

**FACTORS AFFECTING THE USE OF INFORMATION AND
COMMUNICATION TECHNOLOGY IN GOVERNMENT PARASTATALS
A CASE OF NATIONAL ENVIRONMENT MANAGEMENT AUTHORITY**

BY

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**THIS RESEARCH PROJECT IS SUBMITTED TO THE SCHOOL OF
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DECLARATION

I, hereby declare that this research project is my original work and has not been presented to any university or tertiary institution for examination/assessment.

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DEDICATION

This project is dedicated to my husband Mr. Francis Ongaki, my source of inspiration, my sons Geoffrey Mambo and Brian Momanyi for encouragement and understanding during the course of the study.

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TABLE OF CONTENTS

DECLARATION	i
DEDICATION	ii
ACKNOWLEDGEMENT	iii
LIST OF FIGURES	vi
LIST OF TABLES	vii
ABSTRACT.....	viii
OPERATIONAL DEFINITION OF TERMS	x
CHAPTER ONE: INTRODUCTION	1
1.1 Background.....	1
1.2 Statement of the problem.....	4
1.3 Objectives of the study.....	4
1.4 Research questions.....	5
1.5 Significance of the study.....	5
1.6 Justification	5
1.7 Scope of the Study	6
1.8 Delimitations of the Study	6
CHAPTER TWO: LITERATURE REVIEW.....	7
2.1 Introduction.....	7
2.3 Empirical Review.....	14
2.4 Research Gaps.....	17
2.5 Conceptual Framework.....	18
CHAPTER THREE: RESEARCH METHODOLOGY	20
3.1 Introduction.....	20
3.2 Research Design.....	20
3.3 Research Population.....	20
3.4 Sampling Design and Procedures	21
3.5 Data Collection Instruments and Procedures.....	22
3.6 Data Analysis	23
3.7 Ethics of Research.....	24
CHAPTER FOUR: DATA ANALYSIS, PRESENTATION, AND DISCUSSION	25
4.1 Introduction.....	25

4.2 Background Information	25
4.3 Descriptive Statistics.....	25
4.4 Training on ICT	29
4.5 Funding	34
4.6 ICT Budget for facilities	42
4.7 Correlation Analysis	46
CHAPTER FIVE: SUMMARY, CONCLUSION AND RECOMMENDATION	54
5.1 Summary	54
5.2 Conclusion	56
5.3 Recommendations.....	56
5.4 Recommendation for further research	58
REFERENCES	59
APPENDICES	63
Appendix 1: Organizational structure for NEMA	63
Appendix 2: Letter to Respondents.....	64
Appendix 3: Employees Questionnaire	65
Appendix 4: Work Plan for the Project.....	69
Appendix 5: Research Budget	70

LIST OF FIGURES

Figure 1: Conceptual Framework	19
Figure 3: Training on Computers.....	30
Figure 4: Competency in Computer Applications	32
Figure 5: Funding and use of ICT	35
Figure 6: Furnishing of NEMA ICT Laboratories	39
Figure 7: ICT systems upgrading.....	45

LIST OF TABLES

Table 1: Sampling Frame.....	21
Table 2: Gender Distribution	26
Table 3: NEMA Staff Age Bracket as at year 2013.....	26
Table 4: Staff Education Levels.....	27
Table 5: ICT Training Competencies	27
Table 6: Employees' Work Experience	28
Table 7: Level of Operation.....	28
Table 8: NEMA Operational Departments	29
Table 9: Computer Application competency	32
Table 10: ICT Usage.....	34
Table 11: NEMA allocates adequate funds for ICT	36
Table 12: Resources for upgrading ICT infrastructure	36
Table 13: Stakeholders involvement in implementation of ICT activities	37
Table 14: Funding and facilities for ICT unit	38
Table 15: Response to Internet connectivity.....	40
Table 16: Response time for fixing problems.....	40
Table 17: Servicing of ICT equipment	41
Table 18: NEMA ICT staff qualification and competency.....	42
Table 19: ICT Budget for facilities	42
Table 20: ICT equipment's performance	43
Table 21: Employees computer availability	43
Table 22: NEMA's financial support from donor projects.....	44
Table 23: Organizational support from Management.....	44

