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Management Information System and Performance of Governmental Agricultural Projects in Rwanda: A Case of Sustainable Agriculture Productivity and Market Linkage Project (SAPMP)

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Abstract

The purpose of this study was to assess the effect of management information system and performance of Governmental agricultural project in Rwanda. The study was guided by the following specific objectives: To determine the effect of Management Information System software on the performance of Sustainable Agriculture Productivity and Market Linkage project, to identify the effect of Management Information System usage on the performance of Sustainable Agriculture Productivity and Market Linkage project, to assess the effect of quality information on the performance of Sustainable Agriculture Productivity and Market Linkage project and to examine effect of Management Information System user on the performance of Sustainable Agriculture Productivity and Market Linkage project. This study adopted descriptive design to get results related to the study, the target population as well sample size was 81 employees of Sustainable Agriculture Productivity and Market Linkage Project. Researcher applied census as sampling technique. The source of data was primary and secondary methods. Questionnaires were used to collect primary data and documentary review applied for collecting secondary data. The collected data was analysed using descriptive statistical analysis with use of frequency, percentage, mean and standard deviation, and inferential statistics by the use of Pearson correlation (r) and multiple linear regression analysis. The presentation of findings was done using tables, the pilot test was performed to ensure the validity and reliability of instrument used in data collection. The findings have shown that MIS Software and performance of Sustainable Agriculture Productivity and Market Linkage project has strong positive correlation

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of 0.972 and Sig=0.000 which is less than 0.01 significance level. The results also showed that MIS Usage is correlated with performance of Sustainable Agriculture Productivity and Market Linkage project at 0.986 which is high positive correlation and significance of 0.000 which less than significance level of 0.01. Further, the findings have shown that quality information and performance of Sustainable Agriculture Productivity and Market Linkage project of 0.954 and sig=0.000 which is below of significance level of 0.01. The correlation results have also shown that MIS User contributes to the performance of Sustainable Agriculture Productivity and Market Linkage project at highly positive correlation of 0.933 and significance of 0.000 which less than significance level of 0.01. The study concluded that management information system contributes to the performance of Sustainable Agriculture Productivity and Market Linkage project at 96.9 percent. In recommendation, the study recommended project managers to use MIS in making breakdown structure as the way of allocating resource in appropriate manner as well as enhancing project performance.

Keywords: *Management Information System, Management Information System usage, quality information, Management Information System user, Performance*

1.0 Background of the Study

Globally, many project developers use Management Information System in various project practices to enhance utilization of resources and manage project effectively and efficiently. MIS is a tool that helps managers in planning, implementation, monitoring and evaluation, coordinating allocated tasks and resources without going to the site. In Japan and Korea, Management Information Systems is one of the most widely used tools that supports and enhances the collaboration and communication between agriculture project participants. The reason adoption on Management Information Systems in the Korean and Japan in the agricultural project is to disseminate information about how project is going on line of expected objectives (Jung, 2016). Mrema, Baker and Kahan (2016) pointed out that in some developed countries such as U.S.A the government through the ministry of agriculture places a high emphasis on utilization of Management Information System to boost performance of agriculture.

In South Africa, Management Information System is being used in projects to improve communications to stakeholders, strengthen supply chain partnerships, improve decision making capabilities and reduce project completion time and lower costs. These information systems are designed to integrate and partially automate many of the projects such as education, construction, agriculture, IT, public and private projects. The study done by Kaiser (2017) indicated that Management Information System is designed to reduce cost of project required to manage project activities and tasks. He added that the broadening of Management Information System enables project managers to manage individual projects as well as whole project portfolios. It is clear that Management Information System support most of the project life cycle phases from initiation stage, risk management, stakeholder engagement to the management of knowledge and project completion.

Landau (2017) revealed that in developing countries like Ghana; there is challenge of controlling high resources allocated in agriculture projects due to ineffectiveness utilization of project Management Information System. Cleland (2013) stated that without MIS project managers cannot be carried out effective feasibility, planning, implementation, organizational design, monitoring and evaluation and collaboration with project stakeholders, and meaningful project

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reviews leading to poor performance of project. For instance, Uket Ewa (2015) elaborated that main causes of Project failure in Tertiary Institutions in Nigeria are poor planning for the project requirements, fail to plan the sufficient funds and budgetary allocation before projects are taking place, poor information and communication channels. Nyende (2011), information communication and management are crucial aspect of project management. Poor management of information on Governmental projects has highly affected agricultural project performance. Musingafi (2011) revealed that the most important of Management Information System is the reported information. Project staff, outside organizations and the donor form opinions and make decisions based on the information delivered by the project.

In Rwanda, various Governmental agriculture projects were established such as land consolidation, increased areas under irrigation and protected against soil erosion, and expansion of cultivated terraces, developing quality seeds, supplying the fertilizer and subsidized (PSTA 4, 2018). MIS plays great contribution in planning important project activities and tasks, the way of controlling allocated resources, storing and assembles and dissemination the information. It enhances the capability of project managers to find out, evaluate and boost comprehensive project performance. Agriculture project managers use MIS in budgeting, planning and resource allocation.

One of information system used in Rwanda is smart Nkunganire system, the system facilitates farmers to access subsidized agri-inputs, and this system was established due to farmers pass through a lengthy process of verification and approvals by government services. Missing digital database of beneficiaries and delivery tracking system raised time and resources consuming operations. Smart Nkunganire System serves a national database of farmers and stakeholders engaged in subsidized agri-inputs to facilitate access to financial services and markets. <https://smartnkunganire.rw>

SAPMP is implemented on triple cooperation: KOICA, Ministry of Agriculture and Animal Resources and the World Food Programme (WFP) (Minagri, 2020). The Project started from October 2020 to December 2024, and the total number of direct beneficiaries is 13,000 and coverage approximately 600 ha of marshland and 500 ha of hillside is going developed. Thousands of farmers have been employed by the SAPMP as man power to participate in the transformation of their land using comprehensive land husbandry technologies. Apart from Nyirmageni hillside, SAPMP will also develop Nyirmageni marshland.

