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A Journal of the Department of Extra Mural Studies,
University of Nairobi

A Publication of the Department of Extra Mural Studies
University of Nairobi

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Department of Extra Mural Studies
School of Continuing and Distance Education,

P.O. Box 30179-00100 Nairobi / 92 - 00902 Kikuyu
email:demsjournal@uonbi.ac.ke, dems_journal@yahoo.com
Website:www.dems.uonbi.ac.ke

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P. O. Box 30197-00100
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demsjournal@uonbi.ac.ke OR dems_journal@yahoo.com

Preface

The first issue of African Journal of Project Planning and Management contains seven articles covering various themes in Project Management.

The first article focuses on evaluation of the performance of an evaluation framework for constituency development fund. Findings indicate that majority of the projects are educational and health projects. Most of the projects experience delays, however, stakeholder's impact on the projects is significant. The second article focuses on gender mainstreaming strategies in upgrading rural projects. Gender mainstreaming is central to achievement of community interests. Results of the study indicate that the project understudy had a gender policy to which the project team complies to achieve the strategy. This strategy is implemented in various ways and gender representation in the project is average.

Article three presents findings that biogas technology provides a viable alternative to hydro-electric power. Adoption levels which is determined by income levels is between 12.7% and 11.4%. The fourth article examines data feedback mechanisms and quality delivery of artificial insemination services in cattle. Findings reveal that both monitoring and evaluation of service quality in artificial insemination are minimal.

Article five focuses on modern technology and sustainable irrigation of small scale dry-land farming. Results indicate that irrigation technology significantly influences sustainable irrigation of dry-land farming which yields statistically higher farm outputs than natural rain-fed small scale dry-land farming.

The sixth article presents results on the influence of organizational structure on the relationship between performance contracting and organizational performance of government ministries. Results reveal that the strength of the relationship between PC system and organization performance does not depend on the organization structure.

The final article examines influence of participatory monitoring and evaluation on citizen empowerment outcomes. Findings reveal that there is a positive relationship between participatory monitoring and evaluation and citizen empowerment.

Editor

Call for Papers

Department of Extra Mural Studies, School of Continuing and Distance Education, University of Nairobi, Kenya wishes to call for research papers to be published in The African Journal of Project Management. The vision of African Journal of Project Management is to become the journal of choice in project management. To achieve this vision, the journal will publish high quality peer reviewed papers which meet international standards.

The Department of Extra Mural Studies is calling for papers along the following themes:

- Governance Frameworks for Public and Private Partnerships in Project Development
- Sponsorship of Projects and Programs
- Human Resource Management in Project-Oriented Organization
- Leadership and Management of Projects
- Project Management and Entrepreneurship
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- Management Information Systems in projects and E-project Management
- Gender and cross-cutting issues in project management

Interested persons may submit their papers as per the following timeline:

Abstract (250 Words):

Notification of Abstract Acceptance:

10th June 2015

Submission of Paper :

30th August 2015

Final Paper Submission (With Changes):

30th September 2015

Submission Format

Soft Copies of the full paper with the author's full contact details and brief profile to be sent to:

demsjournal @uonbi.ac.ke or dems_journal @ yahoo.com

Paper Submission Guide

Submission of an article implies that the work described has not been published previously (except in the form of an abstract or as part of a published lecture or academic thesis), that it is not under consideration for publication elsewhere, that its publication is approved by all authors and tacitly or explicitly by the responsible authorities where the work was carried out, and that, if accepted, will not be published elsewhere in the same form, in English or in any other language, without the written consent of the Publisher. The Editors reserve the right to edit. Copyrights for articles are retained by the authors, with first publication rights granted to the journal. The journal/publisher is not responsible for subsequent uses of the work.

The paper should contain the following details:

- i. Title of the paper (in bold, Times New Romans 16), Name of Author(s), Professional/Organizational Affiliation, Address of Correspondence.
- ii. Abstract should be about 150-250 words (Times New Roman 12-point type, single spacing, in italics).
- iii. Paper should be written in British or American English, but not a mixture of both.
- iv. Key words should be provided which encapsulate the principal topics of the paper, 3-5 words alphabetically outlined.
- v. All tables and charts, graphs, footnotes, quotations should be cited accordingly and numbered properly.
- vi. Citations in the text should follow the referencing style used by the American Psychological Association (APA) Sixth Edition. All references cited in the text must be listed at the end of the manuscript. References should be complete in all respects and alphabetically arranged.
- vii. As a minimum, the full URL should be given. Any further information (author names, dates, reference to a source publication and time), should also be given. Web references should be included in the reference list.

- viii. Articles should not exceed 7000 words and should be double spaced and should be compatible with MS- Word format.
- ix. Divide your article into clearly defined and numbered sections. Subsections should be numbered 1, 2, (then 1.1, 1.1.1, 1.1.2), 1.2, etc.
- x. Present tables and figures under the themes, number these consecutively in accordance with their appearance in the text. For example, Table 1, Table 2... Avoid large tables: the book size will be 15 x 21 cm (A5), use the tabulator (TAB) only.
- xi. Diagrams produced by graphical computer programs are only acceptable if their quality matches that of handmade diagrams.
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- xvii. If the research is sponsored or supported by an organization, please acknowledge.

Editorial Policy

AJPLAM is a forum for scholars and practitioners for engagement in discourse, reflective thinking and dissemination of results of research in project management.

AJPLAM publishes articles that contribute to scholarly dialogue and the major criteria for choosing articles for publication will be scholarly quality.

All articles submitted for publication will be peer reviewed by scholars of proven competence. However the final decision regarding publication shall reside with the Editorial Board.

Views expressed in articles which appear in AJPLAM and responsibility for them is solely those of the authors and not those of the Editors.

In addition to regular issues of AJPLAM, special issues may be devoted to specific themes based on contributions solicited by the editors.

Articles submitted, if not published, will not be returned to the authors. However, the editors will acknowledge all contributions.

Authors of articles will receive one copy of the journal.

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List of Contributors

1. **Makori Joseph** - Lecturer and Research Scholar at Kenya Institute of Management, P.O. Box 35322-00100 Nairobi, Cell : 0724 224685, joemakori@hotmail.com
2. **Aduda Josiah** - Associate Professor and Research Scholar in the Department of Finance and Accounting School of Business, University of Nairobi, P.O. Box 30197- 00100 Nairobi, Cell: 0722813684, jaduda@uonbi.ac.ke.
3. **Ngacho Christopher** - Lecturer, Faculty of Commerce in the Department of Management Science, Kisii University, P.O. Box 133357 Nakuru Tel : + 919 5311456
4. **Mwenda, Mary Nyawira** - PhD Candidate Department of Extra Mural Studies, University of Nairobi, P.O. Box 41-10101, Karatina, Cell: 254- 0721 582886, marynyawiramwenda@yahoo.com
5. **Otieno- Omutoko Lillian** - Senior Lecturer, Department of Extra Mural Studies, University of Nairobi, P.O. Box 24386-00502, Nairobi, Cell : 0722 630 202, lyllemutoko@yahoo.com : joyce.lillian@uonbi.ac.ke
6. **Njoroge Rose Wanjugu** - Part Time Lecturer, Nakuru Extra Mural Centre, P.O Box 1120-20100, University of Nairobi
7. **Nyonje Raphael Ondeko** - Senior Lecturer, Department of Extra Mural Studies, University of Nairobi, P.O. Box 92 - 00902 Kikuyu, raphael.nyonge@uonbi.ac.ke : rnyonje@yahoo.com
8. **Alex Mirara Methu** - PhD Candidate, Department of Extra Mural Studies, University of Nairobi, P.O. Box 92 - 00902 Kikuyu, Cell: 0722344272, alexmethu@gmail.com
9. **Venzi Francis S.,** - M.A. Student, University of Nairobi, School of Continuing and Distance Education, P.O. Box 92-00902, Kikuyu, Cell : +254 723669999, venzi06@yahoo.com
10. **Mulwa Sabina Angeline** - Lecturer, University of Nairobi School of Continuing and Distance Education, P.O. Box 92-00902, Kikuyu, Cell: +254 724473490, asmulwa2008@yahoo.com
11. **Ndunge Kyalo Dorothy** - Senior Lecturer, University of Nairobi School of Continuing and Distance Education, P.O. Box 92, 00902, Kikuyu, Cell: +254 722821341, ndunge.kyalo@yahoo.com
12. **J. Nganga. Kinyanjui** - Lead Consultant, Shape Afrika, P.O. Box 13514-00100 Nairobi, Cell: +254 721 222243, kinyanjui@shapeafrica.com

1. **Christopher Mwangi Gakuu** - Associate Dean, School of Continuing and Distance Education, University of Nairobi, *P.O. Box 92-00902, Kikuyu, cmgakuu@uonbi.ac.ke*
2. **Harriet Jepchumba Kidombo** - Dean, School of Continuing and Distance Education, University of Nairobi, *P.O. Box 92-00902, Kikuyu, Cell: +254 722 734058, harrietkidombo@yahoo.co.ke*
3. **Kennedy Kibukho** - PhD Candidate, Department of Extra Mural studies, University of Nairobi, Monitoring and Evaluation Officer, RTI International, *P.O. Box 692-00200 Kitengela, kenkib@yahoo.com*

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A PERFORMANCE EVALUATION FRAMEWORK FOR CONSTITUENCY DEVELOPMENT FUND CONSTRUCTION PROJECTS IN KENYA

Makori, R. J.¹, Aduda, J.², Ngacho, C.³

ABSTRACT

Performance criteria and measures among construction projects reflect the value of the project stakeholders on how they would be viewing the projects they undertake. From the literature review, it was established that one of the challenges facing public construction projects is the lack of sufficient and formal approaches on which to evaluate project performance. It is against this background that the present work attempts to develop a theoretical framework of the performance evaluation of construction projects based on six key performance indicators (KPIs) namely time, cost, quality, safety, minimum site disputes and environmental impact. In so doing, the paper considers the perceptions of 160 stakeholders in construction projects comprising of clients, consultants and contractors on recently completed Constituency Development Fund (CDF) projects in Kakamega, Vihiga Bungoma and Busia Counties. We have identified the Key Performance Indicators (KPIs) in public construction projects through exploratory factor analysis and demonstrated the relationship between KPIs and overall project performance with the help of a conceptual diagram. The diagram reveals how performance of a public construction project can be assessed in terms of the above six performance indicators. We have concluded by highlighting the contribution of the paper to the existing body of project management literature and providing recommendations for future research.

Key Words: *Evaluation Framework; Project Performance; Performance Criteria I.*

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1. Lecturer and Research Scholar at Kenya Institute of Management, P.O. Box 35322-00100 Nairobi, Cell : 0724 224685, joemakori@hotmail.com
 2. Associate Professor and Research Scholar in the Department of Finance and Accounting School of Business, University of Nairobi, P.O. Box 30197- 00100 Nairobi, Cell: 0722813684, jaduda@uonbi.ac.ke.
 3. Lecturer, Faculty of Commerce in the Department of Management Science, Kisii University, P.O. Box 133357 Nakuru Tel : + 919 5311456

1. Introduction

Decentralisation, as a system of government's involvement in grassroot projects and community development, has evolved over time. National governments in several countries, including India, Pakistan, Bhutan, Jamaica, Papua New Guinea, Uganda, Tanzania and Kenya, continue to disburse development expenditure through policies such as the Constituency Development Fund (CDF), in order to realize equitable development in all regions. These regions are based on political boundaries and the spending is influenced by elected members of parliament. Previous studies undertaken in the construction industry of such countries have indicated that construction activity forms an important component of a country's economic development in terms of its contribution to Gross Domestic Product (GDP) and total employment and provision of a market for materials and products produced by other sectors of the economy (ILO, 2000, www.globalconstruction2020.com). Generally, in 2011, the economy of Kenya grew by between 3% and 4% with the construction sector registering the highest growth in employment.

The government of Kenya has made deliberate efforts to decentralise some of its development projects since attaining independence in 1963. Among the decentralisation programmes formulated were the District Development Grant Program (1966), the Special Rural Development Program (1969/1970), District Development Planning (1971), the District Focus for Rural Development (1983 - 84) and the Rural Trade and Production Centre (1988-89). Though the aim of these programmes was to attain development in all parts of the country, they failed due to the problem of funding. It is from this background that in 2003, the Constituency Development Fund (CDF) was created, through an act of parliament with the aim of ironing out regional imbalances brought about by patronage politics. CDF was designed to provide funds to parliamentary jurisdictions (constituencies) to fight poverty. Recently, the Government has embarked on projects aimed at meeting the Millennium Development Goals (MDGs). More precisely, in the year 2007-2008 budgetary allocations, more than Kshs 58 billions was allocated to devolved structures. One of the devolved funds earmarked to benefit from the funding during this period was the Constituency Development Fund.

Performance of public construction projects implemented by CDF is a matter of interest to the public which benefits from the projects and the government of Kenya. Since these projects require huge capital investments, there is need to put measures in place to prevent poor management and loss of public funds. Different stakeholders have criticised the manner in which CDF projects are conceptualised, managed and implemented. This has necessitated various studies at both national and international levels mainly focusing on composition of CDF committees, the role of CDF in poverty reduction (through provision of employment and wealth creation), participation of women in CDF activities, distribution of CDF projects in the constituency and the overall manner in which CDF funds are distributed, managed and accounted for. The local organizations in Kenya that have undertaken studies in this area include: the Women's Political Alliance-Kenya (WPA-K), the Institute for Policy Analysis and Research (IPAR), the Kenya Institute of Public Research and Analysis (KIPRA), the Institute of Economic Affairs (IEA), the University of Nairobi (UoN) School of Business, the Parliamentary Select Committee on CDF, the National Tax Payers Association (NTA) and the mainstream media. The international community has also shown interest through organisations such as the Society for International Development (SID), the European Union (EU), the World Bank (WB) and Abantu for Development.

Based on these studies, relevant watchdog organizations including the National Taxpayers Association (NTA) and the CDF monitoring unit have been able to classify constituencies as either good performers or poor performers. Good performing constituencies have witnessed significant improvement in people's lives, whereas in poor performers, the constituents have suffered. In some cases, mismanagement has led to the freezing of fund accounts by the National Management Committee on CDF. It is, however, not clear what performance criteria these agencies have used in classifying the CDF projects as either performing or non performing. It is on the basis of this background that the current study seeks to identify the key performance indicators among CDF construction projects in Kakamega, Vihiga Bungoma and Busia Counties. This work, therefore, differs from previous works in terms of its scope. It focuses mainly on one form of devolved fund, CDF, and the projects implemented under

it during the period 2003-2011. The present work is also important as it develops a framework for project performance measurement of CDF projects in line with similar frameworks for other types of projects developed in different countries.

Project management professionals have provided project performance measurement criteria on three dimensions namely, *time, cost and quality* (Ahadzie et al., 2008; Chan, et al., 2001; Atkinson, 1999). This conventional criteria (popularly referred to as “the iron triangle”), has been hailed for having provided a basis for evaluating the extent of success across projects (Cao and Hoffman, 2011). The criteria for success includes a project being simple (Toor and Ogunlana, 2010), easy and timely to measure (Willard, 2005) and the ability to capture the quantitative (tangible) benefits of a project (Litsikakis, 2009). Whereas the use of these three dimensions is still a good practice for some projects, for others it could undermine some project outcomes. In order to improve a project evaluation system, one has to consider differences in project characteristics and appropriateness of project goals. A project performance measurement criterion should consider changing project stakeholder composition and interests, nature of the project funding, integration of different cultures, shifting functions of the constructed facilities, advances in construction technology, changing demands of the users and the ever-evolving environmental regulations.

Shenhar et al. (2002) argued that the traditional criteria (i.e. cost, time and quality) are essentially not mutually exclusive, rather they are related to each other but they do not provide an adequate vision of the potential for improvement. The proponents of additional measures of performance have considered safety of the project site as an important aspect of construction project performance (Billy et al., 2006; Haslam et al., 2005; Ortega, 2000). They also contend that construction site should have minimum disputes if the objectives are to be realised (Tabish and Jha, 2011). In addition, construction projects have irreversible impact on the local environment because construction process not only consume huge energy but also create the most waste, use large quantity of non-energy related resources and are responsible for the most pollution (Eriksson and Westerberg, 2011). The foregoing discussion seems to suggest that both the traditional measures (*time, cost and quality*), along with the contemporary ones (*safety, no-dispute*

and environmental impact) need to be considered together for proper evaluation of performance in public construction projects. Accordingly, the present work has considered *both traditional and contemporary measures* as key performance indicators of construction projects funded through the constituency development fund in Kakamega, Vihiga Bungoma and Busia Counties.

Sections, 2 below represent an account of literature review on the performance measurement among public construction projects and more specifically, performance of CDF projects. This is followed by a description of the research methodology employed in this study in terms of research design, respondent identification, sampling frame, survey instrument design, pilot survey and eventual data collection. Section 4 deals with the discussion of findings which is considered to be the heart of this paper. The authors present the results of the exploratory data analysis conducted on the 160 respondents surveyed through a combination of mail, telephone, fax and face to face interviews in Kakamega, Vihiga Bungoma and Busia Counties. The section also presents a theoretical framework of performance evaluation of construction projects depicting conceptually the measurement of overall performance of a project in terms of *time, cost, quality, safety, no-dispute and environmental impact* which, in turn, results in *community satisfaction*. In section 5, the researchers seek to validate the measurement instrument developed while section 6 provides the contributions of this research to project management practice and research. The concluding part, section 7, summarizes the present work and reveals its limitations while giving future research directions.

2. Literature Review

2.1 Performance of Public Construction projects.

Performance of construction projects has primarily been evaluated on the basis of the famous “iron triangle” comprising of cost, time and quality criteria (Chan, et al., 2001). These traditional criteria have faced criticism due to their inadequate coverage of performance measurement (Gardiner, 2000); the perceived relationship among themselves (Shenhar et al., 2002) and their short term focus (Shenhar, 2001).

In view of these criticisms, a number of researchers have advocated for a wider focus in relation to construction project performance to cover aspects of project safety, construction contract management, environmental impact and community satisfaction. The construction industry is said to be one of the most unsafe because of its high rate of fatalities (Patrick, 2011). Several researchers, (Billy et al., 2006, Haslam et al., 2005, Ortega, 2000), therefore, consider *safety* of the project site as an important aspect of construction project performance. Other researchers (David, 2009; Tabish and Jha, 2011) consider the *absence of disputes* to be a major reason for the smooth progress of a construction project because the progress of the construction project can be severely affected by controversies and disputes. David (2009) explains that public sector construction projects require management of all stakeholders as this will provide an opportunity for dispute resolution.

Similarly, Tsoulfas and Pappis (2008), Chen et al., (2010), Medineckiene et al., (2010), and Tan et al., (2011) have advocated the inclusion of *environmental impact* into the performance matrix of construction project performance. Factors such as high energy prices, increased costs of building materials, and regulatory incentives are pushing organizations to adopt environmentally friendly construction methods. Each organization should, therefore, develop the capability of delivering sustainable projects within acceptable cost constraints. Shao and Muller (2011) reported that *community satisfaction* is the ultimate goal of every construction project, hence it must be considered while evaluating construction project performance. The most significant impact is likely to result from the displacement of residents, businesses and community services which has an adverse impact on community satisfaction for those who remain in the vicinity of the project site (Wang and Huang, 2006).

Literature review reveals that the additional dimensions, namely, *community satisfaction, safety, no-dispute and environmental impact* need to be incorporated into the overall performance evaluation framework of construction projects. Below is a summary of research on the key performance indicators.

Table 1: Previous contributions to the study of Key Performance Indicators (KPIs).

S/ No	KPIs	A brief description of the KPI.	Contributions
1.	Time	<ul style="list-style-type: none"> • construction time • speed of construction and • time variation 	Kamrul and Indra, (2010); Ahadzie et al., (2008); Iyer et al., (2008); Zuo et al., (2007); Assaf and Al Hejji (2006), Bryde and Robinson, (2005); Kerzner, (2006); Williams, (2003); Frimpong et al., (2003); Atkinson, (1999).
2.	Cost	<ul style="list-style-type: none"> • tender sum, • construction costs, • costs due to variations and modifications 	Ali and Rahmat, (2010); Patanakul and Milosevic, (2009); Kaliba et al., (2008); Ahadzie et al., (2008); Zuo et al., (2007); Bryde and Robinson, (2005); Chan and Chan, (2004); Kerzner, (2006); Chan and Tam, (2000); Atkinson, (1999).
3.	Quality	<ul style="list-style-type: none"> • Ability of the project to adhere to the set up specifications. 	Ogano and Pretorius, (2010); Love et al., (2010); Yung and Yip, (2010); Ahadzie et al., (2008); Palaneeswaran, (2007); Zuo et al., (2007); Jha and Iyer, (2006); Chan and Chan, (2004); Kerzner, (2006); Atkinson, (1999).
4.	Health and Safety	<ul style="list-style-type: none"> • fatalities, • accidents • injuries 	Patrick, (2011); Zuo et al., (2007); Billy et al., (2006); Haslam et al., (2005); Chan and Chan, (2004); Ortega, (2000).
5.	Minimum site disputes	<ul style="list-style-type: none"> • Court cases • Legal claims 	Tan et al. (2011); Tabish and Jha, (2011); Chen et al. (2010); Medineckiene et al. (2010), and Iyer et al., (2008); Tsoulfas and Pappis (2008); Abidin, (2007); David, (2009);
6.	Environmental impact	<ul style="list-style-type: none"> • air emissions, • noise, • solid waste and • Water discharge. 	Gangoellis et al., (2011); Ahadzie et al., (2008); Zuo et al., (2007); Chen et al. (2010); Chan and Chan, (2004); Shen et al., (2010); Chen et al. (2010).
7.	Community satisfaction	<ul style="list-style-type: none"> • community's infrastructure, • provision of job opportunities • and the overall improvement of life 	Shao and Müller (2011); Wang and Huang, (2006); Filkins et al., (2000); Torbica and Stroh, (2001); Sadeh et al, (2000), Liu and Walker, (1998).

2.2 Performance of CDF projects.

Projects undertaken under CDF are usually identified by the community and seek to benefit a cross section of the people residing in a particular area. Funding is usually for a complete project or for an identifiable face of the project that could include acquisition of land. The target projects include educational facilities, health facilities, light industries and agricultural markets for the widespread impact in the community. The educational projects aim at upgrading several primary schools, secondary schools and youth polytechnics as a way of infrastructural improvement to facilitate proper learning in these institutions. The public health and sanitation projects focus on rolling out a comprehensive policy of healthcare through infrastructure development, preventive healthcare and management of facilities. In the agricultural sector, the aim is to support the commercialization of agricultural produce by increasing the per capita number and access to wholesale and fresh produce markets and increasing efficiency in marketing and trade of agricultural produce. Through industrialization, the government aims at constructing and equipping “jua kali” shades (light industries) to facilitate participation of youth as artisans and entrepreneurs.

In spite of the remarkable level of funding to CDF, no work has specifically considered the performance measures of the projects implemented. Studies on the CDF system of funding in Kenya have largely considered the operations of the fund in passing without making the projects, a focus of their attention. Other studies have focused on a general review of the CDF projects in North rift (Barasa, 2009), CDF as tools of decentralised development (Bagaka, 2008), the use of informal labour in construction sector (Mitulla and Wachira, 2003), modelling of construction activity as a system (Mbiti et al., 2011), management of multicultural teams in project construction (Ochieng and Price, 2009) and construction sector statistics as a whole (K’Akumu, 2009). The main shortcoming of these studies has been their inability to aptly come up with an empirical measurement system that cuts across different categories of projects funded through CDF.

The CDF projects mainly have the following objectives:

- Improve provision of services within the community and undertake planning and implementation of development activities based on local needs and conditions,

- Improve coordination between various government agencies involved in development at regional or local level,
- Reduce delays in decision making thereby increasing flexibility in the administration of development activities,
- Mobilise local resources, including finance and human capital , for purposes of development in the community and
- Increase the level of commitment to the development of the community.

From the foregoing objectives, CDF projects can be said to entail both economic and political objectives that are sometimes conflicting in nature.

The major challenge facing CDF projects can be said to be the balance of the trade-off between political and managerial objectives. Politically, the issues revolve around CDF as a measure of effectiveness among Members of Parliament (MPs). This is characterised by poor management of transition during elections, too many small projects thinly spread with little impact, and non-adherence to laid down government procedures, rules and regulations regarding tendering. On the management front, the challenges are: low utilization of completed facilities, poor community participation and contribution to projects, weak capacity to identify viable projects, low technical capacity to implement development projects and low utilization of technical officers in the implementation of projects (Wanjiru, 2009; Kimani et al., 2009).

3. Research Methodology

In this study, we adopted the quantitative approach because it enabled us to gather evidence that answered the key empirical questions of ‘how *much*’ or ‘how *many*?’ The key research questions involved in the study necessitated a survey research in order to collect information from groups of people (population) with a purpose of establishing the prevalence, the distribution, and/or the interrelationships between variables within these groups (Polit and Hungler, 1999). Therefore, this study enabled the researchers to explore a wide range of issues since several variables were involved. More specifically, a cross-sectional survey was adopted since the questionnaire sort to solicit information from a cross-section of

participants involved in construction of CDF projects regarding their perceptions on key performance indicators.

3.1 Research Design

The study was preceded by the following activities:

3.1.1 Literature review

We conducted literature review at two levels - evaluation of the performance of the construction projects, in general, and the performance of CDF projects in Kenya. This was necessary so as to gather existing information on performance evaluation and specifically performance evaluation of CDF projects. The information gathered provided background information on evaluation of public construction projects as well as what could be considered when evaluating performance among CDF projects in Kenya. This enhanced the understanding of project evaluation as well as the environment within which CDF projects are implemented. It gave the direction of the research as it facilitated a list of key performance indicators and critical success factors to be assessed in the study.

3.1.2 Review of the literature review findings

The list of KPIs derived from the literature review were shown to 5 experts comprising 2 academicians, 2 practitioners and 1 consultant in order to secure their viewpoints regarding their suitability as the measurement of the performance of construction projects in developing countries. The two academicians are university professors, specialising in the area of project planning at the University of Nairobi and Kenyatta University, Kenya. They were selected because they had over 10 years` in teaching and consulting for many government projects. Due to their rich experience, they were thought to be familiar with economic, socio-cultural and political environment surrounding various projects earmarked for this study. They also understood resource and expertise requirements for various projects. The practitioners were chairmen of two regional associations of contractors drawn from Busia and Kakamega counties. The choice of these practicing managers was based on their constant interaction with other contractors in their respective regions. They are also expected to intervene in solving disputes

that arise between contractors and any other stakeholder in project construction. The fifth expert was a regional public works officer in charge of all construction projects funded by the Government in Busia County. This officer was chosen because he has been the regional officer since 2003 when the Government of Kenya started funding projects through CDF.

3.1.3 Development of data collection tools

The literature review along with the feedback received from experts on variables constituting KPIs enabled us to design a preliminary questionnaire on the relationship between KPIs and overall performance of public construction projects. The questionnaire was presented to the same experts once again with a view to seeking their expert opinion on the adequate and appropriate coverage of all the items affecting the performance of construction projects and also the framing of each question. The respondents indicated that the six KPIs (*time, cost, quality, safety, no-dispute and environmental impact*) are very much relevant to the construction industry in developing countries. However, despite community satisfaction having been considered a project performance criterion (Shao and Müller, 2011) in the literature review, the experts felt that it should be excluded because it was thought to be a consequence of performance and cannot, therefore, be used to measure performance. They reiterated that the exclusion of community satisfaction from performance matrix could help in the exploration of the remaining key performance indicators. This viewpoint is supported by the work of Liu and Walker, (1998) who argued that satisfaction should be considered as an attribute of success and that of Torbich and Stroh (2001) who believed that if end-users were satisfied, then the project could be considered to be successful. They stated that some of the questions need to be rephrased for ease of understanding given the varying level of education of the prospective respondents. They also indicated that the classification of items into various factor groupings was necessary in order to appropriately address the individual performance indicators.

3.1.4 Review of the draft data collection tools

To strengthen the data collection tools, a pilot survey was carried out through personal interview among 5 contractors (including 2 sub-contractors), 4

consultants and 21 clients, who were working on ongoing construction projects. Sekaran (2000) suggests that 30 representative participants from the population of interest is a reasonable minimum recommendation for a pilot study where the purpose is preliminary survey or scale development. The sample used in this survey was drawn primarily from a database of contractors/builders, consultants and CDF committees in Kakamega, Vihiga, Bungoma and Busia Counties maintained by the CDF offices. These respondents were found to have over 7 years' experience in the construction industry and had been involved in the construction of CDF projects for at least 3 years. Further, they handled over four (4) CDF projects per year in various constituencies. They played different roles during project construction depending on their respective positions. The projects identified were educational, health, industrial estates and agricultural markets. This is evidence that these respondents are capable of providing the information requested in the questionnaire.

From the feedback provided by respondents, the average time taken to complete a questionnaire was approximately 15 minutes. It was, therefore, considered unnecessary to reduce the overall number of questions in the questionnaire to make it shorter. All the respondents felt the need for improvement in the efficiency of implementation of construction projects. This feedback informed the design of the final questionnaire that was subdivided into two sections. In section A of the questionnaire, respondents were asked to provide their demographic information as well as the descriptions of the projects they had worked on. They were then requested to indicate their perceptions on each of the 35 identified KPIs according to a five point Likert scale (1=Strongly Disagree, 2 = Disagree 3 = Indifference, 4 = Agree and 5 = Strongly Agree) with reference to a particular project they had been involved in.

3.1.5 Reliability and Validity of the survey instrument

The standard deviations and the inter-quartile range were inspected to assess variability among the measurement items. The standard deviations were all found to be greater than 1 except in 3 variable: “disputes were observed due to the frequent changes in the design of the current project”, “no changes were introduced in the designs of the current project during project execution” and

“all stakeholders associated with the current project supervised the quality of the project in all its phases”. Whereas the first two variables had relatively low inter-quartile range as well and seemed to measure the same concept of design changes, the two variables were not deleted because of their theoretical significance. The last variable had a low standard deviation but a relatively high inter-quartile range, a basis upon which it was retained for further analysis.