ABSTRACT

Information and Communication Technology (ICT) is a diverse set of technological tools and resources used to communicate, create, disseminate, store and manage information. The use of ICT is undertaken to meet goals and objectives of an organization so as to bring about beneficial and added value to beneficiaries. This study therefore sought to establish factors affecting the use of Information and Communication Technology in government parastatals with a focus on the National Environment Management Authority (NEMA) offices within Kenya. Specific objectives that guided this study were; to establish the influence of training on the use of ICT, assess the effect of funding on the use of ICT and determine the effect of facilities on the use of ICT. The input variables were categorized into factors for success and output variable was categorized into organizational and technological benefit. This study presents literature review of case studies from both developed and developing countries and preliminary studies grounded in the Kenya e-Government reality. The key factors were identified and categorized under common broad categories. This resulted in a rich picture of experience in the use of ICT in government parastatals. The population for the study was 47 county offices and NEMA headquarters, Nairobi. The target population was 240 employees of NEMA offices in Kenya. Sampling design was considered in selecting respondents who participated in the study. Descriptive survey was used in collecting information by administering questionnaire. The research used primary sources to collect data, questionnaires were administered randomly to 120 employees of the authority. A total number of 104 responded and this constituted 86.6% of the targeted population. Stratified sampling technique was used to sample the respondents for the study while simple random sampling technique was used to select employees from 47 country offices. The study targeted Top Management, Technical and operational staff members of the Authority. Collected data was analyzed using Statistical Package for Social Sciences (SPSS), as well descriptive statistics such as correlation analysis, frequencies, and percentages were used in data analysis. The output was represented using frequency tables and charts based on the research objectives. The study came out with findings, summary, conclusion and recommendations. The findings of the study therefore, established that ICT has not been fully tapped in government parastatals to enable them realize maximum benefits. However, the study concluded that the organization management should thoroughly scrutinize an ICT product to establish its suitability in specific geo-cultural contexts and its effectiveness in enhancing job performance at a specific workplace. To this end, the study recommended that there is need to ensure that all workers are trained on how to use ICT facilities, ICT legislations and regulations should be formulated and integrated in the organization's laws and policies to give it a binding and more authoritative touch.

LIST OF ABBREVIATIONS

NEMA	-	National Environment Management Authority
ICT	-	Information and Communication Technology
IT	-	Information Technology
ISs	-	Information Systems
NES	-	National Environment Secretariat
PPCSCA	-	Permanent Presidential Commission on Soil Conservation and Afforestation
DRSRS	-	Department of Resource Surveys and Remote Sensing
WCED	-	World Commission on Environment and Development
CIPD	-	Computer Industry Development Potential
IFMIS	-	Integrated Financial Management Information System
IPPD	-	Integrated Personnel and Pensions Database
TRA	-	Theory Reasoned Action
TAM	-	Technology Acceptance Model
PU	-	Perceived Usefulness
PEOU	-	Perceived Ease of Use
CBS	-	Computer Based Systems
Labs	-	Laboratories
MIS	-	Management Information Systems

OPERATIONAL DEFINITION OF TERMS

Information and Communication Technology - Includes technologies both traditional for example radio, television, print, video and newer technologies such as internet virtual reality, distance education, mobile phones that are intended to fulfill information processing and communication.

Application of ICT - use of ICT to enhance instruction and create rich environment to hold each individual employee develop a depth of understanding and critical thinking.

Information Technology - As defined by the Information Technology Association of America (ITAA) is the study, design, development, implementation, support or management of computer-based information systems, particularly software applications and computer hardware.

Computer - computer is a device that accepts information in the form of digitalized data and manipulates it for some result based on a program or sequence of instructions on how the data is to be processed. Complex computers also include the means for storing data including the program, which is also a form of data for some necessary duration.

IT Capacity Building - Is the process of creating or enhancing local human and organizational abilities to use IT to perform specific tasks in organizations in order to attain organizational objectives and it is based on the idea of human capital.

ICT Infrastructure - physical equipment hardware and software that enables a network to function.

Information Systems - Any written electronic or graphical method of communicating information.

Computer Based Systems - Complex systems in which computers play a major role.

Technical Support - Basic skills to overcome technical problems when ICT are applied. It can be provided by institutional staff or external service provider.

Computer Literacy - Refers to individual knowledge and ability to use computers and related technology efficiently.

Innovation - Refers to a new way of doing something. It may refer to incremental and emergent or radical and revolutionary changes in thinking, products, processes, or organizations.

Training - is the process of bringing a person to an agreed standard of proficiency by practice and instruction.

Management - The Science of organizing, planning, controlling and directing organization activities.

Objective - This refers to the milestones that defines or are used to rate the organization as either having been successful or not. They are specific targets which the organization aims to address.

Resources - Human, material or financial requirements of the organization, necessary for the organization activities take off.

Stakeholders - This refers to all that have special interest in the project.

Beneficiaries - This refers to people who are intended to benefit from the ICT output.

Scope - This refers to the target or the expected outcome of the organization that is, limit of expectations.

