

GOVERNMENT SUPPORT SERVICES AND SUSTAINABILITY OF SMALL SCALE IRRIGATION FARMING PROJECTS IN KISUMU COUNTY, KENYA

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Abstract: The study sought to examine how government support services as issuance of subsidies, marketing support, diversification and extension services, influence the sustainability of small holder irrigation projects in Kisumu County. The study was underpinned by Contingency Theory, Resource Based Theory and stake-holders theory. Descriptive research design was employed. The target population in the small scale irrigation farming projects in Kisumu county was 4,000 farmers which included project officials that is, the chairman of water users association, project secretary and block leaders from Nyachoda, Awach, Gem-Rae , Nyakalewa, Kasiru-Kolal, Sisso,Anyuro,Arombo, Siamy and kotieno small scale irrigation projects, located in Nyando Sub-county since a large population of most small-scale irrigation farmers are located in this Sub-county. The study adopted simple random sampling to select sample size of 102 respondents. The study utilized primary data which was collected using questionnaire. An overall Cronbach alpha of 0.8088 was obtained which indicated that the research instrument was reliable. The analysis of research data was based on multiple regression analysis. The research results indicated that a unit increase in government subsidies leads to a significant and positive increase in sustainability of small holder irrigation projects by 0.779 times with a p value of 0.003. One unit increase in marketing support holding other factors constant leads to a significant increase in the sustainability of small scale irrigation projects by 1.041 times; p value of 0.000. Further, diversification has a significant increase in the sustainability of small scale irrigation projects by 0.330 times; p value is 0.034. Lastly, one unit change in extension services has a significant decrease in small scale irrigation projects by 0.572; p value is 0.026. The study concluded that government support services are important in enhancing small scale irrigation projects sustainability in Kisumu county Kenya. The study recommended that government support services should be continuously provided to small scale irrigation project farmers' in Kisumu county in order to boost irrigation projects' sustainability.

Keywords: Government Support Services, Marketing Support, Diversification, Extension Services and Sustainability.

1. INTRODUCTION

1.1 Introduction

Global population is estimated at 7.3 billion (FAO, 2014) out of this figure, one-ninth is suffering from chronic malnutrition. This represent 791 million, who live in developing countries which account for one-eighth (13.5%) of population in developing countries (FAO, 2014). Over the years the Kenyan government has invested significantly in small-scale farming projects in order to improve the livelihoods and incomes of small scale farmers mostly based in the rural parts of the country in order to reduce poverty levels. Yet it struggles to meet hopes. It is troubled by a whole range

of specific difficulties, including unfunded agricultural programs, financing problems and lack of adequate technical management (Alber & Hall, 2012). Gomo (2012) argues that the efficiency of smallholder irrigation projects is below stakeholder standards and problem with multiple dimensions that needs to be assessed from several viewpoints.

Sustainability of Irrigation Systems play a key position in the development of agricultural output and do a great deal in ensuring security of food, reducing the number of children affected with undernourishment and decrease poverty levels. This can also serve as driving force in turning around stagnant economic growth of nations around the world. In Kenya Irrigation projects are run by National Irrigation Board created by Parliament Act CAP 347 Kenya laws in 1966. Mwea, Hola and Perkerra irrigation schemes were taken over by the board, and Ahero, West Kano, Bunyala and Bura Irrigation Schemes were later established. Later on many others have come in such as South-West Kano, Sisenye, Kibwezi, Tana Delta and Katilu (GOK 2016).

Government support services refer to various ways in which government or the state helps to boost farming (Gomo, 2012). Over the years, the Kenyan government has in many ways taken various steps in supporting small scale farming. According to Heymans, Mackinson, Sumaila, Dyck and Little (2011), these supports from government include but not limited to government subsidies, marketing support, diversification, leasing, capacity building through farmers training programs, infrastructural development (building of roads, communication networks, seed stores, laboratories), technology generation, dissemination & access to knowledge, agriculture extension & advisory services among others. However, the current study adopted subsidies, marketing support, diversification, extension services as government support services. The choice of these four variables is guided by literature.