Scale reliability (internal consistency) was checked using Cronbach coefficient alpha. A scale is said to be reliable if it produces a coefficient alpha of at least 0.7 (Hair et al. 2006; Pallant 2001). In this study, the Cronbach’s coefficient alpha for the entire scale, consisting of 35 measurement variables was 0.831 with relatively high corrected item-total correlations indicating the presence of high internal consistency in the measurement scale. Investigation of each of the five individual variables revealed that a clear plan was formulated and an efficient planning and control system was designed to keep the current project up-to-date”, “this project has led to the increased release of toxic material”, “no delays were experienced in securing funds during project implementation”, “the right material was used for the construction work” and “proper medical facilities were available for people working on the project”, will improve the value of Cronbach alpha. However, the improvement that will be achieved was relatively insignificant to necessitate their deletion.

Content validity was achieved through extensive literature review and an in-depth discussion with experts. The dimensions of variables were identified from construction project literature available in internationally refereed journals and previous academic researches. The experts included 2 university professors, 2 practicing contractors and 1 regional consultant based at the ministry of Public works.

3.1.6 Identification and recruitment of field assistants

The researcher recruited 24 field assistants, one for each of the 24 in Kakamega, Vihiga, Bungoma and Busia Counties. These were students in the Faculty of Commerce at the Kisii University College. The field assistants were expected to administer questionnaires to the general respondents, namely clients, consultants, contractors and the community. The researcher mobilized the target respondents

in particular constituencies and prepared the research schedule before the actual field research commenced.

3.1.7 Training of the constituency field assistants

To ensure that the field assistants clearly understood the study and the data collection exercise, a one-day training for them was organized and executed. The training revolved around different stakeholders' responsive methodologies, sampling and mobilization techniques. They were also taken through the data collection tools to familiarize themselves with the instruments they would use in the data collection exercise.

3.2 Identifying potential Survey Participants

The target population for this research consisted of individuals who took part in construction of CDF projects. To recognize the difficulties that could arise in the sampling frame, the target population was redefined (Kassim 2001) to consist of the clients, consultants and contractors who were involved in the construction of CDF projects between 2003/2004 and 2010/2011 financial years. In each year, several projects are undertaken in each constituency. Inspection of the list of projects in each constituency revealed that there were over 4,000 projects undertaken between 2003 and 2011. However, only 586 construction projects involved educational facilities, health facilities, light industries and agricultural markets, a criterion used in the selection of projects.

3.3 Sampling Design

3.3.1 Sampling frame

The sampling frame adopted comprised of three sources as clients, consultants and contractors. The clients were sampled from a list of all construction projects undertaken and completed since 2003 in the four categories specified above. Project Management Committees (PMCs) of these projects, numbering 586 constituted the sampling frame for clients. A list compiled by AAK county offices of the four counties of Bungoma, Busia, Kakamega and Vihiga, provided the frame for sampling of consultants, whereas the contractors were selected from

a list of contractors provided by the regional Ministry of Public Works and was corroborated with the list obtained from contractors' associations at the regional offices. A total of 124 consultant organizations and 212 contractor organizations were found to be registered by AAK and KAC respectively.

3.3.2 Sampling procedure.

First the target population was stratified into three groups, clients, consultants and contractors. Then simple random sampling was done within each stakeholder group

3.3.3 Sample Size.

Based on Cochran's formula of sample size determination:

$$ss = \frac{z^2 \times p \times (1 - p)}{c^2}$$

A minimum sample of 464 respondents was required comprising of 234 clients, 93 consultants and 137 contractors. This minimum sample size for sub-samples was adjusted using Cochran's (1977) correction formula, because it exceeds 5% of the population (Bartlett et al., 2001). Assuming a 60% response rate as is the norm in social science research (Huston, 1996), this process resulted in a minimum sample size of 509 (280 clients, 90 consultants and 139 contractors)

3.4 Data collection

A total of 480 questionnaires were printed and distributed equally to 24 research assistants representing the 24 constituencies for purposes of data collection, with clear instructions on the modalities for their administration. The survey was conducted through face to face interviews with systematic respondents willing to participate in the study. At the end of four weeks, the research assistants submitted 181 completed questionnaires for purposes of data analysis, indicating a response rate of 37.7%. Through initial inspection, 21 questionnaires were found to be improperly filled as some had a large proportion of missing data. They were omitted for this study leaving 160 questionnaires for the analysis.

4. Discussion of Key Findings

This section discusses the demographic profiles of the project and respondents, descriptive statistics, and the results of exploratory factor analysis. Table 2 shows that majority of the projects surveyed were educational and health, each constituting 33.8% of the sample. The procurement method used was mainly negotiated general contract followed by the competitive bid while design/build was the least used. Whereas the majority of projects experienced delays in schedule ranging from 6 months to over a year, only 47% of the projects exceeded the original cost. Stakeholders' impact on projects was evenly spread except that the consultants seemed to have the lowest impact during construction. Further most projects had between 10 and 199 employees during their construction.

Table 2: Demographic profile of the projects

	Item	No	%	Item	No	%	
Project classification	Educational	54	33.8	Project Delay	None	24	15.0
	Health	54	33.8		Less than 6 months	98	61.3
	Industrial Estate	23	14.4		6-12 months	26	16.3
	Agricultural Market	29	18.1		over 12 months	12	7.5
Procurement approach used	Design/Build	11	6.9	Client impact on the project	Low	46	28.8
	Competitive bid	54	33.8		Medium	55	34.4
	Negotiated general contract	95	59.4		High	47	29.4
					Very High	12	7.5
Cost overrun	None	85	53.1	Consultant impact on the project	Very Low	10	6.3
	Less than Ksh.100,000	50	31.3		Low	80	50.0
	Ksh.100,000 - Ksh. 300,000	20	12.5		Medium	39	24.4
	ksh. 300,001- Ksh 500,000	5	3.1		High	31	19.4
Number of Employees on the project	Less than 10	1	0.6	Contractor impact on the project	Low	26	16.3
	10-29	68	42.5		Medium	22	13.8
	30-199	89	55.6		High	69	43.1
	200-999	2	1.3		Very High	43	26.9

4.1 Demographic profile of the respondents

The respondents were asked to indicate their experience in the construction industry in general and in CDF projects, in particular. Table 2 summarises the responses. It can be noticed that the majority of respondents were actually clients followed by contractors and then consultants. The organizations that these respondents worked for were fairly experienced with majority having over three years' experience.

Whereas 91.2% of the respondents had over 3 years in the construction industry, only 76.9% had been involved in the construction of CDF projects for over three years. Most stakeholders had worked on more than 4 projects per year whose value was below kshs. 10 million, an indication that CDF funds small projects. Finally, 63.1% had had previous work relationships with each other in an almost equal proportion.

Table 3: Demographic profile of the respondents

	Item	No	%	Item	No	%	
Respondent position on the project	Client	76	47.5	Respondent involvement in CDF Projects	Below 3 years	54	33.8
	Consultant	36	22.5		3-6 years	84	52.5
	Contractor	48	30.0		over 6 years	22	13.8
Organizational Experience in construction	Below 3 years	14	8.8	Previously worked with one another	Yes	101	63.1
	3-6 years	63	39.4		No	59	36.9
	7-10 years	64	40.0	Who did they work with	none	59	36.9
	11-14 years	19	11.9		With Client	31	19.4
Respondent Experience in Construction	Below 3 years	37	23.1		With Consultant	34	21.3
	3-6 years	75	46.9		With Contractor	36	22.5
	7-10 years	48	30.0				
Value of CDF projects worked on in the last 3 years	Over ksh. 15m	29	18.1	Average quantity of projects involved in per year	Upton 3 projects	30	18.8
	10m-15m	47	29.4		4-6 projects	99	61.9
	Upton ksh. 10m	84	52.5		7-9 projects	31	19.4

4.2 Descriptive statistics of performance measures.

In exploring the performance indicators, all the standard deviations are found to be above 1 except two, V34- “all stakeholders associated with the current project supervised the quality of the project in all its phases” and V27- “the project contractors were often called back during the Defects Liability Period to repair defects”, whose values are however close to 1. This is an indication that the scale measures variations among the performance indicators. The means vary from of 2.50-3.85 indicating that surveyed respondents consider all the 35 items relevant for measurement of performance among public construction projects. The highest ranking was all stakeholders supervised the project quality throughout with a mean of (3.85), an implication that according to respondents, an extremely important measure of performance among public construction projects. The other measures among the top five were: workers were provided with proper medical facilities (3.78), adversely affected the quality of groundwater level (3.68), no delays were experienced in securing funds (3.50) and no financial claims at handover (3.47). The three least important measures were; the work utilised environmentally friendly technology (2.66), no additional costs due to variations (2.60) and fatalities did occur on this project during construction (2.50).

4.3 Identifying the factor structure of the KPIs construct.

The researchers conducted exploratory factor analysis to further explore the factor structure of the 35-item instrument. The value of Kaiser-Meyer-Olkin (KMO) measures of the sampling adequacy is 0.578 indicating that factor analysis can proceed ($0.578 > 0.50$) since the sample size is large enough. Bartlett's sphericity test obtained a chi-square value of 6461.540 and significance level of 0.000 suggesting that the correlation matrix is not an identity matrix, that is, the intercorrelation matrix contains sufficient common variance to make factor analysis worthwhile. Principal component analysis extraction method and varimax factor rotation method were used to examine the sample data of 160 responses. While identifying factors underlying the KPIs construct, the process was subjected to four conditions; a) fixed number of factors to six, b) items whose loadings are less than 0.4 or cross loadings of greater than 0.5 be deleted, c) retain only factors with at least two items and d) that the number of factors extracted

should account for at least 60% of the variance (Malhotra and Das, 2011; Hair et al., 2006; Field, 2005; Kassim, 2001).

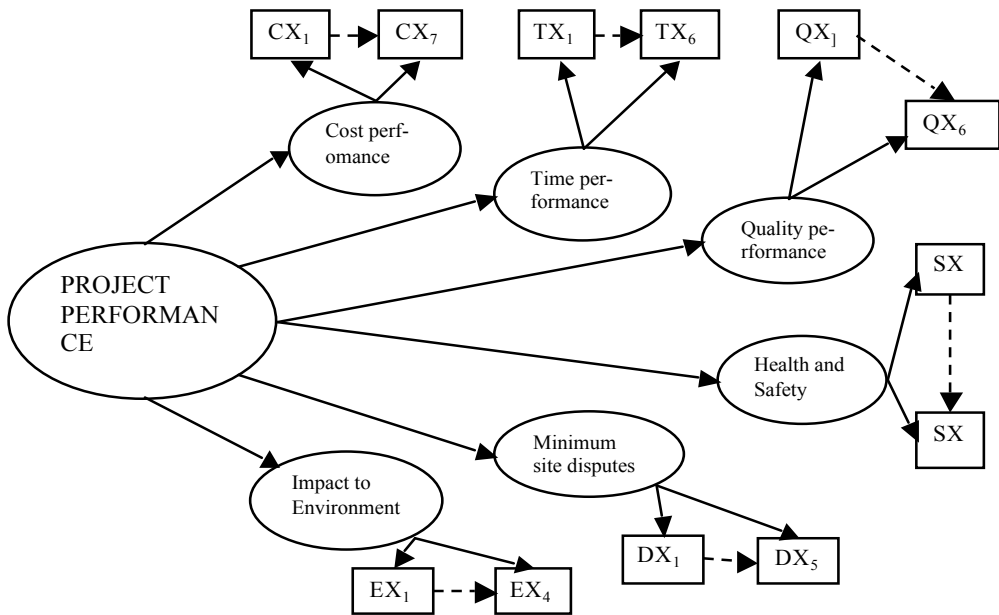
Factor analysis was iteratively repeated and items deleted sequentially resulting in a final instrument of 31 items represented in six factors, accounting for 71.37% of the variance in the data set. The variance explained by each factor was factor 1-16.53%, factor 2-14.96% factor 3-11.60%, factor 4-9.83%, factor 5-9.68% and factor 6-8.77%. Inspection of the variables identified cross loading on six items: “disputes due to the frequent changes”, “the work utilised environmentally friendly technology”, “at handover there were no apparent defects”, “contractors were often called back to rework”, “utilised reusable and recyclable materials in construction” and “employees had requisite skills and experience”. Whereas the differences in the cross loading of five items were fairly large, and the items cross loaded on the theoretically appropriate variables, the item, “at handover there were no apparent defects” had very small differences in cross loading (*0.558 versus 0.530*). The item was, therefore, assigned to factor 5 despite relatively lower loading due to its characteristic features. In this study factors were named based on the measures that load highly on specific factors as indicated in Table 4.

Table 4: Identification of performance measurement items.

<p><i>Factor 1: Cost Performance</i></p> <p>CX₁= No increase in cost of materials CX₂= Resources matched plan budget CX₃= Equipment at pre budgeted rates. CX₄= Stability in Labour costs CX₅= No additional costs due to variations CX₆= No incidences of fraud CX₇=Utilised reusable and recyclable materials in construction.</p>	<p><i>Factor 2: Time performance measure.</i></p> <p>TX₁= Timely delivery of project resources. TX₂= A clear plan was formulated and followed TX₃= No delays were experienced in securing funds. TX₄= Harmonious relationship between labour and management. TX₅= Weather and climatic conditions delayed the project. TX₆= No design changes were introduced.</p>
<p><i>Factor 3: Minimum dispute measure.</i></p> <p>DX₁= No trade unions agitation DX₂= No serious dispute between the client and contractor. DX₃= Dispute resolution meetings were often held. DX₄= No financial claims at handover. DX₅= Disputes due to the frequent changes.</p>	<p><i>Factor 4: Quality performance measures</i></p> <p>QX₁= All stakeholders supervised the project quality throughout. QX₂= A sound quality management system was strictly adhered to. QX₃= Contractors were often called back to rework. QX₄= Workers were trained on positive attitude and methods. QX₅= Employees had requisite skills and experience. QX₆= at handover there were no apparent defects.</p>
<p><i>Factor 5: Health and safety measures</i></p> <p>SX₁= Near misses occurred quite often during construction. SX₂= Fatalities did occur on this project during construction. SX₃= Accidents were often reported during project construction.</p>	<p><i>Factor 6: Minimum environmental impact factors.</i></p> <p>EX₁=Project has led depletion of the natural and mineral resources. EX₂=This project has led to air pollution in the adjoining areas. EX₃=Increase in solid waste due to the project construction. EX₄=The work utilised environmentally friendly technology.</p>

From the factor relationships in the above table, we were able to develop a theoretical framework of construction project performance. This framework (figure 1) demonstrates that project performance can be described in terms of cost variables (CX_1, CX_2, \dots, CX_7), Time variables (TX_1, \dots, TX_6), Quality variables (QX_1, QX_2, \dots, QX_6), Health and Safety variables (SX_1, SX_2, \dots, SX_5), Minimum disputes (DX_1, \dots, DX_3) and minimum environmental impact (EX_1, EX_2, \dots, EX_4).

Figure 1. Relationships between KPIs and overall project performance.



5. Validation of the Key Performance Indicators.

5.1 Reliability

Reliability of the KPIs scale was established through internal consistency of the items retained in the scale under various factors by use of Cronbach's alpha coefficient. The 31 item scale had a reliability of 0.806 well above 0.70 recommended for similar studies (Malhotra and Das, 2011; Hair et al., 2006). The Cronbach's alpha coefficient for each factor was as follows: cost performance measures = 0.895, time performance measures = 0.880, minimum disputes measures = 0.723, quality performance measures = 0.862, health and safety measures = 0.752 and environmental impact measures = 0.814. All the 31 items had a corrected item-to-total correlation above 0.38.

5.2 Content validity

The content validity of the KPIs instrument was achieved through the procedure used in designing the instrument. Specifically, the final instrument was designed after extensive literature review as well as in-depth interviews with experts and discussions with practitioners.

5.3 Discriminant and convergent validity

Discriminant and convergent validity in order to assess convergent and discriminant validity of the 31 item scale, the researchers used the correlation matrix. The inter-item correlation of the scale had a mean of 0.118, an indication that they were large enough to warrant an assessment of discriminant validity. The smallest within-factor correlations are cost performance measures = 0.457, time performance measures = 0.437, minimum disputes measures = 0.486, quality performance measures = 0.160, health and safety measures = 0.400 and environmental impact measures = 0.423. These correlations are significantly greater than zero ($p < 0.000$) and the existence of several cross-loading items necessitate examination of discriminant validity

To assess discriminant validity, the reproduced correlation matrix was used. This matrix showed that correlations in the validity diagonal exceeded any other correlation in its row or column of each factor grouping. This provides support for the existence of discriminant validity in the measurement scale. Further, a factor correlation matrix using Promax rotation method indicates that the correlations between the six factors were low (below 0.300) demonstrating that the scales were sufficiently different from each other (Steine et al., 2001).

6. Managerial implications

Through exploratory factor analysis, the researchers developed a 6 factor, 31 item instrument with sound theoretical properties for the measurement of performance of public construction projects. This instrument provides a basis for effective assessment of performance among CDF construction projects. The economic, political, societal and ecological environment in which construction of CDF projects is undertaken is highly uncertain, making the task of project execution a

gigantic task in itself. There is need for all stakeholders to understand the interplay of different key performance indicators on the overall performance. In this study, we have been able to develop an empirically validated model of measuring performance of projects at all phases. The instrument was demonstrated to be highly reliable and it empirically supported the presence of content validity, convergent validity and discriminant validity. The cross-sectional aspect of the data considering the views of clients, consultants and contractors makes this instrument appropriate for performance measurement from the perspective of all stakeholders.

Apart from providing a framework for overall assessment of project performance, the developed measurement instrument can be used to compare performance of different types of projects at different phases on specific dimensions of performance. Even though a better way would have been to consider the level of performance derived from each KPI, this evaluation instrument will provide stakeholders in building construction with a fast and early feedback on project performance. The project stakeholders can use this measurement instrument to clarify their understanding of project performance during construction and be able to take corrective action in order to improve overall performance.

Even though the developed instrument will enhance decision making, it has several limitations. Given that data for the development of the measurement instrument was gathered in Kakamega, Vihiga, Bungoma and Busia Counties, there is need for a confirmatory analysis to establish the extent of its application. Further, the instrument ought to undergo cross-cultural validation using data gathered elsewhere in Kenya and the world as a whole to enhance item generalization. Similarly, there is need for evaluation of test-retest reliability of the instrument to ensure its stability over time.

7. Conclusion

This study concludes that project performance is a multi dimensional construct which goes beyond satisfaction. We recommend that those in practise in construction project performance utilise the proposed instrument in measuring performance of construction projects. The instruments can be used to investigate aspects of the project and overall assesment.

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GENDER MAINSTREAMING STRATEGIES IN UPGRADING OF RURAL PROJECTS IN KARATINA, NYERI COUNTY, KENYA

Mwenda, M. N.¹, Otieno-Omutoko, L.²

ABSTRACT

Gender mainstreaming is a concept that addresses the well being of women and men. It is a strategy that is central to the interests of the whole community and a concept that has received much attention in literature on project management. This paper aimed at examining the application of gender mainstreaming strategies in upgrading of Karatina market, a rural-based project in Nyeri County in Kenya. It sought to assess how gender policies were adhered to in the project. The study used descriptive survey research design and document desk review of relevant research literature. Questionnaires and interview guides were used as instruments of data collection. The resultant data was analyzed using quantitative and qualitative methods. Descriptive data analysis was done using measures of central tendencies. For qualitative data, content analysis was applied. Findings indicated that the plan for the project was designed in a way that met women's and men's needs. 58% of the respondents maintained that both men and women were included in decision-making organs engaged in project development. However, findings revealed reluctance by women to undertake construction work. 58% of top management team maintained that some regulations in the gender mainstreaming guidelines were difficult to comply with. The article argues for gender mainstreaming strategies such as application of the one third rule of affirmative action in favour of women during recruitment of project team members and gender-responsive consultation with project beneficiaries. This paper concludes that gender mainstreaming strategies should be integrated in all phases of the project cycle.

Keywords: *Gender equality, Gender mainstreaming, Gender strategies, project cycle, project management, rural projects*

1. PhD Candidate Department of Extra Mural Studies, University of Nairobi, P.O. Box 41-10101, Karatina, Cell: 254- 0721 582886, marynyawiramwenda@yahoo.com

2. Senior Lecturer, Department of Extra Mural Studies, University of Nairobi, P.O. Box 24386-00502, Nairobi, Cell : 0722 630 202, lyllemutoko@yahoo.com : joyce.lillian@uonbi.ac.ke

1. Introduction

The quest for development has led to a consensus that participation by both men and women is essential for sustained development interventions. Development initiatives can be significantly improved through greater awareness on the part of government counterparts, project management and beneficiaries on gender mainstreaming and its practical implication. It is widely acknowledged that promoting gender equality is an essential component of an effective economic and human development strategy (GOK, 2007). *The Kenya Vision 2030* was formulated as the long-term development blueprint for the period 2008–2030 and envisions creating ‘a globally competitive and prosperous country with high quality of life for its citizens by the year 2030’. *Vision 2030* strives to achieve its aims through initiation and implementation of sectoral projects (GOK, 2007). Kenya is one of the countries which ratified the Millennium Development Goals. Goal number 3 on Gender equality necessitates integration of gender issues in planning and development, implementation, monitoring and evaluation of policies and programs in the political, economic and societal spheres so that women and men benefit equally. The World Bank (2007) recognizes gender equality as a core development issue and a development objective in its own right because it strengthens countries’ abilities to grow, reduces poverty and increases opportunities for effective governance.

The ultimate goal of gender mainstreaming is to achieve gender equality (Moser & Moser, 2005). Gender mainstreaming is a strategy for ensuring that the concerns of both women and men form a fundamental aspect of project management and programs in all political, economic and societal spheres so that they can benefit equally. Women and men exhibit distinct differences in their perspectives, and priorities concerning environmental quality, use of natural resources, project activities and benefits and access to services. Experience with best practice cases across projects highlights the importance of including a gender analysis, as part of social assessment or as a stand-alone exercise, at the onset of a project. The *Status of Women-Canada* (2001) report, points out that undertaking gender analysis is critical, because all policies and activities have a gender perspective or implication. The book further explains that policies and programs become more effective when the impact of gender is considered and addressed during

conceptualization and finally, it contributes to the rectification of systemic gender-based discrimination.

Gender equality is not solely a women's issue as it seeks to tailor activities to the beneficiaries of the project from both sexes (GEF Report, 2008). In most developing countries, gender inequality is a major obstacle to meeting the Millennium Development Goals (MDGs) (GoK, 2005b). According to the Government of Kenya, achieving this goal is rather difficult because of the eminent gaps between women and men in terms of capacities, access to resources and opportunities, and vulnerability to violence and conflict. MDG Goal 3 focuses on the historical disadvantages affecting women and girls and identifies men and boys as strategic allies in transforming the factors causing this disparity. The gender equality goal also incorporates indicators which address persistent gender differences in labour market opportunities, legal rights, and the ability to participate in public life and decision making (GoK, 2005b). A people-centred agenda must work to ensure the equal rights of women and girls, and empower them to participate and take on leadership roles in public life. Women across the world have to work hard to overcome significant barriers to opportunity. These barriers can only be removed when there is zero tolerance of violence against and exploitation of women and girls, and when they have full and equal rights in political, economic and public spheres (Yudhoyono, Bambang, Sirleaf & Cameron, 2013).

To realize the MDGs, governments and their partners must seriously and systematically 'engender' efforts to achieve all the goals (UNDP, 2006). In the past decade, United Nations Development Program (UNDP) has put in place a number of policies and strategies to mainstream gender throughout its programmatic activities. Failure to understand and address gender dimensions within programs and projects, risks wasting of development resources and negative effects on household welfare, women's equality, and environmental sustainability (ADB, 2009). For a project to realize its intended goals, measures must be put in place to safeguard it against reproducing or generating gender disparities (Wendoh and Wallace, 2005). Gender mainstreaming should not only be regarded as a factor requiring attention in infrastructure projects but rather must be considered as a critical factor in ensuring the project's success and sustainability by ensuring that

women do not become worse off both absolutely and in relation to men (World Bank, 2008).

2. Statement of the Problem

Equality between women and men is seen both as a human rights issue and as a precondition for, and indicator of, sustainable people-centred development. Gender mainstreaming includes all aspects of project management. Despite efforts at the policy level and a growing awareness of the crosscutting gender issues in development programs, gender mainstreaming has been slow to translate from policy into action. Gender issues continue to be viewed by many development practitioners as separate and unrelated to programmatic issues (Tiessen, 2005). For many male programme implementers, gender issues are irrelevant to the development problems they seek to address. There are cultural norms that perpetuate gender inequality within communities, organizations and institutions. Gender inequality is produced and reproduced at all these levels on a daily basis through the sanctioning of norms, behaviors and practices, which reinforce women's subordinate position in society.

There is also the challenge of overseeing and integrating gender strategies in all programs and project activities (Wendoh & Wallace, 2005). Programme implementers responsible for gender mainstreaming are seldom in positions of power which enable them to make decisions about, and modifications to, other personnel's programs. In a study on gender mainstreaming, Wendoh et al (2005) explain that government officials dealing with gender mainstreaming in African countries reported a resistance at implementation level where senior officials give higher priority to other activities and grade gender issues at a lower level. A study conducted by Ebila (2004), reported that although Uganda was known for having a gender-sensitive approach to development, there were no clear guidelines on how to mainstream gender in the water and sanitation policies, despite the fact that gender cannot be divorced from effective water management and use.

Mainstreaming approaches have the potential to alter societal norms and practices. A study by Souza (2003) of Brazil on "Conscious Fostering of Women's Leadership: 'Water Women' project in Brazil" reported that a couple of

women who started in the project left because of the lack of support from their husbands. Similarly, Majekodunmi of Nigeria in his research on “Using Gender Mainstreaming Processes to Help Protect Drinking Water Sources of the Obudu Plateau Communities” observed a major obstacle that the traditional village system was patriarchal, and endowed men with all decision-making powers (Majekodunmi, 2006), indicating a need for sensitization of men on gender issues and education of all on importance of gender mainstreaming. In a study titled “Empowering Women’s Participation in Community and Household Decision-making in Water and Sanitation” carried out in Egypt by Hammam (2004), it is clear that existing power structures hinder women’s empowerment, particularly at the management level. Poku (2006) reiterated that although women are the key players in implementing changes in hygiene behaviour, the contribution and roles of rural women are often overlooked or under-utilized in the drafting of water and sanitation policies.

Despite all the positive gains made in the last few years, gender mainstreaming efforts in government projects are still facing serious challenges. There is an apparent lack of common understanding within government departments on what gender mainstreaming entails (Sedibelwana, 2008). In Kenya, in a study by the International Development Research Centre (IDRC) on “Gender Differences in Community Water Management in Machakos”, 85% of respondents in the survey said women are victims of harassment by men and attacks by thugs when they go out to draw water. The research further pointed out that few women sat on water management committees, since they were afraid of expressing themselves in front of men and many more women were too busy with household chores. The report also revealed that women were not consulted during the design of the water supply system hence no provision was made for making facilities available for use of the water (IDRC, 1997).

This paper, therefore, sought to examine gender mainstreaming strategies in a rural market project with a view to identify best practice for effective gender integration in the context of project management.

3. Development of Gender Mainstreaming Strategies in Project Management

Alston (2006) traces the historical development of gender mainstreaming to the 1975 International Women's Year, which culminated in holding of the World Conference on Women in Mexico, sponsored by the United Nations (UN). At this conference, women recognized the fact that despite their differences, they share commonalities with regard to their unequal treatment by society. Furthermore, the conference sought to raise awareness on the fact that international and national development depends on the participation of both women and men.

In 1979, the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW) was adopted by the United Nations (UN) General Assembly. In 1980, halfway through the "Decade of Women", the UN adopted a Program of Action, which emphasized equality, development and peace. At the end of the decade of women, the UN held a conference in Nairobi in 1985 to consolidate the organization's efforts in the area of gender equality. At this conference, the "Forward Looking Strategies" were adopted. The strategies called for sexual equality, women's autonomy and power, recognition of women's unpaid work, and advances in women's paid work (Alston, 2006). Alston further stated that women activists progressively changed their direction from focusing on women's issues to the advancement and empowerment of women. This change of direction was instrumental in that by the time the Beijing Conference was held in 1995, the emphasis had changed to ensuring that a gendered perspective is included in all policies and programs, thereby, leading to the beginning of the gender mainstreaming approach.

Overall, these international conferences reinforced the need to ensure that gender mainstreaming is operationalised at all levels. The change was also brought about by criticisms of a women-focused approach, which occurred in the run-up to the Beijing Conference. These criticisms ranged from the dangers of viewing women as an indivisible category, to focusing attention on women in one small area of organizational structures (thus, ignoring the organizational cultures), to the complex gender relations and ideologies that perpetuate women's disadvantage, to the lack of significant change in gender disadvantage

over time (Chant and Gutmann, 2000, in Alston, 2006). De Waal (2006) argues that Gender mainstreaming has developed over several decades, and has its roots in the Women in Development (WID) approach, which emphasised the need to integrate women into the development process. The second approach was Gender and Development (GAD), which examined the social differences between women and men and the need to challenge existing gender roles and relations (De Waal, 2006). International agencies pursued the WID and GAD models at the expense of gender equality and women's empowerment, and accordingly measured the impact of development according to WID and GAD, rather than gender equality and women's empowerment.

In view of the above historical trend, gender mainstreaming has emerged not only to focus on the gender equality situation within an organization, but also on equal opportunities in terms of recruitment, advancement, conditions of work, norms, attitudes, values, organizational culture, management style, and others. Furthermore, gender mainstreaming is not only concerned with increasing equal opportunities and gender balance within an organization, but also with incorporating attention to gender perspectives and the goal of promoting gender equality in the substantive work of an organization (Hannan, 2000).

