

# **The Relationship Between Research & Surveillance in M & E and Sustainability of Agricultural Food Crop Projects: The case of Nyeri County, Kenya**

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**Abstract** – Many Kenyans live in poverty with most of these living in rural areas and deriving their livelihood directly from agriculture. Agriculture plays a dual role in the abolition of hunger as it enhances production of food and also serves as a source of employment that can provide families with a source of livelihood as well as providing raw materials for industries in the this sector and stimulating the formation of new industries. Being the world's single largest employer agriculture, if improved it can improve the income of the marginalized. The performance of agriculture impacts on the whole economy, underlining the need for urgent revitalization of this sector. Research & surveillance in M&E are integral tools in managing and accessing efficiency and effectiveness of investments in agriculture sector and sustainability through curbing wastage. This study aimed at assessing the influence of Research & Surveillance in M&E on sustainability of food crop projects. The study adopted descriptive survey design and correlation design and was undertaken in Nyeri South Subcounty, The target population were the Sub County agricultural office in-charge, and four other Sub County officers, four extension officers and 503 farmers in the agriculture food crops projects. Stratified random sampling was used to select the strata's that provided 211 respondents among the farmers using the Yamane's formula out of whom 206 completed the questionnaire. Simple random sampling was used to identify respondents from the various agriculture food crop projects using the Neyman's formula. A census/saturated sampling was used in the case of the Sub County agricultural officer in-charge, four other Sub County officers and four extension officers. Questionnaires, observation were used to collect data from farmers and extension officers and interview guides were used to collect information from e Sub County agricultural office in-charge, and four other Sub County officers one of whom did not complete the interview. The data was analyzed using both descriptive statistics and inferential statistics. Multiple Linear regression was used for hypotheses testing. Inferential statistics mainly made use of Pearson correlation tests, indicating the relationship between the main study variables. Relationship having a value of  $r=0.7$  and above was considered very strong and between 0.5 and 0.69 strong and between 0.3 and 0.49 reasonably strong and a value of  $r$  below 0.29 was considered weak and an indicator that there was no relationship at all. Statistical Package for Social Sciences (SPSS) was used in data analysis. Based on the study findings, the study has exhibited a positive and significant influence of surveillance in M & E ( $f_{1,4}=0.282, p<0.05$ ) on the sustainability of Agricultural food crop projects. Thus, the study concludes that with more research & surveillance sustainability of Agricultural food crop projects will be enhanced. Moreover, there is need for increased investment in Research & Surveillance so as to enhance project sustainability.

**Keywords** – Research and Surveillance, Sustainability of Agricultural Food Crop Projects.

## **I. INTRODUCTION**

Surveillance is the standard analysis of multisector integrated context of the targeted populations/areas. It requires competent sharing of findings and recommendations in order to enable decision makers to define adequate strategies for timely responses to observed changes in the operating context Navarro,(2011). In regard to research and surveillance key considerations include the type of research; Instances of research use; how the research is developed for purposes of sustainability and what causes the research to be developed. Research due to disease outbreak & development of new crop varieties and, boosting of production is crucial in this respect.

According to the World Bank (2008), developing countries invest only a ninth of what industrialized countries put into agriculture research and development (R&D) as a share of agricultural GDP. To narrow this gap, developing countries must prioritize on increasing investment in R&D and intensify surveillance. In China and India, over the last two decades investment in agricultural R&D has tripled, whereas in the sub-Saharan African countries the investment increased by barely a fifth, with decline in half of these countries. Inadequate research, especially demand driven research related to capacity deficiencies, coupled with infective extension and delivery system of research finding have been identified as being issues of concern to the agricultural sector in Kenya, which hinders the use of the findings (Otieno & Atieno, 2006).

Project success can only be realized after sustainability of the project has been realized. In support of this, Nuguti (2009) noted that in developing countries getting to the level of sustainability of a project is particularly difficult, owing to inbuilt challenges. However, even with these challenges, almost all developed countries see Monitoring and Evaluation (M & E) as an important tool for ensuring sound accountability and surveillance in relationships between the government, Parliament and civil society (Mackay,1998).