1.1 Problem Statement

Project management information System provides the framework for collecting, organizing, processing and storing project information. Hasan, Shamsuddin, Aziati, (2013) indicated that 75% of Information Technology projects used MIS have achieved on its objectives and succeeded while, 75% of projects failed due to lack of support of MIS. Further, Christopher (2015) indicated that effective utilization of MIS enhances improvement of project success by 75%. The project Management Institute indicated that between 2017 and 2018, 67% of failed projects globally caused by ignoring effectiveness utilization of Management Information System in project running. Further, 39% of governmental agriculture project using Management Information System indicated poor performance at global level due incapability of software, inability to provide information on time of the system and less willingness of system users (PMI, 2019). Peter (2021) stated that poor quality information generated by Management Information System put project team in dilemma which cause project to delay. The study conducted by

Turner and Muller (2021) indicated that agricultural project encountered by project delays and budget overruns due to inappropriate application of Management Information System. For instance, Mwai (2021) showed that Irrigation project implemented by Malawi Government at Nkhosha district was completed after consuming 1.5 billion dollars budget compared to 1 billion planned initially while the time was extended to three years from 2 years due to project stakeholders failed to use Management information system adequately in running daily project activities

In Rwanda, 42% Governmental agriculture projects showed poor performance in 2020 and 2021 due to low utilization of Management Information System in project practices (NISR, 2021). However, with Management Information System being increasingly used by project managers in all sectors including agriculture, not much is known on the characteristics of these systems that contribute mostly in Governmental Agriculture projects. Hence, the purpose of this research was to assess the effect of Management Information System and performance of Governmental Agricultural projects in Rwanda in line of the System software, system usage, information quality and the System user during the whole project life cycle to stimulate extent of project performance.

1.2 Research Objectives

- i. To determine effect of Management Information System software on the performance of Sustainable Agriculture Productivity and Market Linkage project
- ii. To identify the effect of Management Information System usage on the performance of Sustainable Agriculture Productivity and Market Linkage project
- iii. To assess the effect of quality information on the performance of Sustainable Agriculture Productivity and Market Linkage project
- iv. To examine effect of Management Information System user on the performance of Sustainable Agriculture Productivity and Market Linkage project

1.3 Research Hypothesis

H0₁: There is no significance effect of Management Information System software on the performance of Sustainable Agriculture Productivity and Market Linkage project.

H0₂: Management Information System usage has no effect on the performance of Sustainable Agriculture Productivity and Market Linkage project

H0₃: Quality information does not have effect on the performance of Sustainable Agriculture Productivity and Market Linkage project

H0₄: There is no significance effect of Management Information System user on the performance of Sustainable Agriculture Productivity and Market Linkage project

2.1 Theoretical Framework

2.1.1 DeLone and McLean Information Success Model

Shan et al. (2011) stated that the evaluation of e-government projects indicates strengths and weaknesses, tracks national progress and moves toward an inclusive information society. Furthermore, the rapid development governmental project has created an urgent need for

effective utilization management information system to enhance performance of project in the world (Alcaide-muñoz & Bolívar, 2015).

DeLone and McLean's (2003) model, developed six perspectives of successful information systems: system quality, information quality, intention to use, use, user satisfaction and service quality. System quality in a management information system is about the performance of the system in terms of its ease of use and learning integration (Teo et al., 2008): how flexible and reliable the management information system is to the users; and how friendly and usable the system is in terms of accessing project information. Stefanovic et al. (2016) pinpointed that availability of the system to users, provision of individualised attention by the IT personnel and the specific needs of users were assessed under this construct. The focus of this construct is to measure how well the management information system services are delivered, and whether or not they match the expectations of the users. The intention to use/use is the degree to which beneficiaries and staff use the capabilities of the system.

2.1.2 Results Based Management Theory

Result-Based Management model indicates some of the concept that must be checked while ensuring desired results are getting through planning as well as some of the principles in the theory namely using results for decision making, dialoguing on results and aligning expectation of the organization based on results (Örtengren, 2016). Monitoring and evaluation is one of the advantageous concepts that support the entire project system to reach desired goals in project management (UNDP, 2016). It makes sure that all need and desire results are up to quality, within precise time and quantity. This theory is appropriate because it supports the concept of integrating management skills through planning, allocation of resources, communication and risk management to ensure that favourable results are achieved.

2.2 Empirical Literature

2.2.1 Management Information System Software and Project Performance

Ahleman (2017) carried out a study about contribution of Management Information System in agricultural project performance in Japan. The objective of the study was to establish the Management Information System on the performance of Agricultural Project. The study used purposive sampling techniques for sample of five Governmental Agricultural Projects composed of 472 participants. The data was collected using both questionnaires for employees and interview guide for managers. The study indicated that Project Management Information Systems speed up performance of agricultural project at 81% which is good indicator between independent variable and dependent variable. On the other hand, the study recommended project managers full complementarity management information of complex to optimize the distribution and multi-functional systems that are capable to cover all project planning.

Murangwabugabo (2021) did research on the Management Information System packages used by managers in projects in Rwanda. Objective of the research was to assess the Management Information System adopted by Project managers in Rwanda. The research used quantitative and qualitative design to get the sufficient information. The sample size was 130 participants selected using stratified random sampling. The questionnaires and interview guide were used to collect necessary information requires to achieve on the study objective. The findings showed that 76% of respondents indicated that project managers used various management systems such as Decision Support Systems (DSS), Knowledge Management System (KMS), Executive Support

Systems (ESS), Management Information Systems (MIS), Business Intelligent Systems (BIS), Supply Chain Management (SCM), virtual reality (VR), and risk management (RM) tools. In his recommendation, he recommended managers to select effective MIS software incorporate all project lifecycle activities.

Kerzner (2017) did research on effect of Nkunganire System on the performance of agricultural sector in Rwanda. The results showed that software empowers and links all stakeholders incorporated in the Subsidy Program for fertilizers, pesticides, improved seeds, mechanization and Small-Scale Irrigation Technology (SSIT) as well as other items. The findings showed that 89% of respondents indicated that Nkunganire system enables the farmers to receive advisory messages from experts on best agriculture practice, warnings as well as general notification from different stakeholders. Furthermore, they added that the platform provides accessible to farmers and other stakeholders via a Mobile App, Unstructured Supplementary Standard Data, Short Code, and Web-Based App. The study advised project managers to encourage entire project team to participate in useful of technology in project daily activities. The study recommended that there is need of effective training for farmers to be willing in utilization of system.

2.2.2 Management Information System usage and Project Performance

The research done by Weerakkody *et al*, (2017) about importance of utilization project management information on the performance of project in private companies in Cameroun. The study adopted descriptive research design to explore how Management Information System contributes to project performance in private companies, the sample of 82 managers were selected from 8 companies using purposive sampling, data was collected using online method. The study concluded that Management Information System support project managers in planning, monitoring and evaluation, consolidating reports, tracking deviations and allocating resource in appropriate ways.