Project undertakings, especially in rural settings, face distinct challenges associated with gender inequalities. This is mainly due to the gender stereotypes that exist. Cultural norms deeply entrenched in communities' traditions strongly militate against equal regard for men and women. In some communities, the woman is supposed to remain at home and is not expected to go out and seek wage labour hence have limited opportunities for paid employment and lack control over house-hold resources. In such cases the man is the sole breadwinner and he can work on the family farm or seek wage labour outside the home. The nature of work a woman can do is also biased in most societies. In many cases, the society expects women to assume subordinate positions not only at home but also outside home (UNDP, 2002). Therefore, although gender mainstreaming strategies have largely gained root in urban and peri-urban settings, United Nations Development Program (UNDP) indicates that in the rural areas, a lot still needs to be done to sensitize and empower women to arise and contribute to development on an equal basis with men. Gender relations in Kenya have been

molded by a combination of factors that include customs and cultural practices, awareness and education levels, economic conditions, traditional and modern laws and emerging patterns of social organization (Mwatha, 2009).

4. Gender Mainstreaming in Public Policy in Kenya

Kenya has ratified various international instruments which oblige the government as a duty bearer to promote and protect women's rights. In the same breathe, too, the Constitution of Kenya 2010 domesticates international human rights instruments into Kenyan law and commits the state to align its legislation, policies and practices to conform. These instruments and conventions include the Convention on the Elimination of All Forms of Discrimination Against Women (CEDAW), Nairobi Forward Looking Strategies for the Advancement of Women (NFLS), Beijing Platform for Action, Millennium Development Goals, Declaration on Gender Equality in Africa Convention on the Rights of the Child (CRC), United Nations Declaration on Violence Against Women (1993), International Covenant on Civil and Political Rights (ICCPR), the International Covenant on Economic, Social and Cultural Rights (ICESCR), the Universal Declaration on Human Rights (UDHR), the African Charter on Human and Peoples Rights (ACHPR, Banjul Charter), the Protocol to the African Charter on Human and Peoples' Rights on the Rights of Women in Africa (the Maputo Protocol) and the Programme of Action adopted at the International Conference on Population and Development (ICPD) held in Cairo in 1994 (GOK, 2008d).

This paper recognizes the importance of international and regional treaties, conventions and agreements/instruments and their role in promoting gender equality. In 1984, Kenya signed and ratified the Convention on the Elimination of All Forms of Discrimination against Women (CEDAW). Subsequent to the World Conference to Review and Appraise the Achievements of the UN Decade for Women, held in Nairobi in 1985, Kenya adopted the Nairobi Forward Looking Strategies for the Advancement of Women (NFLS). Kenya also committed to the Beijing Platform for Action (BPFA) in 1995 and in November 1996, the National Assembly adopted a motion for the implementation of the BPFA. Other commitments include the Millennium Development Goals, which were signed in September 2000; the Declaration on Gender Equality in Africa made during

the African Union Summit (July 2004) on employment creation and poverty alleviation; the Convention on the Rights of the Child (CRC) 1989; the United Nations Declaration on Violence against Women (1993); and the Programme of Action adopted at the International Conference on Population and Development (ICPD) held in Cairo in 1994 (GOK, 2008d).

It is instructive to note that international treaties have continued to inform legislation and policy in Kenya. According to the National Policy on Gender and Development (GOK, 2000), the need for a national policy arose from the government's realization that without a coherent and comprehensive overall framework for guiding gender mainstreaming within different sectors and ministries, enormous resources may continue to be misplaced. Kenya's participation in the first UN Conference on Women in 1975 in Mexico set in motion the process that led to the establishment of the Women's Bureau in the Ministry of Culture and Social Services in 1976. The Women's Bureau was given the national mandate to support the advancement of women in social, economic and political development. Its continuing role entails policy formulation, implementation, monitoring and evaluation, as well as coordination of government initiatives and programs for women, collection and analysis of sex-disaggregated data and information, and support to and liaison with non-government organizations (NGOs), women's organizations, and other stakeholders (GOK, 2006b).

The commitment of the Government of Kenya to mainstream gender into national development for equitable growth and poverty reduction is also evidenced by the establishment of different national machineries with distinct but complementary roles. The establishment of the now defunct Ministry of Gender, Sports, Culture and Social Services in 2003 marked the beginning of a focused consideration of the situation and status of women and their participation in various spheres of life in the country. Within the ministry, the Department of Gender was set up in December 2004 and assigned the task of providing technical support for promoting the range of mechanisms in gender mainstreaming. This includes aspects of policy, plans, programs and law. The Devolved government has further entrenched gender mainstreaming in its policies. In this case, all public institutions are required to implement Government policy on gender mainstreaming, including

compliance with one third rule on appointments, promotions and employment in the public service, as per the Constitution (GoK, 2014).

The National Commission on Gender and Development (NCGD) was also established in December 2003. It was mandated to coordinate, implement and facilitate gender mainstreaming in national development and to advise the Government on gender concerns (CEDAW Report, 2009). The Commission's core mandate is to undertake lobbying and advocacy, monitoring and evaluation, and oversight for legal reforms on issues affecting women and girls. Gender desks have also been set up in every ministry to sensitize ministries on gender and push for gender mainstreaming in policy making, planning, budgeting, implementation, monitoring and evaluation. A gender database was also officially launched by the former Ministry of Gender, Children and Social Development in 2009. In addition to the creation of national machineries, several policy documents relating to gender have been developed and adopted. Among these are the National Policy on Gender and Development (GOK, 2000) and its plan of action for 2008–2012 (GOK, 2008), Sessional Paper No. 2 of 2006 on Gender Equality and Development (GOK, 2006b), and the Monitoring and Evaluation Framework for Gender Mainstreaming (GOK, 2009b).

The Constitution also identifies areas of focus in the process of promoting equality and human rights of women, enhancing the effective participation of women, and integrating a gender perspective into development. The Constitution of Kenya, 2010, ensures that women and men will have the right to equal treatment and opportunities in political, economic, cultural and social spheres without discrimination. Article 27 of the constitution provides for equality of rights and freedoms including equal political, economic, cultural and social opportunities and outlaws discrimination on any grounds. Article 59 entrenches the proposed Kenya National Human Rights and Equality Commission to protect gender, human rights and freedoms. Further, gender rights are reinforced by Article 2 (6) which requires that any treaty or convention that Kenya has ratified, become part of Kenyan law, including those on women's rights. The Bill of Rights also provides for legislation to give full effect to the principle of Affirmative Action (The Constitution of Kenya, 2010). The Policy on Gender Equality and

Development establishes institutions as well as programs and activities through which the specified government objectives would be met. The former Ministry of Gender, Children and Social Development supported gender mainstreaming in all government ministries, advised on the impact of all government policies on women, monitored the situation of women, helped formulate policies and implement strategies to eliminate gender-based discrimination (CEDAW Report, 2009).

These documents emphasize the need to eliminate all forms of discrimination and enhance equity between men and women. They promote gender equality in opportunities, gender inclusion and empowerment and they set goals and targets to be achieved. Several milestones have been attained in Kenya in an effort to create policies to guide and track gender mainstreaming strategies. To this end, a Training Manual on Gender Mainstreaming has been developed to co-ordinate and harmonize gender mainstreaming initiatives by various government and non-state actors. Similarly, a monitoring and evaluation system is in place to track gender mainstreaming in the country, alongside a National Plan of Action to Implement the Gender Policy (2008 – 2012). The training manual is also meant to guide lobbying by both government and non-governmental organizations for gender mainstreaming, promote women's participation in various development activities as well as improve equality between men and women in socio-economic and cultural sectors. The manual also seeks to inform the implementation of a Presidential Executive Order issued on 30th October 2006 requiring that at least 30 per cent of new employees recruited or appointed into the public service be women (CEDAW Report, 2009).

5. Strategies for Effective Gender Mainstreaming in Project Implementation

Gender mainstreaming strategies are vital in all project phases as women need to be given fair representation as men. *Sessional Paper No. 2 of 2006 on Gender Equality and Development* expresses the government's commitment to advance the status of women. The overall objective of the policy is to ensure women's empowerment and mainstreaming of their needs and concerns in all sectors of development in the country so that they can participate and benefit equally from

development initiatives (GOK, 2006b). The policy paper outlines how gender should be integrated in all the planning phases: that is from problem identification (situational analysis and needs assessment), through design, implementation, monitoring and evaluation to the end-line evaluation. To this end, deliberate steps have to be taken to encourage women to participate in planning and all project activities, such as sitting on management committees (Lorber, 1994). Enhancing women's participation in project work would also require the project management teams to assess and address gender differences and inequalities in planning and implementation, of projects. Lastly, the project management teams would need to support and sustain gender perspectives in the recruitment of staff. (WHO, 2009).

Operationalising gender in policy analysis has been a critical element in Gender and Development (GAD) discourse (Boserup, 1989). Unlike the WID approach, Boserup posits that GAD approach seeks to challenge multiple forms of women's disempowerment and subordination (including gendered structures and institutions). She argues that projects should include gender-sensitive strategies in the project framework and associated project description. She avers that the project team should assess whether appropriate strategies have been defined to address the gender issues within project component activities of the proposed project and whether the gender issues relating to the project would be effectively addressed by either a targeted intervention or activities mainstreamed in the project component activities.

According to the African Development Bank (2009), project teams should verify whether all the quantifiable and non quantifiable, gender and social related direct and indirect benefits have been defined, and if they are realistic. In the same vein, too, projects must assess whether the proposed project has a relocation site selection in the design and if this has taken into account both women and men's concerns such as safety of the sites and proximity to viable sources of livelihoods and access to basic social service. A relocation site is crucial to allow continued sustainability of livelihoods. It is also pointed out that an assessment of how time is used locally along gender lines (informed by socially-constructed responsibilities) is critical at the preparation stage, as it should guide the design

of the project activities. Such knowledge helps to eschew the possibility of increasing the burden on women or forcing them to pass over some of their responsibilities to their daughters, whose schooling may then be negatively affected (ADB, 2009).

6. Methodology

This article draws on numerous documents and reports as well as a set of primary data collected in July 2012 using a descriptive survey research design. The aim was to collect information from respondents on their experiences, attitudes and opinions in relation to gender mainstreaming in upgrading of Karatina market in Nyeri County. Participation in this study was limited to adults working in, and those affected by implementation of the project. Efforts were made to find an equitable representation of male and female participants by convenient or purposive and snowball sampling techniques. Convenient sampling allowed selection of cases or units of observation as they became available to the researcher while snowball technique helped to locate individuals who were difficult to trace. The target population of the study consisted of 150 stakeholders who included project management team members, project workers and project beneficiaries/market traders. These included 10 members of Karatina Municipal Council, 10 members of the contractor's team, 10 members of the site committee, 60 project workers and 60 registered prospective stall owners (traders) with Business Permits. For triangulation purpose, both primary and secondary data was gathered. Primary data was collected through semi-structured interviews and a closed and open-ended structured questionnaire. Secondary data was obtained from project manuals, journals and books. Semi-structured interviews were used because of the flexibility they allow in the interview process as well as the standardization of research questions. Face to face interview was also used to clarify any ambiguities in information gathered using the instruments. Questionnaires were used since time was limited and information needed could be easily described in writing and clarification obtained from the respondents without restricting their responses.

The qualitative approach was adopted because it allows discovery and identification of new ideas, thoughts, attitudes and perceptions. Data was analyzed

using descriptive statistics with the aid of Microsoft Excel software. Measures of central tendency - mean, mode and median were analyzed. For qualitative data, content analysis was done to identify patterns, themes and biases. Finally, data was presented on frequency distribution tables and stored in soft and hard copies.

7. Discussion of Findings

7.1 Gender Policy in the Project Framework

The study used data to present and interpret the findings which revealed that 54% of the respondents across the board were aware that policies and regulations existed on gender mainstreaming. 67% of respondents explained that there was a gender policy that was operational. This aspect of gender mainstreaming is being fronted in all public and private organizations. The existence of a written policy is an indication of the effectiveness of the government's attempt to implement its own commitments to gender equity and equality. Almost all engaged in this study were aware that gender mainstreaming efforts were being implemented in all units. More than half (54%) of the project workers and market traders indicated that they adequately knew issues of gender policy, an indication of growing awareness.

Findings indicated that project implementers managed to comply with the gender regulations and policies, as both men and women were given equal opportunities for all the jobs and that 1/3 of either gender was maintained during each recruitment drive. Information obtained revealed that top management team consisted of 14 men and 6 women. This is in line with the constitution, the National Gender Policy (2000), the Presidential Directive of 2006 on at least a 30% minimum representation by women in all positions of leadership and employment across the public sector. Specifically, the constitution as the supreme law of the land, in Article 27, provides for equality of rights and freedoms including equal political, economic, cultural and social opportunities and outlaws discrimination on any grounds.

To establish further the strategies applied in gender mainstreaming within the project, the study sought to find out whether both men and women were included in most of the decision making panels throughout the project cycle. From the

findings, 42% of the respondents disagreed, which implies that there was a fair representation of women and that gender equity was an important component in the project management structure. This concurs with the views of Lorber (1994) that women have to take part on an equal basis with men in all the planning and project activities, such as sitting on management committees.

The project implementers made efforts in gender mainstreaming largely through sensitizing the stakeholders, offering equal opportunities to both gender and allocating specific positions to the disadvantaged gender. Stakeholders were informed of the need to ensure participation of both men and women in decision making throughout the project cycle. In addition, the views of the market traders as the key beneficiaries (most of them were women) were taken into account during the planning and implementation stages of the project). Indeed, 77% of the respondents indicated that both women and men were fairly represented at the planning stage of the project. Gender policy was not a document known to 44% of the respondents which implies that perhaps gender mainstreaming is still a preserve of management and they do not sensitize other organizational levels. This concurs with Hannan (2000) who stated that a number of serious misconceptions around gender mainstreaming do exist, hampering the effective implementation of project strategy. These are sometimes linked to the lack of understanding of basic concepts such as “gender” and “gender equality”.

7.2 Gender Concerns in Terms of Reference

The study further found that the majority of the respondents confirmed the project Terms of Reference (TOR) clearly specified gender issues and that majority of the implementing unit was aware of the gender mainstreaming strategy in place, as required by the constitution. 67% of the respondents indicated that gender concerns were factored and spelt out in the TOR of the project. This concurs with ADB (2009) that a key element for the success of a project is having clearly spelt out TORs to ensure gender concerns have been taken into consideration in the project plan and ensuring that there are linkages to policies and commitments to the gender equality strategy.

Allocation of facilities is meaningful to all only if it is done on the basis of sex as learned and understood by all members of a given society. While 73% of

the respondents indicated little concern for needs specific to men and women, a much smaller, 27% indicated that much was done towards taking specific needs separately for men and women in project undertakings. This may imply that needs specific to each gender were not adequately provided for. ILO (2002) stresses on the need to take into account both women and men's concerns such as safety of the sites and proximity to viable sources of livelihoods and access to basic social service. The same idea has been embraced by the African Development Bank (2009), which states that project costs and financing arrangements should always be assessed to determine whether adequate resource allocations have been made for the implementation of the gender mainstreaming actions in the project budget estimates of any proposed infrastructure project.

7.3 Gender Disaggregated Performance Indicators

Developing a set of gender disaggregated performance indicators, with gender disaggregated data, is *sine qua non* to facilitating monitoring and evaluation. Monitoring performance is also a key component of building accountability into every project (Touwen, 2001). 75% of the respondents indicated that gender – disaggregated data was not monitored in the project's monitoring/supervision plan and reflected in the monthly reports. This reflects low level of awareness on the tracking of gender specific performance indicators in the project. While it is essential that projects should include gender specific project performance indicators such as gender-specific monthly or quarterly reports in their monitoring and evaluation process, monitoring and evaluation is largely hampered by the lack of such crucial sex disaggregated data. In terms of evaluating the practice of gender mainstreaming, the findings are in line with the view taken by Moser (2005) that the ultimate test of whether gender mainstreaming has either succeeded or failed lies in the rigorous monitoring and evaluation tools. Gender-specific project performance indicators are a necessary component of a project's monitoring and evaluation framework. The study, however, found that gender issues were well addressed during the process of project evaluation. It was noted by half of the respondents that gender issues raised after the evaluations were well addressed by the management. The other half failed to agree that the concerns were addressed. This ratio is an indication of lack of a clear mechanism to address gender issues after project evaluations.

Tanja (2000) expressed the view that when those planning or implementing programmes, projects or policies act on the evidence of gender-differentiated impact, they end up promoting equal access and benefits to both men and women. This concurs with Wendoh et al (2005) who pointed out that government officials dealing with gender mainstreaming in African countries reported a resistance at implementation level where senior officials give higher priority to other activities and grade gender issues at a lower level. Addressing gender issues after project evaluations is a vital element of the project cycle which was found to lack in the project.

7.4 Challenges Hindering Effective Gender Mainstreaming

Despite the existence of the policies, legislative reforms, plans and programmes, gender disparities persist in legal, social, economic and political levels of decision making, as well as access to and control of resources, opportunities and benefits (GOK, 2008). The Plan of Action attributes the slow implementation process mainly to gaps in the laws, delayed enactment of gender-related legislation and lack of comprehensiveness in the content of some laws. More so, affirmative actions are selectively implemented without a grand plan for gender equity in all facets of human life (GoK, 2005).

Other challenges include weak coordination, harmonization and networking among actors at all levels, inadequate resources (human and financial), limited technical capacity and capacity consistency resulting from deployment/transfers. Socio-cultural issues, misinterpretation of the concept of gender as applying only to women rather than to women, men, boys and girls, and a lack of gender sensitivity in the development of core sector indicators and targets are also well entrenched barriers. Finally, despite the ambition of the gender action plan, sector and national budgetary allocations are lacking to support targeted gender activities at all levels.

The debate on gender mainstreaming, its theoretical concepts, and the manner in which it is implemented is highly complex and contested. People-centered approaches do not always ensure that gender perspectives are taken into account. As a result, one observes a different and inconsistent approach in the implementation of gender mainstreaming across some government projects. Moser (2005) states

that in many projects, there is no reliable and systematic evaluation of gender mainstreaming outcomes and impacts. For Moser, the biggest challenge lies in identifying correct indicators, which would require four interrelated indicators measuring inputs, outputs, effects and impacts.

Other challenges observed during the research included the lack of a gender specialist in the project, the absence of women engaged in actual construction work, ignorance by project beneficiaries on gender concerns in project implementation and inadequate resources to provide required facilities for each gender. Resistance by women to undertake construction work was reported to emanate from societal norms that place heavy manual work on men (owing to their masculinity). During the interviews, one respondent stated that the few women who attempted to participate in the construction soon abandoned the work claiming it was very exhausting while another one argued that women abandoned the project site due to their additional household responsibilities. The only woman available at the construction site was an elderly lady who sold simple meals to the construction workers. According to Tiessen (2005), women are more likely to feel the burden of additional community responsibilities and work. The findings clearly point out the complexities associated with gender roles as dictated by culture.

8. Recommendations

Integration of a gender dimension into a project's analytical work is important and an understanding of gender issues is a necessary prelude to gender-responsive project design. For successful implementation, there should be tracking of whether gender analysis of projects has been conducted for improvement of performance and achievement of quality which would result in gender balance that is necessary for development.

Training of project managers and project team members is of paramount importance. To assist project managers in mainstreaming gender issues into operations, The Ministry of Labour, Social Security and Services should work with project partners to add gender and development content to project management. The National Commission on Gender and Development should continue to create and disseminate adaptable operational tools and good practice examples for use in project operations.

There is need for capacity building of project implementers. The National Commission on Gender and Development and the Ministry of Labour, Social Security and Services should work with project partners to add gender and development content to project management. The National Commission on Gender and Development should continue to create and disseminate adaptable operational tools and examples of good practice for use in project operations. Accountability and responsibility of project staff for gender mainstreaming should be clarified. Project managers should be held accountable for integration of gender issues in project management.

9. Conclusion

This paper concludes that gender mainstreaming strategies are vital in all phases of the project cycle. If well executed, gender strategies would help to enhance gender responsiveness among policy makers as they will re-focus their energies to incorporate a gender perspective in project processes and to mitigate against gender stereotypes and gender-based discrimination. Gender strategies will ensure bringing on board all men and women as equal development partners thereby yielding synergy and greater output in economic development. Women can be effective agents for change if empowered, this can be done through analysis of their status, priorities, contributions and needs relative to men's. Resultant data can be used in planning for access and control of resources for decision making. Monitoring and evaluation of institutionalisation of gender is necessary for appropriate and context-specific indicators that capture the impact of interventions to promote gender equality and empowerment of women.

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ADOPTION OF BIOGAS TECHNOLOGY PROJECTS AMONG RURAL HOUSEHOLDS OF LANET LOCATION, NAKURU COUNTY-KENYA.

Njoroge, W. R.¹, Nyonje O. R.², Gakuu M. C.³

ABSTRACT

Biogas technology is one of the renewable energy with various benefits and the ability to provide an alternative to the more expensive hydro-electric power. Effort by the government of Kenya to promote the adoption of the Biogas technology is well spelled out in the National Energy Sessional Paper of 2004 and in the Energy Act No. 12 of 2006. There is evidence that adoption of Biogas technology is very low and little is known about factors that could be causing this poor adoption rate particularly among the rural population. This study sought to investigate how selected household characteristics, household attitudes, and household income influenced adoption of biogas technology projects. Descriptive research design targeting 6,956 households in Lanet Location, Dundori Division of Nakuru North District was employed. A sample size of 364 households was selected proportionally and systematically from two sub-locations forming Lanet location (Mereroni and Muruyu). Descriptive statistics were used to analyze the data. The study established that only 24.1% of households had adopted biogas technology. The adoption levels between Male-headed and female-headed households were found to be 41(12.7%) and 37(11.4%) respectively. Among the households heads with positive attitude towards biogas technology projects, only 18.8% had actually adopted the technology. Of those who had not adopted the projects, 37% had neutral attitude towards the technology. Income was the main factor behind the adoption of biogas technology. The study concluded there was low adoption which could have been caused by factors such as education level of the respondents.

Key Words: *Biogas technology; sustainable energy; Technology adoption; community projects*

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1. Part Time Lecturer, Nakuru Extra Mural Centre, P.O Box 1120-20100, University of Nairobi
 2. Senior Lecturer, Department of Extra Mural Studies, University of Nairobi, P.O. Box 92 - 00902 Kikuyu, raphael.nyonge@uonbi.ac.ke : rnyonje@yahoo.com
 3. Associate Dean, School of Continuing and Distance Education, University of Nairobi, P.O. Box 92 - 00902 Kikuyu, cmgakuu.gakuul78@gmail.com

1. Introduction

Africa has substantial new and renewable energy resources, most of which are under-exploited. Based on the limited initiatives that have been undertaken to date, renewable energy technologies (RETs) have been cited to contribute significantly to the development of the energy sector in eastern and southern African countries. Renewable energy technologies are well suited for meeting decentralized rural energy demand, they utilize locally available resources and expertise, and would, therefore, provide employment opportunities for the locals (Karekezi and Kithyoma, 2003). Placing low income households at the center of energy, sanitation, and hygiene interventions offers opportunities to address multiple development priorities effectively and simultaneously using integrated approaches. In Sub-Saharan Africa, the majority of poor households lack basic cooking facilities such as rudimentary latrines and engage in poor hygiene practices. An estimated 80- 90% of African households rely on traditional biomass fuel (such as firewood, charcoal, dung, and agricultural residues) to meet their daily cooking needs (WHO, 2000).

Wood fuel in Kenya constitutes 90% of energy consumption in the rural areas with the demand growing at 3.6% per annum. The use of such fuel has significantly contributed to deforestation through felling of trees leading to a low forest cover in Kenya of less than 4% of the total land area compared to the world requirement of 20%. The rate at which wood fuel is obtained from forests has caused alarm since the 1970's due to lack of sufficient information that would lead to sustainable management of forest resources (GOK, 2010). Biogas technology has been in Kenya since 1950's but is restricted to the highly productive areas of Kiambu, Nakuru and Kisii (Mulwa et al, 2010).

The Government of Kenya has recognised the fact that there are significant economic and environmental benefits the country could derive from undertaking increased investment in clean energy through a combination of efficient energy use and increased use of indigenous forms of renewable energy mainly leading to a reduction in global emissions of Green House gases. The projects that have received funding are those that exploit Kenya's renewable energy which exists in abundance: these include geothermal, wind, solar, biomass, solid waste and other

recycled power generation facilities (Ochieng and Makoloo, 2007). The national energy policy as outlined in Sessional Paper No.4 of 2004 and operationalized by the Energy Act No. 12 of 2006 encourages implementation of these indigenous renewable energy sources to enhance the country's electricity supply capacity.

1.1 Statement of the Problem

Continued overdependence on unsustainable wood fuel and other forms of biomass as the primary source of energy has contributed to uncontrolled harvesting of trees and shrubs with negative impact on the environment (NEMA , 2005). Yet in Kenya since 1951, there exists Biogas technology which is appropriate and economically feasible since it combines solid waste and wastewater treatment, which can simultaneously protect the surrounding water resources and enhance access to affordable energy. With all its values, benefits and other sources of energy, it is interesting that most rural households have not embraced this technology despite government support. It is in relation to the foregoing background that this study aimed at establishing the determinants of adoption of biogas technology projects among rural households of Lanet Location, Dundori Division in Nakuru County Kenya.

1.2 Objectives of the study

The study was guided by the following objectives:

- i. To examine how selected demographic characteristics of households influence their adoption of biogas technology projects in rural households in Lanet location
- ii. To establish the extent to which the attitudes of rural households towards biogas technology projects influence adoption in Lanet Location.
- iii. To determine the extent to which household income level influences adoption of biogas technology projects in rural households in Lanet Location.

1.3 Research Questions

The study was guided by the following research questions: -

- i. How does selected demographic characteristics of households influence their adoption of biogas technology projects in rural households in Lanet location
- ii. To what extent do rural households attitudes towards biogas technology projects influence its adoption by rural households in Lanet Location?
- iii. To what extent does household income levels influence adoption of biogas technology projects in rural households in Lanet Location?

2. Literature Review

Continued over-dependence on unsustainable wood fuel and other forms of biomass as the primary sources of energy to meet household energy needs has contributed to uncontrolled harvesting of trees and shrubs with negative impacts on the environment (deforestation). Environmental degradation is further exacerbated by climate variability and unpredictability of rainfall patterns. In addition, continued consumption of traditional biomass fuels contributes to poor health among users due to excessive products of incomplete combustion and smoke emissions in the poorly ventilated houses common in rural areas. Biogas is an energy technology that has the potential to counteract many adverse health and environmental impacts (NEMA, 2005). The study by Shell Foundation in 2007 noted a low level of education among the targeted population owing to the scarce and fragmented promotional activities by agencies promoting the energy. Institutions promoting the technology were found to be relatively few. Poor dissemination strategy by promoters was also rife. Biogas demonstrations are carried out with little or no digester research and development to understand quality and end-use issues (Shell Foundation, 2007;Hankins, 1987).

There is growing consensus among policy makers that efforts to disseminate Renewable Energy Technologies (RETs) in Africa have fallen short of expectations. While it is recognized that RETs cannot solve all of Africa's energy problems, they are still seen as having a significant unexploited potential to meet the growing energy requirements on the continent. Renewable energy is

already the dominant source of energy for the household sub-sector (biomass energy). If properly harnessed, it could meet a significant proportion of energy demand from the industrial, agricultural, transport and commercial sub-sectors. Despite recognition that they are important sources of energy for sub-Saharan Africa, RETs have attracted neither the requisite level of investment nor tangible policy commitment. Although national and international resources allocated to developing, adapting and disseminating RETs in the last two decades may appear substantial, the total amount is still insignificant compared to that allocated to the conventional energy sector. The success of RETs in the region has been limited by a combination of factors which include: poor institutional framework and infrastructure; inadequate RET planning policies; lack of co-ordination and linkage in RETs programmes; pricing distortions which have placed renewable energy at a disadvantage; high initial capital costs; weak dissemination strategies; lack of skilled manpower; poor baseline information; and weak maintenance service and infrastructure (Ochieng and Makoloo, 2007).

A study by the Shell Foundation in 2007 cited several challenges facing the adoption of biogas technology that included poor management and maintenance emanating from lack of proper knowledge. For optimal production, a certain level of management both for the zero-grazing units and the digesters was needed but with so many competing uses for rural farm labour, management of the digesters was bound to suffer. The findings indicated that households were content to get 'acceptable' and not 'optimal' levels of production from their investments in the biogas technology. Poor maintenance was cited as a key challenge with digesters being built without proper explanation to users on how to care for them. In other cases, people simply stop maintaining them, especially the repair of the gasholder. The study further noted that many potential users of the technology were unaware of the technology with many having not seen it. There were some who were ignorant about how it operates/works, its benefits and personal relevance.

Karekezi and Kithyoma (2003) point out that experience in Africa shows that the introduction and success of any renewable technology is to a large extent, dependent on the existing government policy. Government policies are an important factor in terms of their ability to create an enabling environment for RETs dissemination and mobilizing resources, as well as encouraging private

sector investment (Sampa and Sichone, 1995). Most of the early policy initiatives on renewable energies in the region were driven by the oil crises of the early and late 1970s. In response, governments established either an autonomous Ministry of Energy or a department dedicated to the promotion of sound energy policies, including the development of RETs. For example, Zambia responded by outlining policy proposals in its Third National Development Plan (1979-83) to develop alternative forms of energy as partial substitutes for conventional energy resources (Karekezi, 1988).

One of the variables measured in this research is the attitude of the rural population towards biogas technology. It is instructive to note that attitudes are evaluative statement either favourable or unfavourable concerning objects, people or events. Attitude reflect how one feels about something. A person acquire attitude in the course of his or her experience and maintains them when they are reinforced. Thus, attitude are learned and not inherited and can be acquired in one or more ways, including direct experience with a particular object, which generates an attitude based on whether or not such experience was rewarding or punishing. This experience, in case of biogas technology, could include the positive or negative attitude developed by an individual's direct experience or learning about the performance ability of the technology after use. Performance expectations have been found to be powerful predictors of adoption of technology or innovations (Vankatesh, et.al, 2003). Attitudes may also form by associating an object with another about which attitudes had been previously formed; or through learning from others. According to the social theory, an individual tends to comply with other referees' opinion (Bagozzi and Lee, 2002), thus, developing a positive attitude towards adoption of technology. Generally, attitudes which are acquired through personal experience tend to be more resistant to change than those learned from association or from others.