There is substantial potential to increase global food production by promoting better use of existing skills scientific knowledge and technology. Both within and between countries there are differences in productivity that are not explained by local physical conditions - what has been called the 'yield gap' and Monitoring and Evaluation is critical in addressing this gap. These differences are especially notable in low- and middle-

income countries, due to services provision among other reasons. It has been estimated that the application of existing knowledge and technology could increase average yields two to three fold in many parts of Africa, and two fold in the Russian Federation. Recent growth in agricultural productivity in Brazil and China has been built in particular on a significant and expanding domestic research base and surveillance. This is in distinct from many other countries, where the priority given to agricultural research and surveillance has been waning in recent decades (Harkness 2011).

Lekorwe & Mpabanga (2007) point out that at the local level staff might not be familiar with government policies and this affects efficiency of the NGO's because of tensions which may arise slowing down surveillance. Inadequate research especially demand driven research and delivery system of research findings were identified as being issues of concern to agriculture sector in Kenya as indicated by Otieno and Atieno (2006).

The Brazilian agency EMBRAPA (Empresa Brasileira de Pesquisa Agropecuaria), has become one of the world's biggest funders of agricultural research and development, with a budget of nearly R\$2billion in 2009 (roughly US\$1.11 billion) and China's spending on agricultural R&D increased by about 10% per year between 2001 and 2007, reaching RMB12.3 billion in 2007 (around US\$1.78 billion). This investment is already reaping benefits - it has been estimated that every RMB10, 000 (US\$1,500) of investment in agricultural R&D helps seven people move out of poverty. Yield gaps exist for numerous reasons including economic mismanagement but in other cases yields are low because of lack of research and surveillance hindering the application of existing knowledge. (Harkness, 2011).

According to Maputo Declaration (2014) In order for the agriculture sector to contribute more to GDP and development and to significantly reduce food insecurity, the sector requires greater public investment by African governments to increase the productivity and competitiveness of smallholder farmers.

Project sustainability especially the food crop project sector has been a great concern. For instance, according to IFAD (2009), 50 per cent of the projects evaluated in 2007 including in the agriculture sector were rated only moderately satisfactory in sustainability and 33 per cent were unsatisfactory. Performance of agriculture sector in Sub-Saharan Africa compared to the rest of the world is still wanting. In terms of maximum yield per hectare and Sub-Saharan Africa, has continued to lag behind, compared to the rest of the world (WDR, 2008).

In reference to Nyeri South M & E there are no mechanisms that exist to ensure that recommendations of previous findings and reports are referred to when solutions to current challenges, are being sought. At the same time, research work is mainly undertaken by institution such as KARI (Kenya Agriculture Research Institute), yet at the grassroots, these institutions are hardly represented. The implication of this is that the mistakes of previous years are still being repeated since

agricultural activities are carried without the benefit of research. Twenty one project groups are involved in production of various food crops in Nyeri South. At the same time data available indicate a big gap in terms of yields realized in Kenya in comparison to the rest of the world, hence there is need to critically address, the most likely underlying causes, responsible for this deficit and M & E if properly undertaken can address this WDR Report (2008) and (Nyeri South Sub-county Agriculture office 2015)..

## **II. STATEMENT OF THE PROBLEM**

Each society globally requires food for existence and research & surveillance in M and E plays a critical role in this regard facilitating sustainability of projects. Sustainability of projects is still a major challenge in many developing countries with many projects having challenges despite commitment of colossal resources especially in agriculture sector. The total acreage of the area on which food crops can be grown globally due to rapid urbanization and growth of towns and cities has been decreasing. Therefore less land is used to produce food for an increasing population especially in developing countries such as Kenya. In Nyeri South Sub County land under food crop production totaled 7047.4 hectares and the income generated from this land was Kshs 690.74 m while coffee and tea cultivated on 5725 hectares had an income of Kshs 2258.9m. According to a Nyeri South Sub (2012) attainment of food crop production targets has not been realized despite this being a high potential area. Crop production deviation in Nyeri South Sub-county for the period 2010/2011 for maize and beans only totaled 41 500 bags. In addition, income and unit value for individual crops shows that there is high disparity (Nyeri South Sub-county Agriculture office 2013). Part of what would increase the yield is close M & E of food production activities.

Data on the progressive performance of agriculture in selected countries globally shows notable gaps between African countries and other countries and in comparison of yields per hectare African countries and indeed Kenya and Nyeri south Sub County lag behind the rest of the world. The exploitable yields gaps for maize in Africa indicate that production on demonstration farms is way above actual production in Nyeri south Sub County. The above noted statistics indicate that there is still a lot that requires to be done by M & E oversight agencies. Efforts have been made to improve food production by various stakeholders such as County Government of Nyeri and Ministry of Agriculture such initiatives include provision of fertilizers, provision of seeds for planting and training of farmers, however follow up regarding surveillance and research appears not to have been effectively undertaken (Nyeri South Sub County 2012).