Obeidat and Aldulaimi (2016) conducted research about impact of technology on the performance of universities projects in England. The research applied quantitative and qualitative research design for collecting the adequate information. The stratified random sampling was adopted to select respondents while data was gathered using questionnaires for 56 respondents. The study revealed technology enhances controlling process, reporting system and keeping project information once project closed. Further, the study recommended Universities to encourage the staff to promote effective utilization of Management Information System to maintain organization performance.

2.2.3 Quality information on the performance of Governmental Agricultural Project

Kahura (2013) conducted research in Nairobi; Project has to come out the contribution of project management information systems and project success. The quality of information output, the quality of the software, the influence of the MIS user on the project success was tested. Data were measured on a likert scale. The findings showed that the use of the software generate quality information required by the user (project manager) to run project tasks and supporting the project managers to perform their tasks in a more professional manner thus improve the performance rate of the project. The research concluded that the use of MIS contributed in the achievement of the project success

Rinġis and Bērziša, (2016). In their work entitled Management Information System on the Governmental Agricultural planning project in Namibia. The study adopted explanatory research

design. Documentary review, questionnaires and interview guide were used as data collection instrument. The sample of 65 respondents were drawn using simple random sampling. The study indicated that information must be processed so that decisions made and executed at high degree of assurance so that the results contribute to the project's performance. Furthermore, they added that in project planning, information provides the basis for generating project action plans, network diagrams, projections, schedules and other elements of planning. Information is advantageous to establish project objectives, goals, and strategies; promote understanding; develop mechanisms for controls; communicate status; forecast future performance and resources; recognize changes; and reinforce project strategies.

In the study done by Fuller, Valacich, *et al* (2017) about the factors influencing performance of project performance in Zambia. Objective of the study was to assess the MIS factor on the performance of governmental project in Bujumbura, Burundi. The study used descriptive research design for sample of 49 respondents. The data was collected using self-administered questionnaires the study concluded that MIS factors enhance performance of project include Ease of Use and Learning, requirements of users, Accuracy, flexibility, customization of interfaces, integration of modules, features of exiting system and Sophistication.

Fallah and Gholipour (2016). Conducted that research on the MIS attributes on the performance of Irrigation Project performance in Malawi. The study adopted purposive sampling method where 57 respondents participated in responding questionnaires. The six elements were selected as the followings, quick recover of errors, coordination, security, fast access and balanced payment. In this study, system quality is operationalized as interdependence (described as the compatibility with the information technology tools and other software) and Usability Accessibility, Ease of Use and stability in its use). Furthermore, information systems quality attributes include defining Accuracy, Consistency, Complexity, and Timeliness

2.2.4 Management Information System user and Project Performance

Nguyen (2012) did his research on critical factors affect users' intention of using MIS in Vietnam farmers' union. Descriptive design was adopted during carrying out his research while sample size of 62 respondents were selected using purposive sampling. Data was collected through questionnaires instrument. Data was analysed using frequency, percentage, mean, standard deviation and regression. The regression analysis was used to examine relationship of system quality, information quality and system complexity effects to intention of using Project Management Information System. This result shows that there is an important contribution to make a strategy on project management for Vietnam farmers' union (VNFU) which implements different kinds of projects.

Ngari and Ndiritu (2017) did research about the influence of Management Information System attributes on project performance, a case of Youth polytechnic development projects in Embu County, Kenya. The study employed descriptive survey design on the population of 265 respondents composed of 32 Youth Polytechnic managers, 143 Youth Polytechnic instructors and 90 support staffs selected from 32 public Youth Polytechnics in Embu County. The simple random sampling procedure was applied to select the participants, in data collection self-administered questionnaire was used. The researcher formulated questionnaires using likert scale ranging from strongly agreed to strongly disagree to measure attitude and feeling of respondents about formulated questions. The confirmed that MIS influence performance of project at 75% which confirmed fail to use MIS decline performance of project at 75%. They added

recommended Youth polytechnics to use Management Information System in management of their development projects.