Financing plays a major role in the formulation of RET policies. Studies have shown that one of the main obstacles to implementing renewable energy projects is often not the technical feasibility of these projects but the absence of low-cost, long-term financing (News at Seven, 1994). This problem is complicated by competition for limited funds by the diverse projects and becomes critical if the country is operating under unfavourable macro-economic conditions.

Governments and private enterprises must, therefore, seek creative ways of financing RETs projects. Economically, the evaluation of biogas technology can be approached as a macroeconomic problem incorporating the investment in the wider context of the economy's overall fuel and rural development policies. It can also be treated as a microeconomic problem in which the returns to a safe investment are examined at a specific location and within specific economic conditions (Barnet *et al.*, 1978). In deciding whether to develop or adopt a new technology, individual entrepreneurs engage in calculations of expected benefits and expected costs to themselves and if the former is likely to exceed the latter then they adopt the technology (Teich, 1990). This is referred to as cost / benefit analysis. Another economic consideration is that of alternatives where the evaluation of the impact of an investment is in principle the comparison of the investment with the next least expensive investment alternative. Land tenure and time horizon also affect the adoption of technologies. An example is that of technologies that are inherently long term and which require security such as land tenure for effective adoption. Many farmers are resource poor and may lack the land security and may, therefore, be unable to invest in such technologies (Drechsel *et al.*, 2005)

2.1 Theoretical Framework

The study is guided by Technology Acceptance Model (TAM). The main assumption of the TAM model is that when an individual forms an intention to act, they will be free to act without limitation (Davis, 1989). However, it is known that in real life situations there are constraints such as limited ability (cognitive, psychomotor or materials), time, environmental or even organizational issues, and unconscious habits that will limit the freedom to act.

The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use the same. TAM helps to understand the role of perceptions such as usefulness and ease of use in determining technology adoption and holds forth that external variables influence behavioural intention to use, and actual usage of technologies, indirectly through their influence on perceived usefulness and perceived ease of use. Perceived risk is taken as a direct determinant of attitude towards adoption

of technology; in relation to this, the perceived usefulness and perceived ease of use are taken as direct determinants of attitude (Davis, 1989). This model is relevant as it helps in understanding the attitude of the household as shaped by the environment they live in and how this on the other hand influences their attitude towards adopting biogas technology.

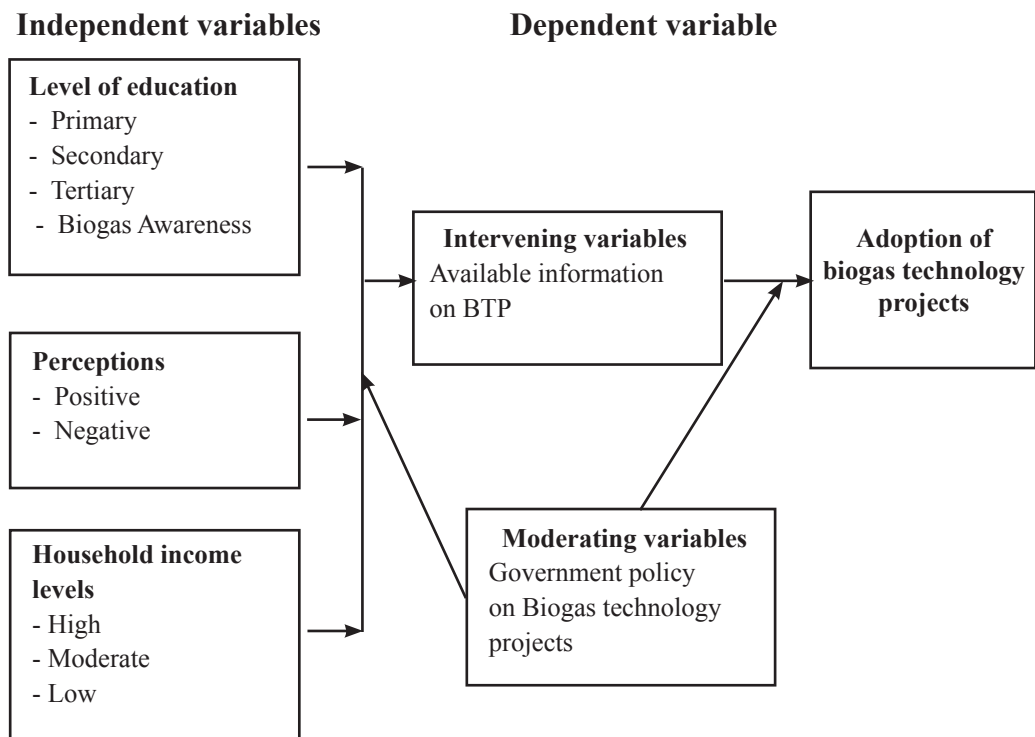
Perceived usefulness (PU) was defined by Davis (1989) as “the degree to which a person believes that using a particular system would enhance his or her job performance”. The technology acceptance model has identified the role of the perceived usefulness and perceived ease-of-use constructs in the adoption process of new technology. Whereas past research has been valuable in explaining how such beliefs lead to system use, it has not explored how and why these beliefs develop. TAM represents an important theoretical contribution towards understanding usage and acceptance behaviour.

Davis (1989) defined Perceived Ease-Of-Use (PEOU) as “the degree to which a person believes that using a particular system would be free from effort. Perceived ease of use has been identified as one of the key factors that motivates individuals to accept and use specific technologies. Studies have found PEOU to be influenced by characteristics of the technology on the one hand, and individual differences among the prospective users, on the other hand (Hong et al., 2002). Individual differences such as personality traits determine how individuals think and behave in different situations. Therefore, personality traits are commonly used in psychological research to explain beliefs and behaviour. Introduction of new technologies often involves some form of change for users. As such, the recent identification of the Resistance To Change (RTC) personality trait, and the development of a scale to measure it, provides an opportunity to assess the impact of RTC on the PEOU of users.

Concern Based Adoption Model (CBAM) by George, Hall and Stiegelbauer (2006) postulates that individuals have certain concerns that they always feel need to be addressed as they prepare to adopt new technology. The model mainly concerned itself with change implementation at system level and not the individual. It is a model that can help change agents (supervisors, change leaders) to understand the dynamic process of change particularly how individuals respond to change and

how the right corrective actions are taken to facilitate the success of the change initiative. The main tenets of the model are as follows: that it is important to understand how people typically respond to, or think about change; and that change initiatives are more successful if they are implemented in a community of interested individuals (learning community), which creates a sub-culture of practitioners from whom other individuals can learn from. CBAM was selected to fill in the gaps left by TAM in that CBAM looks at the system as the main influencer for adoption while TAM looks at the individual. In this study CBAM was used to show how government policy can influence adoptions. According to this study it is assumed that the combined interaction of the two models have implications on the adoption of technology in general and the adoption of biogas technology in particular.

Based on the above theoretical framework, the study was guided by the following conceptual framework.



This study was guided by the conceptual framework which has the following independent variables: level of education, perceptions of households, household

income levels and size of household land. Other intervening variables included government policy on energy and investments in biogas technology. Level of education of the respondents is bound to affect their adoption of biogas technology since those with formal education have access to information and are, therefore, more likely to invest in biogas unlike those without formal education. How people react when presented with biogas technology depends on their attitudes or perceptions regarding its use and cost, among other factors. Perceptions may either be positive leading to their investing in the technology or negative which may mean their declining to invest. House hold incomes play an important role in determining the decision to either invest or not based on the amount of disposable income available as well as priorities that require allocation of scarce resources within the household.

3. Study Methodology

The descriptive research design was adopted for this study. The design enabled the researcher to provide description factors enabling the adoption and none adoption of biogas technology projects among households (Mugenda and Mugenda, 1999). The target population comprised 6,956 households drawn from Lanet location, according to 2009 population and housing census (Republic of Kenya, 2009). From the aforementioned population, a sample size of 364 households was derived basing on Krejcie and Morgan (1970) table.

Lanet location is in Nakuru North District and has two sub-locations, namely, Mereroni with a total of 1,888 households and Muruyu with 5,068 households. The sample size of households in each sub-location was determined proportionally. The implication was that out of 363 households, Muruyu sub-location contributed a proportion of 265, while Mereroni's proportion was 99 households. Trained research assistants were used to identify geographical features/landmarks within each sub-location. In Muruyu sub-location, five features/landmarks were identified and around each one of them, a total of 50 households were reached. In Mereroni sub-location, three features/landmarks were identified and around each one of them, 33 households were reached. At every landmark, the assistant researcher sampled households in four directions: North, South, East and West. For instance, in Muruyu sub-location, at every landmark identified, 13 households

were sampled towards the North, while 12 households were sampled to the South, East, and Western directions respectively. In Mereroni sub-location, around the three landmarks identified, 9 households were sampled to the North and 8 towards the South, East and West respectively. Sampling of individual households in each direction selected was done systematically. For every household interviewed, the researchers skipped four households toward the determined direction. At every household, the researcher interviewed the head of the household

The Main instruments for collection of primary data was a structured questionnaire targeting households and an interview guide for household heads of ten selected households selected randomly (five from adopters and 5 from none adopters). This variation was to help me to triangulate information given in the household questionnaire. The questionnaire comprised five sections: personal characteristics of the household respondents, level of education and technological knowhow, respondents' attitude towards biogas technology projects, and level of income of respondent. The instrument had 20 items seeking the respondents' attitude towards biogas technology projects. These items were based on a 5 point *likert* scale with scores ranging from Strongly Disagree with a score of 1; Disagree, with a score of 2; Neutral with a score of 3; Agree with a score of 4 and Strongly Agree that was rated with a score of 5. The research instruments were pilot-tested on five households in Dundori Location, Nakuru North District that had similar characteristics as Lanet location. To ensure validity of the instruments, the researchers sought the opinion of two research experts and adjusted the instrument accordingly. Split half technique was used to determine the reliability of the instrument. A correlation coefficient index of 0.734 was realized implying that the instrument could be considered reliable enough to draw conclusions on the subject matter. Data analysis was done using descriptive statistics using SPSS version 17.

3.1 Construction of Attitudinal scale

Analysis of attitudinal items was done manually. The 20 items seeking households' attitude towards the projects were analysed by computing the average score per household. The households were then tallied against the attitude range and attitude classification on the attitude scale. The range included 61 – 100 positive attitude;

60 Neutral and 59 and below negative attitude. For a household to be considered to have a strong positive attitude, it was assumed that the highest score on each perception items was 5, thus if one were to score 5 on 20 items, it will give a score of 100, which was considered as strongly positive. For a household to be considered as having a neutral attitude with regard to the adoption of biogas technology, the household head would be expected to score 3, and the average for 20 items would be 60. Anything below a score of 60 meant negative attitude, while any score above 60 was an indication of positive attitude. After construction of the attitude range, each household was tallied as per the average score on the 20 items before the frequency and percentages were determined.

4. Findings and Discussions

This section presents analysis, interpretation and discussion of findings on influence of demographic characteristics, education, perceptions and income status of household on their adoptions of biogas technology projects.

4.1 Forms of energy consumed by Lanet household

The study established that charcoal was the most preferred form of energy as cited by 64.2% of the households, electricity came second as cited by 56.2% households, Liquefied Petroleum Gas (LPG) was third as cited by 46% households, firewood came fourth as cited by and 45.4% of the households. Biogas technology and paraffin were preferred by 24.1% and 16.4% households respectively. From these findings, it is clear that charcoal, and firewood are the most popular sources of energy for the households around Lanet area of Nakuru District. These findings conform to similar findings in a government study which reported that wood fuel in Kenya constitutes 90% of energy consumption in the rural and peri-urban areas. Due to this preference/prevalence, deforestation, felling of trees and a low forest cover have become a growing and serious challenge to the country (GOK, 2010). The above statistics reveal low adoption of Biogas Technology within Lanet areas, which can be one of the reasons why forest products such as charcoal and firewood are on the increase in terms of utilization.

4.2 Selected demographic characteristics and biogas adoption

In this section, the researcher sought to analyse how/the extent to which household characteristics such as gender and age of the respondents, influenced the adoption of biogas technology projects.

4.2.1 Age of the respondents and adoption of biogas technology projects

The sampled respondents were asked to indicate their ages in order to help the researcher to understand how different age segments of the population perceived investing in biogas technology and the responses were summarised in Table 1.

Table 1 shows age group of respondents cross tabulated with investing in biogas technology.

Table 1: Age of respondents and adoption of Biogas Technology

Age in years			
	Yes	No	Total
Below 25 years	2 0.6%	1 0.3%	3 0.9%
25 to 30 years	2 0.6%	19 5.9%	21 6.5%
31 to 40 years	16 4.9%	63 19.4%	79 24.4%
41 to 50 years	29 9.0%	97 29.9%	126 138.9%
above 50 years	29 9.0%	66 20.4%	95 29.4%
Total	78 24.1%	246 75.9%	324 100%

In Table 1, the age groups with the highest ratings in terms of adopting biogas accounted for 29 (9%) of the sampled respondents, coming from 41 to 50 years and above. These findings contrast sharply with the fairly low ratings of 16 (4.9%) and 2 (0.6%) in the age groups of 40 years and below. The age groups below 30 years reported significantly low proportions of respondents having adopted

biogas technology. This suggested that the technology was more acceptable to relatively older populations that seemed to have invested more in the technology as opposed to the younger generations. These findings are different from that of Rubas (2004) who found that older people are generally less likely to adopt technology than younger people. The adoption of biogas technology projects by older households in Lanet area seems to be propelled by experience of elderly people about usage of various sources of energy. This seems to be captured in the following statement by one elderly household head: *'I have tried several sources of energy in this household and I think this one (biogas) is more sustainable'*.

4.2.2 Gender of the respondents and adoption of biogas technology projects

The respondent's gender was essential in order for the researcher to understand how different people adopt biogas technology based on their gender. This was analysed and the findings presented in Table 2.

Table 2: Gender of the respondents and adoption of Biogas technology projects

Gender	Adoption of Biogas Technology		Total
	Yes	No	
Male	41 12.7%	77 23.8%	118 36.5%
Female	37 11.4%	169 52.2%	206 63.6%
Total	78 24.1%	246 75.9%	324 100.0%

The study sought to determine the distribution of the sampled respondents based on their gender. Findings from the study sample indicated that 206(63.6 %) were female while the male accounted for 118(36.4 %). This indicated a relatively skewed distribution in favour of the females while their male counterparts formed a minority of the study sample. The findings further indicated an almost fair distribution of males and females in the households who had adopted biogas accounting for 41(12.7%) and 37(11.4%) respectively. It is, therefore, evident that no status of gender featured highly as a factor in determining whether to

adopt biogas or not as the responses from both sexes were fairly distributed. Based on simple comparisons and observations, evidence consistently suggest that male-headed households adopt new agricultural production technologies faster than female-headed households across regions (Doss, 2001; Bourdillon *et al.*, 2002; Jagger and Pender, 2006; Ragasa, 2012). There is a high relationship between Biogas technology projects and agriculture since the biogas depends on the by-products of agriculture. From the findings, it is clear that more men adopted the biogas technology than female households justifying the findings from other studies.

4.2.3. Education and adoption of biogas technology project

An analysis of extent to which the level of education influences adoption of biogas technology was done. This was established through cross tabulating the responses given by the sampled households in Lanet location. The respondents were asked to indicate their highest level of education and whether or not they possessed biogas technology projects in their homesteads.

Table 3: Highest level of Education and adoption of biogas technology project

Response	Highest level of Education				Total
	Non formal	Primary	Secondary	Tertiary	
Yes	5	4	40	29	78
	1.5%	1.2%	12.3%	9%	24.1%
No	19	11	105	111	246
	5.9%	3.4%	32.4%	34.3%	75.9%
Total	24 7.4%	15 4.6%	145 44.8%	140 43.2%	324 100.0%

The majority of the respondents 246 (75.9%) acknowledged that they do not use biogas, while only 78 (24.1%) used biogas. A larger segment of those who use biogas in their homes had secondary education 40 (12.3%), followed by those educated up to tertiary level 29 (9%), followed by those educated in non-formal

institutions at 5(1.5%) and lastly those with primary education at 4 (1.2%). We can conclude that majority of those who use biogas in their homes have secondary and tertiary education, hence education influences investment and adoption of biogas technology.

The study further sought to establish distribution of respondents based on access to knowledge on Biogas technology. Davis (1989) argues that the perceived ease of use has been identified as one of the key factors that motivates individuals to accept and use specific technologies. Individual differences such as personality traits, which include their level of education, determines how individuals think and behave in different situations, and in this case, how they make their decision to invest in biogas technology.

The respondents' access to knowledge on biogas technology project was also analysed to establish the level at which it influenced households' adoption. The respondents were asked to indicate how they got to know about biogas technology. Analysis of the responses revealed six sources of information cited by the households in the following order: friends and neighbors 67.9%; agricultural shows and exhibitions 55.9%; media 46.3%; promotional groups and agencies 28.7%; local meetings and barazas 6.5% and other sources such as schools 2.8%. Access to information about technologies has also been consistently mentioned as a key factor explaining observed gender difference in technology adoption. The limited available studies on new and more controversial technologies, such as genetically-modified organisms (GMOs), highlights the need for greater understanding of these new technologies and stresses the key role of extension agents or rural advisors in bringing this information to both men and women farmers to facilitate their adoption (Ragasa, 2012).

4.3 Households' attitude and adoption of biogas technology projects

The research sought to examine the extent to which households' attitude towards biogas technology projects influenced their uptake of biogas technology projects.

The respondents were, therefore, asked to respond to a set of general statements that were geared to measure their attitude towards adoption of biogas technology projects. The responses were based on a five point likert scale that was rated as

follows: strongly disagree with a score of 1, disagree with a score of 2, neutral with a score of 3, agree with a score of 4 and strongly agree with a score of 5. The items were presented to both adopters and none-adopters whose responses were analysed and compared as recorded in table 4.

Table 4: Attitude scale for adopters and none adopters

Category	Attitude Range	ADOPTER		NONE ADOPTER		TOTAL	
		Freq.	%	Freq.	%	Freq.	%
Positive	61 - 100	61	18.8	50	14.5	111	34.3
Neutral	60	9	2.8	120	37.0	129	39.8
Negative	0 – 59	8	2.5	76	23.5	84	25.9
Total		78	24.1	246	75.9	324	100

The analysis of data showed that 129 (39.8%) of both the adopters and none adopters scored neutral on the attitude scale while 111 (34.3%) scored positive. Those recording negative attitude constituted 84 (25.9%). The scale also revealed that out of those respondents with positive attitude towards biogas technology projects, 61 (18.8%) had adopted the projects, while only 50 (14.5%) had not. This implies that those who had adopted the technology were sure about it. Another interesting revelation from the scale is that the majority of those were recorded neutral on the scale 120 (37.0%) had not adopted the biogas technology projects. It is important to note that the same number of those who had not adopted the technology indicated lack of information about the projects. It is obvious that one can have either positive or negative attitude towards something based on the knowledge and experience he/she has about that object. Thus, the neutral attitude and lack of adoption of the biogas technology can be attributed to lack of information. Further analysis indicates that out of those who recorded negative attitude, a big number 76 (23.5%) had not adopted the technology, while only 8 (2.5%) had. One of the main reason given for the negative attitude towards the projects by the households was the cost of setting up biogas units which was cited by 77.3% of none adopters. The Sessional Paper No. 4 of 2004 on Energy points out that despite the potential benefits of biogas, the penetration

rate of biogas technology is still very low and attributes this to poor management, high initial capital costs, high maintenance costs, limited water supply and weak technical support necessitating the need for a legal and regulatory framework for promotion of renewable energy, which includes biogas (Government of Kenya, 2003).

4.4 Household income levels and investment in biogas technology

The study sought to determine whether household income levels influence investment in biogas technology. The respondents were requested to indicate the sources of their income as well as the range on their monthly income. They were further required to state whether their level of income influenced their decision to invest in biogas technology projects.

The study established that 200 (61.7%) households cited salary as the main source of income, 55 (17%) indicated business sources, 46 (14.2%) pointed at farming, 20 (6.2%) derived income from casual employment, and 3 (0.9%) depended on donations as their main source of income. The cross-tabulation of sources of income and adoption of biogas technology projects was computed as reflected in Table 5.

The study established that slightly more than a half 170(52.4%) of household that had not adopted biogas technology projects depended on salary as their main source of income. Further analysis indicated that 38 (11.7%) of those who had adopted biogas technology projects depended on farming as the main source of income. These findings imply that there is a relationship between farming as a source of income and adoption of biogas technology projects probably because the biogas is produced from the animal refuse among other agricultural by-products.

Table 5. Cross-tabulation of source of income and adoption of biogas technology projects

Source of income	Adoption of Biogas technology		Total
	Yes	No	
Salary	30 (9.3%)	170 (52.4%)	200 (61.7%)
Business	19 (5.9%)	36 (11.1%)	55 (17.0%)
Farming	38 (11.7%)	08 (2.5%)	46 (14.2%)
Casual Employment	0 (0.0%)	20 (6.2%)	20 (6.2%)
Donation	0 (0.0%)	3 (0.9%)	3 (0.9%)
Total	78 (24.1%)	246 (75.9%)	324 (100.0%)

Farming, therefore, provides key resources and inputs required to complete the biogas technology projects, leading to the conclusion that availability of biogas technology projects inputs enhances adoption of the technology. The same seemed to be suggested by Ragasa (2012) who pointed out that availability of inputs is affected by distribution systems and physical infrastructure, as well as the geographical location and remoteness of the rural people and by the presence of social networks or organizations that can help facilitate their access to these technologies.

Households were asked to state whether the level of income influenced the adoption of biogas technology projects and the responses were cross-tabulated against adopters and non-adopters as presented in Table 6.

Table 6 shows that an overwhelming proportion 262 (80.9%) of the total respondents affirmed that the level of income influenced the adoption of Biogas technology projects. Out of this number, 62 (19.2%) had adopted the projects while a big number 200 (61.7%) had not. A small number 62 (19.1%) of the households felt that income had no influence on adoption of biogas technology projects and that could explain why 46 (14.2%) had not embraced the technology while only 16 (4.9%) had adopted the projects.

Table 6: influence of income on adoption of biogas technology projects

Influence of income		Biogas technology		Total
		Adopters	None Adopters	
	YES	62 (19.2%)	200 (61.7%)	262 (80.9%)
	NO	16 (4.9%)	46 (14.2%)	62 (19.1%)
Total		78 (24.1 %)	246 (75.9 %)	324 (100%)

Given that the majority 200 (61.7%) household heads agreed that income influenced adoption of biogas technology, but they had not actually adopted it, we can conclude that although income was one of the predicting factors for adoption of the technology, a combination of other factors such as access to information, inputs and perception of the households are key in influencing adoption of the technology (Ragasa, 2012).

5. Recommendations on policy

The following recommendations were made based on the study:

- i. There is need for concerted efforts in conveying and organization of seminars and workshops on Biogas targeting rural households in an attempt to raise more awareness on the technology and its benefits and applicability
- ii. There is need for better sensitization and support in the area to increase the uptake of the technology. Innovative strategies such as biogas loans as has been done by Kenya power (*stima* loan), may be considered as a mechanism of helping rural households scale up its use in the long term.
- iii. The government, NGO's and other agencies promoting the use of biogas technology need to address challenges that appear to hinder the adoption of technology, namely, costs and access to information. They should consider subsidizing the cost.

- iv. Enactment of strong legislation to deter use of firewood and charcoal, alongside incentives to the private sector, through tax waivers on materials, to encourage more private sector participation in provision of renewable energy solutions to the rural and urban households
- v. The need for more research on the usage of alternative biomass materials in the generation of biogas such as human waste and kitchen refuse so as to encourage more households to consider investment in the technology
- vi. Provide incentives to large scale establishments to adopt biogas technology, while also supporting more research to generate new cost effective innovations.
- vii. The Government and other partners to consider setting up demonstrations on biogas units on small plots to encourage uptake of the same in rural areas.

6. Conclusion

The study concluded that among other sources of energy, charcoal was most preferred among the households in Lanet location, while biogas technology was the least. Male-headed households adopted biogas technology faster than female-headed households. Higher education and access to information about the biogas technology had an influence on the adoption of the technology. Perception of the households on the biogas technology projects and their income level were key factors that influenced the level of adoption of the technology in Lanet location of Nakuru District. The overall conclusion of study, therefore, was that the adoption of biogas technology projects among the rural household was very low.

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DATA FEEDBACK MECHANISMS AND QUALITY OF SERVICE DELIVERY: A CASE STUDY OF ARTIFICIAL INSEMINATION SERVICES IN CATTLE IN CENTRAL KENYA

Methu, M. A.

ABSTRACT

In an effort to improve service delivery and reduce expenditure, governments in Sub-Saharan Africa engaged in a process of privatization of certain services that were considered to be non-core or non-essential. This was done through the prompting of the World Bank under the Structural Adjustment Programmes (SAPs). Artificial Insemination (AI) in cattle was one of the services that was privatized and handed over to private practitioners in Kenya. To date, this service is available through individual service providers or cooperatives, with the government playing a minimal regulatory role. The greater part of the regulation is left to market forces. This paper sought to review existing literature to find out if there are existing monitoring and evaluation feedback mechanisms for the government as a regulator from the service consumers who are mostly small scale farmers. It further sought to find out whether the information feedback systems, if any, are used in improving aspects of service quality namely - reliability, assurance, tangibles, empathy and responsiveness. The paper found that apart from licensing of service providers and collecting monthly data on the number of inseminations provided, there was little documented evidence of monitoring and evaluation of service quality in Artificial Insemination services. Further, even if the government has been licensing importers of semen, there has been little documented evidence of monitoring and evaluation of the imported semen.

Key words: *Artificial Insemination; Monitoring; Evaluation; Service Quality; SERVQUAL.*

1. PhD Candidate, Department of Extra Mural Studies, University of Nairobi, P.O. Box 92-00902, Kikuyu,
Cell :+254 722344272, alexmethu@gmail.com

1. Introduction

Citizens' demands for quality services have prompted governments to continuously implement improvement measures by putting in place service delivery standards in public services all over the world. Governments are, therefore, adopting service delivery approaches that are competitive and satisfying by responding to citizens' needs as best as possible. This results from the greater conscientisation that citizens are experiencing and the ever widening democratic space in most countries of the world. Kusek and Rist (2004) note that while the role of the state has changed and evolved during recent history, it is now apparent that good governance is key to sustainable socio-economic development.

In Kenya, public service at independence was said to be uncaring for the needs of their clients and the quality of goods and services was not important. As time went by, citizens became more aware of the fact that governments exist to serve them and a constant evolution of the institution emerged leading to today's public service that has adopted the slogan "*Huduma Bora ni Haki Yako*" (quality service is a right to all citizens), implying that the government is obliged to provide very high quality services. . This calls for a quality service delivery approach that emphasizes on continuous improvement and relies on monitoring and evaluation to inform decision making and to meet the ever changing needs of the citizens.

Government services are most often provided on a business-to-customer (B2C) basis and in very few cases of business-to-business (B2B) basis. In some instances, these services are provided through projects with specific goals and mandates. Some of the projects cover specific thematic areas whereas others cover a wide scope whereby they are divided into project components. In any business-to-customer type of environment, satisfying a customer is the ultimate goal and objective (Munusamy, Chelliah and Mun, 2010). Customer satisfaction cannot be achieved unless the needs of the customer are met through providing goods and services that meet customers' quality specifications. The International Organization for Standardization in its ISO 8402-1986 standard, defines quality as "the totality of features and characteristics of a product or service that bears its ability to satisfy stated or implied needs". The definition of quality cannot be complete without looking at it from the customer's point of view because it

is the customer's needs that goods and services are meant to satisfy. Yi (1991), Anderson and Sullivan (1993), Boulding, Kalra, Staelin and Zeithaml (1993), have found that high customer satisfaction will lead to greater customer loyalty which in turn leads to better achievement of goals and better revenue bases. This also applies to government services that aim at achieving economic growth and social development.

In an effort to realize its dream of improving service delivery, the Government of Kenya, through the prompting of the World Bank, engaged in a process of public service reforms which included downsizing the core civil service and harmonizing pay and benefits, thus reducing the proportion of government revenue directed towards meeting the wage bill. Privatization of government owned enterprises e.g. Kenya Airways, was a major milestone in achieving this, in which the government disengaged itself from enterprises that could be taken over by the private sector. For those non – essential enterprises, where the private sector could not be allowed to take full control, services were released to the private sector with the government only taking a regulatory role.

Privatization of Artificial Insemination (A.I.) services is one such measure which was instituted in 1991 (Mogoa, Omiti, Tsuma and Bwanga, 2004). This service was privatized in most of the developing countries, thus, giving the private sector greater control over the livestock sub-sector. Sen and Chander (2003) deduced that the major driving forces behind privatization of some veterinary services were improving the quality of the services, reducing fiscal constraints on the governments and donor pressure.

According to Mogoa *et al* (2004), available data between 1990 and 1998 shows a disparity in the performance of A.I. services and a decrease in the total number of inseminations in different parts of the country by 73.5% from 394,361 in 1990 to 104,661 in 1997 despite bringing in the private sector. As privatization took effect, it became more and more difficult to accurately determine the number of inseminations that led to conception. Prior to this, the non-return method was used to determine the conception rates. The efficiency of this method for monitoring fertility is reduced today because of multiple suppliers of semen to individual farms and within herd inseminators who have no strict obligation to give feedback

(Foote, 2002). This paper explores literature on how monitoring and evaluation mechanisms are used to determine the quality of artificial insemination services and seeks for an empirical study on artificial insemination service quality in Central Kenya.

2. Methodology

This paper sought to find out if there are existing monitoring and evaluation feedback mechanisms for the government as a regulator from the service consumers who are mostly small scale farmers. It further sought to find out whether the information feedback systems if any are used in improving aspects of service quality namely reliability, assurance, tangibles, empathy and responsiveness.

