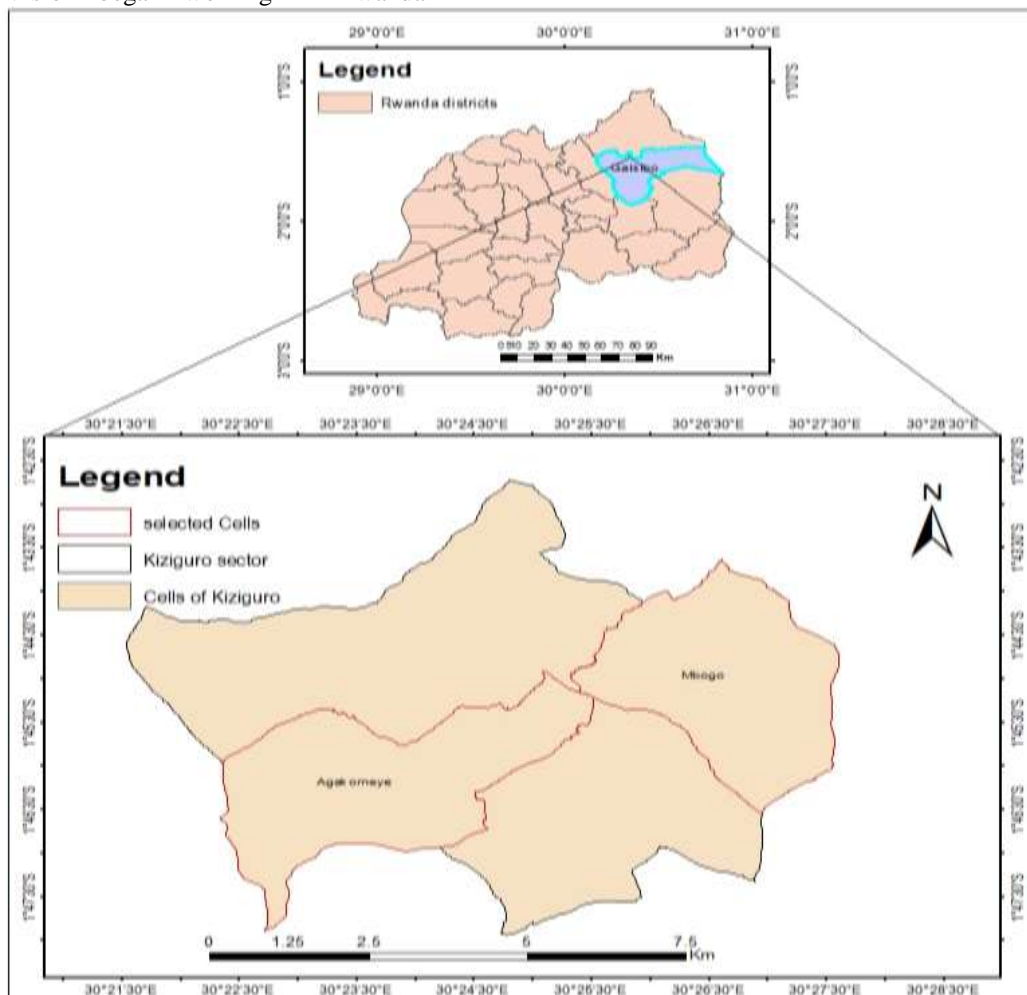

Figure 1: Location of Kiziguro sector with two cells (Agakomeye and Mbogo)
Source: Application of GIS 10.7

2.2 Data collection
2.2.1 Target population
The target population in this study was considered form households ofMbogo and Agakomeye Cells who isdirect World Vision funded Project beneficiaries. However, since it was not possible to reach all the members, a sample was selected fromforest landscape restoration for improved livelihood project beneficiaries which are 720 households.

2.2.2Sampling Technique
For the sampling, the formula of Singh (2006) was approached that whenever a population of origin of reference is fewer than one million of persons, it is good to match this to a sample of 85 individuals, which leads to 10% inaccuracy. And this was utilized as a guideline in this study to determine the exact number of people to interview. Therefore, the sample size of was calculated as follows:

Nc= corrected sample

NC= n*N/n+N(1)

NC= 720*96/720+96= 84.7=85 respondents (2)

Thereafter, the research utilized the questionnaires and interviews in order to collect the needed information from the above study sample. In addition, the authors utilized secondary data which were collected from the topic related literature, including published documents and internet sites, was also used.