M & E as a tool monitors what is happening providing feedback that can be used to improve research & surveillance therefore enhancing sustainability of food crop projects. There is need to assess influence of research & surveillance in M&E and its influence on

sustainability of food crop projects. This study sought to establish the extent to which research & surveillance on M & E influences sustainability.

### III. PURPOSE OF THE STUDY

The study was aimed at establishing how research & surveillance in M and E influences sustainability of agricultural food crop project in Nyeri South District.

### IV. OBJECTIVES OF THE STUDY

The specific objectives of this study were to examine:-  
To establish how M & E surveillance influences sustainability of Agricultural food crop project

### V. RESEARCH QUESTIONS

How does Research & Surveillance in M & E influence sustainability of Agriculture food projects?

### VI. RESEARCH HYPOTHESES

H<sub>i</sub>: Research & Surveillance in M & E influences sustainability of agricultural food crop projects.

### VII. RESEARCH METHODOLOGY

The paradigm that guided this study was pragmatism. Johnson and Onwuegbuzie. (2004) noted that pragmatism paradigm is the best suited for mixed methods research approach stating that mixed methods research is an approach whose time has come. This paradigm accommodates both the

positivist and constructivist philosophies (Morgan 2007). The pragmatist paradigm suited acknowledges the integration of views from others.

A. *Research Design*- A Mixed model comprising descriptive survey design and correlation research design was used in this study, this choice being informed by the fact that descriptive and inferential data analysis were required in the study.

### VIII. RESULTS AND DISCUSSIONS

#### A. *Research and Surveillance in Monitoring & Evaluation*

Surveillance in M& E was also put into consideration by the study. This would help assist in understanding and identification of current gaps with the aim of perfecting the projects. Four items were measured on a 5- point Likert scale. The 5- point Likert scale was defined such that the scale of 1 meant strongly disagree, 2 was disagree, 3 was neutral, 4 was agree and 5 was strongly agree with the statements.

#### B. *Research and Surveillance in Monitoring & Evaluation Perspective of Farmers*

The views of the farmers were sought regarding their level of agreement or disagreement with various aspects of research and surveillance in Monitoring & Evaluation. This helped in getting an understanding on the level or implementation of research and surveillance activities from the perspective of the farmers with the aim of identifying existing gaps and ways of addressing these emerging gaps.

The results regarding this were presented in table 1.

Table 1: Research and Surveillance in Monitoring & Evaluation Monitoring & Evaluation by farmers

Statement		SD	D	NS	A	SA	Mean	Std. Deviation
Research & Surveillance is undertaken in food crop projects	Freq.	12	107	43	30	12	2.63	1.04
	%	5.8	51.9	20.9	14.6	5.9		
Research & Surveillance on the agricultural food crop production is effective	Freq.	35	96	44	27	4	2.36	0.977
	%	17	46.6	21.4	13.1	1.9		
Research & Surveillance in its current state influences food crop project sustainability?	Freq.	44	88	44	26	4	2.3	0.992
	%	21.4	42.7	21.4	12.6	2		
Research & Information from surveillance is used in decision making	Freq.	18	67	91	25	5	2.67	0.888
	%	8.7	32.5	44.2	12.1	2.4		

From the results in Table 1, the majority of the farmers were not sure if research and surveillance is undertaken in food crop projects (mean = 2.63, SD = 1.04). This is an indication that there was no reliable data available to the public on research and surveillance of agricultural food crop projects. It was, therefore, difficult to fully ascertain its contributions to sustainability. Surveillance

should be complemented by essential research, including epidemiological, evaluation and social impact research. Evaluation is mostly done through surveys and surveillance to determine outcomes and impact.

Similarly, majority of the farmers were not sure whether information from research and surveillance was used in decision-making (mean = 2.67, SD = 0.888). This

means that there is no sufficient research and surveillance on food crop projects making it difficult for farmers to prudently manage resources at their disposal as well as enhancing sustainability and ascertaining conclusively contributions realized. As such, majority of the farmers disagreed the research and surveillance of the agricultural food crop production is effective (mean = 2.36, SD = 0.977).