A formal systematic literature search was carried out to determine The Role of Data Feedback Mechanisms in Service Delivery Quality in Government Regulated Services, with a key focus on artificial insemination services. The literature search focused on data feedback mechanisms in government regulated service; data feedback mechanisms in artificial insemination services and the role of data quality mechanisms in service delivery quality. Literature included a range of different educational databases including library books, internet, journals and government documents.

3. Data Feedback Mechanisms in the Kenya Public Service

Feedback mechanisms provide organizations with data and perceptions from primary stakeholders about the quality and effectiveness of their efforts (CDA, 2011). An ideal feedback process involves the gathering of feedback and the communication of a response, which forms a 'feedback loop.' This process forms the basis for monitoring and evaluation of Artificial Insemination Services in Kenya. Kayande, De Bruyn, Lilien, Rangaswamy and van Bruggen (2009) have demonstrated that model-based decision support systems improve performance in many contexts that are data-rich, uncertain and require repetitive decisions.

Prior to the year 2004, there was no defined monitoring and evaluation system in the Kenyan Public Service. Every government department would carry out their own monitoring and evaluation function without any defined common standard

or guideline. There seemed to be no common goal for the different government entities and more so, there was very little reference to quality, either in goods or services offered by the public service to the citizens of Kenya. The government of Kenya formed the Monitoring and Evaluation Department in the Ministry of Planning and National Development in the year 2004 (MOPND, 2012), which was later placed under the Ministry of Devolution and Planning. This department was later upgraded to a Directorate in August 2006. It was charged with the responsibility of tracking the implementation of government policies and programmes in line with the Economic Recovery Strategy (ERS) and long-term development goals, including the Millennium Development Goals (MDGs) and the United Nations post 2015 Development Agenda (UN, 2013).

The Monitoring and Evaluation Directorate established a National Integrated Monitoring and Evaluation System (NIMES) in 2004, which comprehensively covers all public sector organizations and is expected to be rolled out to cover other non-state actors involved in development activities such as development partners, Non-Governmental Organization (NGOs), Faith Based Organizations (FBOs), and Civil Society Organizations (MOPND, 2012). The decision to formulate the system was based on the recognition of the fact that there was no central mode that coordinated and compiled the vast knowledge derived from the multiple monitoring and evaluation activities undertaken in the various programmes in the country. The system would also aid in providing a framework within which the private sector and civil society would report their achieved progress to the government.

The purpose of setting up NIMES was to improve on quality and effectiveness of government service delivery by providing information on progress achieved right from the devolved government level through to the national, regional and global levels on policy commitments and implementation of programmes. The system has five strategic components which guide its activities. These components are: capacity development and policy coordination; quantitative and qualitative data collection, indicator construction and storage; research and results analysis dissemination for advocacy and sensitization and project monitoring and evaluation (MOPND, 2012).

4. A Historical Perspective on Artificial Insemination in Cattle

Artificial insemination (AI) is the human induced introduction of semen into female reproductive organs for the purpose of fertilization, by means other than the natural processes. Artificial Insemination (AI) was the first great biotechnology applied to improve reproduction and genetics of farm animals (Foote, 2002). According to Schutte, Pereira and Galloway (2004), Foote (2002) as well as Galloway and Pereira (2003), using A.I. has the following advantages: It allows efficient control of venereal diseases; it is economical and eliminates purchase of expensive bulls, reduces maintenance costs and prevents possible losses of bulls; Semen from bull studs or imported semen is usually genetically superior and disease free and it is the most efficient technique of cattle improvement. One bull can sire 500 to 8,000 offspring per year, while natural servicing provides a mere 30 to 40; adequate offspring for a reliable evaluation of the breeding value of a bull are available at a relatively young age; it necessitates accurate record-keeping and high level of management, resulting in a high degree of efficiency; frozen semen from proven bulls can be distributed world-wide, and the semen of outstanding bulls can be stored for years enabling its use in subsequent breeding programs. On farms, this process is used to control breeding among different farm animals. Artificial insemination in cattle has been used to produce genetically superior dairy and beef cattle. However, artificial insemination does have its own disadvantages such as Venereal diseases being distributed quickly if there is incorrect or negligent handling of equipment and animals; undesirable characteristics and heritable deficiencies being transferred to more offspring, and the possibility of in-breeding becoming much greater than under natural servicing if proper records are not kept.

It is believed that Leeuwenhoek (1678) and his assistant, Hamm, were the first people to see sperm, which they called “animalcules.” This marked the beginning of a greater understanding of reproduction in animals. The University of Florida Institute of Food and Agricultural Sciences (IFAS) extension documents that approximately in the year 1322 AD, an Arab chieftain who wanted to mate his prized mare with a stallion owned by an enemy used cotton containing the scent of the female to excite the stallion, causing him to ejaculate. He placed the released semen in the reproductive tract of the mare, leading to conception. In

the 1780s, Italian naturalist Lazzaro Spallanzani artificially inseminated a dog (Gacto, 1999).

Research in Artificial Insemination started in 1899 when Russian Scientist E. I. Ivanoff studied the process in domestic cattle, horses, sheep, dogs, foxes, rabbits, and poultry (Foote 2002). He was the first person recorded to have accomplished the first successful artificial insemination in cattle. As a result of Ivanoff's success, 19,800 heads of cattle had been bred in Russia by 1931 (Ivanoff, 1932).

While research on artificial insemination continued through the 1930s and 1940s, groups of people would form to improve their livestock through the process. The first Artificial Insemination Association was formed in Denmark in 1936 while the first artificial insemination cooperative was established in 1938 at New Jersey State College in Atlanta. These provided the model for forming other cooperatives across the United States in the late 1930s and the 1940s.

In the 1940s, the Bureau of Animal Industry registered a new breed, the Santa Getrudis, which represented the direct results of artificial insemination in cattle. Despite this significant breakthrough in cattle breeding, it would take 13 years to improve this process. During that time, scientists realized that collected bull semen could be saved by placing them in egg solution containing antibiotics and chemicals and freezing it for later use. Universities of Pennsylvania and Cornell conducted genetic tests in which they learned how to distribute genetic material.

In Kenya, artificial insemination has been used in cattle since 1935 when Dr J. Anderson performed the first insemination (Duncanson, 1975). This practice was then confined to the collection of semen from bulls on individual farms for use on cows within the farms from which it was collected for the purpose of controlling infectious fertility diseases. A survey carried out by Dr. Anderson at that time revealed that over 35 percent of bulls tested were sterile. This emphasized the importance of AI and so its use grew steadily.

The first AI scheme was set up in Kenya in 1941 on the basis of a community bull scheme. This was followed in 1942 by a scheme operated by the Limuru Cattle Breeders' Association, which was linked to the Kenya National Artificial Insemination Service. The Central Artificial Insemination Station (CAIS), operating under the Department of Veterinary Services, was established in 1946

in Kabete to control reproductive diseases and to improve the genetic quality (van der Valk, 2008). In 2011, CAIS was turned into a Semi-Autonomous Government Agency and was renamed Kenya Animal Genetics Resource Centre (KAGRC). It has continued to function as the main national seed bank for cattle semen.

After independence in 1963, the Government of Kenya took up the role of providing artificial insemination services for cattle at a nominal fee. Duncanson (1975) noted that while it cost Fifty Kenya Shillings (KShs 50/=) to produce one heifer, only 4.5% of that cost came from farmers in direct fees. The rest of the cost was covered by the government, implying that funds had to be raised for the service through a taxation levy on dairy products. This went on up to the late 1980s when government funds were low. In the early 1990s, the Structural Adjustment Programmes of the World Bank were introduced which led to the privatization of some functions that were previously run by the government. Artificial insemination was privatized in 1991 (ROK, 1997), thus, subjecting the services to the forces of demand supply. The government took a regulatory role without actively providing the AI services

According to Gamba (2006) “Private AI service provision has evolved into two major models. The first model involves practicing veterinarians and Agrovet shops that link AI service provision to their veterinary practices and/or farm input stores. The second model consists of co-operative that run AI services that seem to be having an upper hand in their areas of operation. This trend may be explained by the patronage the dairy co-operatives exercise on their members through the provision of auxiliary services and the ability to extract payment at source”.

The effectiveness of the service after privatization is an area that still needs to be studied since the reporting and feedback systems changed hands from the government to the private sector, hence, the frequency and quality of the feedback system is likely to have changed. A preliminary survey has revealed that though District Veterinary Offices receive regular reports on the numbers of inseminations done by the service providers, there is little information on the number of conceptions that result from the service. This is so because while the number of non-successful inseminations could previously be known through the

number of cows requiring repeat services, these statistics may not be known from the current privatized system because farmers are likely to look for an alternative service provider instead of seeking for a repeat service from the same provider in the existing open market system. This situation is aggravated by the fact that the farmers have to pay for each insemination regardless of whether it is the first time or a repeat.

5. The Concept of Service Quality

Quality can be defined as a measure of excellence or the degree to which a product is free from deficiencies, defects or significant variations. The ISO 8402-1986 standard relates quality to the totality of features and characteristics of a product or service and the ability of the product to satisfy stated or implied needs of the consumers. Quality has also been described as an elusive and indistinct construct which has been mistaken for imprecise adjectives like “goodness, luxury, shininess and weight” (Crosby, 1979). In industry, quality is associated with the adherence to strict, measurable and consistent standards of product specifications which are often described in relation to consumer needs and are geared towards achieving satisfaction to both internal and external customers. The definition of quality must in the first instance be defined in terms of parameters or characteristics, which vary from product to product or from service to service (UNIDO, 2006). This is important in ensuring that the specifications dictated by the market can be easily described and communicated precisely.

According to Parasuraman, Zeithaml and Berry (1985), efforts in defining and measuring quality have come largely from the goods sector. The Japanese philosophy of quality which emphasizes on zero defects, doing it right the first time, six sigma (Tennant 2001), counts of internal and external failure (Garvin 1983), Fishbone (Ishikawa, 1976) and the Plan-Do-Check-Act Cycle (Demming, 1986), are all quality management approaches that are focused on tangible products with little reference to services.

Quality management is a practice aimed at meeting customer expectations through the production of goods and services that conform to defined or undefined specifications in the product features. Juran (1992) points out that

product satisfaction has its origin in the product features and is the reason why customers buy a product. While the substance and determinants of quality may be undefined, its importance to firms and consumers is unequivocal (Parasumaran *et al*, 1985). Rabin (1983) proposes that the search for quality was arguably the most important customer trend of the 1980's. However, with the continuing education and awareness among consumers, this trend has continued to be ever more important in the first and second decades of the 21st century.

Service quality has not been studied much, hence, the need for more investigations in the subject. Bramklev and Strom (2011), for example, found that while Japanese firms have a long tradition of outstanding manufacturing quality, the Japanese service industry is less developed in comparison with other OECD countries. The few writers who have investigated it, however, suggest three underlying themes: Service quality is more difficult for the consumer to evaluate than goods quality; service quality perceptions results from a comparison of consumer expectations with actual services rendered and quality evaluations are not made solely on the outcome of a service but also involve evaluations of the process of service delivery (Parasraman *et al*, 1985). This suggests that service and process quality is as important to management as product quality, thus, the need for investments in customer satisfaction before, during and after the delivery of a service.

The trend in search of quality has not only affected the production of goods and services in the private commercial sector but has also become a pertinent factor in the public sectors. This is even more apparent with the changing systems of government in most African and Arab countries. The year 2011 and 2012 marked a major shift in Arab politics. The violent protests -- in countries like Algeria, Bahrain, Egypt, Iran, Jordan, Libya, Morocco, Syria, Tunisia and Yemen, in demand for increased democratization -- which have come to be known as the Arab Spring, are an example of the changing trend in search of quality in public services through changes in leadership. A similar trend was observed in sub-Saharan Africa with the changes of governments in Kenya, Cote d'Ivoire, Ghana, Zambia and Malawi - though this was largely achieved through peaceful constitutional means.

5.1 Measuring Service Quality in Artificial Insemination Services

Consumers are arbiters of value (Priem, 2007). Quality cannot be properly defined without considering the perspective of the consumer. All aspects of quality must take into account the consumer's needs and wants since the consumer determines what to consume, thus, influencing the producer's products. Some authors, however, dispute the importance of quality at the firm level. Priem (2007) observes that "remarkably, some strategy scholars (Makadok and Coff, 2002), argue that an understanding of consumer utility is largely superfluous to the overall goal of the strategy field which, they say, is to explain firm profitability, determined by the value captured by the firm".

Several authors have developed models for measuring service quality. They include the Kano Model (Kano, Seraku, Takahashi and Tsuji 1984), Servqual or Gap Model (Parasuraman *et al*, 1985), Technical and Functional Quality Model (Gronroos, 1984), Attribute Service Quality Model (Haywood-Farmer, 1988), Synthesised Model of Service Quality (Brogowicz, Delene and Lyth., 1990), Performance Only Model (Cronin and Taylor, 1992), Ideal Value Model of Service Quality (Mattsson, 1992), Evaluated Performance and Normed Quality Model (Teas, 1993), IT Alignment Model (Berkley and Gupta, 1994), Attribute and Overall Affect Model (Dabholkar, 1996), Model of Perceived Service Quality and Satisfaction (Spreng and Mackoy, 1996), Pivotal-Core-and-Peripheral (PCP) Attribute Model (Philip and Hazlett, 1997), Retail Service Quality and Perceived Value Model (Sweeney, Soutar and Johnson, 1997), Service Quality, Customer Value and Customer Satisfaction Model (Oh, 1999), Antecedents and Mediator Model (Dabholkar, Shepherd and Thorpe, 2000), Internal Service Quality Model (Frost and Kumar, 2000), Internal Service Quality Data Envelope Analysis (DEA) Model (Soteriou and Stavrinides, 2000), Internet Banking Model (Broderick and Vachirapornpuk, 2002), IT-Based Model (Zhu, Wymer and Chen (2002) and Model of e-Service Quality (Santos, 2003). This paper will examine the application of the most commonly used Gap Model, and its application in studying the quality of artificial insemination services.

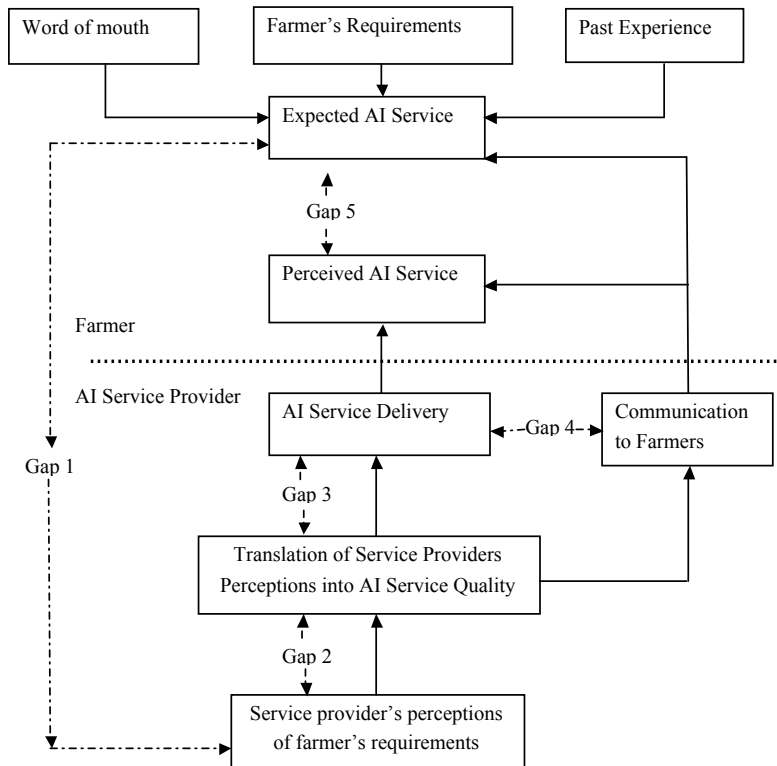


Fig. 1: The SERVQUAL Model

The SERVQUAL model is perhaps the most appropriate model for measuring the quality of artificial insemination services in cattle. Gronroos (1982), Lehtinen and Lehtinen (1991), Gummenson, 1991 and Edvardsson (1998) have identified ten items that are determinants of service quality. Parasumaran *et al* (1985) went ahead to use these determinants to develop a conceptual model of measuring service quality known as SERVQUAL. These determinants are reliability (consistency of performance and dependability), responsiveness (willingness and readiness to perform services), competence (possession of skills and knowledge to perform, understanding (knowing the customer's needs and requirements), access (approachability and ease of access to management), communication (providing the customer with effective information), courtesy (friendliness of personnel and ownership), credibility (trust and personal characteristics of personnel), security (safety, financial security, and confidentiality) and tangibles (physical evidence of service).

Parasuraman, Zeithaml and Berry (1988) later reduced the ten determinants of service quality to five specific dimensions. These dimensions were listed as: reliability (ability to perform service dependably and accurately), responsiveness (willingness to help and respond to customer needs), empathy (the extent to which caring and individualized service is given), assurance (ability of staff to inspire confidence and trust) and tangibles (physical facilities, equipment and staff appearance). These determinants of service quality are applicable in any service business including artificial insemination.

The SERVQUAL model applies to the Artificial Insemination when the five dimensions of service quality are modified to fit into this field. Reliability would refer to the ability of the service provider to perform the service dependably and accurately, including timeliness of the service and the chances of conception. Responsiveness refers to the willingness of the service provider to respond to farmers' special needs including unanticipated problems like dealing with fertility diseases and related problems. Empathy refers to the extent to which the farmer is able to identify with the service provider as a result of the provider's ability to give caring and individualized service. It may be manifested by the provider's willingness to take consideration of the farmer's specific situation and his other related needs. Assurance refers to the ability of the service provider to inspire confidence and trust in the farmers and it manifest in the way the provider presents himself and his ability to display skillfulness and to adhere to known procedures. Tangibles may include the type and cleanliness of equipment and the supply of the exact type of breed required by the farmer as well as how the inseminator presents himself.

In any public service, it is challenging to make service delivery fault tolerant while at the same time making it scalable to fulfil the many demands of users. It is, therefore, quite common to find stalled public projects because they could not meet the expectations of certain stakeholders. While many service delivery approaches are used to meet those demands, address the challenges and accommodate changes in service delivery, they are often quite expensive or sometimes require new strategies to handle the service interruptions caused by any necessary changes, thus, hindering the service practicability. This was one

of the reasons that drove African governments to privatize some of their services including artificial insemination.

In the globalized economy, organizations compete on the value-added services they offer (Bramklev *et al*, 2011). This calls for the need to continuously monitor own performance in comparison with the performance of competing goods and services in order to maintain a competitive edge in the market. Those organizations whose products are of highest quality are likely to have the highest advantage in the market. This advantage translates into better profits and easier achievement of targets. According to the reputation model, firms refrain from cutting quality or price because if they did they would forfeit future profits (Klein and Leffler, 1981).

The considerable attention that customers place on the notion of the quality of services has altered the practices which service organisations make use of, in order to assess and improve their service quality (Zisis, Garefalakis and Sariannidis 2009). This has not only affected private business organizations but has to a large extent influenced the way governments conduct their businesses in providing public services all over the world. It has been greatly influenced by the ever increasing demand for high quality services from the citizens, coupled with a growing competition from the private sector. States are being challenged as never before by the demands of the global economy, new information and technology, and calls for greater participation and democracy (Kusek *et al*, 2004).

5.2 The Gap Model

The Gap model was developed by Parasuraman *et al* (1985) based on the proposition that service quality is a function of the differences between consumer expectation and service performance along quality dimensions. It was developed as a result of exploratory studies based on four major questions i.e. what do managers of key service firms consider to be key attributes of service quality? What problems and tasks are involved in providing high quality service? What do consumers consider to be key attributes of quality in services? Do discrepancies exist between perceptions of consumers and service marketers? Can consumer and marketer perceptions be combined in a general model that explains service quality from the consumer's standpoint? (*ibid*).

Parasuraman *et al* (1985) carried out their investigations on four service categories, that is, retail banking, credit card, securities brokerage and product repair and maintenance. While these may appear to be services oriented to the cash industry, Lovelock (1980) agrees that the services represent a cross - section of industries which vary along key dimensions used to categorize services. These categorizations may be based on the degree of contact, discrete services and the tangible results of the service act.

According to Seth, Deshmukh and Vrat (2005), five gaps were identified by Parasuraman *et al* (1985) in relation to their survey questions based on the Gap Analysis illustrated in the SERVQUAL Model (see Appendix). An adaptation of the Gap Model to the Artificial Insemination value chain can be illustrated as follows:

- Gap 1: Difference between farmers’ stated expectations and the service provider’s perceptions of those expectations, i.e. not knowing what consumers expect.
- Gap 2: Difference between the service provider’s perceptions of farmers’ expectations and service quality specifications (improper service-quality standards.)
- Gap 3: Difference between service quality specifications and service actually delivered - the service performance gap.
- Gap 4: Difference between service delivery and the communications to farmers about service delivery i.e. whether promises match delivery.
- Gap 5: Difference between farmers’ expectations and their perception of services rendered. This gap depends on size and direction of the four gaps associated with the delivery of service quality on the service provider’s side.

Seth *et al* (2005) further described service quality in relation to SERVQUAL as a function of perception and expectations and modelled it as:

$$SQ = \sum_{j=1}^k (P_{ij} - E_{ij}) \dots\dots\dots (1)$$

where:

SQ = overall service quality;

k = Number of attributes.

P_{ij} = Performance perception of stimulus i with respect to attribute j .

E_{ij} = Service quality expectation for attribute j that is the relevant norm for stimulus i .

Seth's model illustrates that whenever the performance of a service exceeds the expectation of the consumer, the value of service quality is positive, implying that there is consumer satisfaction, therefore, all the benefits of satisfaction are likely to be enjoyed by the service providing organization. Artificial Insemination services are evolving to be highly competitive and exceeding customer expectations will gradually become paramount in ensuring business survival for service providers.

6. Discussion of Findings

This study sought to investigate the use monitoring and evaluation data feedback in determining the quality of AI services. It viewed data use from four perspectives namely presence of a monitoring and/or evaluation system; personnel for M&E; presence of specific indicators of achievement and the allocation of resources for M&E.

From the literature reviewed it appeared that before privatization, there was a clear system of recording inseminations performed because the service was a monopoly of government. However after privatization, the recording system did not continue because the service was taken over by service providers who were not obliged to report to government and some did not see the need to do so. Records existing after privatization are for semen sold to service providers by KAGRC which may not necessarily translate to the inseminations done or the conceptions achieved. Semen sold by other suppliers was not recorded.

Personnel specifically for M&E have not been in place, both before and after privatization. Before privatization, the inseminators kept records which were then compiled into reports and sent through official channels from the inseminators at the frontline to the decision makers at the Department of Veterinary Services Headquarters. After privatization, the private practitioners did not report back and

hence it was difficult to tell how the service was progressing. Data on artificial insemination was hard to find and it could only be obtained through estimates. This can be attributed to the absence of personnel to perform the M&E function in the department.

The indicator for success in artificial insemination has for a long time been the conception rates. Before insemination, it was easy to determine this because records used to be kept for every cow inseminated and it was easy to determine which particular cow required a repeat insemination after one month, implying that it did not conceive in the first insemination. This indicator also served as a tool for determining which cows required clinical interventions if the failure to conceive was due to disease or injury. After privatization, there was no measures put in place to follow up on specific cows and the use of repeat insemination as an indicator became untenable because of the free market nature of the service where farmers did not have to rely on specific inseminators. This was coupled with impaired information sharing among players in the industry. It would therefore be easy to conclude that there is no strong enough indicator of progress in the AI industry to give a clear picture of the situation and trends.

From the literature reviewed, government and other stakeholders do not provide resources for M&E in the AI industry. Even though the government was left with the regulatory role of the industry, funding provided for the function was low as compared to the needs hence resources required for M&E were inadequate. This would also imply that the frequency and quality of M&E was low hence even the results may not be very reliable in decision making.

There was no indication of quality in the literature reviewed meaning that no attempts have been made to determine the role of data feedback mechanisms on quality of artificial insemination both before and after privatization. It would therefore be inconclusive to suggest that there is a relationship between the two variables or otherwise and would require further investigation. This may be attributed to the fact that for a long time the service has been prescribed by the Department of Veterinary Services thus making stakeholders complacent to issues of quality.

7. Conclusion

The privatization of some government services was meant to improve the quality, availability and accessibility of services. The extent to which this was achieved is a matter that has not received much attention in form of evaluation and even if the government of Kenya can rightfully claim to have completed the privatization process successfully, there is need to study the achievement of its intended goals. The same can be said of all other privatized non-core services which are still necessary for the country to achieve its development goals.

Even though government regulation was meant to be a key feature in the privatization of artificial insemination services, literature reviewed showed no elaborate means of data collection by the government on the direct performance of the services in terms of conception and calving rates. There is need to carry out further studies to investigate government data collection mechanisms and their effects on the benefits accrued by the farmers.

Whereas some of the privatized services such as supply of water seem to be doing well, based on their financial records, artificial insemination services may not be as financially successful due to some underlying factors. First, services for the supply of water were privatized to service companies that were fully owned by the local authorities while artificial insemination was privatized to individuals and cooperatives with little financial or auxiliary support and networking. Secondly, the consumption of tap water is a basic necessity with no alternative in the rapidly urbanizing society, whereas users of artificial insemination services always have an alternative to fall back to – that is, using live bulls. Thirdly, the cost of consumption of artificial insemination services is very high as compared to consuming water services. Therefore, there is need to study the factors influencing the uptake and success of the privatization of various government services.

Most Artificial Insemination Services are concentrated in areas with high dairy cattle density (Mogoa *et al* 2004). This implies that areas with low dairy cattle populations are likely to suffer low production and slow progress in the development of the dairy sector. From the literature reviewed, there was little information on the progress in the sector. Embracing service quality in such areas may not be as fast as in areas of high dairy cattle concentration and certain aspects

of service quality may be easily overlooked. This calls for a study to review the status and the progress of dairy development in such areas.

The concept of service quality in artificial insemination services seems to be a new idea in the practice. From the author's point of view, service quality in artificial insemination cannot be overlooked. This calls for research that would investigate the links between service quality in artificial insemination with the productivity of the practice and the role of monitoring and evaluation in the practice.

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MODERN TECHNOLOGY AND SUSTAINABLE IRRIGATION OF SMALL SCALE DRY-LAND FARMING IN KITUI COUNTY, KENYA

Venzi F. S.¹, Mulwa S. A.², Ndunge K. D.³

ABSTRACT

The Purpose of this study was to investigate the influence of technology on sustainable irrigation of small scale dry land farming in Kitui Central District, Kitui County, Kenya. The study sought to establish the extent to which adoption of new irrigation technology, gravity free flow irrigation and access to credit has influenced sustainable irrigation of small scale dry land farming. Descriptive survey research design was adopted. A sample of 150 participants was randomly selected from 1540 small-scale dry land irrigation farmers in the district. Data was collected using questionnaires and an interview schedule. Descriptive and inferential statistical procedures, including Pearson's correlation coefficient and one way ANOVA were used to analyze quantitative data. Qualitative data was analyzed by daily briefs, categorization into themes and narrations of respondents' quotations and verbatim explanations. The findings revealed that irrigation of intensive, small scale dry-land farming yields statistically significantly higher farm outputs from a 2-acre dry-land farm than the natural rain-fed small scale dry-land farm of similar acreage at 95% confidence interval. The study recommended that farmers and County governments should adopt both indigenous and new technologies that are supportive to the development and growth of small scale dry land farming. Further studies should be done on the relationship between training and sustainable irrigation of small scale dry land farming to ensure successful artificial agricultural productivity from the Arid and Semi Arid Lands (ASALs) of Kenya.

Key words: Irrigation technology, gravity free flow, access to credit, dry-land farming

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1. M.A. Student, University of Nairobi, School of Continuing and Distance Education, P.O. Box 92-00902, Kikuyu, Cell :+254 723669999, venzi06@yahoo.com
 2. Lecturer, University of Nairobi School of Continuing and Distance Education, P.O. Box 92-00902, Kikuyu, Cell : +254 724473490, asmulwa2008@yahoo.com
 3. Senior Lecturer, University of Nairobi School of Continuing and Distance Education, P.O. Box 92, 00902, Kikuyu, Cell: +254 722821341 ndunge.kyalo@yahoo.com

1. Introduction

Sustainable irrigation is defined pragmatically by (Abrams, 1998) as “when the irrigation scheme continues to work overtime after the initial donor support has been withdrawn.” Sustainable irrigation, in this study, refers to the ability of small scale farmers to continue practicing irrigation farming effectively for intensive crop production in the dry land region of Kitui County after the initial donor support is withdrawn. That is why Parry- Jones, Reed and Skinner (2001) defined sustainable small-scale irrigation dry-land farming as involving the notions of minimal external support, village-level financing and the continuation of beneficial service overtime, long after the withdrawal of donor support. Sustainable irrigation of small scale dry land farming in the ASALs like Kitui County could only be achieved by irrigation technology.

The World Food Summit of 1996 defined sustainable irrigation of small scale dry-land farming as “when all people at all times have access to sufficient, safe, nutritious food to maintain a healthy and active life.” Sustainable irrigation of small scale dry-land farming also focuses on the adoption of new irrigation technology, gravity free flow irrigation and access to credit. The food insecure population in the world is increasing at an alarming rate (Gabre-Madhin, 2009). In the year 2000, about 830 million people in the world were food insecure, but in 2011, this figure had gone up to 925 million (Jamah, 2011).

Sub-Saharan Africa is the home of nearly 240 million chronically food insecure population, which makes 25% of the total population living in the developing countries (Jamah, 2011). But agricultural production is declining significantly in Africa (Gabre-Madhin, 2009). In 1995, over one-third of the African continent’s grain consumption depended on food imports (Aileen, 2003) and each year, some 30 million people require emergency food aid. In the year 2000, food aid in Africa amounted to 2.8 million tonnes (Slater, Peskett, Ludi and Brown, 2007). It is significant to note that the adoption of rain-fed dry-land farming has failed to attain sustainable food production in the sub-Saharan Africa (Gabre-Madhin, 2009). Africa needs a sustainable irrigation technology for agricultural food production in order to improve in its agricultural food production to a level that can sustain the high population growth rate (Slater, *et al.*, 2007).