3.3Data analysis
For this study, the collected data were analyzed by using both quantitative and qualitative methods including the descriptive, correlation analysis for quantitative. The STATA 13.0 software was used to perform the multiple linear regression where the predicted dependent variable is the extent to which the World Vision funded project contributes to improving households' livelihood in Kiziguro sector. Other explanatory variables like socio-economic variables, provision of agricultural inputs, support in tree planting,

training/education, mobilization services and market linkages were considered to assess the contribution of NGO's projects to household's Livelihood improvement.

The linear regression model was implicitly specified as follows:

$$Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_5 X_5 + \beta_6 X_6 + \cdots + \epsilon_i \quad (3)$$

Where β_0 is the intercept, Y= is level of the extent to which the World Vision funded project contributes to improving households' livelihood in Kiziguro sector (Very extent =1, otherwise = 0), $\beta_1 - \beta_6$ are the regression coefficient, X_1-X_6 are the X1=socio-economic variables (age, gender, education etc,…), X2=Provision of agricultural inputs, X3=Support in tree planting, X4=Training/education, X5=mobilization services and X6=Market linkages respectively and ϵ_i is the error term designed to capture the effects of unspecified variables in the model.

2.4 Ethical Considerations
For ethical reasons, the authors informed local leaders and specifically targeted people about the purpose, process, and surroundings, while maintaining respondents' anonymity by not disclosing their names while answering questions. Respondents agreed that the study was for academic purposes only and that their responses would be kept private.

III. RESULTS AND DISCUSSION
3.1. Distribution of respondents
The results in Table 1 show that female respondents are more than males. The difference is that of 61.2% for females and 38.8% for males. For the age, Table1 indicated that 11.76 percent of respondents were between the ages of 15 and 25 and 51.76 percent were between the ages of 41 and 60, Regarding marital status, 71.76% of the household heads are married while 11.76% are single headed households (Table 1).

Table 1: Gender, age and marital status of respondents

Gender	Freq.	Percent
Female	52	61.18
Male	33	38.82
Total	85	100

Age category	Freq.	Percent
15-25 years	10	11.76
26-40 years	16	18.82
41-60 years	44	51.76
==> 60 years	15	17.65
Total	85	100

Marital status	Freq.	Percent
Married	61	71.76
Single	10	11.76
Divorced	6	7.06
Separated	5	5.88
Widow/ widower	3	3.53
Total	85	100

Source: Primary data, April, 2022

For the education, Table 2 revealed that 60% of the respondents attended primary education while only 2.35% had no education (they are not able to read and write/illiterate). The same Table 2 shows that 36.47% are farmers, 30.59% were livestock owner while 10.59% are unemployed (jobless). Also, it is noted that 69.41% have the family size of 4-6 members, 18.82% are above 6 members while only 11.67% have the family size between 1 – 3 members respectively (Table 2).

Table 2: Education, income source and household size

Education	Freq.	Percent
Primary school	51	60
Secondary education	7	8.24
College	11	12.94
Technical education	14	16.47
None	2	2.35
Total	85	100
Income source	**Freq.**	**Percent**
Farmer	31	36.47
Livestock Owner	26	30.59
Business man	11	12.94
Salaried/ Government employed	8	9.41
Unemployed	9	10.59
Total	85	100
Household size	**Freq.**	**Percent**
1-3 members	10	11.76
4-6 members	59	69.41
Above 6 members	16	18.82
Total	85	100

Source: Primary data, April, 2022

3.2 Livelihoods status before World Vision interventions

From the Table 3, it was found that about 41.18% were challenged by lack of income generating activities, 36.47% were constrained by food insecurity and resilience, and 16.47% lacked fertilizers while only 5.88% lacked the fuel wood used in cooking their daily foods.

Table 3: Problems encountered by beneficiaries before intervention of World Vision

Problems encountered	Freq.	Percent
Lack of Income Generating activities	35	41.18
Lack of Fuel wood	5	5.88
Lack of Fertilizers	14	16.47
Food Insecurity and resilience	31	36.47
Total	85	100

Source: Primary data, April, 2022

In addition, as shown in Table 4 shows that apart from World Vision, the community had other sources of livelihood assistance where 67.06% said that WVIR is mainly involved in churches, 16.47% in other NGOs and only 1.18% are in state. This is also explained by the significance between types of assistance and percentage of beneficiaries who received assistance (p-value=0.045). The higher rate of churches creation are in line with its mission that World Vision is a Christian humanitarian organization, dedicated to working with children, their families and communities worldwide to see them reach their full potential by tackling the root causes of poverty and injustice.