Performance - This refers to factors that are used to rate the organization as either being a success or not such as attainment of the project targets/objectives.

CHAPTER ONE

INTRODUCTION

1.1 Background

This chapter gives a general perspective on the background to the problem of the research, objectives, research questions, significance, justification and delimitations of the study.

Information and Communication Technology (ICT) is defined as a diverse set of technological tools and resources used to communicate, create, disseminate, store and manage information (Blurton 1999). ICTs encompass a range of rapidly evolving technologies which include telecommunication technologies such as telephone, cable, satellite, Television and Radio, computer-mediated conferencing and video conferencing as well as digital technologies which include computers, information networks such as internet, World Wide Web, intranets and extranets and software applications (Chisenga, 2006).

The advent of the internet, digital connectivity, the explosion and use of e-commerce and e-business models in the private sector are pressuring the public sector to rethink hierarchical, bureaucratic organization models (Ndou 2004). The increasing expectation of the citizens and the better service delivery of the private sectors demand the bureaucracy to time responsive. To this end, the recent decades have experienced the paradigm shift in the role of government, where the government role is redefined as to empower rather than serve customer, to shift from hierarchy to teamwork and participation, to be mission oriented and customer focused, and to focus on prevention rather than cure (Osborne & Gaebler 1992). As early as 1980s, the need to reform the bureaucracy was highly discussed all around the globe and as a result the governments of developed and developing countries faced the challenge of transformation and the need to modernize administrative practices and management systems (Tapscott 1996). In this regard, ICT is seen as a tool to support the work of government institutions and agencies with the objectives of delivering public services and information in a more convenient, citizen centric and cost effective manner.

Kenya government like other developing countries has recognized the importance of ICT for making service delivery prompt and effective and thus has introduced ICT in various public sectors. The country stepped in ICT world in early 1970s with introduction of IBM computer systems to process the population census data (Kim et al 2007). Since then, various attempts have been made to modernize the public bureaucracy to ensure effective service delivery.

Computer Based Systems (CBS) and IT have had a significant impact on organizations over the past years. They are viewed as means of providing competitive edge and hence, they are becoming part of the organization strategy. Recent generations of information systems in public sector support electronic delivery of public services to the citizens and business enterprises by enabling them to make most of their transactions with the government through electronic channels such as the Internet, (Bellamy & Taylor 1998), (Bekkers & Zouridis 1999). New concepts are being developed based on the above advanced capabilities such as the 'New Electronic Customer Focused Government', and the 'Virtual Public Enterprises'.

Despite the proliferation of computer based applications in government parastatals, the implementation of systems remains a significant issue. The usage of ICT in government parastatals is sometimes underutilized and does not fully meet potential as expected. Information systems planning, design, development, operation and implementation are sometimes performed in a uniquely challenging context and as a result most organizations are often burdened with inflexible procurement rules in hiring and rewarding procedures and operate in an inflexible institutional framework. Although they are rarely subjected to the challenges of the market competition they are often confronted with political pressures (Doherty et al, 1999).

The above factors contribute towards a set of unique, demanding and difficult issues in the implementation of ICT. There is need for parastatals to implement information systems effectively in order to be able to harness the capabilities of a particular information system in line with the strategy of the organization. Improvement in ICT implementation continues to rank highly among major issues facing managers in many

parastatals in the management of user-oriented ICT services in many public sector organizations, (Doherty et al, 1999). Challenges of the use of ICT in government parastatals have grown over the recent years. The approaches used currently to manage information systems have not always produced satisfactory results. Computer based systems take too long to develop, user departments often voice their dissatisfaction with the quality and timeliness of support they receive from ICT departments, while implementation of information systems often run over budgets. Systems are in most cases perceived not to deliver the benefits on which they were originally, business justified, (Gottschalk, 2001).

The National Environment Management Authority (NEMA) is a government parastatal under the Ministry of Environment and Mineral Resources (MEMR) in Kenya. It is the principal instrument of the government in the implementation of all policies relating to the environment. In this regard, the use of ICT is critical in enabling NEMA achieve its vision, mission, mandate, goals and objectives of becoming a world class authority that ensures a clean and health environment for all. NEMA has introduced use of ICT through Navision System and Environment Licensing Management System for financial management and automation of licensing operations to provide services to the public. This will assist NEMA in achieving its objectives which include; act to protect, conserve and improve water, land, air and biodiversity through the integration of gender concerns for all, work with EMCA institutions to create a better environment for all, coordinate and enhance harmony of approaches by diverse stakeholders to promote sustainable development, domesticate and implement Multilateral Environmental Agreements for the benefit of people, act to reduce impacts of climate change and its consequences to various targeted vulnerable groups and lastly to build and strengthen NEMA'S capacity to undertake its mandate.