In Kenya, the agricultural sector supports livelihoods of about 80% of the 41 million people (Government of Kenya [GoK]: *Population Census*, 2009). The sector also accounts for 25% of Kenya's Gross Domestic Product (GDP) and it is the second largest after the service sector. Small-scale farmers account for over 75% of the total agricultural output and about 50% of the marketed agricultural produce (GoK, 2009). Initiation and management of irrigation schemes in Kenya is delegated to the National Irrigation Board (NIB) by the Ministry of Water and Irrigation (MWI) which is legally mandated by the government to manage all irrigation related resources on behalf of the Government of the Republic of Kenya (GoK, 2009).

The board, which was established through the Irrigation Act of 1966 (CAP 347) of the Laws of Kenya, is also subject to the State Corporations Act (CAP 446) that guides the operations and functions of all Public Sector Corporations (Kinyua, 2004). The latest NIB policy on irrigation foregrounds the normalization of operations; provision of infrastructure for the existing irrigation schemes; restarting of the stalled irrigation schemes through farmers' sensitization and capacity building; initiation of long term sustainability of irrigation schemes through self-owned activities which eschew the trap of dependency on external support; increasing farmers' participation in irrigation management; expanding irrigation development through assessments and developing new irrigation schemes (GoK, 2009).

One of the challenges facing irrigation is the availability of freshwater, which is associated with global climate change. Karl, Melillo and Peterson (2009) argued that agriculture uses roughly 70% of the total global freshwater supply and so, the agricultural sector is adversely influenced by the global climate change. The global climate change influences the small-scale irrigation dry-land farming worldwide due to the increased variability in precipitation and competing demands for fresh water supply, which challenge the capacity to maintain output (Slater, *et al.*, 2007).

Other irrigation technology-related constraints influencing small-scale farming in ASALs include: high cost of equipment, their repair and maintenance, especially the motorized pumps (Baker, 2005). Similarly, there is no collateral to safeguard

loans either from the government Agricultural Finance Corporation (AFC) or from commercial banks in small scale irrigation farming (Karl, *et al.*, 2009). However, income gains from small-scale irrigation agriculture are impressive (Omiti, Otieno, Nyanamba and Mccullouch, 2009).

On average, a small-scale farmer on 2-3 acre-land of rain-fed agriculture makes less than Kshs. 60,000 gross income annually, which contrasts with Kshs. 100,000 from an equivalent unit of land under irrigation, for Kshs Snow peas and French beans, Kshs. 34,000 for Kale and Kshs. 45,000 for onions (Omiti *et al.*, 2009). But less than 50,000 hectares of land are used for small-scale irrigation which pales in comparison with the estimated small-scale irrigation potential of 300, 000 hectares as well as the 80, 000 hectares total irrigation area in Kenya (Omiti *et al.*, 2009). Kitui Central District is in a central hilly part of Kitui County, one of the driest Counties in Kenya (GoK, 2010, *Kenya Vision 2030*).

In Kitui Central District, the main agricultural land use utilizes the unreliable short-rains (Christian and Mbuthia, 2008). The rainfall pattern is bi-modal but erratic and unreliable within the range of 500 mm to 700 mm annually (Vasudevan and Gichohi, 2008). Rain-fed food production is unreliable, except among the farmers who grow crops such as millet, sorghum, green grams and cowpeas. Thus, there is rampant food insufficiency in the district (Vasudevan and Gichohi, 2008). Small scale irrigation of dry-land farming is dominant in the rural regions surrounding the Kitui County headquarters, along the Kalundu and Nzeeu river banks and by isolated cases of farmers who use water from their shallow wells for irrigation (Christian and Mbuthia, 2008). It is against this background that this study sought to establish the extent to which technology influences sustainable irrigation of small scale dry-land farming in Kitui Central District, Kitui County, Kenya.

1.1 Statement of the problem

Although there has been low small scale irrigation in Kenya as revealed in the introduction, its contribution to the national income, employment, sustainable irrigation of small scale dry-land farming and nutrition is recognized worldwide (Jamah, 2011). For example, the increasing demand for staple food and income

generated from small scale irrigation agriculture in Africa is currently at Kshs. 12,000 billion annually (Jamah, 2011). This shows that there is untapped food production and income generation potential from small scale irrigation farming. With relevant government policy support, small scale irrigation of dry-land farming is capable of solving not only food and income insufficiency, but may also create employment opportunities for many people (Christian and Mbutia, 2008).

In spite of the foregoing knowledge, sustainable irrigation of small scale dry-land farming has not been addressed in Kitui Central District (Vasudevan and Gichohi, 2008). In the *Kenya Vision 2030* policy paper, it was convincingly projected that Kenya would have attained an economically viable agricultural production which would be sustainable and commercially competitive in the global market by the year 2030 (GoK, 2010). However, three years down the line in 2012, there was no significant impact of its implementation in Kitui Central District.

Consequently, rural poverty and food insecurity persist with the decrease of food aid and donor funding from the World Food Programme (WFP), the World Bank and International Monetary Fund (IMF) respectively (Christian and Mbutia, 2008). There are approximately 93,000 people in Kitui Central District (GoK, *Population Census*, 2009). This population still depends on relief food aid to meet the deficit from the rain-fed agriculture. (Christian and Mbutia, 2008). Although small scale irrigation of dry-land farming can be sustainable and has potential to supply surplus for commercial purposes, it has not been adequately adopted in the district. This is why this study investigated the influence of technology on sustainable irrigation of small scale dry-land farming in Kitui Central District, Kitui County, Kenya.

1.2 Objective of the study

The objective of the study was to establish the extent to which adoption of new irrigation technology has influenced sustainable irrigation of small scale dry land farming.

1.3 Hypothesis of the study

The following Null Hypothesis was tested:

H₀: There is no significant difference between the treated mean values of technologically irrigated dry-land 2-acre farm yields and the control mean values of rain-fed dry-land 2-acre farm yields at 5% significance level.

H₁: There is significant difference between the treated mean values of technologically irrigated dry land 2-acre farm yields and the control mean values of rain fed dry-land 2-acre farm yields at 5% significance level.

2. Literature Review

Kenya is already utilizing the low-cost technology for small-scale irrigation defined in this study as irrigation on small plots where farmers have the major control and influence and under which farmers use any level of technology that they can effectively operate and maintain (Meinzen-Dick, 2007). Many different technologies and techniques are used for water collection and distribution for small-scale irrigation in Kenya, including rainwater harvesting, bucket irrigation, gravity fed sprinkler and drip, treadle and pedal pumps, rope and washer, motorized pumps, wind-power and construction of small earthen dams (Meinzen-Dick, 2007).

Inexpensive simple gravity and pump sprinkler systems for horticultural crops have been extremely profitable investments. Their numbers are growing fast in high-potential areas such as on the slopes of Mt. Kenya where commercialization of horticultural crops for domestic and international markets is in full swing. However, the spread of this technology to cover most of the estimated potential irrigation area is limited by physical conditions and increasing competition for water. Techniques focused on keeping water in the field, distributing it more efficiently, achieving better soil moisture retention are typically less expensive than management strategies or system modifications (Evans, 1998). Field practices are techniques focused on keeping water in the field, distributing it more efficiently, achieving better soil moisture retention (Verhallen, *et al.*, 2003). When traditional field practices fall short of expectations and the management strategies and

systems modifications discussed below are out of reach, the field practices of dry-land farming are another avenue to explore. Examples of dry-land farming field practices include: chiselling of extremely compacted soils; furrow diking to prevent runoff; and land levelling for more even water distribution (Verhallen, *et al.*, 2003).

In order for dry-land farming to be feasible for farmers, it must be accompanied by financial incentives like conservation easements, which involve the transfer of development and/or land use rights to a government agency or non-profit providing tax benefits or direct payment for retirement of the land (Kromm and White, 1990). Management strategies allow the irrigator to monitor soil and water conditions to ensure water is delivered in the most efficient manner possible (Evans, 1998). By collecting this information, farmers can make informed decisions about scheduling, the appropriate amount of water for a particular crop, and any system upgrades that may be needed (Anderson and Heimlich, 2000).

The methods include: measuring rainfall, determining soil moisture, checking pumping plant efficiency, and scheduling irrigation (Evans, 1998). Farmers have to rely on a number of factors to monitor soil moisture, including temperature and humidity, solar radiation, crop growth stage, mulch, soil texture, percentage of organic matter and rooting depth. The government of Queensland (2002) in Australia has done an effective job of compiling a fact sheet on a variety of irrigation scheduling tools, including the associated pros, cons, and costs of each (Anderson and Heimlich, 2000). When pumping plants are running at their most efficient, water gets delivered to the plant without being wasted (Evans, 1998). A pump in need of repair or adjustment cannot only waste water but also cost money (Anderson and Heimlich, 2000). The management strategies described above allow for the correct amount of moisture to be delivered to the plant. When combined with system upgrades, farmers can maximize the amount of water savings and the efficiency of their land (Verhallen, *et al.*, 2003). While this is not an automatic replacement for a dam, there could be an opportunity for removal or the ability to delay construction of a new barrier depending on the size of the diversion (Kromm and White, 1990).

Monitoring the water needs of crops in the most efficient manner possible requires technological upgrades that also require an initial outlay of capital (Evans, 1998). In addition to the cost of implementing these system upgrades, there may be training required to integrate new computer systems and others (Verhallen, et al., 2003). System modifications, often the most expensive of the three categories, require making changes to an existing irrigation system or replacing an existing system with a new one (Evans, 1998).

One typical system modification that allows for the most efficient delivery of water is the addition of drop tubes to a centre pivot system and the retrofitting of a well with a smaller pump (Evans, 1998). Replacement irrigation systems include: installing drip irrigation, micro sprinklers, or solid set systems, or constructing a tail water recovery system (Kromm and White, 1990). Many farms still use inefficient irrigation techniques like travelling gun, and centre pivot, which apply more water than crops require (Bureau of Reclamation, 1996). Modern irrigation technologies such as drip irrigation, micro sprinklers and solid set systems can deliver water much closer to the actual plant and achieve much greater water efficiency (Evans, 1998). These irrigation tools are the most efficient in terms of delivering water to crops. They use the latest technologies to determine the exact amount of water a crop needs in order to grow and delivers the water directly to the plant. However, they often prove most efficient when used with vegetable and fruit tree crops and less so with dense grain crops (Verhallen, et al., 2003).

Low horsepower (LHP) diesel pumps are also very popular among farmers who can afford them: the pumps are not inexpensive, typically selling for Kshs. 50,000- Kshs.70,000 for 3-5 HP pumps (Meinzen-Dick, 2007). There has been no revolution in pump technology in small-scale irrigation in Kenya due to the expensive cost of acquiring the motorized pump. Pump breakdowns are major problems: farmers are not trained to maintain pumps and do not know the spare parts for these pumps (Meinzen-Dick, 2007). Irrigation small scale dry-land farmers do not have collateral to safeguard loans either from the government-run AFC or commercial banks (McIntyre et al., 2009). Overall, the government has put a lot of effort into crop and livestock research, but much less effort has gone into support for agricultural engineering and improvement of sustainable small-scale irrigation. Thus, knowledge and capacity for technology development

and application is lacking. Overall, there remains little national awareness of innovative, lower-cost technologies (Baker, 2005).

2.1 Theoretical framework

This study is based on the Janssen and Anderies (2007) after Irrigation Management Transfer (IMT) viability theoretical framework for a sustainable dry-land farming irrigation scheme. The broad objective of IMT is to increase irrigation performance while reducing constraints on public budget. It is a strategy to improve economic conditions by reducing the role of the state or its agents through privatization and empowerment of local communities.

The underlying principle is to encourage farmers and local communities to take responsibility for the management of local resources, thereby limiting external interventions to the provision of information and institutional support services that enhance efficient resource allocation (Janssen and Anderies, 2007). Janssen and Anderies (2007) define viability as the ability of the irrigation scheme to generate sufficient income to satisfy the household income expectations of the irrigators and to cover basic operational and maintenance costs of the irrigation infrastructure, while not mining the natural resources (soil and water). Janssen and Anderies (2007) also postulates that although income expectation may differ widely across cultures and among individuals, it is much related to the relative role irrigation plays in the income functions of individual irrigators. Janssen and Anderies (2007) have developed their Irrigation Scheme's Viability Theoretical Framework from International Water Management Institute's global studies on sustainable dry-land farming irrigation schemes (Svendsen, 1994; Brewer *et al.*, 1999).

These studies, however, have only stressed on getting the right sustainable dry-land irrigation process along with the favorable technical, legal and institutional conditions' viability; while, Janssen and Anderies (2007) have emphasized on the fact that dry-land irrigation scheme's viability after IMT will further depend on the costs of sustainable self-management and reliance of the farmers on their sustainable irrigation.

2.1.1 Conceptual framework

Conceptual framework is a graphical/narrative of relationships of the study variables-network where the independent variables network with moderating/intervening ones, while the outcome, also called dependent variable, is the output (Orodho, 2005). *This is shown in Figure 1.*

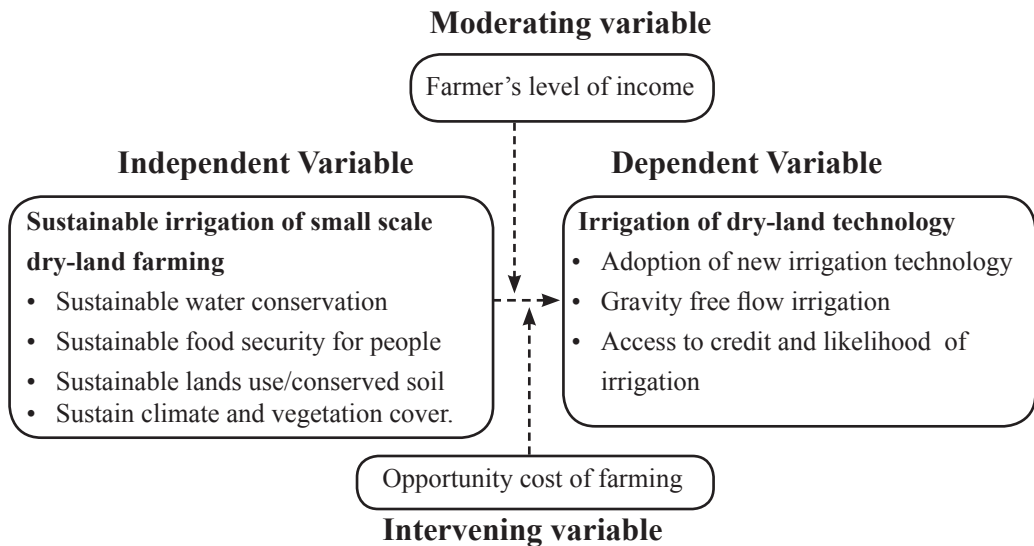


Figure 1: Conceptual framework for sustainable irrigation of small scale dry-land farming technology

Access to irrigation technological support services like (extension services and inputs) is often restricted in dry-land agricultural management. Rural communities, however, have proven capable of tackling extreme livelihood conditions deriving from dry-land degradation, including through reforestation and irrigation activities. Providing Credit is one of the best ways of encouraging rural population to take an interest in environmentally sound activities. Smallholder dry-land farmers, using irrigation, often face difficulties in obtaining credit due to lack of collateral.

3. Research Methodology

A descriptive survey research design was adopted for this study. The target population was all the 1540 small-scale dry-land irrigation farmers in Kitui central district (Christian & Mbutia, 2008). The small-scale farmers were grouped into

three clusters - Kalundu and Nzeeu river banks and those using shallow wells. From each cluster a sample proportional of 10% of the population was selected using simple random sampling to give 76, 61 and 13 a total of 150 small-scale farmers respectively. According to Mugenda and Mugenda, (2003), 10% is given as the minimum sample size representing the target population. A questionnaire and an interview guide were used for data collection. The instrument was pretested by means of a pilot study.

In the pilot study, the questionnaire was administered on a random sample of ten small scale irrigation agriculture farmers who did not participate in the actual study and reliability was determined using a split-half method. During data collection, the questionnaire was personally administered to 103 farmers as well as face-to-face interview with 47 of the selected farmers who were not able to fill in the questionnaire independently. The filled-in questionnaire was collected before leaving each of the selected farmers. The Statistical Package for Social Sciences (SPSS) was used to analyze the resultant information to produce frequencies, percentages. For additional analysis, Pearson's correlation coefficient and one way ANOVA techniques were used by employing the quantitative approach which involved descriptive and inferential statistical procedures. Qualitative data was analyzed by daily briefs, categorization into themes and narrations of respondents' quotations and verbatim.

4. Discussion of the Findings

The study sought to establish the extent to which irrigation technology had influenced sustainable irrigation for small scale dry-land farming in Kitui Central District in Kenya. The selected small scale irrigation dry-land farmers were asked to rate the following indicators of the level of influence of the farmers' irrigation technology on sustainable small scale dry-land farming: adoption of sustainably efficient irrigation technology, gravitational free water flow, convenient and sustainable irrigation and access to credit to secure sustainable irrigation technology equipment.

As was revealed in literature, inexpensive simple gravity and pump sprinkler systems for horticultural crops are extremely profitable investments. However,

the spread of this technology to cover the estimated potential irrigation area is limited by physical conditions and increasing competition for water. The research also examined irrigation field practices, that is, the techniques focused on keeping water in the field, distributing it more efficiently, achieving better soil moisture retention, as shown in Figure 4.1(Verhallen, *et al.*, 2003).



Source: Copyright © Verhallen, Fisher, and Shortt (2003) Irrigation Conservation Practices.

Figure 2: Land that has been levelled and furrow irrigation for feasible dry-land farming

When traditional field practices fall short of expectations and the management strategies and systems modifications discussed below are out of reach, the field practices of dry-land farming are another avenue to explore. Examples of Dry-land farming field practices include: The chiselling of extremely compacted soils, furrow digging to prevent runoff, land levelling for more even water distribution (Verhallen, *et al.*, 2003). The adoption of planned use of technologies can also help people exchange experiences, find common ground for decisions and actively participate in and guide development activities (Ado, 2009).

The irrigation small scale dry-land farmers were asked to use a 5-point likert rating scale ranked from 1-to-5 as **(SA)** Strongly Agree = 1; **(A)** Agree = 2; **(N)** Neutral = 3; **(D)** Disagree = 4 and **(SD)** Strongly Disagree = 5. The responses were grouped together then coded and analyzed. After data analysis, the results were presented in tabular form. The distribution of farmers by influence of irrigation technology on irrigation of small scale dry-land farming was given as shown in Table 1

Table 1: Distribution of farmers by irrigation technology influence on sustainable irrigation of small scale dry-land farming.

Frequency distributions by 5-point rating scale values

Irrigation technology indicators for dry-land farming	SA	A	N	D	SD	Total
Adoption of sustainably efficient irrigation technology	110	18	8	12	2	150
Gravitational free water flow for sustainable irrigation	111	32	3	3	1	150
Access to credit for sustainable irrigation technology tools	79	51	7	13	0	150
Cumulative sum of the 3-indicators' frequency	300	101	18	28	3	450

As shown in Table 1, the majority (401) of the cumulative sum of the total 450 of the 3-indicators' frequency responses from the selected irrigation small scale dry-land farmers, agreed that irrigation technology influenced the sustainable irrigation of small scale dry-land farming in Kitui Central District.

The interpretation was that irrigation technology negatively influenced sustainable irrigation of small scale dry-land farming in Kitui Central District. The summary of the study results in Table 1 were used with the 5-point scale rater and tabulated as shown in Table 2, where (x) = Scale Values in 5-point numerical values of likert scale ranked as $x = (1,2,3,4,5)$, and (fx) = Sum of product of Cumulative Sum of Frequency and the 5- Scale Values $(x) = (1,2,3,4,5)$.

Table 2. Responses on the influence of irrigation technology sustainable irrigation of small scale dry-land farming.

5 point ratings	No. of farmers	(x)	(fx)	Percentage
Strongly agree	300	1	300	66.7
Agree	101	2	202	22.4
Neutral	18	3	54	4.0
Disagree	28	4	112	6.3
Strongly disagree	3	5	15	0.6

As shown in Table 2, 89.1 per cent of the 150 farmers (most of the respondents) had strongly agreed that irrigation technology had influence on sustainable irrigation of small scale dry-land farming in Kitui Central District, Kenya. Only 6.9 per cent (of the respondents) had strongly disagreed, including all those who had strongly disagreed and disagreed that the gender stereotyped roles had influence on sustainable irrigation of small scale dry-land farming, while 4% of the respondents were undecided.

The mean calculated was $\sum fx / \sum f = 683 / 450 = 1.52$. Therefore, the calculated mean was in between likert scale point values of 1 and 2, where 1 – represented strongly agreed and 2 represented agreed which when combined for purposes of this study stood for strongly agreed. Thus, the findings of the study were interpreted to have indicated that the majority of the sampled dry-land irrigation farmers were in agreement that the farmers' inadequacy in adoption of the irrigation technology negatively influenced sustainable irrigation of small scale dry-land farming in Kitui Central District.

The study findings were similar to the information from literature reviewed, which confirmed that sustainable agricultural development is based less on material inputs (seeds and fertilizers) than on the people involved in their use (Okoro and Amaechi, 2008). Investments in scientific and material inputs for agricultural production bear little fruit without parallel investments in people. To this end, communication technologies are powerful tools for informing people

and providing them with the knowledge and skills they need to put agricultural science and production inputs to best use (Mbah, 2008).

To test the study hypothesis, the sampled farmers' responses to the questionnaire and the interview guide item number 19, were interpreted, analyzed and presented as shown in Table 3, which presents the two sets of 2-acre farm annual yields from the irrigation and the rain-fed small scale dry-land maize farming. The two levels of ANOVA were treated-irrigation small scale dry-land farm 90 kg annual outputs of dry maize and the control was the rain-fed small scale dry-land farm 90 kg annual outputs of Maize. The treated case was assumed to be the mean values of the 2-acre 90 kg annual yield from the 5 class intervals of 30 farmers each from the total sample size of the 150 farmers who were grouped according to responses on the yields from the irrigation small scale dry-land maize farm outputs. The control case was assumed to be the mean values of the 2-acre 90 kg annual yield from the 5 class intervals of 30 farmers each from the total sample size of the 150 farmers who were grouped according to responses obtained from the rain-fed small scale dry-land farm 90 kg annual outputs of maize.

The mean values of the 2-acre 90 kg annual yield from the 5 classes of 30 farmers each from the 150 farmers grouped into class intervals of 30 farmers on the two sets of yield of 150-150 responses (treated irrigation = 150 responses of 90kg bag yields) and the (control rain-fed = 150 responses of 90kg bag yields). Of both the treated- irrigation technology and control- rain-fed small scale dry-land maize farming five 2-acre 90 kg annual yield mean values for each of the five-30 member class interval of 10 classes of the selected irrigation small scale dry-land maize farmers were calculated and presented as in Table 3.

Table 3. Distribution of farmers by the five-30 member group mean values from the 150

<i>Irrigation 2-acre 90 kg yields each 30 farmers</i>	<i>Rain-fed 2-acre 90 kg yields each 30 farmers</i>
11	9
10	7
12	8
14	11
13	10
Total = 60	Total = 45
Grand Total = 105	

The Correction Factor $CF = (\text{Grand total})^2 / N = 105^2 / 10 = 1102.5$; The total sum of squares = $\sum (X^2_i) - \text{Correction Factor} = 11^2 + 10^2 + 12^2 + 14^2 + 13^2 + 9^2 + 7^2 + 8^2 + 11^2 + 10^2 - \text{Correction Factor} = 1145 - 1102.5 = 42.5$; The treatment sum of squares = $\{[(\text{Irrigation total})^2/n + (\text{Rain-fed total})^2/n] - \text{Correction Factor}\} = \{[60^2/5 + 45^2/5] - 1102.5\} = 1125 - 1102.5 = 22.5$.

The results are set out in the ANOVA Table 4 in which there are three sources of variation, as the Treatment, Error and Total. Since there are two treatments, T, there is $T-1 = 1$ DF (degrees of freedom) for treatments and as there were $T = 10$ observations total there were $10-1 = 9$ total DF. The error DF is obtained by subtraction $9-1 = 8$. The SS calculated above are then put in the Table 4, and the error SSE is obtained by subtraction of the treatment sum of squares = 22.5 from the total sum of squares = 42.5 as $[(42.5 - 22.5)] = 20.0$. The MS is calculated as the $SS/DF = 22.5/1 = 22.5$ and the error MSE is calculated as the $SSE/\text{error DF} = 20.0/8 = 2.5$.

The F is calculated as the $MS/MSE = 22.5/2.5 = 9.0$. Using the Critical Significance Level ($\alpha = 0.05$) and the between treatment F ($df_1 = 2-1 = 1$) and within treatment ($df_2 = 10 - 1 = 9$) degrees of freedom calculated to find the Critical Value of ($F_{(1,9)\text{critical}}$) using a Critical Value Table as shown in (Appendix V p.76) if $\alpha = 0.05$, $df_1 = 1$ and $df_2 = 9$ then $F_{(1,9)\text{critical}} = 7.209$ compared to calculated F value = 9.000, as shown in Table 4.

Table 4. Analysis of variance table for comparison of rain-fed and irrigation yields

Source	DF	SS	MS	F value	$F_{(1,9)\text{critical}}$ at ($\alpha = 0.05$)
Treatment	1	22.5	22.5	9.000	7.209
Error	8	20.0	2.5		
Total	9	42.5			

On condition that the Null Hypothesis is rejected if the calculated F value is greater than or equal to the F (1, 9) critical where the critical value is at (1,9) degrees of freedom in which ($df_1=1$) is between treatment degrees of freedom and ($df_2=9$) is within treatment degrees of freedom. Therefore, if $F \geq F(1, 9)$ critical, there is a significant difference and the calculated F value = 9.000 is a significant result.

The Null Hypothesis is accepted if the calculated F value is less than the critical value - $F < F(1,9)$ critical there is no significant difference and the calculated F value is a non-significant result. According to the Critical $F_{(1,9)}$, Table Value = $F_{(1,9)\text{critical}} = 7.209$ compared to the calculated F value = 9.000: it was concluded that the null hypothesis shows that there is no significant difference between the treated mean values of irrigation dry-land 2-acre farm yields by using technology and the control mean values of rain-fed dry-land 2-acre farm yields was rejected at 5% significance level since the $F_{(1,9)\text{critical}} = 7.209$ is less than the calculated F value = 9.000 at $\alpha = 0.05$.

Interpretation of the study findings above, implies that irrigation of small scale dry-land farming yields statistically significant higher farm outputs from a 2-acre dry-land farm on intensive small scale farming than the natural rain-fed small scale dry-land farm outputs from the similar 2-acre dry-land intensive farming would do at 95% confidence interval. This is in part explained by the fact that rain-fed small scale dry-land farming utilizes the natural unreliable and poorly distributed rainfall in Kitui County where Kitui Central District is located.

Hazell (2006) had noted that although small scale dry-land farmers needed enhanced access to arable land, appropriate technology and key farm inputs like seed, fertilizer and access to credit, these key farm inputs might not be the end of the road map to attaining the effective, efficient and reliable improved irrigation dry-land agricultural productivity. Therefore, the farmers' limited access to modern irrigation technology is among the key barriers to improving agricultural productivity.

The majority of the sampled irrigation small scale dry-land farmers (89.1 per cent) had strongly agreed that irrigation technology had influence on sustainable irrigation of small scale dry-land farming in Kitui Central District. However, from the literature review, sustainable agricultural development is not only based on material inputs but also on the people involved in their use (Okoro and Amaechi, 2008). In other words, investments in scientific and material inputs for agricultural production bears little fruit without parallel investments in people (Mbah, 2008).

5. Recommendations

The study recommends that the Ministry of Agriculture and policy makers should formulate policy on irrigation and technology that is supportive to the development and growth of small scale dry-land farming. The policy should provide incentives that promote small scale dry-land farming establishments. These would include access to the market, access to credit, transport and the general provision of the required infrastructural facilities that could help in enhancing sustainable irrigation of small scale dry-land farming in most of the arid and semi-arid lands.

On the appropriate use of irrigation technology, the agricultural extension officers should develop sensitization programs for small scale dry-land farmers covering appropriate irrigation technology, economical irrigation farming practices and sustainable water supply in the irrigation of small scale dry-land farming. This is because the farmers would have a broad range of options for adoption of appropriate irrigation technology and irrigation farming practices.

In agricultural economic terms, however, there must be adequate research to support the fact that the measurement of profit supersedes the measurements of cost in the application of the irrigation technology in the arid and semi-arid regions.

6. Conclusions

Sustainable irrigation of small scale dry-land farming could be obtained by enhancing own irrigation technology through adoption of improved, affordable and regional appropriate farming technologies. The new farming methods could be achieved through improved access to irrigation technologies. This has indirectly been exerting higher influence on sustainable irrigation of small scale dry-land farming in the ASAL region

of Kitui Central District in Kenya. The study findings revealed that access to farm inputs would enhance higher amounts of farm outputs.

Availability of water for irrigation, legal rights to water and competitive alternative water uses, were noticed as factors to consider in enhancing supportive and sustainable irrigation of small scale dry-land farming programme that would change most of the arid and semi-arid lands to green with adequate agricultural produce.