Table 4: Assistance providers

Beneficiaries received assistance	Types of assistance			Total
	state	NGOs	Churches	
No	1	0	12	13
	1.6	2.1	0.2	3.9
	1.18	0	14.12	15.29
Yes	1	14	57	72
	0.3	0.4	0.00	0.7
	1.18	**16.47**	**67.06**	84.71
Total	2	14	69	85
	1.9	2.5	0.2	4.6
	2.35	16.47	81.18	100
Pearson chi2(2) = 4.6215 and Pr = 0.099; Likelihood-ratio chi2(2) = 6.1884 and Pr = 0.045; Kendall's tau-b = -0.1059 and ASE = 0.090				

Source: Primary data, April, 2022

3.3 World Vision intervention on beneficiaries' livelihoods

As showed in Table 5, 74.12% of the support on animal rearing is provided through educational and trainings, 18.82% is channeled through income generation activities while only 7.06% is channeled through social and moral support. This higher rate is also explained by one core value of World Vision International Rwanda were said that WVIR is focused in helping the most vulnerable children, in the most difficult places, overcome poverty and experience fullness of life.

Table 5: Support channels on animal rearing

Channels	Freq.	Percent
Educational and Training	63	74.12
Income Generation	16	18.82
Social and Moral support	6	7.06
Total	85	100

Source: Primary data, April, 2022

The study findings in Table 6 showed that 55.29% greatly used fertilizers from WVIR, 16.47% very greatly used fertilizers while only 17.65% average greatly used fertilizers from WVIR. This is also explained by the significance between users and non-users of fertilizers from WVIR and the extent to which fertilizers increased production through chi square test (p-value=0.000) less than to 0.05 level of probability.

Table 6: Fertilizers and their contribution to production

Beneficiaries supported by WVI to get fertilizers	Extent to which fertilizers increased production					Total
	Very great extent	Great extent	Average extent	Small extent	Very small extent	
No	0.0	0.0	0.0	6	1	7
	1.2	3.9	1.2	51	4.2	61.5

	0.0	0.0	0.0	28.1	3.6	31.7
	0.0	0.0	0.0	7.06	1.18	8.24
Yes	14	47	15	1	1	78
	0.1	0.3	0.1	4.6	0.4	5.5
	2.4	8.1	2.6	-3.7	-1.2	8.1
	16.47	**55.29**	**17.65**	1.18	1.18	91.76
Total	14	47	15	7	2	85
	1.3	4.2	1.3	55.6	4.6	67
	2.4	8.1	2.6	24.4	2.4	39.8
	16.47	55.29	17.65	8.24	2.35	100
Pearson chi2(4) = 67.0415 and Pr = 0.000; likelihood-ratio chi2(4) = 39.8472 and Pr = 0.000; Kendall's tau-b = -0.4733 and ASE = 0.074						

Source: Primary data, April, 2022

In addition, the results in Figure 2 show that the average number of seedlings received by each recipient was 92, e.g. 97 for male beneficiaries, 77 for female, and 129 for institutions. However, there is a huge range of number of trees provided to beneficiaries and the mean figure is strongly influenced by the beneficiaries who received large number of seedlings, with 59 beneficiaries receiving over 1,000 seedlings. One beneficiary received 12,401 seedlings which are understood that these were meant to be shared by a small group of farmers on a 7.5 ha of land. Almost half of the beneficiaries (47%) received up to 50 trees and only 2.8% have above 400 seedlings (see Figure 4.3 below). In terms of tree species, two third (66%) comprised exotic species (agroforestry and others), 29% fruit trees and only 5% indigenous trees
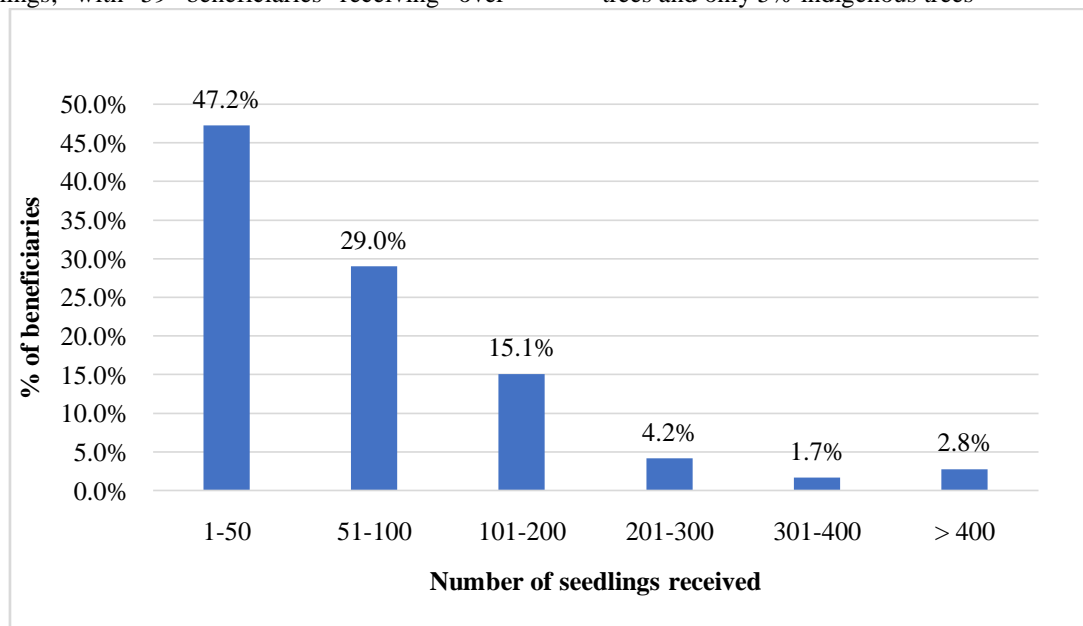