It is essential, therefore, that the ICT infrastructure and systems be secure from destruction, corruption, unauthorized access and breach of confidentiality whether accidental or deliberate. All NEMA's employees and stakeholders are responsible for protecting the organization's information.

1.2 Statement of the problem

A substantial number of Government Parastatals in Kenya, once initiated, are unable to achieve their objectives without any support of ICT capabilities (Daniels & Associates, 2006). Research indicates that quite a number of parastatals lack appropriation of information technologies and that despite the tremendous effort to embed IT in organizational processes, use of ICT in parastatals is not effective (Lytras et al 2008). In Kenya the number of parastatals that have so far proved defunct and futile ventures in relation to their objectives is desperately alarming. The situation seems terribly worse when parastatals are put into the spotlight with regard to performance contract normally signed by parastatals heads every financial year. The overall performance of a parastatal is a key factor to ascertain the success of service delivery. This is usually determined by the achievement of organizational objectives and the sustainability of the organization thereafter (Reuben O. M. et al 2005). The number of parastatals initiated by government in various Ministries in Kenya, forms a worthy spectrum to the curiosity of researchers. For instance, from the office of State Corporations there are 189 parastatals in Kenya. Despite the fact that the use of ICT is meant to enhance service delivery in organizations, its introduction has not always produced satisfactory results as expected. This study therefore seeks to assess factors affecting the use of ICT in government parastatals with a particular focus on NEMA.

1.3 Objectives of the study

The study aimed at achieving the following objectives:-

1.3.1 General Objective

To establish factors affecting the use of ICT in government parastatals in Kenya, with a particular focus on NEMA.

1.3.2 Specific Objectives

The following are specific objectives that study aimed to address:-

1. To determine the influence of training on the use of ICT
2. To assess the effect of funding on the use of ICT
3. To evaluate the effect of facilities on the use of ICT

1.4 Research questions

The study was validated by the following research questions:-

1. What training influence does NEMA have on the use of ICT?
2. What effect does funding has on the use of ICT?
3. Which facilities affect the use of ICT at NEMA?

1.5 Significance of the study

The study was significant because of the rapid use and growth of ICT in service delivery in government parastals. It would assist policy makers in formulation of policies aimed at encouraging usage of ICT and in intervention policies that sought to address the constraints in ICT adoption and use. This Knowledge would also assist the government in planning, budgeting, resource distribution, infrastructure, decision making etc.

This study was quite important to donor agencies as it would assist them channel their support to relevant areas that could put an impact on ICT adoption and consequently respond to dynamic change. It would therefore help in resource mobilization from donors which would assist in implementation of ICT in various aspects within the organization.

1.6 Justification

Kenya government has embraced ICT in service delivery and given emphasis in government policy documents such as vision 2030 and Medium Term Plan 2008-2012. The findings of this study would therefore yield empirical data and information factors affecting the use of ICT in government parastatals. Recommendations would benefit policy-makers, Chief Executive Officers of government parastatals including NEMA, Management Information Systems Managers, researchers and the general public. Researchers would be able to carry out further investigation on this field which would assist other stakeholders including government towards successful implementation of ICT in management of information through the application of various information systems.

1.7 Scope of the Study

This study determined the factors affecting the use of ICT in government parastatals in Kenya, focusing NEMA, Kenya. This research investigated a number of issues pertaining to successful implementation of ICT as well as computer-based information systems. Attempts were also made to unravel the factors that contributed to various trends/problems and opportunities in the use of ICT.

1.8 Delimitations of the Study

The effectiveness on use of ICT services was looked from only one angle and did not take into consideration all objectives of ICT governance. The study was conducted in one parastatal and thus there was lack of general applicability to other government parastatals. Employees' judgmental values and prejudice towards the research problem could affect the research as well and the constraints of response and attitude. Some interviewees were not willing to be interviewed even if there was assurance of confidentiality, since they felt that the information could be used against them on gauging their computer literacy levels and jeopardize their jobs.

CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

This chapter presents a review of literature related to the study as sourced from various scholars, publications and relevant professional journals. There are many research reports, articles and books written on understanding the use of ICT in public organizations. Some of the studies have focused on increasing internal administrative perspective while some have given more concentration on understanding the impact of ICT in service delivery. In addition, many studies are conducted to explore the challenges of adaptation and implementation of ICT in public sectors, especially in the developing countries. In this regard, it is worthwhile to review the cases with the developed and developing countries as well. Thus an attempt is made to learn the relevant literatures in international and the national context so as to have a clear overview of the study. Literature review will help the research to identify gaps and justify the need to carry out further research. This chapter as well gives a brief insight of the history of computers in ICT world, and gives special attention in Africa.