2.3 Conceptual Framework

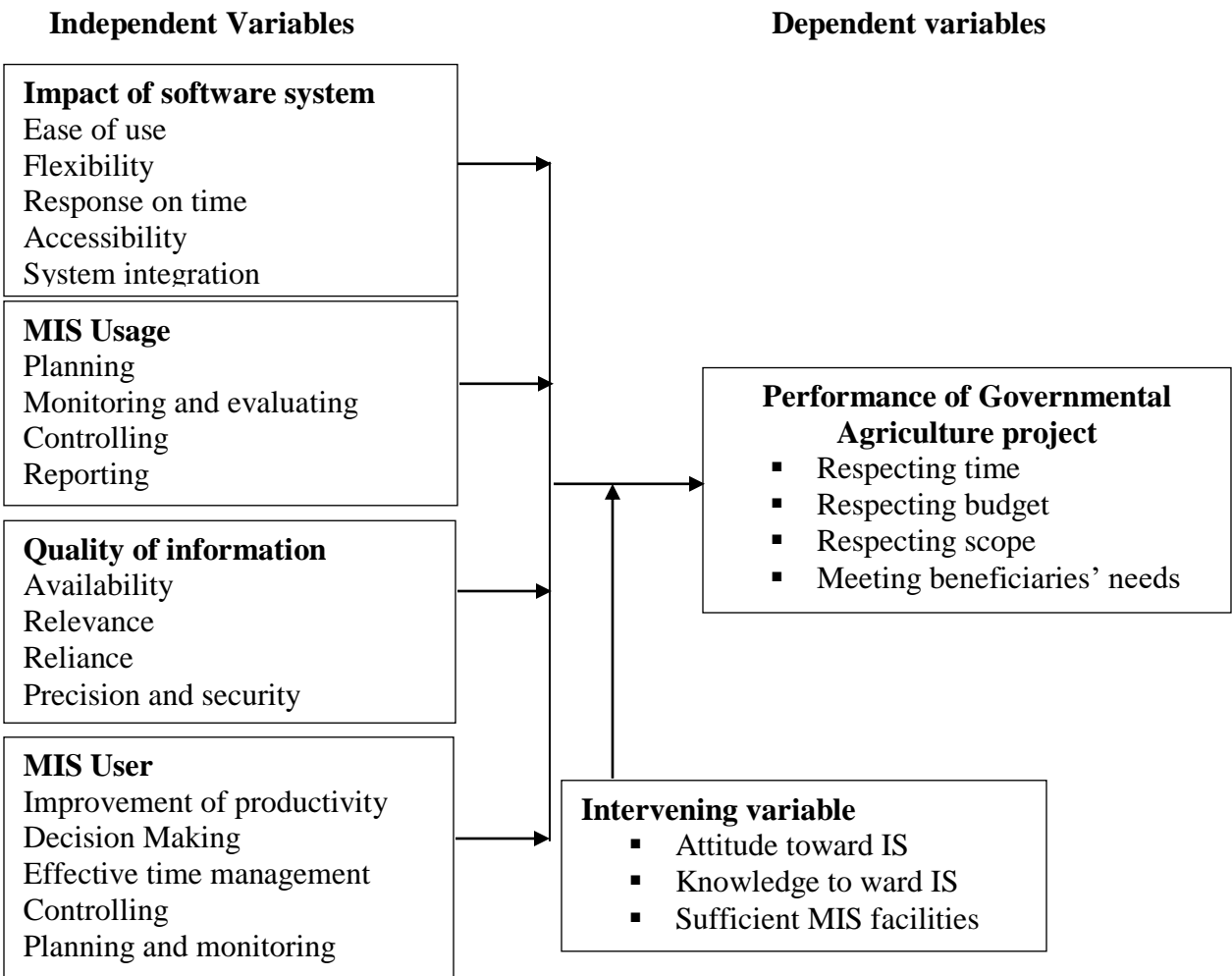


Figure 1: Conceptual Framework

3.0 Research Design

This study used a descriptive research design. Descriptive research designs help in providing answers to the enquiries of who, when, where, how and what related with the research problem (Mugenda &Mugenda, 2018). This study adopted a case study and descriptive design to get results expected from this study. The descriptive research design facilitated the researcher to identify, analyse and interpret the contribution of Management Information System and performance of Governmental Agricultural Project in Rwanda. The target population comprised of 81 employees work at Sustainable Agriculture Productivity and Market Linkage project. In this study, the sample size is equal to the population (81) participants since the number of populations is less than 100 respondents as suggested by Saunders, Lewis and Thornhill (2016) who indicated that researcher considers population as sample size once, then number of populations is below 100 participants. Therefore, this study used census sampling method.

Research adopted the questionnaire for collecting primary data and documentation review to collect secondary data

The Statistical Package for Social Sciences (SPSS) version 21 aided researcher to analyse the collected data. After data collection, the data was edited, organized and edited to remove any repetitions, inconsistencies, or errors that affect data analysis. Non-standardized data that need classification and are analysed through use of conceptualization. Descriptive statistics such as mean, standard deviation and frequency distribution was used to analyse the data. The collected data was present using frequency tables for social characteristic demographics while Central tendency was used to analyse the data related to the specific objectives. Lastly, coefficient of correlation was used to determine the relationship between the independent variables and dependent variable. Pearson’s coefficient of correlation indicated correlation and regression analysis was applied to indicate effect of independent on dependent.

Regression analysis was performed to test effect of independent variable on the dependent variable, regression formula helped researcher to obtain the effect of MIS as independent variable to Governmental Agricultural Performance project as dependent variable.

$$\hat{Y} = a + \beta_1X_1 + \beta_2X_2 + \beta_3X_3 + \beta_4X_4 + \varepsilon$$

Y means Governmental Agricultural Performance project as independent variable

a is the regression constant. This shows the value of y when $X_4 = X_3 = X_2 = X_1$.

$\beta_1, \beta_2, \beta_3$, and β_4 refer to changes in Y with respect to a unit fall or increase in X_1, X_2, X_3 and X_4 respectively.

X_1 presents MIS Software, X_2 represents MIS Usage, and X_3 symbolizes quality of information while X_4 presents MIS User.

ε refers to an error term since some unspecified variables might also affect the Governmental Agricultural Performance Project

4.0 Findings and Discussion

4.1 Descriptive Analysis

Table 1: Management Information System software and performance

Responses	SA	A	D	SD	Mean	Std. Dev
Management Information System software is easy to use	32.1	63	3.7	1.2	3.56	.65
Management Information System software responds on time	29.6	58	8.6	3.7	3.42	.80
The use of Management Information System software is easy and efficiency	37.0	48.1	11.1	3.7	3.29	.81
Management Information System software integrates information easily	34.6	50.6	9.9	4.9	3.14	.79
Management Information System software is capable to perform multipurpose	38.3	53.1	4.9	3.7	3.25	.72
Speed up of Management Information System software is effective	37.0	56.8	3.7	2.5	3.28	.65

Source: Primary Data (2022)

Table 1 shows the effect of Management Information System software on the performance of Sustainable Agriculture Productivity and Market Linkage project. The study was interested in knowing whether Management Information System software is easy to use. The findings showed that 32.1% strongly agree and 63% agreed the statement. However, 3.7% disagreed and 1.2% strongly disagreed the statement, the respondents agreed the statement at strong mean of 3.56 and standard deviation of 0.65. Researcher asked the respondents whether Management Information System software responds on time, the results showed that majority of respondents agreed at 58% and 29.6% strongly agreed. Even though majority of respondents agreed, few of them disagreed at 8.6% and 3.7% strongly disagreed, furthermore results showed that respondents agreed at mean of 3.42% and standard deviation of 0.80.

The researcher asked the respondents whether the use of Management Information System software is easy and efficiency. The findings revealed that 37.0% strongly agreed and 48.1% agreed. Oppositely, 11.1% disagreed and 3.7% strongly disagreed the statement while respondents agreed at mean of 3.29 and standard deviation of .81. Concerning to the Management Information System software integrates information easily, the following responses were obtained 34.6% strongly agreed and 50.6% agreed. Despite 9.9% disagreed and 4.9% strongly disagreed the statement, meanwhile statement was confirmed at mean of 3.14 and standard deviation of 0.79. The study established that Management Information System software is capable to perform multipurpose at agreement of 38.3% strongly agreed and 53.1% agreed. Contrary, 4.9% disagreed and 3.7% strongly disagreed the statement. On the other hand, respondents agreed at mean of 3.25 and standard deviation 0.72. Finally, respondents revealed that speed up of Management Information System software is effective at 37.0% strongly agreed and 56.8% agreed. Whereas 3.7% disagreed and 2.5% strongly disagree the statement. Apart from percent, respondents agreed at strong mean of 3.28 and standard deviation of 0.65.