Kisumu County irrigation projects are mainly located in two sub-counties namely Nyando sub-county which according to latest statistics by National Irrigation Board, covers 6,500 acres and Muhoroni sub-county covering 4,000 acres according to National Irrigation Board, Ahero Irrigation Scheme. Therefore the focus of the study was Nyando sub-county which consists of the largest small holder irrigation projects. Nyando Sub-county small holder irrigation projects consist of clusters of farmer managed irrigation projects located in Nyando Sub-county in the plains of Kano, between Nandi escarpment and Nyabondo plateau on the shores of Lake Victoria in the county of Kisumu. These irrigation projects consists of Nyachoda, Awach, Nyatini, See-Saw, Gem-Rae, Asawo, Dagrao, Nyakalewa, Kasiru kolal, Mbega Ayueo, Amboo, Kabongo. According to National Irrigation Board Ahero Irrigation Scheme the first small-holder irrigation project to be started by the government through Ministry of Agriculture (PIU by then) in Nyando

1.2 Statement of the Problem

Agriculture dominates the Kenyan economy and small holder irrigation projects offer a crucial function in irrigation activities. Is the leading economic field with a gross domestic product (GDP) accounting for 25 per cent. In turn, the industry accounts for 65% of Kenya's overall exports and offers more than 18% of formal jobs. In line with the Government of Kenya initiatives, various government agencies have initiated irrigation projects over the years, in particular small scale irrigation projects with great emphasis on sustainable development (Ministry of Water, 2011). Available estimates indicate that about 50.6% of the Kenyan population lack access to adequate food and this is severe in arid, semi-arid areas (Agriculture Ministry, 2016). So that food supply in the country is safe, the government has advocated for minimal dependence on rain-fed agriculture and embarked on establishing small holder irrigation projects in the country, under strategy for revitalizing agriculture (SRA) (Odoyo, 2013).

Nonetheless, much of the projects once launched and introduced fail shortly after the execution organization drops out on investments by way of weak performance, thereby threatening sustainability (Masya, 2016). According to Mboi (2018), sustainability of several irrigation schemes for smallholder communities in Kenya is a challenge due various emerging issues such as water management factors that is inadequate water for irrigation during dry spells, economic factors that is low funding levels, infrastructure factors that is poor maintenance of irrigation infrastructure and other factors such as poor marketing strategies. Data from Nyando sub-county office of irrigation suggests about 50 percent of small holder irrigation schemes in Kisumu County operate below capacity similarly due to the above named challenges, thereby questioning their level of sustainability.

In order to boost the sustainability of irrigation projects Mboi 2018, asserts that government support services such as rehabilitation / improvement of the irrigation network and the service and repair assistance of the network be offered to the farmers at a subsidy. As this will improve the efficiency and operation capacity of the projects. Other government support services such as legal regulations on the conservation of water resources, current localization related laws controlled by small-scale farmers irrigation projects in terms of marketing are not clearly spelt out and inadequate

extension services. This study sought to establish how government support services affects the sustainability of Small Scale Irrigation Farming project at Kisumu County, Kenya.

1.3 Objectives of the Study

1.3.1 General Objective

The generally determined the relationship between government support services and sustainability of Small Scale Irrigation Farming projects in Kisumu County, Kenya

1.3.2 Specific Objective

Specifically the study aimed at:

- i) Finding out how subsidy affects the Small Scale Irrigation farming projects sustainability in Kisumu County, Kenya
- ii) Determining how marketing support affects the Small Scale Irrigation farming projects sustainability in Kisumu County, Kenya
- iii) Assessing how diversification affects the Small Scale Irrigation farming projects sustainability in Kisumu County, Kenya
- iv) Establishing how extension service affects the Small Scale Irrigation farming projects sustainability in Kisumu County, Kenya.

2. LITERATURE REVIEW

2.1 Theoretical Review

Contingency Theory was propounded by Fielder in 1960. The theory is an approach to the analysis of organizational actions in which explores how contextual influences such as technology, society, and the social world affect organizational nature and work. The fundamental principle of flexibility is the belief that no particular form of corporate arrangement extends the same is true of other organizations. Alternatively, organizational performance depends on a mix or match between the type of technology, environmental variation, the size of the enterprise, the characteristics of the organizational framework and its information system (Njeri, 2014). In relation to the current study, the theory suggests there is no perfect way to coordinate and manage a small-holder irrigated projects or improve its performance.