2.2 Theoretical Review

Information Communication Technology is changing the nature of work at all organizational levels. The emergence of the electronic office has transformed the productivity and job content of office workers. Word-processing, for instance has replaced conventional office procedures for the creation of correspondence, documents, reports and memos. Electronic processing speeds computations and retrieval of data while electronic mail speeds inter-office communications. Teleconferencing reduces the need for business travel. Davis (1989). As well ICT is becoming increasingly used in organizations and policy makers have continued to take increasing interest in the scope of this field, relatively research work is being undertaken which considers aspects of successful implementation of ICT projects Passey (2002).

The challenge faced by policy makers in organizations is to find ways to apply the use of ICT to help realize organizational objectives. Most organizations view cost reduction as a top priority; hence managers must select appropriate office automation systems to create integrative office functions. They must also oversee their implementation, integrate the use of the systems in the daily operations of the organization and overcome resistance to innovation by employees.

Segars and Grover (1993) noted that to take full advantage of ICT, managers must understand what computers can and cannot do, and must actively participate in the development of computer systems for their own special needs. This latter requires not only the ability to define problems, objectives and constraints in operation terms but also a knowledge of problems that may be encountered in design, testing and conversion of new systems.

From the global point of view, it appears that there is tacit consent that a relationship exists between use of information and communication technologies and job enhancement of workers (Ajayi, 2001). Stephen (1995) submits that the use of information technology provides significant benefits in work measurement, cost reduction, productivity improvement and better services to customers and clients. Actually it is availability which makes use possible and it is use that makes performance attainable. So, the combined effect of availability of information and communication technologies can enhance the job performance of the organizational employees. There is need for all developed and developing nations of the world to take information and communication technologies (ICTs) as tools that aid the enhancement of job performance of the organizational staff through the application of the ICTs by the employees (Rosenberg 2005; Mphidi 2004; Chuene, 2000; Lancaster & Sandore, 1997; Siddique, 1997). This cannot be achieved unless organizational employees realize the tremendous role information and communication technologies could play to enhance effective services. Rosenberg (2005) submitted that employees need to develop a strategic information and communication plan that would enhance the deployment of ICTs in their organizations. The ICT deployment and application is done by ICT staff who are trained to man specific sectors of the organizations (Tenant, 1995).

In Canada, the use of ICTs and job performance of staff is recorded. A report prepared by the Canadian Association of Research Libraries (CARL) revealed that in the year 2000/2001, academic staff subscribed to 436,731 electronic journals. The same report also states that employees are leaders in using technology to transform traditional organizational resources and services to meet the challenge of the 21st Century.

In Singapore, Chia, Lee and Yeo (1998) report that a committee was set up by the government and mandated to design an information technology plan for the nation. The Nation of Singapore on its part took an initiative in ensuring all organizations especially academic institutions are ICT based. In Saudi Arabia, Siddique (1997) carried out a study on the use of ICT in public sector and the finding reveals that out of the six organizations surveyed majority of them had Internet, one kind of institution software or the other, CD-ROM facility, OPAC services, FAX and E-mail services. It is eight years since Siddique carried out this study and if the same study were to be carried out today; the findings would be totally different.

In Africa organizations do not enjoy the same information delivery methods like those in developed countries except those in Southern Africa. Chisenga and Rorissa (2001) point out the great disparity in the adoption and use of ICTs in government parastatals. Waiganjo (2006) writing from Kenya states that academic parastatals in Kenya suffer poor funding, poor communication system and lack of ICT qualified staff. The case is not different in Uganda. Magara (2002) pointed out that power unreliability, management attitude and poor ICT skill of employees; Adeya (2007, 2002) writing from Botswana states that inadequate computerization, inadequate infrastructure and inadequate human capacity as the major challenges towards ICT use. Rosenberg (2005) eludes the challenges to ICT use to lack of organizational software standardization.

2.2.1 Expected Theory of Behaviour

The importance of this theory of psychology is that, it modeled the role of beliefs in decision-making. The theory was proposed by Vroom (1964) and developed further by Porter and Lawler (1968). It asserts that the perceived relative attractiveness of various options is related to peoples' beliefs about the consequences to which each option will

lead and their beliefs about the desirability of these consequences. Individuals evaluate the consequences of the behaviour on the disability of the usefulness.