Table 2: Management Information System Usage and performance

Responses	SA	A	D	SD	Mean	Std. Dev
Management Information System is used in planning process	35.8	59.3	2.5	2.5	3.28	.64
Management Information System is adopted in monitoring process	34.8	58.3	5.7	1.2	3.29	.60
Management Information System is applied in evaluating process	27.2	63.0	6.2	3.7	3.13	.68
Management Information System is used in controlling process	30.9	60.5	6.2	2.5	3.19	.65
Management Information System is used in reporting process	22.2	63.0	8.6	6.2	3.01	.74
Management Information System is useful in establishing breakdown structure	1.2	42.0	53.1	3.7	2.407	.59

Source: primary data (2022)

The 2 shows effect of Management Information System Usage on the Sustainable Agriculture Productivity and Market Linkage project. Concerning on effect of Management Information System is used in planning process, 35.8% strongly agreed and 59.3% agreed. Oppositely, 2.5% disagreed and 2.5% strongly disagreed the statement. Also, respondents agreed the statement at

mean of 3.28 and standard deviation of 0.64. Further, Management Information System is adopted in monitoring process at agreement of 34.8% strongly agreed and 58.3% agreed. However, few respondents refused the statement where 5.7% disagreed and 1.2% strongly disagreed the statement. In addition to, respondents agreed at mean of 3.29 and 0.60 standard deviation.

The findings revealed that Management Information System is applied in evaluating process at 27.2% strongly agreed and 63.0% of the respondents agreed the statement. However, 6.2% and 3.7% disagreed and strongly disagreed respectively. Further, results showed that respondents agreed ant mean of 3.13 and standard deviation of 0.68. On the other hand, researcher asked the respondents whether Management Information System is used in controlling process answers provided where, 30.9% and 60.5% strongly agreed and agreed respectively. Despite of 6.2% disagreed and 2.5% strongly disagreed the statement. On the other hand, respondents agreed at mean of 3.19% and slightly deviation of 0.65 standard deviation

The study sought to find out whether Management Information System is used in reporting process. The findings showed that 22.2% strongly agreed and 63.0% agreed. Oppositely, 8.6% disagreed and 6.2% strongly disagreed the statement, in addition to, respondents agreed at mean of 3.01and inconsistency standard deviation of 0.74. Lastly but not least, the respondents indicated that Management Information System is useful in establishing breakdown structure, 1.2% strongly agreed and 42.0% agreed the statement. However, 53.1% disagreed and 3.7% strongly disagreed, also respondents agreed at mean of 2.40 and standard deviation of 0.59.

The findings concurred by research done by Yoon (2017) showed that MIS facilitates project managers in construction companies to maximize performance of project lifecycle activities. The use of management information system is paramount, project key stakeholders uses MIS in different project life cycle, in planning MIS is used to organize and identify all requirements needed in order project starts, for the project members completed project within triple constraints effective collaboration, accountability, monitoring and evaluation need to be consistency. MIS is important tools support project members to perform their duties and responsibilities properly, effective project resources allocation is achieved through well utilization of management information system daily to daily to prevent any deviation and misuse of resources, MIS provides effective information required by managers to make right decision pushing the project forward.

Table 3: Quality Information Provided and Performance

Responses	SA	A	D	SD	Mean	Std. dev
Management Information System improves availability of information	29.6	55.6	11.1	3.7	3.11	.74
Management Information System provides relevance information	25.9	60.5	9.9	3.7	3.08	.71
Management Information System provides reliable information	38.3	49.4	8.6	3.7	3.33	.79
Management Information System gives out precise information	34.6	54.3	6.2	4.9	3.18	.76
Information obtained from Management Information System has adequate security	38.3	53.1	6.2	2.5	3.27	.68

Table 3 shows that Management Information System improves availability of information at agreement of 29.6% strongly agreed and 55.6% agreed. However, 11.1% disagreed and 3.7% strongly disagreed the statement, the mean of respondents was 3.11 and standard deviation of .74. Furthermore, researcher asked whether Management Information System provides relevance information, the following responses were provided by respondents, 25.9% strongly agreed and 60.5% agreed. Although, 9.9% disagreed and 3.7% strongly disagreed, also respondents agreed at mean of 3.08 and standard deviation of 0.71. Researcher sought to find out whether Management Information System provides reliable information, 38.3% strongly agreed and 49.4% agreed. Contrary, 8.6% disagreed and 3.7% strongly disagreed the statement. Meanwhile, respondents agreed at strong mean of 3.33 and standard deviation of 0.79.

The study indicates that Management Information System gives out precise information, 34.6% strongly agreed and 54.3% agreed. Despite of majority agreed the statement, few respondents answered oppositely, where 6.2% and 4.9% disagreed and strongly disagreed the statement, addition to, respondents agreed at mean of 3.18 and standard deviation of 0.76.

Finally, respondents revealed that information obtained from Management Information System has adequate security, 38.3% strongly agreed and 53.1% agreed. Even though, majority of respondents agreed, 6.2% disagreed and 2.5% strongly disagreed the statement. On the other hand, respondents agreed at mean of 3.27 and standard deviation of 0.68.

The study agreed with Caldwell (2018) revealed that Management Information System delivers the project manager and team the necessary and quality information used to make decision and planning. Quality information provided by Management Information System on the performance of Sustainable Agriculture Productivity and Market Linkage project improves availability of information needed by managers to make decision.

Table 4: Management Information System user and performance

Responses	SA	A	D	SD	Mean	Std. Dev
Management Information System contributes to the improvement of productivity at work	28.4	56.8	9.9	4.9	3.08	.76
Management Information System enhances quality of decisions made	43.2	44.4	8.6	3.7	3.27	.77
Management Information System reduces time required for decision making	27.2	55.6	12.3	4.9	3.04	.77
Management Information System reduce time needed to complete a task	42	51.9	4.9	1.2	3.44	.65
Management Information System improve ability to control activities and costs	35.8	54.3	6.2	3.7	3.22	.72
Management Information System facilitates user to make better management of budget	37.0	53.1	7.4	2.5	3.24	.69
Users use Management Information System to plan and monitor project activities	44.4	46.9	6.2	2.5	3.35	.71

Source: Primary data (2022)

Table 4 indicates that Management Information System contributes to the improvement of productivity at work, 28.4% strongly agreed and 56.8% agreed. However, 9.9% disagreed and 4.9% strongly disagreed. Also, respondents agreed the statement at mean of 3.08 and standard

deviation of 0.76. Further, Management Information System enhances quality of decisions made where, 43.2% strongly agreed and 44.4% agreed the statement. Contrary, 8.6% disagreed and 3.7% strongly disagreed, respondents agreed at mean of 3.27 and standard deviation of 0.77