Resource Based Theory was introduced by Edith Penrose in 1959. Resource Based Theory notes that ownership of resource is important, impossible to duplicate, rare and unreplaceable. The resource-based theory suggests companies should seek to find the sources of competitive advantage by exploiting their resources. Competitive advantage is an advantage a business has over its rivals which allows it to produce revenue or profits and/or maintain more customers than the competition. The strategic edge of a organization emerges from the organisation's capital (Ruhara & Moronge, 2016).

Stakeholder Theory was introduced by Freeman (1984). He proposed the notion of stakeholder companies and presented the core features of the Stakeholder Model. The stakeholder approach has been described as a powerful means of understanding the environment of the firm. Mitchell *et al.* (2010) suggest that this strategy is meant to enlarge management's perception of its roles and responsibilities outside the framework for optimizing rewards and the stakeholders defined in the company's input performance models to incorporate non-stockholding community priorities and statements as well.

2.2 Empirical Review

2.2.1 Government Subsidy and Sustainability

Hudon and Traca (2010) conducted a study on subsidies and sustainability of United States Microfinance. It was revealed that subsidy negatively and significantly related with sustainability. The study further indicated that the negative relationship is attributed to the fact that institutions or individuals who receive loan subsidies are the poorest. Therefore, the loans are usually small in size with large administrative cost. The research focused especially on the United States. The study addressed this gap by focusing on of small scale irrigation projects in kisumu county with a specific focus in nyando subcounty.

Pati (2010) conducted a study on the impact of subsidy on Sustainability of SHGs: An Empirical Analysis of Micro Lending through SGSY Scheme. The study centered on the effect of this scheme on the stabilization of SHGs, which carries a subsidy portion of its total lending section. The Indian experience often shows that introducing new structural structure to resolve the issue of rural finance has not managed to change the condition and has instead generated new issues. Nonetheless, the research was focused on India and would be centered on the feasibility of small-scale irrigation schemes in Kisumu County in order to overcome the contextual difference.

Heymans, Mackinson, Sumaila, Dyck and Little (2011) researched the effect of North Sea Fisheries subsidies on the environmental protection and potential revenues. This research intends to examine the effect of fishery subsidies on the ecological stability and economic viability of the environment in the North Sea. The study showed that while the abolition of subsidies could decrease the total capture and income, total fisheries production and overall economically useful species abundance rose. For example, when optimizing for profit, the biomass of cod, haddock, herring and plaice increased in the simulation and also increased the biomass for cod, plaice and sole for ecological stability. Once subsidies are withdrawn, the analysis indicates that fisheries are more competitive, following a decline in overall income due to a lack in policy subsidies, rather than pushing those interested in fisheries to red.

Gates and Stephen (2010) assessed factors affecting sustainability of small scale irrigation projects in Kirinyaga District, Central Province Kenya and funding an economic factor was one of the Independent variables considered. The results from the analysis revealed that much of the SSIP had issues with its finances, although almost all depended on donations from participants, their willingness to donate was not sufficient. If budget problems impact projects, then mismanagement sets in and continuity is challenged as was the case for the projects being examined. The report found that insufficient financing negatively impacted viability of the programs. Before beginning, farmers' capacity to contribute to these results should be evaluated.

Zampasabina and Bojnec (2017) examined the Impact of Subsidies on Production Innovation and Sustainable Growth. The research explores the connection between grants to invest in infrastructure programs, creativity, financial success and economic growth. The research focused on incentives to co-finance the procurement of advanced technical equipment intended to encourage progress and the development of innovative goods. Subsidies are allocated in compliance with EU legislation and directives, focused on the approved European Union (EU) and national systems for the purposes of greater economic development. The research used a mix of accounting data from undertakings, support data, and special in-depth details collected from a business level survey. The findings showed a strong effect on financial metrics from subsidies, and a minimal influence on creativity. While analyzing sustainable growth, the study found that the companies receiving subsidies had a higher increase in financial indicators.

2.2.2 Marketing Support and Sustainability

Hudon and Traca (2010) conducted a study on the impact of marketing on sustainability of Microfinance in the United States. It looked at marketing in respect to promotion and creation of awareness. The research results showed that the partnership between marketing and sustainability is optimistic and important. The research, though, focussed on the United States. Pati (2010) performed a study on marketing effect on Sustainability of SHGs: an observational review of micro loans by SGSY. Findings from the regression study found that advertisement impacts sustainability dramatically and favorably. However, the study was based on India and will be based on the sustainability of small-scale irrigation projects in Kisumu County in addressing the contextual gap.