Finally, majority of the farmers indicated that research and surveillance rarely influenced food project sustainability (mean = 2.30, SD = 0.992). The farmers were unable to establish if research and surveillance would contribute to food project sustainability since much has not been done with respect to research and surveillance. Precisely, information from research and

surveillance is rarely used in decision making and the farmers viewed it as ineffective and unreliable and an undertaking whose role and place in agricultural food crop sustainability is still uncertain.

*C. Research and Surveillance in Monitoring & Evaluation by Extension Officers*

Table 2 below presented the results on research and surveillance in Monitoring & Evaluation from the perspective of the extension officers. Gaining an understanding of research and surveillance from the extension officers helps understand how the ministry and ministry officials identify its importance especially towards the sustainability of agricultural food crop projects.

Table 2: Research & Surveillance in Monitoring & Evaluation as Observed by Extension Officers

		SD	D	NS	A	SA	Mean	Std. Deviation
Funds are available for research	Freq.	3	0	0	0	1	3	0.816
	%	75	0	0	0	25		
Mechanisms for surveillance for the funds received exist	Freq.	3	1	0	1	0	2.33	0.577
	%	75	2	0	25	0		
Regulation to apprehend those misappropriating funds exist	Freq.	2	1	0	1	0	2.25	0.957
	%	50	2	0	25	0		
Monitoring & Evaluation work is undertaken based on research findings	Freq.	3	0	0	1	0	2.5	1.291
	%	75	0	0	25	0		
Employees are adequately motivated to undertake research	Freq.	2	0	0	2	0	2.25	0.5
	%	50	0	0	25	0		

From the table 2, majority of extension officers were not sure if funds are available for surveillance (mean = 3.00, SD = 0.816) and only 1 officer or 25% indicated that funds are available for research. This implies that there are insufficient funds for the purpose of research and surveillance in mitigating against crop diseases, enhancing prudent management of scarce resources among other undertakings so as to boost production. However, majority of the extension officers felt that there were no mechanisms for research and surveillance for the funds received (mean = 2.33, SD = 0.577) although 1 officer or 25% of the officers indicated that mechanisms exist for ensuring prudent utilization of the funds. Lack of closer scrutiny of use of funds received is a challenge thus creating opportunities for misappropriation of funds and compromise on sustainability of agricultural food crop projects. This situation is compounded by the fact that majority of the extension officers indicated that regulation to apprehend those misappropriating funds were non-existent (mean = 2.25, SD = 0.957) but 1 officer or 75% strongly noted that such regulations exist. In this respect, accountability is not enhanced since there are no regulations to deal with misappropriation. This adversely impacts on

project sustainability. Further, majority of the extension officers indicated that Monitoring & Evaluation work is not undertaken based on research and surveillance findings (mean = 2.50, SD = 1.291) with 1 officer or 25% holding a contrary view. This scenario portends great risk since there is need to use research findings to guide M&E work with a view of ensuring maximization in productivity and ultimately sustainability.

Finally, the lack of mechanisms to manage funding of resources as well as the making of decisions that are devoid of being informed by findings from research and surveillance was brought out clearly by majority of the extension officers who indicated that employees are not adequately motivated to undertake research (mean = 2.25, SD = 0.500) although half of the officers or 50% were of the view that officials are adequately motivated this possibly indicates preferential treatment regarding the officers. Due to inadequate motivation to undertake research and surveillance, employees are unable to undertake research and surveillance to satisfactory levels. This would definitely impact on project sustainability as there is no alertness on challenges in existence and no mechanisms for early warning systems regarding issues bedeviling food crop projects.

*D. Hypothesis Testing for Research and Surveillance in M&E*

Results on Monitoring & Evaluation research and surveillance from farmers and extension officers have shown that Monitoring & Evaluation research and surveillance activities are rarely carried out. Furthermore, there are no adequate funds that can be used to implement Monitoring & Evaluation research and surveillance activities. The findings have also

shown that there are poor tracking mechanisms in place to ensure that those who misappropriate resources are held accountable. Furthermore, the findings also showed that employees are not adequately motivated to undertake research and surveillance. These highlighted gaps, if not properly addressed, will have an eventual negative effect on the sustainability of agricultural food crop projects.