The respondents were asked whether Management Information System reduces time required for decision making, 27.2% strongly agreed and 55.6% agreed. Even though majority of respondents agreed, 12.3% disagreed and 4.9% strongly disagreed the statement, other way, respondents agreed at mean of 3.04 and standard deviation of 0.77. Also, research was interested in knowing whether Management Information System reduces time needed to complete a task, 42% strongly agreed and 51.9% agreed. Oppositely, 4.9% and 1.2% disagreed and strongly disagreed the statement respectively. Results showed that respondents agreed at mean of 3.44 and 0.65 standard deviation

The findings showed that Management Information System improve ability to control activities and costs, 35.8% strongly agreed and 54.3% agreed. However, 6.2% and 3.7% disagreed and strongly disagreed the statement, while respondents agreed at mean of 3.22 and standard deviation of 0.72. Also, the findings showed that Management Information System facilitates user to make better management of budget, 37.0% strongly agreed and 53.1% agreed, 7.4% disagreed and 2.5% strongly disagreed the statement. In addition to, respondents agreed the statement at mean of 3.24 and standard deviation of 0.69. Lastly, respondents revealed that users use Management Information System to plan and monitor project activities, majority of respondents confirmed the statement, 44.4% and 46.9% strongly agreed and agreed respectively, Although, large number of respondents agreed the statement, 6.2% disagreed and 2.5% strongly disagreed the statement. Further, researcher obtained that respondents confirmed the statement at mean of 3.35 and 0.71 standard deviation which confirmed the strong agreement of statement.

The study concurred with Sikudi and Otieno (2017) who showed that MIS assists project managers in tracking variance, and forecasting for any level of the WBS and project performance in an organization. MIS User improves productivity and enhances ability to make decision without consuming much time, MIS provides information easily and accurate leading to the increasing performance of project, it is significantly that utilization of technology boost productivity of organization due to MIS performs many and complexity project activities and tasks at minimum resources, time and cost

Table 5: Sustainable Agriculture Productivity and Market Linkage Project Performance

Responses	SA	A	D	SD	Mean	Std. Dev
Meeting deadlines	40.7	44.4	11.1	3.7	3.22	.79
Respecting budgets	38.3	49.4	7.4	4.9	3.32	.81
Meeting quality specifications	40.7	59.3	0	0	3.4	.49
Meeting project scope	42.0	46.9	7.4	3.7	3.27	.75
Satisfying beneficiaries needs	16.0	63.0	13.6	7.4	2.87	.76

Source: Primary data, (2022)

Table 5 illustrates the level of sustainable Agriculture Productivity and Market Linkage Project Performance. The researcher was interested in knowing whether project meet deadlines, majority of respondents agreed at 44.4% and 40.7% strongly agreed with mean of 3.22 and standard

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deviation of 0.79. On the other hand, 11.1% and 3.7% disagreed and strongly disagreed the statement. Also, the study revealed that project respects budgets at agreement of 38.3% strongly agreed and 49.4% agreed with strong mean of 3.32 and standard deviation of 0.81. However, 7.4% disagreed and 4.9% strongly disagreed the statement.

The respondents indicated that project meet quality specifications as indicator of project performance at 40.7% strongly agreed and 59.3% agreed with highest mean of 3.32 and low standard deviation of 0.49, the results indicates strong agreement of respondents. Furthermore, project meet scope as indicator of good performance of project, results showed that 42.0% of respondents chose strongly agreed and 46.9% agreed while respondents agreed at mean of 3.27 and standard deviation of 0.75. However, low disagreement results were obtained, 7.4% disagreed and 3.7% strongly disagreed the statement. At the end, researcher asked whether project satisfy beneficiary's needs as criteria of project performance, the results showed that 63% of the respondents agreed and 16% strongly agreed with mean of 2.87% and standard deviation of 0.76. On the other hand, 13.6% disagreed and 7.4% strongly disagreed the statement. The findings were in line of research done by Bonner and Gundlach (2015) who indicated that project performances are characterized by meeting project objectives within triple constraints such as budget, scope and schedule.

Basing on the finding's sustainable agriculture productivity and market linkage project meet various indicators of Governmental agriculture project performance such as completion on time, useful budget as planned, meeting scope and provide quality product and service as targeted during initiation and planning phases, project performance is achieved due to well cost managed, schedule is considered and respected, scope is maintained, managers concentrate on the effective and efficiency utilization of budget to avoid overrun of budget, project tends to suffer poor performance when project manager fails to manage effectively triple constraints.

4.2 Correlational Analysis

Correlation analysis results revealed that there is high positive relationship between MIS Software and performance of Sustainable Agriculture Productivity and Market Linkage Project because of the positive value for correlation coefficient. The MIS Software variable has 0.972 correlations with the project performance variable. Thus, when MIS Software is used in appropriate manner the performance of Sustainable Agriculture Productivity and Market Linkage Project become very high as shown by coefficient correlation. It is clear that there is statistically significance between MIS Software and Performance of Governmental Agricultural Project. Further, the finding is in line of research done by Liberatore and Pollack (2017) who revealed that Management Information System (MIS) software optimizes productivity by speed up processing and deliver information needed by project managers run project performance effectively

The findings indicate that there is strong correlation between MIS Usage and performance of project where researcher observed that MIS Usage is correlated with Sustainable Agriculture Productivity and Market Linkage project at 0.986, the result is statistically significance due to p-value is 0.000 which is less than 0.01 as suggested by SPSS program. The findings concurred the research done by Yaser *et al.*, (2014), where they revealed that effective utilization of MIS enhances project's performance through increase in intention to use, speed up sharing of information to all project's stakeholders.

There is strong positive relationship between quality information provided by Management Information System and Performance of Sustainable Agricultural Productivity and Market Linkage at coefficient correlation of 0.954. Further, the result is statistically significant due to p-value is 0.000 which is less than 0.01 as suggested by SPSS program. Thus, when MIS System provides right and appropriate information performance of project are more likely to be improved. Further, the value of this correlation coefficient 0.954 is fall under coefficient range from +0.91 to +1.00. Therefore, the relationship between quality information and Performance of Governmental Agricultural project is very strong. The study agreed with Lee *et al.* (2011) indicated that quality of information used to make decision has greatly effect on the outcome of the project.

There is positive relationship between MIS user and Project performance because of the positive value for correlation coefficient. The MIS User variable has 0.933 correlations with Performance of Sustainable Agricultural Productivity and Market Linkage variable, .000 is less than 0.01, is signified that p-value is significantly statistically. Thus, when MIS User are committed to use MIS daily to daily the Performance of Governmental Agriculture project is high. The findings explained the statistically the contribution of MIS User on the performance of Governmental Agricultural Project. The findings revealed that management information system correlated to the performance of Sustainable Agriculture Productivity and Market Linkage Project at 0.969, the result is statistically significant due to p-value is 0.000 which is less than 0.01 as indicated by SPSS Program.