Zampasabina and Bojnec (2017) examined effect of marketing on Sustainable Growth. The study used a combination of accounting data from enterprises and unique, in-depth data obtained through a company-level survey. The findings indicate a positive marketing influence on sustainable growth. The research, however, centered on sustainable growth in the US. The current thesis will concentrate on the feasibility of small-scale irrigation schemes in Kisumu County in particular.

2.2.3 Diversification and Sustainability

Ruhara and Moronge (2016) studied the influence of different credit sources on sustainability of Non-Governmental Organizations Health Projects in Nairobi County. The respondents familiarized themselves with the methods and procedures of finance management. The study findings indicate that diversification has a important and optimistic effect on the viability of NGOs health projects in Nairobi County. The research concentrated therefore on NGOs. The current study will be based on projects of small scale irrigation in Kisumu County, Kenya.

Etengu and Amony (2016) studied the impact of diversification on sustainability of Non-Governmental Organizations in Uganda: A Case Study of International Union for Conservation of Nature. Results of the study showed that income diversification significantly affects sustainability of NGOs. The research focused, in particular, on NGOs. The results cannot therefore be extended to small-scale irrigation projects in Kisumu Kenya which are the subject of the present study.

Wandera and Sang (2017) conducted a study on diversification and Non- Governmental Organizations Projects sustainability in Juba, South Sudan. Diversification was considered in terms of income diversification. Study findings proved that it was positively and significantly affected diversification on financial sustainability of NGOs in South Sudan. The study focused on NGO's in South Sudan, though. The new research will concentrate on the viability of limited irrigation schemes, County Kisumu, Kenya.

2.2.4 Extension Services and Sustainability

Sattaka *et al.* (2017) carried out a study on agricultural extension services on sustainability for food and cultural security of glutinous rice farmers in Vietnam. The research explored glutinous rice farming in households as food and for cultural protection, as well as the extension facilities in glutinous rice production areas. Data were obtained from 400 local farmers using the number, decimal mean and hypothesis testing with logistic regression based on interview schedules and statistical analysis. Most glutinous rice farmers were found to be small-scale producers, having an average glutinous rice-growing area of 0.15 ha and a yield of 3,200 kg per ha. Seed varieties were supplied locally as well as for breeding. Many farming households had ample glutinous rice to sustain daily food and cultural use. They also ate certain starchy foods as part of their conventional diets. Importantly, the findings suggested that funding for extension services is significant in supporting sustainable glutinous rice development and helping to maintain local food and cultural protection in Vietnam. However, the research focused on Vietnam's farmers.

Baloch and Thapa (2018) conducted a study on the impact of agricultural extension services on sustainability while focusing on Date farmers in Balochistan, Pakistan. The Government of Pakistan has adopted a policy to provide farm expansion facilities to promote agricultural production by disseminating relevant knowledge and technology to farmers. The information required was gathered from a survey of 200 date palm farm households, group discussions and key informant surveys of farmers who had access to extension services in Panjgur District of Balochistan, about half of whom had used the knowledge / technology provided by extension officials. Overall, the small-scale farmers who used the extension services made better returns than the medium- and large-scale farmers. The linear regression model identified five variables that greatly impacted growth. Such variables included the total amount of date palms, the land preparedness program suggested by extension officials, irrigation length, pesticide consumption as suggested by extension officials and farm-household profits. Generally, owing to a combined effect of several factors, farmers in the study area have access to extension resources very minimal. It was attributable in part to institutional shortcomings, including a comparatively limited number of extension personnel and their lack of knowledge about how to resolve real concerns such as the Dubas virus, Infested by approximately 90 percent of trees and shortage of irrigation water for approximately 90 percent of growers, resulting in a 65 percent decline in date growth. Findings suggest that extension programs affect sustainability dramatically.