Table 3: Hypothesis testing for research and surveillance in M&E

	Unstandardized Coefficients		Standardized Coefficients		Correlations		
	B	Std. Error	Beta T	Sig.	Zero-order	Partial Part	
(Constant)	1.535	0.13		11.819	0.00		
Surveillance	0.353	0.051	0.439	6.979	0.00	0.439	0.439 0.439
R Square Adjusted	0.193						
R Square	0.189						
F	48.705						
Sig.	.000						

Dependent Variable: sustainability Basing on these results and the multiple regression results presented in table 3 on estimates of the model coefficients, the study also sought to test the hypothesis stating that Monitoring & Evaluation research and surveillance significantly influences sustainability of agricultural food crop projects. The results showed that Monitoring & Evaluation research and surveillance had a coefficient of estimate which was significant basing on  $p_4 = 0.439$  ( $p$ -value = 0.000 which is less than  $\alpha = 0.05$ ) implying research and surveillance in M&E has a significant influence on sustainability of agricultural food crop projects. This meant that for each unit increase in Monitoring & Evaluation research and surveillance, there was 0.282 units increase in sustainability of agricultural food crop projects. Furthermore, the effect of Monitoring & Evaluation research and surveillance was stated by the t-test value = 4.422 which implied that the standard error associated with the parameter was less than the effect of the parameter.

sustainability of agricultural food crop projects.

The results are in line with what Otieno and Atieno (2006) noted indicating that inadequate research, especially demand driven research related to capacity deficiencies, is among the issues of concern to agriculture sector in Kenya.

Based on the study findings, surveillance is of essence in the sustainability of agricultural food projects. Through surveillance, the concerned stakeholders can access information on projects and can be used to provide early warning systems as well mitigate the challenges inherent in agricultural food crop projects. Such information can also be used in decision making, thus contributing to sustainability. In the context of this study, there is inadequate surveillance. The farmers require sensitization on the role of adopting to change by being informative, formative and transformative on the integrative approach of monitoring and evaluation. This transformational approach is advocated for by the theory of change. The performance of agriculture sector cuts across the whole development of economy of any state. Therefore, this study borrows a lot from the theory of change which acts as an eye opener for agricultural growth and development in monitoring and evaluation. The research & surveillance in M&E is very vital in sustainability of agricultural projects enhancement. Therefore, this study advocates for urgent policy review on how research & surveillance in monitoring and evaluation is undertaken in agricultural sector in Kenya.

From the findings of the research most of the farmers were unaware of contribution of research & surveillance to food projects sustainability. This presents a gap that needs to be filled in order to enhance the sustainability of projects. The study established that Surveillance is of essence in the attainment of project sustainability. It is, therefore, necessary for surveillance to be undertaken on food crop projects. The surveillance requires proper framework for it to be effective so that information derived from it can be used for the purpose of quality decision making and enhancement of sustainability.

**IX. SUMMARY OF FINDINGS, CONCLUSION AND RECOMMENDATIONS**

*A. Research and Surveillance in M & E and Sustainability of Agricultural Food Crop Projects*

Furthermore, results on surveillance in Monitoring & Evaluation revealed that the respondents were uncertain as to whether or not surveillance had an influence on food crop projects and if information from surveillance is used in decision making. However, it was established that surveillance on the agricultural food crop production is ineffective. This infers that there is no sufficient surveillance on food crop projects making it difficult for farmers to ascertain conclusively its contributions. Assessment of the effect of Monitoring & Evaluation research and surveillance showed that for each unit increase in Monitoring & Evaluation research and surveillance, there was 0.282 units increase in

Moreover, there is need for increased investment in R&D to be in tandem with other food success story nations such as Brazil and China (Harkness, 2011). This can further enhance project sustainability.

Cognate to the results, Ibrahim (1999) posits that the Norwegian Agency for Development Cooperation (NORAD) provides substantial funds to governments and NGOs for the purpose of surveillance. In so doing, they make available to the public or to oversight bodies basic data on projects and subsequently Monitoring & Evaluation and sustainability. The results are also in line with those of Otieno and Atieno (2006) indicating that inadequate research, especially demand driven research related to capacity deficiencies, is among the issues of concern to agriculture sector in Kenya.

Further, there is need for the Ministry of Agriculture to develop a comprehensive guideline and/or ensure enforcement of the same so that the views of stakeholders are brought on board particularly regarding to critical decisions. In implementation of community food projects, there is need for such involvement of the target groups to enhance ownership and sustainability. Modalities should also continually be put in place to ensure that farmers and indeed officials at the grassroots have access to locally and internationally available best practices that are critical in the agriculturally successful nation systems.

There is need for a study to establish whether the challenges noted have been occasioned by the transition in the regulation and control from the national government to the county government following promulgation of a new constitution in Kenya in 2010.

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