4.3 Regression Analysis

In this study model summary, variances and coefficients of variables were determined as shown

Table 8: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.988 ^a	.976	.976	.59036

a. Predictors: (Constant), MIS software, MIS Usage, Quality information and MIS User

The table 8 shows that regression analysis revealed (R = 988) which is a favorable connection while the R coefficient of 0.988 indicated that the model's predictors, MIS Software, MIS Usage, Quality information and MIS User computes a 98.8% correlation with the dependent variable as Performance of Sustainable Agriculture Productivity and Market linkage. Further, the research indicated that a combination of MIS Software, MIS Usage, Quality information and MIS User contributed to 97.6 percent (R2= 0.97.6) of the Project performance.

Table 9: Analysis of Variance (ANOVA)

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	1562.378	3	520.793	1.501E3	.000 ^a
	Residual	39.732	114	.349		
	Total	1602.110	117			

Source: Primary Data (2022)

Predictors: (Constant), MIS software, MIS Usage, Quality information and MIS User

Dependent Variable: Performance of sustainable Agriculture Productivity and Market Linkage Project. Table 9 shows that the model indicates that 97.5% of the differences in performance of Sustainable Agriculture Productivity and Market Linkage Project (1562.378 out of 1602.110), while other variables not captured by the model where it can explain 2.47 percent (39.732 out of 1602.110). F value of the model given a p-value of 0.015, where significantly different from zero. P-value of 0.015 is below predetermined level of significance of 0.05 for distributed data (0.0150.05). In recommendation, the model is good to indicate the performance of Sustainable Agriculture Productivity and Market Linkage Project.

Table 10: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	.522	.209		2.494	.14
	MIS Software	.300	.071	.557	4.253	.000
	MIS Usage	.281	.098	.404	2.860	.004
	Quality Information	.474	.053	.137	8.870	.000
	MIS User	.037	.049	.235	.230	.003

Source: Primary Data (2022)

- a. Dependent Variable: Performance of Sustainable Agriculture Productivity and Market Linkage Project

The recognized regression equation was:

$$Y = 0.522 + 0.557X_1 + 0.404X_2 + 0.137X_3 + 0.235X_4$$

Table 10 shows the responses of the regression. The performance of Sustainable Agriculture Productivity and Market Linkage was established through determination of standardized coefficients (Beta). In reference to the T-statistics, the higher utilization of MIS Software, MIS Usage, and Quality information is directly proportional to the performance of sustainable agriculture Productivity and Market Linkage Project. Where the results indicated that Sustainable Agriculture Productivity and Market Linkage Project is influence by MIS Software (=0.557), MIS Usage (=0.404), Quality information (=0.137) and MIS User (=0.235).

In addition to, a unit change in MIS Software would rise performance of Sustainable Agriculture Productivity and Market Linkage project at multiple of 0.557, the greatest predatory of the study, any factor change in MIS Usage would contribute to the performance of Sustainable Agriculture Productivity and Market Linkage Project at 0.404 times, and a section change in Quality information leads to the performance of Sustainable Agriculture Productivity and Market Linkage Project at 0.137 times. Finally, result shows that factor change in MIS user influences performance of Sustainable Agriculture Productivity and Market Linkage Project at 0.235 times. All p-values in the research were less than 0.05, it explains that variables are statistically confirming independent variables influence performance of dependent variables significantly.

4.4 Hypotheses Testing

The first hypothesis revealed that there is no significance effect of Management Information System software on the performance of Sustainable Agriculture Productivity and Market Linkage project, the second hypothesis relates that Management Information System usage has no effect on the performance of Sustainable Agriculture Productivity and Market Linkage project, third hypothesis indicates that quality information has no effect on the performance of Sustainable Agriculture Productivity and Market Linkage project and the fourth hypothesis states that there is no significance effect of Management Information System user on the performance of Sustainable Agriculture Productivity and Market Linkage project. All hypotheses are rejected because p-value were less than 0.005 which means that all variables have significantly effect on the performance of Sustainable Agriculture Productivity and Market Linkage Project.

5.0 Conclusions

The study concluded that management information system software respond on time, integrates information easily and is capable to perform multipurpose, the effective software influence performance of project by integrates all information refereed by managers in making decision and allocating needed resources to stimulate performance Governmental Agricultural Project. Further, management information system software assists project team to perform multiple activities in single period.

The study also concluded that management information usage influence performance of Governmental Agriculture project in reference to Sustainable Agriculture Productivity and Market Linkage project, the findings of this research show that the usage of management information system has more advantageous to Governmental Agriculture Productivity and Market Linkage project. MIS contributes to the effectiveness and efficiency in managerial tasks were observed in terms of better project planning, scheduling, monitoring, and control. Advantages obtained from management information system use are not limited to individual performance but also include project performance.

The study confirmed that quality information contributes to the performance of Sustainable Agriculture Productivity and Market Linkage project where the systems provide reliable and accurate information that will enable the project team to perform their tasks efficiently and effectively. In addition to, MIS provides precise information and relevance information guiding project team in daily activities of project.

Apart from, management information system plays great role in helping the users in timelier decision-making and proper budgeting leading to the performance of Sustainable Agriculture Productivity and Market Linkage Project, MIS helps users to reduce time needed to make decision and time needed to complete a task. Furthermore, MIS is very important to the users in planning and monitoring the performed activities.

In overall conclusions, management information system contributes to the performance of Sustainable Agriculture Productivity and Market Linkage Project at 96.9% ($r=0.969$) which is very strong correlation. Management information system facilitates Project managers in planning, obtaining accurate and precise information, speed up integration of information and guiding project team. Further, the study confirmed that information provided by MIS helps the users/ project managers to perform their tasks in a much professional manner.

6.0 Recommendations

Management information system contributes significantly to the performance of Governmental Agriculture Project performance. However, majority of respondents disagree that MIS is used in making breakdown structure, thus research recommended Governmental Agriculture Project managers to use effectively MIS in making breakdown structure since it helps project managers to allocate resources in effective and efficient manner as the way of optimizing performance of project. The study recommended all project managers to promote the culture of establishing strong software and ensure the information provided are accessible to everyone needed to optimize the performance of Project using advanced technology.