3. RESEARCH AND METHODOLOGY

3.1 Research Design

Cooper and Schindler (2009) contend that the design of research is a blueprint for data collection, measurement and estimation. A research design is, according to Rajendra (2018), the defined guideline criteria for the compilation and review of appropriate research data (Ozcelik & Ferman, 2016). A descriptive research design was utilized. The research design sought to establish the why and how of a phenomena as it aids investigation into such scenarios. In this case, the design was suitable for the study.

3.2 Target Population

The word refers to a category of individuals, objects or variables which have specific features of interest to researchers (Mugenda & Mugenda, 2013). The statistics from National Irrigation Board, Ahero Irrigation Scheme office indicate that there are 38 small scale irrigation projects in nyando sub-county, Kisumu County as of 2015, Including 4000 Participation. Therefore, the population targeted was the 4000 representatives of irrigation. The population comprises of project committee members, project officials and block leaders as presented in table 3.1.

3.3 Sampling Technique and Sample Size

Sampling relates to the method of picking a part of a population to use to draw conclusions in a study and recommendations. The current study employed simple random sampling in selecting small holder irrigation projects, project management officials and block leaders. Simple random sampling as a technique in which a population is selected entirely by chance and each member of the population has equal opportunity to be included in the sample (Mugenda & Mugenda, 2013). The sampling method required selecting a certain number of subjects from a given population as their representative (Mugenda & Mugenda, 2013). This study applied simple random sampling technique to both select 10 small holder irrigation projects in the Sub-county and sample 3 members of project management committee from each project, 2 project officials (chairman and secretary) and 7 block leaders per irrigation project. This brought the sample size to 102 respondents.

3.4 Data Collection Instrument

Primary data was used in the analysis to draw inferences and hypotheses regarding the sample population. The research instrument was a questionnaire. The choice of questionnaires was utilized because most people familiarize themselves with the questionnaires. Moreover, The use of questionnaires is easier than the interviews. The results were obtained using standardized analysis questionnaires, which were pre-tested in a pilot study and subsequently rendered appropriate modifications. The questionnaires were based on a likert scale of 1 to 5 to help attribute numerical values to the answers (Mugenda & Mugenda, 2013).

3.5 Pilot Study

A pilot test was carried out to check the relevance of the questionnaire. It was done by the researcher, with the help of research assistants. The study was based on 15 respondents from small-scale irrigation projects in Kisumu, County Kenya. In the key analysis the respondents participating in the pilot test did not take part. A pilot analysis had the purpose of finding and setting up some Questionnaire mistakes prior to data processing. Ensure the questionnaires suitable for data collection (Brotherton, 2008).

4. RESEARCH FINDINGS AND DISCUSSION

4.1 Analysis of Response Rate

Out of the 102 distributed questionnaires, only 79 were filled and returned. This translated to a response rate of 77% which was regarded as adequate for making inferences and conclusions. Mugenda and Mugenda (2013), said a response rate of 50 percent is adequate; a response rate of 60 percent is considered good, whereas a response rate of 70 percent and above is considered really strong. In line with this statement, the answer rate for the sample is considered quite positive for analysis.

4.2 Pilot Study

A pilot test was carried out to determine the reliability and validity of the testing instrument. The findings of the study on the reliability test are set out in Table 4.1.

Table 4.1: Reliability Test Results

Variable	Cronbach's Alpha	No of Items	Comment
Government subsidy	0.743	4	Reliable
Marketing support	0.781	5	Reliable
Financial diversification	0.824	5	Reliable
Extension services	0.775	6	Reliable
Sustainability	0.811	7	Reliable
Average score	0.8088	27	Reliable

Source (Survey Data, 2020)

In Table 4.1, a value of 0.8088 to be the overall reliability coefficient was found with every variable studied having an alpha above 0.70. In line with Polgar and Thomas (2009), the implication of this is that the research instrument of the study was reliable.