Figure 2: Seedlings received by recipients (year 2)

The results in Table 7 reveal that in terms of appreciating the WVI services on community livelihoods, 76.47% were more effective, 10.59% were effective, and 7.06% were less effective while only 4.71% were ineffective. In line with the national theme for the tree-planting season, 'Forests for Community Livelihood and Sustainable Development, and in an effort to contribute towards the Government's target of planting 25 million trees this tree-planting season, World Vision organized a tree-planting event in Gatsibo District to create awareness on the challenges of land degradation and the need for land restoration initiatives. Also, World Vision

supported technically from World Agroforestry (ICRAF), together in supporting farmers to improve their livelihoods by providing improved food and nutritional security, climate resilience for smallholder farmers and restored ecosystem services through evergreen agriculture - a form of agroforestry where trees are incorporated onto crop and pasture lands and thus this agree with the research conducted by (AIMABLE, 2014).

Table 7: Appreciation of beneficiaries on WVI services

Appreciation of Beneficiaries of how WVI assistance improved HH livelihoods	Freq.	Percent
More Effective	65	76.47
Effective	9	10.59
Less Effective	6	7.06
Ineffective	4	4.71
Not Known	1	1.18
Total	85	100

Source: Primary data, April, 2022

Furthermore, WVIR is mainly focused in reducing poverty from marginalized and vulnerable people through Access to qualityplantingmaterials andmanagementamong thedifferentspecies. The employed respondents (beneficiaries) were asked to mention income generated from tree tomato plant compared to other fruits plants like avocado. It was found that (Table 8) when the total production of tree tomato was 3,400kg sold at 500Frws per 1 Kg, the total gross farm income is around 2,100,000 Frws respectively. It is an indication that tree tomato contributed to a raised income of beneficiaries one adopted as agro venture business and this agree with the research conducted by (Gasengayire, 2021).

Table 8: Income from fruit selling

Sector	Fruit Type	Households					Amount/kg	Selling price/Frw	Total income/Frw
		Male	Female		MWD	FWD			
	Tree tomatoes	5	0	5	0	0	600	500	150000
	Tree tomatoes	9	2	10	0	1	2500	500	1125000
	Tree tomatoes	7	1	8	0	0	1200	500	600000
	Tree Tomatoes	3	0	3	0	0	450	500	225000
Total				26			3400	500	2,100,000

Note: MWD: Male working days, FWD: Female working days
Source: Secondary data, April, 2022

3.4 Contribution of World Vision International Rwanda on households' livelihoods
The results in Table 9 reveal that 82.35% were supported in provision of agricultural inputs, 94.11% were supported in trees planting, 76.47% were supported in trainings and related educations, 34.12% were supported in mobilization activities while only 84.71% were supported in markets linkages. With regard to the poor and vulnerable groups, a sustainable livelihood for the supported beneficiaries is keeping the positive momentum.