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ORGANIZATIONAL STRUCTURE, PERFORMANCE CONTRACTING SYSTEM AND ORGANIZATIONAL PERFORMANCE IN GOVERNMENT MINISTRIES IN KENYA

Kinyanjui N. J.¹, Gakuu M. C.², Kidombo J. H.³

ABSTRACT

This paper presents results of the influence of organizational structure on the relationship between Performance Contracting (PC) system and organizational performance in government ministries in Kenya. Descriptive survey design and correlational research designs were used in a mixed methods research approach. Quantitative data was collected through a questionnaire while qualitative data was collected through an interview guide. Research instruments were pilot tested for validity through content related method and reliability through test-retest criterion. A sample size of 310 respondents was selected by use of Sekaran's (2003) sampling size criterion from a population of 103,010 employees in government ministries through multi-stage sampling technique. Arithmetic mean and standard deviation were used for analyzing descriptive data while Pearson Product Moment Correlation (r) and Stepwise Regression (R^2) analysis were used for analyzing inferential data. F -tests were used to test the hypotheses in the study. Tests of statistical assumptions were carried out before data analysis to avoid invalidation of statistical analysis. With $R^2 = 0.057$, $F(2,177) = 5.315$ at $p = 0.006 < 0.05$, the null hypothesis was rejected and it was concluded that the strength of the relationship between PC system and organizational performance does not depend on organizational structure. Organizational structure, therefore, does not moderate the relationship between PC system and organizational performance in government ministries in Kenya. It is recommended that PC system should be synchronized across government ministries through an integrated M&E system to enhance performance.

Key Words: *Organizational Structure, Performance Contracting System, Organizational Performance*

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1. Lead Consultant, Shape Afrika, P.O. Box 13514-00100 Nairobi, Cell: +254 721 222243, kinyanjui@shapeafrica.com
 2. Associate Dean, School of Continuing and Distance Education, University of Nairobi, P.O. Box 92-00902, Kikuyu, cmgakuu@uonbi.ac.ke
 3. Dean, School of Continuing and Distance Education, University of Nairobi, P.O. Box 92-00902, Kikuyu, Cell: +254 722 734058, harrietkidombo@yahoo.co.ke

the relationship between Performance Contracting system and organizational performance in government ministries in Kenya. The research question in this paper is: To what extent does organizational structure influence the relationship between Performance Contracting system and organizational performance in government ministries in Kenya? The hypothesis that was formulated and tested was:

H₀: The strength of the relationship between Performance Contracting system and organizational performance does not depend on organizational structure.

H_A: The strength of the relationship between Performance Contracting system and organizational performance depends on organizational structure.

2. Literature Review

This study was grounded on Results Theory. This is because Performance Contracts are monitoring and evaluation (M&E) tools designed for measuring results as indicated by Hatry (2006). While undertaking a critical evaluation of the PC system in Kenya, Nuguti (2009) agreed with Hatry (2006) that the PC system in Kenya is an M&E system. In addition, Nuguti (2009) indicates that the tools that were designed in the PC system in Kenya complied in many aspects with the M&E system proposed by Kusek and Rist (2004). This study was, therefore, grounded on Results Theory since the M&E system proposed by Kusek and Rist (2004) was founded on Results Theory. Further, Dobbin (2012) portrays Results Theory as a participatory management approach which is the principle under which PC systems were founded. Derived from Results Theory, Eltville Results Model illustrates attainment of results in three levels whereby attainment of third level results (outputs) leads to attainment of second level results (objectives) which in turn lead to the ultimate project result (project goal) (Balogun, 2008).

Several studies have been undertaken on the influence of organizational structure on organizational performance. For instance, while studying on the association between strategy, structure and environmental uncertainty, and the design and the use of performance measurements systems, Maurice (2011) administered questionnaires to randomly selected respondents from 200 Canadian manufacturing organizations. The research design was mixed mode. Organizational strategy,

structure, environmental uncertainty and deployment of innovative performance measurement systems were found to influence organizational performance in the study. Although in this study Maurice (2011) considered multiple determinants of organizational performance, the current study identified the moderating role of organizational structure on organizational performance as a gap in knowledge.

In a separate study, Quingmin et al. (2012) investigated the relationship between organizational structure and performance by setting up a conceptual and structural equation model through a questionnaire survey and a sample of 90 Austrian and 71 Chinese companies. Data was analyzed through partial least squares and the results tested by bootstrap methods. Results from that study identifies learning and innovation as moderating factors influencing the relationship between organizational structure and organizational performance. The current study, however, suggested that the study by Quingmin et al. (2012) could have been enriched though mixed methods research approach and the influence of the performance management system on performance investigated.

In the study on the influence of organizational structure on entrepreneurial orientation and performance by Levent and Mehmet (2004), decision-making process of an international hotel group was investigated. Interviews, observations and document analysis were used as the data collection techniques. Results from the study by Levent and Mehmet (2004) indicates that a centralized decision making organizational structure demotivated employees and negatively influenced organizational performance. Although the study was qualitative in design, it was proposed in the current study that the determinants of organizational performance could be expanded to include employees' skills and attitudes.

3. Research Methodology

Descriptive survey design and correlational research design were used. The choice of these two research designs was informed by the descriptive and inferential data analysis required in this study. While descriptive survey helped the researcher to describe phenomena, correlational research design helped the researcher to identify predictive relationships by using correlations and stepwise regression modelling. Mixed mode research approach was used. By use of mixed

mode research approach, qualitative and quantitative data analysis were carried out simultaneously in a cross-sectional manner. This means that descriptive, inferential and qualitative data analysis were carried out in the study with the research freedom to make use of both descriptive and inferential data analysis techniques as advanced by pragmatism research paradigm, the philosophy that guided this study.

The research population was 103,010 public service employees in the 18 Government Ministries in Kenya (GOK, 2013) who are employed on permanent terms basis and are involved in performance contracts. Multi-stage sampling technique was used because the research context comprised government ministries which are large and complex organizations in respect to departmentalization. Huber (2004) argues that multi-stage sampling technique would be the most preferred sampling technique for large organizations with various departments in research situations whereby it is desired every sub-population to be presented in the sample.

At the first stage of the sampling procedure, 50% of the government ministries were selected. In selecting 50% of the government ministries, the 18 ministries were arranged alphabetically and every even number ministry was selected for study. The 9 selected ministries formed the research sub-population. At the second stage of the sampling procedure, departments (research categories) were randomly selected for study from the ministries (sub-populations). For ministries with less than 30 departments, only one department was selected at random. For ministries with more than 30 departments, 2 departments were selected at random. In total, therefore, 10 departments were selected.

At the third and last stage of the sampling procedure, individual respondents were randomly sampled from the selected 10 departments. This is because by selecting respondents from each strata (research category) in the research population, the sample was more representative. For acquisition of the qualitative data, the ten departmental heads for the selected departments were interviewed. The sample size was 310 respondents. Three hundred (300) of the respondents were selected from ordinary employees while 10 of the respondents were the heads of the selected departments. In the determination of the sample size, Sekaran's (2003) criterion on selection of sample size was considered.

Secondary data was used to acquire information on the performances of the ministries of government. This information was obtained from previous evaluation reports carried out as well as the performance contracting documents. Raw data was gathered directly from the respondents and was used to analyze the relationships that were being investigated in the study. To obtain sufficient information, triangulation of research instruments was done. The research instruments that were used in this study for data collection were a self-administered structured questionnaire and an interview guide. A self-administered structured questionnaire was used to collect the quantitative strands while the interview guide was used to collect the qualitative strands of the research.

Reliability of research instruments was done through test-retest method using Cronbach. In the pilot test, the composite Cronbach's α (Alpha) Reliability Coefficient for the research instrument was 0.705222. This method involved administering the same test twice to the same group after a time interval of two weeks between the first and the second administration of the research instruments. The test re-test criterion was selected because the respondents were expected to understand the significance of the research and were therefore expected to willingly fill the questionnaires for the second time. In addition, ministries of government in Kenya, being public entities, were easily accessible and hence the practicality of re-testing the research instruments.

While collecting data from heads of the selected departments from the 9 ministries of government under study, interviews were conducted by the researcher. Data collection from the ordinary employees in government ministries was done with the aid of nine research assistants trained in research, each assigned one ministry to enhance the rate of return of questionnaires.

Mixed methods data analysis techniques were employed in this study incorporating both descriptive and inferential data analysis. Non-parametric data was analyzed descriptively by use of measures of central tendency and measures of dispersion as the tools of data analysis. The arithmetic mean was the measure of central tendency statistical tool that was used for data analysis while the standard deviation was the measure of dispersion statistical tool of data analysis that was used. In data analysis, measures of central tendency are used when the set of data

values are finite and the data is expected to cluster around some central value (Weisberg, 1992).

To analyze the influence of the moderating variable on the relationship between the independent variable and the dependent variable, Stepwise Regression (R^2) analysis was used. Larry (2013) indicates that Stepwise Regression (R^2) involves mathematical modeling whereby the predictor variables are deliberately chosen without necessary being backed by theory. Although literature has been cited in this study on the influence of organizational performance on the dependent variable, no previous literature has been identified that directly indicates the influence of the moderating variable on the relationship between the main predictor variable and the dependent variable. Since the influence of the moderating variable on the relationship between the main predictor variable and the dependent variable was deliberately chosen in this study, then the requirement for the use of Stepwise Regression (R^2) for parametric data analysis was satisfied. The regression model that guided the inferential analysis in this study was:

Organizational Performance = f(PC System, Organizational Structure)

$$y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \beta_{14} X_1 X_4 + \beta_{24} X_2 X_4 + \beta_{34} X_3 X_4 + \varepsilon$$

Although various tests are used to test hypotheses for Stepwise Regression (R^2), Moriya (2008) argues that in practice, F-Tests are the most commonly used to test confidence intervals and hypotheses. If for a given sample, $F(r)$ is the Fisher transformation of r , and n is the sample size, then $F(r)$ approximately follows a normal distribution given the assumption that the sample pairs are independent and identically distributed and follow a bivariate normal distribution. Thus an approximate r -value can be obtained from a normal probability table. For a large enough sample where $n > 30$ as was the case in this study, then F -values can be obtained using Fisher transformation and the hypotheses tested normally by use of F -Tests (Moriya, 2008). In stepwise regression modelling, if the moderating variable under consideration was excluded from the final regression model, H_0 was accepted. Where H_0 was rejected, R^2 values were considered in determination of the strength of the relationship.

4. Findings

Out of the 300 questionnaires that were administered, 184 questionnaires were duly filled and returned and therefore regarded as the responsive instruments and formed the basis for data analysis. This formed a response rate of 61.3%. Forty two percent (42.1%) of the respondents were females while 57.9% were males and they were normally distributed in respect to government ministries, age group, level of education and tenure of service in public service. Kolmogorov-Smirnov test statistic (KS-test) and Shapiro-Wilk test (SW-test) were carried out to ascertain that the research data was collected from a normal population.

Existence of singularity and multicollinearity between predictor variables were also checked before undertaking regression analysis through correlations and residual tables generated by SPSS by analyzing the tolerance values under collinearity to ensure that the linear assumptions were not violated. Scatter diagrams were plotted prior to undertaking correlation analysis among the independent variables to check existence of homoscedasticity while existence of heteroscedasticity was checked through the correlation and residual tables generated by SPSS that were used to test for existence of collinearity.

Type I error was minimized by using a confidence level of 95% implying that the standard variate was 1.96 and the sample proportion (p) was less than or equal to 0.05 while Type II error was minimized by taking a large enough sample of 310 respondents. The weighting criteria of responses of Likert-type data assumed an equidistance of 0.8 whereby Strongly Disagree (SD) $1 < SD < 1.8$; Disagree (D) $1.8 < D < 2.6$; Neutral (N) $2.6 < N < 3.4$; Agree (A) $3.4 < A < 4.2$; and Strongly Agree (SA) $4.2 < SA < 5.0$.

Theoretical literature linked organizational structure with organizational performance. Empirical review indicated that organizational structure moderates the relationship between PC system and organizational performance. Ten items were developed to measure the extent of this relationship. In the descriptive analysis, the composite mean score for these items was 3.7286 while the composite standard deviation was 0.53194. This result indicates that respondents agreed that organizational structure positively influenced the relationship between the PC system and organizational performance.

To analyze inferential data, stepwise multiple regression was used. The regression results for the moderating influence of organizational structure on the relationship between PC system and organizational performance were as presented in Table 1.

Table 1: Regression results for the influence of organizational structure on the relationship between PC system and organizational performance

Model	r	R ²	Adjusted R ²	F	Beta	Predictor Variables
1	.184 ^a	.034	.028	6.250	2.696 .129	Constant term PC Tools
2	.238 ^b	.057	.046	5.315	2.970 .209 -.145	Constant term PC tools PC targets

Model 1 significant at $p = 0.013 < 0.05$; $F(1,178) = 6.250$

Model 2 Significant at $p = 0.006 < 0.05$; $F(2,177) = 5.315$

Since the components of PC system were PC targets, PC tools and implementer participation; stepwise multiple regression was performed to determine the best linear combination of PC targets, PC tools, PC implementer participation and organizational structure for predicting organizational performance. At the first step in stepwise regression modelling; PC targets; PC implementer participation; and organizational structure were excluded leaving PC tools as the only predictor variable of organizational performance. Since $F(1,178) = 6.250$ at $p = 0.013 < 0.05$ level of significance, it was 98.7% confidently concluded that PC tools predicted organizational performance (y) when PC targets, PC Tools, PC implementer participation and organizational structure were combined in regression modelling. The R² values of the model indicated that PC tools explained 3.4% of organizational performance.

By substituting the beta values as well as the constant term, model 1 emanating from step one in regression modelling was as follows:

$$y = 2.696 + 0.129X_2 + \epsilon$$

Based on the beta values of model 1 at the first step in regression modelling, PC tools (X_2) contributed to 12.9% of the model.

At the second and final step of stepwise regression modelling; implementer participation and organizational structure were excluded in stepwise modelling leaving PC targets and PC tools as the predictor variables of organizational performance. Since $F(2,177) = 5.315$ at $p = 0.006 < 0.05$ level of significance; it was 99.4% confidently concluded that the combination of PC targets (X_1) and PC tools (X_2) influenced organizational performance (y) when organizational structure and PC system were combined in determination of organizational performance. Since in this study the minimum required confidence interval for predicting influence on the dependent variable was 95% ($p = 0.05$), then a regression model existed for this relationship. The R^2 values of the model indicated that the combination of PC targets and PC tools explained 5.7% of organizational performance.

By substituting the beta values as well as the constant term, model 2 emanating from the second step in regression modelling was as follows:

$$y = 2.970 - 0.145X_1 + 0.209X_2 + \varepsilon$$

Based on the beta values of model 2, it was concluded that PC tools (X_2) positively contributed 20.9% of the model while PC targets negatively contributed 14.5% of the regression model. That organizational structure was excluded in stepwise regression modelling indicated that organizational structure did not moderate the relationship between PC system and organizational performance. The null hypothesis was, therefore, accepted and it was concluded that the strength of the relationship between performance contracting system and organizational performance did not depend on organizational structure.

The final model emerging from stepwise regression, therefore, excluded the moderating influence of organizational structure on the relationship between performance contracting system and organizational performance. This implied that with efficient PC tools (reliable, valid and simple to use), organizational performance would still be realized irrespective of the organizational structure. Setting targets on the other hand would produce undesired results in respect to organizational performance.

Respondents interviewed indicated that both the tools used as well as the evaluation criteria in government ministries should be contextualized since organizational

mandates varied. Respondents indicated that ministries whose core mandate was infrastructural, for example, the Ministry of Transport and Infrastructure, appealed more to the public since projects executed by such ministries were visible. However, quantifying the performance of ministries that were service oriented, for example, the National Treasury, was more complex to the average citizen. This scenario was, therefore, seen by respondents to necessitate for contextualized performance measurement in government ministries.

It was also indicated in interviews conducted in this study that inter-departmental delays in execution of activities negatively influenced the performance of other team members and this had an impact on the overall organizational performance. Respondents further indicated that the organizational size, departmentalization and bureaucracies in government ministries made it difficult for all employees to undertake joint team building sessions that would enhance inter-departmental coordination and a desired organizational culture that supports performance.

5. Discussions of Findings

To assess the moderating influence of organizational structure on the relationship between Performance Contracting system and organizational performance in government ministries in Kenya was partially informed by the fact that Sector Performance Standards (SPS) indicated that the PC system is applied uniformly across the entire public sector irrespective of organizational structures (GOK, 2010). Hypothesis in this study stated that the strength of the relationship between Performance Contracting system and organizational performance depends on organizational structure was tested to verify the relationship. Findings indicated that organizational structure in respect to size, mandate and model of the organization did not influence the relationship between the PC system and organizational performance in government ministries in Kenya.

These findings concur with the Bureaucratic Theory examined in respect to These findings concur with the Bureaucratic Theory examined in respect to management of large entities like governments (Bruun, 2007; Korotayev, 2006; Radkau and Patrick, 2009). Although Kenneth and Kenneth (2005) argues that employees in large organizations hide in the system, findings concurred with Radkau

and Patrick (2009) that the important factor in organizational performance in bureaucratic organizations is enacting an effective performance system. Further, Kusek and Rist (2004) indicate that an effective performance monitoring and evaluation system would eliminate lack of defined roles in an organization and lack of performance accountability by employees.

Results also indicated that an effective PC system was found to lead to organizational performance irrespective of organizational structure. Of importance, then, for government ministries, is to ensure that the PC tools used are relevant to a specific ministry since the validity, reliability and simplicity of PC tools were shown to be the main determinants of organizational performance.

Although respondents indicated that organizational structures of government ministries in Kenya support performance, interviews conducted indicated that performance evaluation oriented meetings were habitually done at higher levels of management. Periodical meetings being convened irregularly across board indicates inadequate efficiency attributed to organizational structure. Qingmin et al. (2012) argue that ability by staff members to know each other in an organization and frequency of meetings indicate the extent to which an organization's structure is conducive for performance.

Respondents interviewed also indicate that government ministries were rarely involved in corporate social responsibilities. Interviews conducted indicate that involvement in corporate social responsibilities was largely viewed as an obligation of the private sector rather than the public sector. Since Hatry (2006) indicates that public entities benchmarked the concept of performance contracts from performance measurement systems implemented in the private sector, the public sector, therefore, should embrace performance measurement best practice in organizations, which includes, involvement in corporate social responsibilities.

Performance measurement, therefore, should be achieved at the stage of identification of performance indicators. Respondents also indicated that the PC system in government ministries, despite being a performance measurement system, was not supported by an integrated information management system as is the case with the Integrated Finance Management Information System (IFMIS) used for management of public funds. There is, therefore, need to develop and

implement an integrated performance monitoring and evaluation system in government ministries in Kenya.

6. Conclusion

This study concludes that the strength of the relationship between PC system and organizational performance does not depend on organizational structure. Organizational structure is a factor of organizational performance and the implementation of the PC system in government ministries in Kenya should be independent of organizational structure. It is further concluded that for government ministries in Kenya to enhance organizational performance, the tools used in the PC system should be simple, reliable and valid for enhanced performance.

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INFLUENCE OF PARTICIPATORY MONITORING AND EVALUATION ON CITIZEN EMPOWERMENT OUTCOMES: A CASE OF KAREMO DIVISION, SIAYA COUNTY, KENYA.

Kibukho K.¹, Kidombo J. H.², Gakuu M. C.³

ABSTRACT

While there is a considerable enthusiasm for participatory monitoring and evaluation (PM&E) in monitoring and evaluation, the claim to its effectiveness has hardly been tested empirically. This study assessed the extent to which PM&E influences citizen empowerment. The empirical investigation took the form of a mixed-methods approach. The study employed a concurrent parallel design, in which samples for quantitative and qualitative components were drawn from the same population and data collected within the same timeframe. Two hundred and twelve participants responded to a self-report questionnaire. Six Focus Group Discussions (FGDs) were also conducted; two with starter group members and four with 4 CBOs randomly selected from each of the locations within the study area. The participants were community members who participated in a World Vision International's PM&E model. Quantitative data were analysed through linear regression analyses while, the qualitative component utilized interpretive technique, coding and recursive abstraction to organize, summarize and give an impression of the causal mechanisms at play in the quantitative data. Both the quantitative and qualitative findings support the notion that there is a positive linear relationship between PM&E and citizen empowerment. Policies that provide opportunity for citizens to participate in M&E process are therefore advised as worth of investment since they can lead to significant impact on citizen empowerment outcomes.

Key words: *Citizen Empowerment; Participatory Monitoring and Evaluation*

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1. PhD Candidate, Department of Extra Mural studies, University of Nairobi, Monitoring and Evaluation Officer, RTI International, P.O. Box 692-00200 Kitengela, kenkib@yahoo.com
 2. Dean, School of Continuing and Distance Education, University of Nairobi, P.O. Box 92-00902, Kikuyu, Cell : +254 0722734058, harrietkidombo@yahoo.co.ke
 3. Associate Dean, School of Continuing and Distance Education, University of Nairobi, P.O. Box 92-00902, Kikuyu, cmgakuu@uonbi.ac.ke

1. Introduction

Participatory monitoring and evaluation (PM&E) emerged primarily because of the limitations of the conventional approach to monitoring and evaluation in reflecting the aspirations of primary stakeholders who are directly affected by development. PM&E involves primary stakeholders, development agencies, and policy makers deciding together how progress in development should be measured, and results acted upon. Hilhorst and Guijit (2006) define PM&E as a process where primary stakeholders – those who are affected by the intervention being examined – are active participants; take the lead in tracking and making sense of progress towards achievement of self-selected or jointly agreed results at the local level, and drawing actionable conclusions. In consonant with this definition is Obure, Dietz & Zaal (2008) who argue that a true PM&E is one in which all the stakeholders take part in all the processes of monitoring and evaluation (M&E). However, as Guijit, Arevalo & Saladores (1998) observe, a key part of understanding PM&E depends on how ‘participation’ is interpreted. Unfortunately, participation has many different interpretations as each process, with its unique purpose and context, involves different groups of people to varying degrees.

The definition of PM&E thus goes beyond involving primary stakeholders in a process of ‘conventional’ M&E, where they are only consulted on indicators and involved in providing information and feedback on the results (Hilhorst and Guijit, 2006). The process as Fraser, Dougill, Mabee, Reed & McAlpine (2006) note, should be as simple as possible so that members who are not as sophisticated can participate in all areas right from the identification of the indicators, decision on data collection methods, interpretation and presentation as well as utilization. PM&E has, therefore, come to be seen as a development theory and practice that occasion power to the marginalized (especially the ‘poor’, women, children and people with disabilities). In this approach a range of stakeholders, especially beneficiaries are engaged in designing and implementing the evaluation, and then acting on its findings (Jackson, 1999). The ideal PM&E situation is one in which all the stakeholders take part in all processes of design, implementation as well as M&E.

PM&E processes are commonly being implemented in communities with the objective of improving social and economic development and the empowerment of citizens. The compelling question that should be asked is, therefore, whether or not PM&E as applied by the NGOs is effective in empowering primary stakeholders. Although there are some exceptions, the gulf between the ideal PM&E and those that are applied by many organizations is often huge. Ideal PM&E demands that stakeholders, particularly at the local level, be involved actively in all stages of M&E. This involves determining the objectives of monitoring or evaluation, identifying indicators to be employed, as well as participating in data collection and analysis (Ezemenari, Rudqvist & Subbarao, 1999; Fraiser et al., 2006). One can use participatory methods not only at project formulation stage, but throughout the duration of the project, and especially for evaluating how the poor perceive the benefits from the project (Ezemenari et al., 1999; Leeuwen et al., 2000; Codd, 2011).

While rhetoric abounds, arguing for participatory approaches to M&E in development programming, the use of such approaches appears to be limited and the claims have hardly been tested empirically (Abbot & Guijit, 1998; Burton, Goodlad & Croft, 2006). The objective of this study was to empirically determine the extent to which PM&E influences citizen empowerment. Subsequently, the study explored the question, “To what extent does PM&E influence citizen empowerment?” The study thus hypothesized that there is a relationship between PM&E and citizen empowerment.

2. Literature Review

Empowerment as a construct has been conceptualized variedly by different scholars. This conceptualization also differs across levels of analysis. According to Zimmerman (1990), at the individual level (citizen empowerment), empowerment includes participatory behaviour, motivations to exert control, and feelings of efficacy and control; at the organisational level empowerment includes shared leadership, opportunities to develop skills, expansion, and effective community influence; and empowered communities include opportunities for citizen participation in community decision making, and allow for fair consideration of multiple perspectives. This also resonates well with Laverack and Labonte (2000)

assertion that achieving empowerment objectives would improve the quality of individuals' social relations with each other (social support), their collective and individual experience of capacity and their perception as being important in the eyes of other institutions. Spreitzer (1996), advancing the same argument as Zimmerman defines empowerment as intrinsic motivation manifested in four cognitions reflecting an individual's orientation to his or her work role. The four cognitions are meaning, competence, self-determination, and impact. This is well summarized by Hilhorst and Guijit (2006), who note that empowerment is about building the capacity, self-reliance and confidence of citizens, programme staff and other partners to guide, manage and implement development initiatives effectively.

Empowerment has also been defined as a construct that links individual strengths and competencies, natural helping systems, and proactive behaviours to matters of social policy and social change (Kasmel and Tanggaard, 2011). According to Kasmel and Tanggaard, empowerment is associated with feelings of competence to change a situation (self-efficacy) and with expectations of positive outcomes for one's efforts (locus of control). This is elaborated further by Gigler (2004) who identifies outcome indicators for the psychological empowerment. These he claims include: (1) the improved ability to analyse and solve problems; (2) to enhance a person's self-esteem; and (3) a sense of participation in the modern world. According to Gigler, the psychological dimension of empowerment is relevant for strengthening a person's ability to influence strategic life choices – human agency, one of the core concepts of empowerment (Alsop, Bertelsen and Holland, 2006).

PM&E advocates that the ultimate beneficiaries of a development intervention – the poor, the disadvantaged, the disempowered – can, and should, lead the effort among other stakeholders to define the results to be achieved by a given intervention (Ezamenari et al., 1999; Jackson, 1999). This has the implication of the primary stakeholders taking part in defining what change should look like (indicators of intervention); participating in the monitoring and implementation where the progress towards the realization of the change is tracked and reports

generated (reports in this case capture the stories as told by the beneficiaries); and involvement in the evaluation to establish whether the desired change has occurred.

A study conducted by Prestby, Wandersman, Florin, Rich, and Chavis (1990 cited in Zimmerman, 1990) observes that analysis of the effects of perceived benefits and costs of participation provides a unique understanding of psychological empowerment. In their study, Prestby and others observed that the most highly involved individuals reported more benefits of participation – learning new skills, gaining information, helping others, increasing social contact, and fulfilling obligations – than less involved individuals. Samah and Aref (2011) also note that people who are involved in setting up community groups and organizing their activities learn and gain knowledge. These are all considered outcomes of empowerment in literature. Papineua and Keily (1996), for instance, operationalize the construct to include aspects like: (1) perception of self-efficacy and control: the transformation from a self-perception of powerlessness to viewing oneself as efficient, competent at carrying out activities to attain goals, and in control of one's life; (2) acquisition of resources, knowledge and skills needed to accomplish personal and collective goals; (3) participation in collective action to effect change leading to improved quality of life and sustainable development.

According to Abbot and Forward (2000), participation affirms dignity and self-respect; it develops political and moral awareness and responsibility; it develops community cohesion; and it empowers communities, community groups and individuals to pursue their own interests and to challenge existing power structures. However, according to Strandberg (2001), for empowerment to be transformative it must be seen as a process existing on all levels – individual, group and societal. Leeuwen et al. (2000) also argue that PM&E is an indispensable means for ensuring that NGOs and aid agencies are accountable, not only to their supporters and donors, but also to the poor, for whom PM&E may serve as a basis for self-reliance and empowerment. As a matter of fact, the adoption of participatory methodologies in evaluation has been argued from different perspectives, but commonly from the perspective of citizen's empowerment (Fetterman, 2001).

This idea of empowerment is emphasized further by Papineau and Kiely (1996) who argue that the issue of promoting stakeholders empowerment goes beyond the

notion of shared control over the evaluation process to a focus on changing larger social structures through a process of grass-roots empowerment. Empowerment thus is the essence of stakeholder participation in an M&E process (Obure et al., 2008). Allowing primary stakeholders to plan their own interventions, make their own decisions and take part in monitoring and evaluation and policy formulation empowers them (Codd, 2011). Codd argues that empowerment of the user generates confidence, independence and greater social inclusion. Similarly, Hilhost and Guijt (2006) argue that, empowerment is about building the capacity, self-reliance and confidence of citizens, program staff and other partners to guide, manage, and implement development initiatives effectively.

2.1 Theoretical Foundation of Citizen Empowerment

The concept of citizen empowerment is influenced by the theory of human development, social capital theory, empowerment theory and social cognitive theory.

2.1.1 Human Development Theory

Human development is a trans-disciplinary theory which integrates ideas from ecological economics, sustainable development, welfare economics, and feminist economics. It focuses on measuring the well-being and social welfare or quality of life of people. The most notable proponents of human development theory are Amartya Sen and MahbubulHaq (Fukuda-Parr, 2003). According to human development theory, development is an expansion of human capabilities achieved through expanding the range of things that a person can do. These include health and nourishment, acquiring knowledge and participating in community life (Fukukda-Parr, 2003; Chimni, 2008). Chimni (2008:7) observes that Sen's theory offers a conception of development that goes beyond the 'technocratic fixes' as it draws attention to the need to consult and deliberate with the subjects of social policies, consistent with participatory paradigms.

Human development theory has, however, been criticized for being ambiguous. According to Chimni (2008), the concept of development is not as attentive to social structures and processes that inhibit its realization. The theory fails to deal adequately with the questions of power and social conflict. It thus does not advance

a theory of practice commensurate with its own perception of development as creation of capabilities. It is this absence of any strategy to achieve the goals of development that undermines its utility. The theory also neglects the subject of political economy that offers valuable ideas into social processes and structures necessary for the realization of development goals. Furthermore, the theory does not explore specifics in the context of real world situations and how these could undermine goal achievement. Similarly, while the theory views the individual as the key agent of social change, it does not explore the role of collective action (social capital) in the shaping of social processes. Because of its inadequacies, other scholars have advanced supporting theories.

2.1.2 Social Capital Theory

In order to produce improvements in quality of life and social cohesion as ascribed by human development theory, people often need to be linked through social capital (Bramley, et al., 2006). Social capital has been described as the “networks, together with shared norms, values and understandings that facilitate cooperation within or among groups” (Cote and Healy, 2001:41). Drawing from this definition, Dugdale (2011) concludes that the main aspects of social capital should therefore include citizenship, neighbourliness, social networks and civic participation. Social capital, as observed by Perkins and Long (2002) is important to the functioning of community life. The theory views sustainability as an asset, occurring naturally and with varying degrees within societies, which allows them to maintain coherences and overcome change and hardship (McKenzie, 2004).