4.3 Inferential Analysis

4.3.1 Multiple Regression Analysis

A multiple regression analysis was carried out and presents the model summary, R², and the regression output as shown in table 4.2

Table 4.2: Multiple Regression Analysis Results

		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	T	Sig.
(Constant)		-2.061	1.078		-1.912	.060
Government subsidy		.779	.257	.343	3.036	.003
Marketing support		1.041	.245	.465	4.251	.000
Diversification		.330	.153	.208	2.158	.034
Extension services		-.572	.252	-.265	-2.265	.026
		R	R Square	Adjusted R Square	Std. Error of the Estimate	Sig. F Change
		.840 ^a	0.706	0.650	0.1316	.000
		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	15.412	4	3.853	12.809	.000 ^b
	Residual	22.259	74	0.301		
	Total	37.671	78			

Source (Survey Data, 2020)

The statistics in Table 4.2 show that R-square and adjusted R-square value of 0.706 and 0.650 were found for the model. The implication of these is the independent variables namely government subsidy, marketing support, diversification and extension services account for 70.6% of the movements or changes in Small Scale Irrigation farming projects sustainability in Kisumu County, Kenya.

The study also conducted Analysis of Variance analysis (ANOVA), as indicated in Table 4.2. The results in Table 4.2 show that the model was significant based on a p-value of 0.000 indicating that the model was adequate for estimation. A significant p-value at 0.05 further implies that the model is adequate for subsequent analyses.

4.4 Interpretation of Findings

The results show that the viability of Small Scale Irrigation farming projects in Kisumu County is declining by 2.061 in the absence of the predictor variables. The first objective of the study was to investigate the effect of government subsidies on the viability of small-scale irrigation farming projects in Kisumu District, Kenya. Empirical results suggest a coefficient of 0.779 and a p-value of 0.003 which means that policy subsidies have a major and beneficial impact on the sustainability of Small Scale Irrigation farming projects in Kisumu County, Kenya. Increasing rates of government subsidies are therefore a source of stabilization for Small Scale Irrigation projects in Kisumu County, Kenya.

The study findings on the effect of government subsidy on sustainability concurs with that of Pati (2010) who also found that government subsidy significantly and positively affected the sustainability for Micro Lending through SGSY Scheme. Similarly, Zampasabina and Bojnec (2017) also found subsidy to significantly and positively predict sustainability. Gates and Stephen (2010) also documented that subsidy significantly enhances the sustainability of small scale irrigation projects in Kirinyaga District. The study findings on the effect of subsidy on sustainability are however at variance with that of Hudon and Traca (2010) who indicated that the negative relationship is attributed to the fact that institutions or individuals who receive loan subsidies are the poorest. The study was centered in the United States. Therefore, the differences in the test results may be traced to the various analysis contexts.

The second specific research objective aimed at assessing how marketing support affects Small Scale Irrigation farming projects sustainability Kisumu County, Kenya. Findings from the regression analysis reveal coefficient of 1.041 and a p-value of 0.000. This therefore implies that marketing support has a significant and positive effect on Small Scale

Irrigation farming projects sustainability in, Kisumu County. A unit increase in marketing support improves the Small Scale Irrigation farming projects sustainability in, Kisumu County Kenya by 1.041. This therefore implies that marketing support boosts Small Scale Irrigation farming projects sustainability in, Kisumu County Kenya.

The study findings with respect to the effect of marketing support and sustainability are in agreement with those of Hudon and Traca (2010); Pati (2010); Zampasabina and Bojnec (2017) who documented that marketing support has a significant and positive effect on sustainability for Microfinance in the United States, SGSY Scheme and United States respectively. The significant and positive effect can be attributed to the notion that marketing support enhances sales of product/services and thus, sustainability.

The third specific objective of the study aimed at establishing how diversification affects Small Scale Irrigation farming projects sustainability in, Kisumu County Kenya. The findings from the empirical analysis show a coefficient of 0.330 and a p-value of 0.034 which implies significance. Therefore, diversification has a significant effect on sustainability of Small Scale Irrigation farming projects in, Kisumu County Kenya. The findings further reveal that a unit increase in diversification results in a corresponding increase in sustainability of Small Scale Irrigation farming projects in Kisumu County Kenya by 0.330. This is an indication that more financial diversification enhances Small Scale Irrigation farming projects sustainability in Kisumu County, Kenya.

The study results with respect to the effect of diversification on sustainability are in line with those of Etengu and Amony (2016) for Non-Governmental Organizations in Uganda: A Case Study of International Union for Conservation of Nature and Wandera and Sang (2017) for Non-Governmental Organizations Projects in Juba, South Sudan. These studies similarly found that diversification brings about a significant improvement in the sustainability of projects. This can however be linked to the notion that diversification hedges against the failure of a single source of finance, thus ensuring the continuity of projects.