This theory has influenced research in acceptance of technology. Robey (1979) while exploring user attitudes and ICT usage, theorized that “a system that does not help people perform their jobs is not likely to be received favourably in spite of careful implementation efforts”. Frandis (1980) also proposed a theory of user acceptance that incorporated many of the concepts in expectancy theory. He however distinguished between beliefs that linked emotions to an act and belief that linked the act to future consequences. Chan (1996) in his modified Technology Acceptance Model (TAM) expanded the concept of perceived usefulness to include near term usefulness and long usefulness.

2.2.1 Changes in Information Management

Mark Keil and his colleagues in the 1960s and 1970s observed that computer resources were highly centralized based on the premise that there were economies of scale in such organization; shared hardware was less costly than dedicated machines. Moreover, computers were difficult to operate and maintain, and only professionals could plan, design and implement information systems. Centralized organization of computing is no longer appropriate. Nowadays, small computers are as economical as large ones, software is user friendly so that users no longer need the intercession of professionals to access information stored in databases and files, and non-technical users are learning to develop their own applications. (Keil, Beranek & Konsynski, 1995).

As a result, managers in functional areas like finance, administration or production not only uses computers for improved decision making but also manage information resources located in their departments. In addition, they are also expected to guide their employees in ICT use to give their organizations a competitive edge. They are the ones who plan how to apply information communication technology in order to add value to products and services (Venkatesh et al., 2003).

The significance of this research to managers is that it explores factors that enhance acceptance of ICT usage by end users and specifically employees of operational staff.

Knowledge of factors that influence the utilization of personal computers and particularly those that cause individual resistance to information system usage can help them avoid the temptation to simply dump technology on workers in the hope of increased productivity.

2.2.3 e-Governments initiatives

According to Kaul and Odedra (1991) governments around the world have been engaged in the process of implementing a wide range of ICT applications. Countries have been classified by the United Nations according to their Computer Industry Development Potential (CIPD) as advanced or less developed (Mgaya (1999)). This includes the United States, Canada, West European countries and Japan; less developed include for example Argentina, Brazil, India, Mexico, Kenya and Bulgaria. In all countries, use of ICTs for government reinvention is increasing not only in investment but also in terms of visibility with a number of high profile initiatives having been launched during the 1990s. According to Heeks and Davies (2000), this reinvention has taken place especially in the advanced countries. Western countries are convinced that the information society will result in economic and social benefits (Audenhove 2000). Organization for Economic Cooperation and Development (OECD), notes that information infrastructures are expected to stimulate economic growth, increase productivity, create jobs, and improve on the quality of life. Heeks (2002) observes that there is a big difference between ICT implementation and use between developed and developing countries. However, Westrup (2002) observes that similarities can also be expected. These similarities include funds which are never sufficient, bureaucracy and user needs. The difference is how problems are addressed in different countries. It can be argued that, with their adequate resources and advanced technology, the Western countries have an easier way of implementing ICT projects than developing countries. Most developing countries are characterized by limited computer applications in the public sector, inadequate infrastructure and shortage of skilled manpower (Odedra 1993). Odedra (1993, p.9) notes that “this situation exists not merely due to lack of financial resources, but largely due to lack of coordination at different levels in making effective use of the technology”. This uncoordinated efforts can only

result in duplication if each department implements its own ICT projects without due regard to compatibility within the government.

2.2.4 ICT Implementation in the Government of Kenya

Over the last five years, the Kenyan government has initiated some capital investment towards set up and installation of ICT infrastructure. Funding for these investments is achieved through partnerships between the government and development partners. The foreign funding component constitutes the largest percentage of this investment in terms of technology. The government contribution is usually in the form of technical and support staff and facilities including buildings. So far, the Government Information Technology Investment and Management Framework is connecting all ministries to the Internet under the Executive Network (Limo 2003). The government is also connecting the ministries to run integrated information systems for example the Integrated Financial Management Information System (IFMIS) and the Integrated Personnel and Pensions Database (IPPD). While developing countries may have similar characteristics, the Kenyan context presents various challenges that affect the successful implementation of ICT projects.

Characteristics that define Kenyan ICT environment include; ICT projects which are initially donor funded, some donations are made without prior consultation or carrying out a needs analysis by the recipient organization. Operational/running costs are met by the government. Funding such as capital and human resource requirements ends with the project phase. The budgets for ICT are inadequate but rising, lack of ICT policies and master plans to guide investment to the extent that, with a number of donors funding ICT, there have been multiple investments for the same product due to lack of coordination. There is focus on ICT applications that support traditional administrative and functional transactions rather than on effective information processing, and distribution with and without government departments and unstable ICT resources.

2.2.5 Government of Kenya ICT Policies

Jones & Kozma as quoted in Hennessy et al (2010), National ICT policies can serve several important functions. ICT policies provide a rationale, a set of goals, and a vision

of how the government works if ICT is introduced in all parastatals, and it can benefit organizations in the country.