Table 9: Contribution World vision to livelihoods of beneficiaries

Variable	Obs	Mean	Std. Dev.
Provision of agricultural inputs	85	0.823529	0.383483
Support in trees planting	85	0.941177	0.236691
Trainings in education	85	0.764706	0.4267

Mobilization	85	0.341177	0.476918
Markets linkages	85	0.847059	0.362067

Source: Primary data, April, 2022

The results in Table 10, the findings from multiple linear regression model (MLRM) indicated that the Prob>F =0.000 which is statistically significant [F(16,68=41.63)]. The R-square (R^2) is 0.9074 or 90.74% indicating the specification fits the data highly the variables included in the model and explain that 90.74% of total variation within the model contributed to the improved livelihoods of beneficiaries due to intervention of World Vision international in Kiziguro sectorand the remaining of 9.26% is due to unpredicted factors.   From Table 11, the following econometric model was expanded and developed due to the number of factors that are statistically significant:

$$Y = 0.392 + 0.854X_1 + 0.500X_2 + 0.783X_3 \\ + 1.201X_4 + 1.783X_5 \\ + 0.462X_6 + 1.192X_7 \\ + 1.471X_8 + 1.101X_9 \\ + 1.061X_{10} + 0.741X_{11}$$

The findingsof this study are in line with the research conducted by Ouya et al. (2020)that households who participated insustainable agricultural intensification practicestraining were more likely to have improvedaccess to food. Trainings were expected to transferimportant agricultural knowledge and skillswhich is beneficial to farmers improving foodproduction (Stewart et al., 2016).

The study findings showed that a unit increase in provision of agricultural inputs, Support in agroforestry trees and mobilization would lead to increased livelihoods of the households (beneficiaries) by 1.1 percent, 1.06 percent and 0.74 percent respectively. From this perspective, and referring to the study conducted by Sibande et al. (2017), the farm input subsidy program in Rwanda provides coupons which entitle the recipient to purchase specified quantities of subsidized fertilizerand other selected inputs at subsidized prices.

Table 10: Relationship between WVIR and household livelihoods

Contribution of WVI on improved Livelihoods	Coef.	Std. Err.	t	P>|t|
Gender	0.8541	0.0933	9.150	0.000**
Age	0.0635	0.0543	1.170	0.246
Marital status	0.0712	0.1085	0.660	0.514
Education levels	0.0361	0.0301	1.200	0.235
Family Size	0.5004	0.2251	2.220	0.030**
Occupation	0.7833	0.0543	14.420	0.000**
Trainings on Modern Farming practices	1.2010	0.3012	3.990	0.000**
Trainings on Business management Skills	1.7833	0.4367	4.080	0.000**
Trainings on Orchard management	0.4615	0.2792	1.650	0.103*
Trainings on Modern animal rearing	1.1921	0.3467	3.440	0.001**
Trainings on Other Incomegeneratingactivities	1.4714	0.3049	4.830	0.000**
Provision of agricultural Inputs	1.1012	0.5916	1.860	0.067**
Support in agroforestry trees	1.0608	0.3147	3.370	0.001**
Trainings in Education	-0.1617	0.2713	-0.600	0.553
Mobilization	0.7405	0.1773	4.180	0.000**
Markets linkages	-0.1246	0.3917	-0.320	0.751
_cons	0.3920	0.9043	0.430	0.666
Model Summary				
Source	SS	Df	MS	
Model	62.512	16	3.907	
Residual	6.3825	68	0.0939	
Total	68.894	84	0.8202	

Number of obs	=	85
F(16,68)	=	41.63
Prob>F	=	0.000
R-squared	=	0.9074
Adj R-squared	=	0.8856
Root MSE	=	0.30637

Source: Primary data, April, 2022

IV.   CONCLUSION

The current study findings found that World Vision International Rwanda involved in numerous activities that improved households' livelihoods in Kiziguro sector of Gatsibo district. Regarding capacity building, WVIR trained the beneficiaries in modern farming practices, business management skills, orchard management, animal rearing and other Income generating activities and beneficiaries greatly used fertilizers from World Vision International Rwanda. The World Vision Rwanda, through its partnership has committed to plant a total of 7,695,300 trees throughout the 2020/21 tree-planting season to address climate change and improve livelihoods and most of beneficiaries were more effective. Furthermore, the results show that World Vision International Rwanda was engaged in provision of agricultural inputs, supported beneficiaries in trees planting, supported in trainings with education, was engaged in mobilization support in markets linkages. The total production of tree tomato was 3,400kg sold at 500Frws per 1 Kg; the total gross farm income is around 2,100,000 Frws respectively. Hence, it is concluded thatWorld Vision interventions contributed to increasing the livelihoods of its beneficiaries.

Acknowledgements

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