Lastly, the study aimed at evaluating how extension services affect Small Scale Irrigation farming projects sustainability in Kisumu County Kenya. The outcome of the regression analysis indicated a coefficient of -0.572 and a p-value of 0.026. The findings therefore imply that extension services significantly and negatively affect Small Scale Irrigation farming projects sustainability of in Kisumu County, Kenya. The negative effect therefore imply that increases levels of extension services by government is detrimental to the Small Scale Irrigation farming projects sustainability in Kisumu County Kenya. Lastly, the research findings reveal that a unit increase in extension services yields a corresponding decrease of 0.572 in the sustainability of Small Scale Irrigation farming projects in Kisumu County, Kenya.

The study findings with regards to the effect of extension services on sustainability are in agreement that of Baloch and Thapa (2018) who studied the impact of agricultural extension services on sustainability while focusing on Date farmers in Balochistan, Pakistan. The study documented that extension services significantly and negatively affect sustainability. On the contrary, the study findings deferred from that of Sattaka *et al.* (2017) who did a study on agricultural extension services and sustainability of food and cultural security of glutinous rice farmers in Vietnam. The study documented extension services is significant in fostering the sustainable production of glutinous rice and helping to ensure local food and cultural security in Vietnam. However, the study was centered on farmers in Vietnam whereas this study was on Small Scale Irrigation Farming projects sustainability in Kisumu County, Kenya.

5. CONCLUSION AND RECOMMENDATIONS

5.1 Conclusion

The conclusion is motivated by the study's specific objectives and research questions. The research concluded that government support programs are essential to the survival of small-scale irrigation agriculture projects in Kisumu County, Kenya. The research concluded that policy subsidy increases the Small Scale Irrigation farming programs sustainability in Kisumu County, Kenya, in the case of government subsidies. The higher the funding from related government departments the further the efficiency of the irrigation scheme increases.

On the effect of marketing support and sustainability, the conclusion of the study was the marketing support is one of the key predictors of the sustainability of Small Scale Irrigation farming projects in Kisumu County, Kenya. The more support the farmers get from the government with respect to the marketing of their farm produce, the more sustained the Small Scale Irrigation farming projects in Kisumu County, Kenya will be.

In respect to the effect of financial diversification and how it affects sustainability, the study concludes that financial diversification is key in affect the sustainability of Small Scale Irrigation farming projects in, Kisumu County Kenya. Therefore, the more farmers diversify their sources of income/finance towards the irrigation system, the more enhance the sustainability of Small Scale Irrigation farming projects in Kisumu County, Kenya will emerge.

Last, with regards to the effect of extension services and sustainability, the conclusion of the study was that extension services is key in affecting the sustainability of Small Scale Irrigation farming projects in Kisumu County Kenya. However, too much of it becomes detrimental to the sustainability of the irrigation project.

5.2 Policy Recommendations

The policy recommendations for this research are guided by the research variables that significantly predicted the sustainability of Small Scale Irrigation farming projects in Kisumu County, Kenya. All the variables notably are key predictors of the sustainability of Small Scale Irrigation farming projects in Kisumu County, Kenya. The study recommends that government should continue to provide subsidies to the farmers which can be through subsidized seeds and/or fertilizers.

The study recommends that marketing support by government to farmers should continually be enhanced as this the most important ingredient of ensuring the sustainability of Small Scale Irrigation farming projects in Kisumu County, Kenya. The study further recommends that farmers should diversify their sources of income and finance. By doing this, the farmers are hedging against the case where a source of income or finance fails or delays, as others sources will cushion against the effect of such scenarios. Lastly, the study recommends that extension services by government should be done with caution. As too much of it is detrimental to the sustainability of the sustainability of Small Scale Irrigation farming projects in Kisumu County, Kenya. The extension services by government should thereby be based on a step by step approach.

5.3 Recommendations for Further Studies

The study sought to investigate the effect of government subsidy, marketing support, financial diversification and extension on sustainability of Small Scale Irrigation farming projects in, Kisumu County, Kenya. Further studies can be done on other irrigation farming projects in other regions of the country. Further researches can also assess the moderating effect of environmental conditions such as weather conditions on the relationship between government support services and sustainability of Small Scale Irrigation Farming projects.

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