According to Nduati & Bowman, quoted in Hennessy et al (2010), the earliest attempt at ICT policy formulation in Kenya dates back to the 1980s, but the process remained incomplete by 2000. After several years of effort, Kenya promulgated a national ICT policy in January 2006 that aims to 'improve the livelihoods of Kenyans' by ensuring the availability of accessible, efficient, reliable and affordable ICT services. The national policy has several sections, including information technology, broadcasting, telecommunications and postal services. However, it is the section on information technology that sets out the objectives strategies pertaining to ICT usage in government. The relevant objective in this section states that the government will encourage the use of ICT in institutions in the country so as to improve the quality of service delivery (Farrell, 2007).

2.2.6 National Environment Management Authority ICT policy (2010)

The use of ICT is very vital in enabling NEMA towards achieving its vision of becoming a world class Authority that ensures a clean and health environment for all. The purpose of NEMA ICT policy is to establish a framework for implementing security and control over the use of computerized information systems and equipments at NEMA. Dependency on the information technology to provide effective operation of the business and service delivery in modern world is a necessity. It is essential therefore, that the ICT infrastructure and systems be secure from destruction, corruption, unauthorized access and breach of confidentiality whether accidental or deliberate. All forms of information need to be protected, regardless of the medium used for communication and storage. To accomplish this, NEMA policy will establish proper safeguards to protect information from accidental or intentional unauthorized modification, destruction and disclosure.

NEMA ICT policy therefore establishes base policies, standards and guidelines to protect the Authority's information assets stored on its distributed computing platforms, and provide a framework for the continued development of these rules as the processing environment changes.

2.2.7 ICT performance evaluation

ICT evaluation can be defined as establishing by quantitative, and/or qualitative methods the value of the ICT to the organization Khalifa et al. (2004). Performance cannot be judged as good or bad without the successful implementation of the project.

Evaluating ICT projects can be quite problematic and can sometimes be quite subjective (Heeks 2002, Currie 1995, Bannister, Remenyi 2004, Irani 2002, DeLone and McLean 2002, Bannister and Remenyi 2000) and there is no single ICT evaluation method that can be applied to all situations (Khalifa et al. 2004). Currie (1995) justifies this position using various case studies drawn from businesses in various developed countries while Heeks (2002) observes that evaluation is subjective and can depend on circumstances including time. Evaluation leads to the determination of success or failure of an ICT project.

2.2.8 ICT and Information System (IS) success and failure

Literature shows that planning and management of ICT projects has a very poor record in developing countries (Galliers et al. 1998, Qureshi 1998, Heeks 2002, Mgaya 1999). However, a careful review of reasons for failure identifies other factors whose presence or absence determines success or failure of projects. Therefore the researcher looks at the output variables which are the benefits to be achieved if the initiative succeeds. The purpose of this is to clarify the goal of ICT projects. These goals may form a key element to the planning process as described above. Achievement of these goals helps to determine how to classify ICT projects. In addition, perceptions of, and reasons for ICT failure are reviewed and these helps to identify possible key variables.

2.3 Empirical Review

The research concentrates on usage of ICT which specifically examines factors affecting the use of ICT. Though viewed as a technological curiosity in the 1970s, the rapid growth of usage of ICT in organizations represents a significant development. Thompson (1991), Lee (1986) and Guimaraes et al (1986) argue that the computer revolution will change the nature of professional work. According to Igarria et al (1989), today

computers make an increasingly important component of the computing resources in most organizations.

The expanding role of computers as components of individual, departmental and organization-wide transactions, management information systems, data processing, office decision support systems is an important reason for gaining a better understanding of the factors affecting ICT usage. Stewart (1990), in the UK survey reports that the ratio of computer terminals or computers to office workers was already approaching an average of 1:1. This indicates that almost all knowledge workers will have their own computers both to perform stand-alone tasks and to use networks services.

Hutchinson and Sawyer (2002) observed that there are six elements of an information system which include; hardware, software, data, people, procedures and communications. Hutchinson and Sawyer (2000) emphasize that people constitute the most important component of an information system. They say that it is people who operate the computer hardware, it is people who create and use computer software and it is people who face ethical issues and decisions regarding the use of ICT.

According to a research conducted on knowledge worker aspect, the use of ICT has advanced from the automation of structured processed to systems that are truly, revolutionary, in that they introduce change into fundamental business procedures, workflow and the management of organization (Daud & Kamsin 2004). Information technologies, such as database, networks and programming languages are used to create organizational systems, Watson (2007). The computer has had and will continue to have the greatest impact on business organizations. It has revolutionized the way companies operate through product design, product features, processing technology, information processing and communication Weller (2005).