REFERENCES

- Allen, G. (2017). *Understanding research philosophies & approaches*. Research Methods for Business Students, 4, (106-135).
- Bonner, T. & Gundlach, M. (2015). *The Management Information System (MIS)* Retrieved from: <http://www.brighthubpm.com/project-planning/44058-the-project-management-information-system-MIS-described/>, Accessed on 9Th November 2014
- Caldwell, R. (2018). *Project Management Information System: Guidelines for Planning, Implementing, and Managing a DME Project Information System*, 1st edn, CARE, New York (Vol. 69, p. 72).
- Christopher, K. (2015). *Effect of Project Management Information Systems on Project Success. A Case Study of World Vision Tanzania*. Page4
- Cleland C. (2013). *Agricultural modernization programme of Uganda*: <https://relief.web.int/report/Uganda/u>, retrieved on 5th march 2018.
- Cooper, D., & Schindler. P.S. (2014). *Business research methods* (8th ed). New Delhi: Tata McGraw-Hill Publishing Company. India.
- Delone & McLean, U. (2003). The DeLone and McLean Model of Information Systems Success: A Ten-Year Update, *Journal of Management Information Systems* 19(4):9-30
- Dos Santos, B.L., Peffers, K., and Mauer, D.C., (2015) “*The effect of information technology investment announcements on the market value of the firm*”, *Information Systems Research*, (4)1, pp. 1-23.
- Fallah, H & Gholipour-Kanani, Y, (2016). *The effect of Management Information System on project managers and project success*
- Farhoomand, A.F. and Drury, D.H. (2014). *A Historiographical Examination of Information Systems*, *Communications of the Association for Information Systems*, (1)19. URL: <http://cais.aisnet.org/contents.asp>
- Frederick, E. & Webster, JR. (2009). Marketing IS management: *Journal of the Academy of Marketing Science* volume 37, pages20–27
- Gasser, R. (2016). RBM and Theories of Change. *Journal of conventional Weapon Destruction*, 20(4), Art. 4.

- Hasan, Y., & Shamsuddin, A., & Aziati, N. (2013). The Effect of Management Information Systems adoption in Managerial Decision Making : A Review, *The International Scientific Journal of Management Information Systems*, Vol.8, No.4, pp. 010-017
- Jung, P. (2016). *Management Information Systems Managing the Digital Firm*. Upper Saddle River, New Jersey: Prentice Hall. ISBN 978-0-27-375453-4.
- Kahura, M. N. (2013). The Role of Project Management Information Systems towards the Success of a Project: The Case of Construction Projects in Nairobi Kenya, *International Journal of Academic Research in Business and Social Sciences* September 2013, Vol. 3, No.9
- Kaiser, M. G. (2017). *Measuring project management information Systems success - towards a conceptual model and survey instrument*. 18th European Conference on Information Systems
- Kaiser, M. G., & Ahlemann, F. (2010). *Measuring Project Management Information Systems Success: Towards a Conceptual Model and Survey Instrument*
- Kerzner, H. (2017). *Project Management: A Systems Approach to Planning, Scheduling, and Controlling*, pp.4-7
- Landau, S. (2017). *Socio-economic determinants of climate change effects*. Prepared for the United Nations Development Program, UNDP-Bratislava Regional Center
- Lee, S-K., & Yu, J-H. (2012). *Success model of project MIS in construction*, *Automation in Construction*, vol.25, pp. 82-93
- Liberatore, M. J & Pollack Johnson B. (2017), *Factors influencing the usage and selection of project management software*.
- Love, P.E.D and Irani, Z. (2019). *A project management quality cost information system for the Agriculture sector*. *Information and Management*, 40(7): 649661.
- Ministry of Agriculture and Animal Resources (MINAGRI). (2018). *Strategic Plan for Agriculture Transformation, Report 2018*. Kigali, Rwanda: Government of Rwanda.
- Mrema, V., Baker, R., & Kahan, H. (2016). *Measuring Project Management Information Systems Success*. Paper at the 18th European Conference on Information Systems, June 6–9 2010, Pretoria, South Africa
- Mugenda, K and Mugenda, C. (2018). *Research Methods: Quantitative and qualitative approaches*. *Nairobi: African center for technology studies*.
- Musingafi, M. (2011). *Project management information systems: A handbook for managing development project management information systems in Sub-Saharan Africa*
- Mwai, M. M. (2021). *Factors Influencing Project Performance of ICT Projects in Kenya: A case study of selected firms in Nairobi*. Nairobi, Kenya: University of Nairobi.
- National Institute of Statistics of Rwanda. (2021). *The Fifth Integrated Household Living Conditions Survey EICV5 2016/17 Rwanda Poverty Profile Report*. Kigali- Rwanda
- Ngari, C. W. & Ndiritu, A. (2017). Influence of project management information systems attributes on project performance: A case of youth polytechnic development projects in

- Embu County, Kenya. *International Academic Journal of Information Sciences and Project Management*, 2(2), 135-152
- Nguyen, H. (2012). *Critical factors affect users' intention of using Management Information System in Vietnam Farmers*.
- Nyende, A. (2011). *Building Network for market Access*, Rome, Government cooperative Program
- Obeidat , G & Aldulaimi, Y. (2016). *The Role of Project Management Information Systems Towards the Project Performance*. The Case of Agriculture Projects in United Arab Emirates
- Örtengren, K. (2016). *A guide to results-based management efficient project planning with the aid of the logical framework approach*.
- Piabuo, S.M., Piendiah, N.E., Njamnshi, N.L. (2017). *The effect of ICT on the efficiency of HRM in Cameroonian enterprises: Case of the Mobile telephone industry*. Glob Entrepr Res 7, 7 (2017). <https://doi.org/10.1186/s40497-017-0063-5>
- Riņģis, M. and Bērziša, S. (2016). *Efficiency Measurement of Project Management Software Usage at State Social Insurance Agency*. Information Technology and Management Science, 19(1).
- Sikudi. A., & Otieno, N. (2017). *Factors Influencing Implementation of County Funded Development Projects by County Governments*, in Kenya. A Case of Kilifi County Government
- Turner, D., & Muller, B. (2021). *The effect of project management practices on building project performance: the case of three organizations*. Unpublished thesis in Kwame Nkrumah University of Science and Technology.
- Uket Ewa, M., (2015). *Examining the effects of information system characteristics and perceived usefulness on post adoption usage of information systems*. Information Management 45 (6), 376–386.
- UNDP. (2016). *Results Based Management: Concepts and Methodology*. Geneva: UNDP
- Valacich, J. George, & Schneider, N. (2017). *Information Systems Project Management: A Process and Team Approach*, Edition 1.1
- Weerakkody,A., Kapoor,P., Balta,I., Irani,L., & Dwivedi,N., (2016). *Factors influencing user acceptance of public sector big open data*