Social capital, according to Bramley, et al. (2006) is the product, intentional or unintentional, of social processes aimed at the building and reproduction of durable and useful social relationships necessary for both material and symbolic benefits. Consistent with Bramley and others’ definition is McElroy (2008) view that social capital consists of shared knowledge and related organisational networks that enhance the potential for effective individual and collective action in human social systems. These relationships are believed to help enlarge individual or collective actors’ action of capabilities and can be extended to social system’s action of capabilities too. Social capital is measured at various levels, namely: individual, community, country or organizational.

While social capital theory has gained acceptance across different disciplines, it has been noted to be having a number of serious weaknesses. The main weakness in social capital theory is that, “it produces descriptions that retain unresolved tensions” (Haynes, 2009:16-17). The theory thus lacks a framework that explains its contribution as more than the sum of the various kinds of relationships. Consequently no consensus exists as to what it is in reality. It is because of these that its critics claim that despite its vast mention in literature, social capital fails to provide a coherent concept at all; making it an elusive concept. According to Hynes (2009), some of the critics, for instance, Ben Fine have argued that theory is highly political in both neutralizing dissent, but systematically disregarding key questions and issues concerning the social problems it is meant to address. This raises questions on its implications as a theory, as well as the type of explanations it advances. Furthermore, there still exist some unresolved methodological and conceptual issues related to the concept and measurement of social capital (Tzanakis, 2013).

2.1.3 Empowerment Theory

PM&E processes are usually implemented in communities with the objective of empowering citizens (Bailey, 2009). The origin of empowerment as a form of theory is traced back to the Brazilian humanitarian and educator, Paulo Freire (Hur, 2006). Paulo Freire’s, “*The pedagogy of the oppressed (1970)* provided the conceptual base for the debates on empowerment. However, according to Bodja (2006), Ernst Friedrich Schumacher’s ‘*Small is Beautiful*’ (1973), which came into circulation at a similar time with Freire’s piece, is also known to have influenced the debate on empowerment. According to Zimmerman (1990), empowerment theory postulates that participation in decision making may enhance individual’s sense of empowerment and that empowered individuals are likely to be active in community organisations and community activities.

Empowerment as a construct is multifaceted. Theories of empowerment touch on different dimensions of life. Hur (2006) argues that empowerment theories are not only concerned with the process of empowerment, but also with results that can produce greater access to resources and power for the disadvantaged. An empowering intervention is that which builds capacity of individuals to

positively influence their wellbeing outcomes. Rappaport (1995) in support of this argument observes that the goals of empowerment are enhanced when people discover, or create and give voice to, a collective narrative that sustains their own personal life story in positive ways.

Just like social capital, empowerment is operative at various levels: personal or individual, interpersonal, organisational, community, and collective (Hur, 2006). Zimmerman et al. (1993) observes that the focus of both empowerment theory and practice is to understand and strengthen processes and context where individuals gain mastery and control over decisions that affect their lives. Thus, interventions that provide genuine opportunities for individuals to participate may help them develop a sense of psychological empowerment (Zimmerman, 1990; Zimmerman et al., 1993). Typically therefore, an empowering development process might begin with an environmental assessment of the opportunities to participate and develop strategies to include participants in the design, implementation, monitoring and evaluation of interventions.

Empowerment, however, is not a panacea for all individual and social illness. It has been criticized as “overly individualistic and conflict-oriented, resulting in an emphasis on mastery and control rather than cooperation and community” (Speer, 2000:58 cited in Hur, 2006). According to Hur (2006), although the practice of empowerment is effective for the removal of powerlessness, certain factors still exist that may inhibit the manifestation of empowerment. He cites organisational aspects, such as an impersonal bureaucratic climate, supervisory styles described as authoritarianism and negativism as well as arbitrary reward systems as hindrances to empowerment.

The other argument against the empowerment theory is the ‘loose’ manner in which empowerment as a concept is framed. According to Lincoln, Travers, Ackers and Wilkinson (2002), empowerment is a highly elusive theoretical concept. This is because, as a concept it has no single guru, nor does it have a clear definition. The same view is held by Bodja (2006), who argues that at a broader level, the concept of community empowerment is short of a strong theoretical foundation. Consequently, the term is attractive, loose and ambiguous enough for it to gain superficial initial acceptance by most people (Lincoln et al., 2002).

Bodja (2006) attributes this ‘vagueness’ in empowerment theory to the non-academic origin of the concept. The concept has its origin in ‘conscientization’ and ‘gift of knowledge’ both of which to a larger extent have their origins in practical development work and not academia. The other deficiency, according to Bodja is that there is no single model of empowerment. There exist diverse empowerment instruments, which are used in different contexts by development practitioners.

The issue of construct measurement also comes to mind. Brook and Holland (2009) identify three challenges that make the measurement of the empowerment construct difficult: (1) measuring empowerment captures processes and relational changes that are less predictable, less tangible, more contextual, and more difficult to quantify. This raises challenges of meaning, causality, and comparability; (2) changes in power relations (empowerment) are not single-event outcomes, but dynamic, process-based tied up with bargaining, cooperation, conflict, co-option, rent seeking, and other forms of contracting; (3) empowerment often involves relative rather than absolute changes in states of being: an observable move towards empowerment by one person or group cannot be assumed to apply to other individuals or groups, both within and across communities or countries. Hence, empowerment as a concept can best be understood under the complexity framework.

2.1.4 Social Cognitive Theory

Social cognitive theory is a learning theory developed by Bandura in 1977 as a direct response to behaviourism to describe how behaviours are learned. The theory is founded on the model of causation, in which behaviour is depicted as being shaped and controlled by environmental influences or by internal dispositions (Bandura, 1989). The internal disposition, also referred to as ‘self-influence’ in Bandura (1991), encompasses the self-efficacy which is an outcome of empowerment, as it plays a central role in the exercise of personal agency. Personal agency is generally considered as one of the factors that influence empowerment (Alsop et al., 2006; Bandura, 1991). Self-efficacy is the individuals’ beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives (Bandura, 1991). Self-

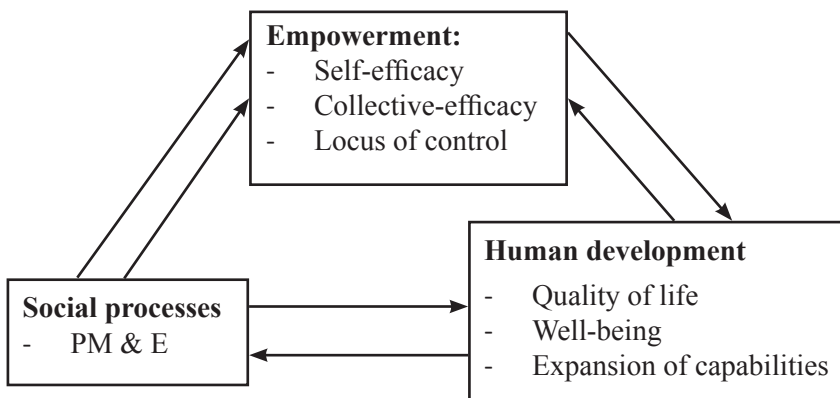
efficacy beliefs are not only confined to judgments of personal capabilities, it also encompasses perceived collective efficacy representing shared beliefs in the power to produce desired effects by collective action (Bandura, 2002). The latter resonates with social capital.

Critical to the understanding of social cognitive theory is self-regulated behavior. Bandura (1989) defines self-regulated behavior as the process of using one's own thoughts and actions to achieve a goal; identify goals and adopt and maintain their own strategies for reaching the goals. Self-regulation also encompasses self-efficacy, a component of empowerment (Papineau and Keily, 1992; Zimmerman, 1990; Zimmerman et al., 1993; Alsop, Bertelsen and Holland, 2006; Bandura, 1991). Self-efficacy is people's beliefs about their capabilities to exercise control over their own level of functioning and over events that affect their lives. Bandura (1991) argues that people's beliefs in their efficacy influence the choices they make, their aspirations, how long they persevere in the face of difficulties and setbacks, the amount of stress they experience in coping with challenging environmental demands, and their vulnerability to depression. Self-efficacy beliefs are not only confined to judgments of personal capabilities, it also encompasses perceived collective efficacy representing shared beliefs in the power to produce desired effects by collective action (Bandura, 2002).

Social cognitive theory is based on a number of assumptions, namely: people learn by observing others; learning is internal; and that learning is a goal directed behavior. The theory therefore assumes that values and behavior patterns arise from diverse sources of influence and are promoted by institutional backing. It highlights the idea that much human learning occurs in a social environment. However, social cognitive theory alone is insufficient to explain why there is often substantial variation in values and behavior patterns, even within the same community segments. The other limitation is about how to measure the related constructs such as general self-efficacy. Chen, Gully and Eden (2001) argue that commonly used general self-efficacy (GSE) measures have low content validity and multidimensionality. This is worsened further by the confusion with the related constructs such as self-esteem. Chen et al. (2001) note that the utility of GSE for both theory and practice is low due to the confusion as to whether GSE is a construct distinct from self-esteem.

While the study was mainly influenced by human development theory, the inadequacies exhibited by the theory created demand for an alternative theoretical framework to respond to these limitations. The study was based on a framework that integrates human development, social capital, empowerment and social cognitive theories. From literature, human development theory emerged as a trans-disciplinary theory that integrates certain ideas resident in the other three theories. Human development theory, for instance, describes development as an expansion of capabilities (Fukukda-Parr, 2003), a phrase used to describe empowerment (Also P et al., 2006). Empowerment itself can also be explained by social cognitive theory (Bandura, 1991). Besides, to produce improvement in quality of life and social cohesion as described by human development theory, people need to be linked through social capital (Bramley et al., 2006). The interrelationships are further explained by Perkins and Long (2002), who distinguish four distinct dimensions of social capital, namely: sense of community; efficacy of organized collective action (empowerment); informal neighboring behaviour, and formal participation in community organisations. Citing from Chavis and Wandersman (1990), Perkins and Long observe that over time, sense of community may lead to greater self and collective efficacy (empowerment), which results in increased participation. Participation, in turn, enhances sense of community, which has also been related to community satisfaction and collective efficacy. Empowerment is thus seen both to lead to participation in community organisations and to result from it (Perkins and Long, 2002). The schema in Figure 1 illustrates these interrelationships in the theoretical underpinnings.

Figure 1: *Theoretical Framework*



3. Methodology

The study employed a mixed-methods approach involving concurrent parallel design, in which samples for quantitative and qualitative components were drawn from the same population and data collected within the same time frame. Taking mixed methods approach allowed for relevant design components that offered the best chance of responding to the objective of the study to be selected. In a mixed methods approach, data arising from different methodologies can be used not only to verify findings from elsewhere through processes of triangulation, but also to extend and to problematize findings and models arising from different methodologies (Tikly, 2010:20). Mixed methods approach was also considered for its relative advantages. The approach has the ability to ensure dependable feedback on a range of questions; improve the depth of understanding of particular interventions; give a holistic perspective; and enhance the validity, reliability, and usefulness of the findings (Stufflebeam, 2001; Driscoll, Appiah-Yeboah, Salib and Rupert, 2007; Creswell, 2009).

Mixed methods was also found to be useful in empowerment studies. With reference to strategies for researching empowerment, Zimmerman (1990) argues against the use of methods that are primarily quantitative. He observes that qualitative approaches such as in-depth case studies, investigative reporting and participant observation among others can equally be instructive. He argues for a method that integrates both qualitative and quantitative methods. He commends studies that have integrated the quantitative and qualitative methods, arguing that in such studies the qualitative aspects reinforce the quantitative data presented and as a consequence, further strengthen the research. It is for these reasons that this study applied a mixed methods approach.

The study targeted known individuals who participated in a World Vision International driven PM&E model. With the list available, the completeness of the sample frame was guaranteed. This notwithstanding, the size of the sample is informed primarily by the research objective(s), research question(s), and subsequently, the research design (Onwuegbuzie and Collins, 2007). The study was based on 17 functional/starter groups – sub-locations based units, with a population of between 6 and 15 members each. In total the study had a target

population of 240. Given the small size of the population, census was applied in the quantitative component.

Taking into consideration the complexity of issues related to PM&E and empowerment, the study opted to go beyond the quantitatively generated data to understand what is behind the statistics. To do this, simple and stratified purposive sampling design was used to select participants for the qualitative phase of the study. On one hand, 2 locations out of 4 in the study area were randomly selected where two sets of between 12 to 15 participants who participated in the World Vision's design process were selected to participate in Focus Group Discussions (FGDs). On the other hand FGDs were conducted with 4 CBOs to help generate qualitative data as well as to triangulate findings on community level empowerment outcome. The CBOs were drawn from each of the 4 locations in the study area. A total of 6 FGDs were conducted in the study. These discussions mainly generated qualitative data, which helped explain the causal mechanisms at work in the quantitative analyses.

Questionnaires were used to gather quantitative data and Focus Group Discussion (FGD) Guides to collect qualitative data. The questionnaires were administered to individual members from the starter groups. The questionnaires were designed to help generate a range of measures of dimensions of the study variables as had been operationalized in the study. A number of composite measures were designed to capture each of these dimensions. These dimensions were arrived at through the review of literature. The questionnaires were administered to 212 respondent out of the intended 240 individuals, representing 88.3% response rate. Those who did not participate either declined or were not available to respond to the questionnaire. Other than the questionnaires, the study also utilized FGD guides. The FGD guides were used to collect qualitative

For quantitative analysis, data entry template was prepared from the questionnaire. This was administered to the study respondents, who were all starter group members. Data from the respondents were entered, cleaned and analysed using the Statistical Package for Social Sciences (SPSS) Version 17.0 software. The data was then explored for normality, linearity, kurtosis, skewness, homogeneity and factorability to decide on the probable statistics if relevant assumptions were

met. Since most of the assumptions for parametric tests were met, the study utilized both descriptive and inferential statistics amenable to parametric analysis. Whereas descriptive statistics involved the use of central tendency (mean, mode and median), frequencies and proportions; the inferential tests employed the use of Pearson *r* correlation to test the relationships between the main study variables and the nature thereof; as well as to test the hypothesis.

The statistical tests for measuring the influence of PM&E were based on regression approach and correlation coefficient and their transformation. A standard approach of stating the null hypothesis of zero coefficient of correlation between dependent and independent variables was applied. The empirical analysis was based on the standard regression formula:

$$Y_i = b_0 + b_1X_1 + b_2X_2 + \dots + b_nX_n + \epsilon_i$$

Where:

Y_i = dependent variable.

X_1 = the first predictor variable (and b_1 is the coefficient of the first predictor, X_2 is the 2nd predictor variable and b_2 is the coefficient of the 2nd predictor X_2 , b_n is the coefficient of n th predictor X_n . In order to appropriately interpret the ensuing statistics, the following considerations were made:

When: $r = -1$ (a perfect negative linear relationship); $r = -.70$ (a strong negative linear relationship); $r = -.50$ (a moderate negative relationship); $r = -.30$ (a weak negative linear relationship); $r = 0$ (no linear relationship); $r = +.30$ (a weak positive linear relationship); $r = +0.50$ (a moderate positive linear relationship); $r = +.70$ (a strong positive linear relationship); $r = +1$ (a perfect positive linear relationship). t -value of greater than 1.96 with less than .05 indicates that the independent variable is a significant predictor of the dependent variable within and beyond the sample. The greater the t -statistics, the greater the relative influence of the independent variable on the dependent variable. A t -statistics of less than 1.96 with significance greater than .05 indicates that the independent variable is not a significant predictor of the dependent variable beyond the sample. Coefficient of Determination (R^2): $R^2 = 1$ (perfect fit); $R^2 = 0$ (no variation).

While quantitative phase of analysis involved the use of data analysis software, the qualitative component involved drawing analytical conclusion from qualitative datasets. Qualitative data were summarized into themes. Techniques such as interpretive, coding and recursive abstraction were then employed in order to summarize the dataset into meaningful chunks. Whereas interpretive technique was used to give and report the observer's impression in a structured form, coding was applied in order to organize the data and provide a means to introduce interpretations into certain quantitative methods. To accomplish this, data was analysed to read the data and demarcate segments within it. Each of these segments was labeled with a 'code' – a word or short phrase suggesting how the associated data segments describe the specified research objective. The analysis also employed recursive abstraction, where data was analysed without coding. The technique involves summarizing the datasets several times until the achievement of desirable end results. The process of analysis involved reading of the qualitative data, discovering of significant groupings and coding and the generation of categories, the regrouping of themes and patterns, testing of evolving understanding of the issues and a search on alternative explanations or divergent views which helped in the identification and explanation of key issues which are likely to have influence on the study findings.

3.1 Measures

In this study, PM&E was conceptualized to constitute four processes which formed the indicators, namely: participation in the project design process; participation in reflection during implementation; participation in the implementation of activities; and participation in the M&E of activities. Citizen empowerment on the other hand was operationalized as perception of self-efficacy, perception of increased control, decision making capacity, acquisition of new skills and increased information about the programme. Each of the study variables and their indicators had 5-point Likert-type sub-variables describing them. There, 15 items for PM&E and 36 items for citizen empowerment.

4. Findings

The analysis began by describing the dataset. Descriptive statistics are shown in Table 1, which describes PM&E and citizen empowerment by mean, mode, median and standard deviation. These were recorded and analysed in aggregates of individual responses across the various variables and their indicators. Table 1 shows the mean, mode, median and standard deviation for the predictor variable and the outcome variable. The mean for PM&E and citizen empowerment were 3.3 and 3.7 respectively. The standard deviation for PM&E and citizen empowerment were 0.78 and 0.43 respectively, indicating that, across the board there was minimal deviation from the mean. Similarly, the mode for PM&E and citizen empowerment were 4.0 and 3.92 respectively. Median for PM&E and citizen empowerment were 3.5 and 3.7 respectively.

Table 1: Descriptive Statistics for the study variables

	PM&E	Citizen Empowerment
Mean	3.3494	3.6978
Median	3.4667	3.7255
Mode	4.00	3.92
Std. Deviation	.77920	.43131

The study hypothesized that there is a relationship between PM&E and citizen empowerment. Both quantitative and qualitative methods of data analysis revealed a strong linear relationship between PM&E and citizen empowerment. Linear regression analysis was conducted to assess the extent to which PM&E predicted citizen empowerment. Table 2 shows the results from the linear regression analysis. The analysis yielded $F(1, 210) = 198.25, p < .05$ indicating that PM&E is significantly related to citizen empowerment. The coefficient is also positive with $p < .05$. The correlation coefficient of $r = .70$, suggests a strong linear relationship between PM&E and citizen empowerment. Similarly $R^2 = 0.486$, shows that PM&E accounts for approximately 48.6% of the variation in citizen empowerment. The regression model showing the influence of PM&E on citizen empowerment can be represented as follows:

$$\text{Citizen Empowerment} = 0.401 + 0.049 \times \text{PM\&E}$$

Table 2: The relationship between PM&E and Citizen Empowerment

Model	R	R ²	Adjusted R ²	Std. Error	B	Predictor Variables
1	.697 ^a	.486	.483	.012	.401	Constant Term
				.003	.049	PM&E

- a. Predictors: (Constant), PME
- b. Dependent Variable: Citizen Empowerment
- Model 1: $F(1, 210) = 198.246; p < .05$

Indicators of citizen empowerment were also explored qualitatively. The first to be explored was the participants' level of knowledge and understanding of development programmes. The participants across the different focus group discussions cited several examples of development programmes and activities, and also explained the purpose of these programmes. Some participants defined development as a positive transformational change in a community and things that cause change in the community. The examples in the study area included: people tested for HIV are no longer scared if tested positive; people moving from traditional systems of farming to current farming practices; improved school infrastructure; better health facilities are now more accessible than in the past.

“Development is moving from one state to another. For instance, if as a person I do not know the importance of putting up a kitchen garden. If I get knowledgeable on the same, then I can consider myself to have developed”
(Participant, Nyandiwa - Mulaha Starter Group)

In their own words the participants could clearly describe their understanding of development and attendant activities within the study area. Judging from the many examples given, it is clear that their understanding of development is not just limited to hardware-based initiatives like building of schools, development of water infrastructure among others, but spans a spectrum ranging from hardware to acquisition of relevant skills imperative for community wellbeing.

“Community members have become aware of the benefits of initiating groups. Working through groups is easier. Information can then be passed to different groups”. (Participant, Mur Ng’iya Starter Group)

Indeed, the respondents, who in this study also participated in the quantitative phase of the study, affirm the fact that they have up-to-date information about development activities in the area. By exploring this sub-theme, the study established that questions touching on participation in development programmes were well interpreted. The sub-theme also points to the existence of some level of empowerment among the respondents. In this study, knowledge of development programmes has been considered as one of the proxy indicators of citizen empowerment.

The other outcome of citizen empowerment is participation in decision making. The study explored the level of knowledge and understanding about decision making process in programme implementation; and the extent to which community members have opportunities to be involved in, and to influence, decision making. Respondents in the focus group discussions with starter groups could clearly articulate their understanding of decision making process in programme implementation. Some of the respondents appeared well informed, and as such could outline the ideal development planning and decision making processes; right from ideas generation, prioritization of needs and consensus building. Although they recognize the role of the donors in the whole process, they feel that the community has the capacity to define their own development agenda. In which case the donor cannot dictate what needs to be done in the community. There has to be consensus between the donors and the community (beneficiaries).

“The ideas are shared in a group meeting; the options are weighed and prioritized; then by consensus the ideas are agreed; donors cannot come and dictate what needs to be done” (Participant, Mur Ng’iya Starter Group)

This response mirrors the ideal development planning and decision making processes. Some of the participants also expressed their own individual level empowerment. They perceive themselves to have acquired pertinent skills that can be used to bring some transformation in the community. They feel that the skills they have acquired can be harnessed to influence certain things within the

community. For them participation is an obligation motivated by the desire to change situations in the community. This is evidence to the existence of self-efficacy among the individuals.

“Being a trained person, I feel empowered to go and tell the community what needs to be done; I feel obliged to go and hear so as to support what is likely to happen afterwards” (Participant, Mur Ng’iya Starter Group)

Some participants, however, held contrary views. They argued that while it is true that community members are involved, the final decision is made by the implementing agency. Community members or beneficiaries are only involved at the point of ratifying the agency’s decision. They do not think that their felt needs are considered in what ultimately becomes the development blue print for the agency.

“The final decision is made by the agency that is implementing the project. We only endorse. For instance, they are usually not concerned with community needs; they do not look at the priorities” (Participant, Mulaha Starter Group)

From the responses by the community members who participated in the study, there is a general understanding that however limited; opportunities for involvement and/or influence have been accorded. Even in areas where the participants perceived their involvement as passive, for instance Mulaha, individual respondents themselves exhibit some level of self-efficacy. They see themselves as having ability to influence given the opportunity.

“We feel we have capacity to influence, but not given opportunity to do so” (Participant, Mulaha Starter Group).

Finally, the level of knowledge about development programme budgets/resourcing; level of community resource contribution towards programme activities budget; and the extent of involvement in managing programme resource budget were explored. The study established that the sources and approximate levels of budget contributions are known. Most development activities include some community contribution (in-kind or even financial) as well as contribution from other governmental and non-governmental agencies.

“Always we contribute, for example in the construction of the dispensary, we gave out the land; we do ‘harambee’(or communal fundraising) for construction of schools” (Participant, Mulaha Starter Group)

It was apparent from the participants that they understand programme resourcing. Other than narrating instances where the community contributed to a development programme process, they argued that their contribution is equally significant, albeit in most cases it is not being quantified by the development agencies. In their opinion, the community contributes more to the development projects than the funding or implementing agencies.

“According to us the community usually gives more than the agency only that ours (the community’s) is not quantified” (Participant, Mulaha Starter Group)

While the respondents acknowledge that the projects are beneficial to the community, they feel that in most cases they are not involved as much by the different development agencies. Moreover, the development agencies are not accountable to them.

“We see the value of the projects but the initiatives usually do not engage us. For the dispensary we were told the cost afterwards, which was standing at Kenya Shillings 900,000” (Participant, Mulaha Starter Group)

Other than individual level empowerment, the study also explored community level empowerment as reflected in the community-level organizations. The CBOs interviewed seem to suggest that the level of participation in decision making processes – by leaders and members is generally good. The processes of planning and budgeting are thus open to members’ influence. Across the different CBOs, members usually have to discuss issues. These are then forwarded to the executive committee which approves the issue to be included in the next planning phase or implementation.

“When we have money to support OVC; we usually sit down as the members together with the management committee. The information is shared in the community which then send applications. The applicants are then subjected to a vetting process in a meeting where they are picked. The people allocated are then brought again to the members with reasons why their applications were considered” (Participant, OkokShida CBO).

Everything that comes up has to be put forward to the group membership before being considered. Most of the decision making process is, however, vested in the management or executive committee. In all the CBOs interviewed, the management committee is charged with the responsibility of approving plans, budgets and activities.

“Members generate the issues; issues come to the management committee; it is the management committee which makes decisions in the organisation”
(Participant, EACODEP CBO).

While in most cases, the members first generate the issues before being put for discussion and consideration by the management committee, in others it is the management committee coming up with issues for discussion. The issues or plans are then subjected to members’ approval. The plans or the issues are only adopted once they have been approved by the members, usually in all members meetings; especially annual general meetings (AGMs).

“When there is something to be decided on or done, the management committee sits. They then look at what needs to be done, then invites the group members to come and have a discussion. If the members approve, the plan is implemented”
(Participant, OkokShida).

In some cases, however, members still perceive the chairperson to have the final decision making powers. Once elected as the chairperson, he/she is bestowed with responsibility to provide leadership within the parameters of responsibility and authority that the position attracts. They are therefore expected, by virtue of the position, to have the final say about issues even when the issues have been put under discussions by the members or the committee.

“The activities are run through the chairperson; we have created some responsibility, so people have different roles and have authority over things. In meetings the chairman makes the final resolution” (Participant, YierNgima CBO)

Overall, the study revealed that people who participated in the PM&E process seem to know and understand who makes decision and how they do so in the implementation of development programmes and activities. Besides, there is emergence of empowerment as revealed by some members exhibiting a level

of self-efficacy and understanding of development resourcing processes. Self-efficacy is described in the study as the perceived competency by an individual to change a situation.

5. Discussion of Findings

The study sought to examine the extent to which PM&E influences citizen empowerment. The analysis yielded $F(1, 210) = 198.25, p < .05$ and $r = .70$. The study findings suggest that there is a strong positive linear relationship between PM&E and citizen empowerment. Similarly, $R^2 = .486$ shows that PM&E accounts for approximately 48.6% of the variation in citizen empowerment. The other 51.4% can be explained by other variables that were not considered in the model. The finding in the current study is consistent with Zimmerman et al. (1992) who argue that there is an association between participation in community organisations or activities and individual empowerment. In their study, Zimmerman and others used perceived control as one of the proxy indicators of individual empowerment. Perceived control has been applied in this study as one of the indicators of citizen empowerment.

The finding confirms most commentators' assertion that PM&E is empowering (Abbot and Forward, 2000; Codd, 2011; Fetterman, 2001; Fraser et al., 2006; Samah and Aref, 2011; Zimmerman, 1990; Papineua and Kiely, 1996). This is also consistent with previous research on the relationship between participation and empowerment. A study conducted by Butterfoss (2006) found that more time spent in activities geared toward effecting change is related to higher levels of empowerment. In consonance with these findings is Lennie (2005) argument that PM&E creates knowledge which is related to power and power gives birth to development. Similarly, Prestby and others cited in Zimmerman (1990) in their study, observed that the most highly involved individuals reported more benefits of participation as reflected in their levels of empowerment.

People who are involved also learn and gain knowledge, which are all indicators of empowerment (Samah and Aref, 2011). Abbot and Forward (2000) emphasizes the same when they argue that participation affirms dignity and self-respect (all outcomes of empowerment); as well as developing community cohesion and

empowering communities to pursue their own interests and challenge their power structure (proxy indicators of empowerment). This explains why the push for the adoption of participatory methodologies in evaluation has been argued mostly from the perspective of citizen's empowerment (Fetterman, 2001; Papineau and Kiely, 1996; Obure et al., 2008). Zimmerman et al. (1992), also in their study concluded that individuals who are involved in community activities (PM&E or otherwise) and organisations reported higher levels of empowerment outcomes. From the same study, Zimmerman and others further observed that participation in community groups and activities increases one's sense of control, which is one of the empowerment outcomes. Thus, higher level of participation in a PM&E process is associated with higher level of citizen empowerment.

The quantitative finding above is also consistent with the relevant indicators from the qualitative phase of the study. Findings on knowledge and understanding of development processes revealed that the participants were fairly knowledgeable. Although opportunities for participation in decision making are limited, they know and understand who makes decision and how they are made. Just like in the quantitative analysis, findings from the qualitative datasets suggest that participants who participated in the initial PM&E process have acquired some important skills, have self-efficacy and are involved in decision making processes. Acquisition of knowledge and skills; self-efficacy and participation in decision making are some of the indicators of empowerment (Papineau and Kiely, 1996); and have been considered in this study as such. PM&E is therefore an important factor in predicting citizen empowerment. This finding is also consistent with empowerment theory. The theory states that participation in decision making may enhance individual sense of empowerment (Zimmerman, 1990). PM&E is therefore an important factor in predicting citizen empowerment. This finding therefore confirms the hypothesis that there is a relationship between PM&E and citizen empowerment. PM&E therefore positively influences citizen empowerment.

6. Conclusion

The study has revealed that PM&E can be integrated in development programming with the promise of influencing empowerment outcomes. This seems to confirm

findings from other previous studies, which have argued for the role of PM&E in influencing individuals empowerment outcomes. Policies that provide opportunity for citizens to participate in M&E processes are thus worthy of investment since they can lead to significant impact on empowerment outcomes.

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