In his review of IT and organizational performance, Melville (2004) states that a review of literature on previous research has shown that IT can contribute to the improvement of organizational performance. Technology advances in new materials, new methods and new equipment have also made their mark on operations. Performance based measurement of all processes and people development activities is necessary to determine

progress so that the vision, goals, mission and critical success factors may be examined and reconstituted if necessary to meet new requirements for the organization and its customers, internal and external Irani (2002). Lowering the costs of horizontal communications, facilitating teamwork, enabling flexible manufacturing and providing information support for time management and quality control are key enablers on the supply side Weller (2005). Technological changes in products and processes have had major implications for production systems, affecting competitiveness and quality, but unless technology is carefully integrated into an existing system, it can do more harm than good by raising costs, reducing flexibility and even reducing productivity, all of which have the end result of reducing the efficiency of organizations, Cole (2004), Weller (2005).

According to Laudon (2007) the new technologies will allow managers to handle more functions and widen their span of control. Fewer levels of management hierarchy will be required, enabling companies to flatten the pyramid of today's management structure. The new information technologies allow decentralization of decision making without loss of management awareness, thus employees at all levels can be encouraged to be more creative and intrapreneurial. Laudon (2003) suggests further that the key responsibility of the CEO will be leadership, to capture the light or synergies of the organization and focus them on the key strategic objectives.

In the network era, electronic linkages within and among organizations are proliferating, altering the ways in which firms acquire factor inputs, convert them into products and services, and distribute the result to their customers. This according to Melville (2004), raises questions about how ICT can be applied to improve organizational performance. To him, although emerging studies are beginning to examine pieces of the network era IT business value puzzle, knowledge of this issue remains underdeveloped and unsystematic (Melville (2004).

The ICT has become a common feature of all organizations' management. According to Agarwal & Lucas (2005), they have become one of the most valuable assets of modern operations. It is now used as a management tool by all managers to effect better

management and improve performance. Faced with the problem of coordinating the activities of specialized sub-units, managers of large organizations need to develop structures or mechanisms which will allow units to operate effectively and in the interest of the organization as a whole.

Ultimately, ICT and ICT enabled services will enable parastatals become professional organizations, knowledge based organizations with appropriate capacity building, government and parastatal collaboration, multi-sectoral coordination, convergences and making organizations to be very powerful, productive organizations on the path of the sustainable organizations and sustainable development Vadaon (2008).

2.4 Research Gaps

Bagozzi, Davis and Warshaw note that new technologies such as personal computers are complex and an element of uncertainty exists in the minds of decision makers with respect to the successful adoption of them, people form attitudes and intentions toward trying to learn to use the new technology prior to initiating efforts directed at using. Attitudes towards usage and intentions to use may be ill-formed or lacking in conviction or else may occur only after preliminary strivings to learn to use the technology evolve. Thus, actual usage may not be a direct or immediate consequence of such attitudes and intentions.” (Bagozzi et al., 1992)

Research on usage and implementation of ICT has been carried out by some scholars namely; Flynn and Arce, (1995) observed ‘advancements in IT and proliferation of ISs in state parastatals,’ Waema (1995) evaluated ‘the issues, problems and strategies of information systems implementation in developing countries,’ Waema (2009) studied ‘implementation of financial management system in local authorities,’ Doherty et al (2002) proposed ‘ various frameworks for improving the effectiveness of IS implementation’, Mentzas (1997) examined ‘strategic ISs planning issues by survey studies,’ Premkumar and King (1994) and Salmela et al (2000) examined ‘ actual ISs planning practices in a turbulent environment’. However there are some gaps since most of the scholars have researched on the usage of ICT in other countries. Factors affecting

usage of ICT in government parastatals in Kenya has not been widely researched and therefore there is need for further research.

In regard to both general and specific literature, not many studies have assessed factors affecting the use of ICT in government parastatals in Kenya. Many arguments for ICT planning prove ICT project implementation is a complex exercise and more research is needed to identify challenges, good practice and solutions for successful implementation. The study seeks to extend previous research by incorporating constructs in the widely use of ICT systems and investigating the impact of internal and external factors its usage.

2.5 Conceptual Framework

The conceptual framework (Figure 1) presents the relationship between the independent and dependent variables of the study. In the framework, the independent variables are the task areas where ICT will be used in government parastatals. These include influence of training, effect of funding and facilities towards the use of ICT. The framework shows how ICT policy support computer infrastructure and human resources work to influence effective implementation and usage of ICT. This includes a clear and well-targeted policy which details intervention measures and government support for ICT in aspects such as resources and skills. Availability of infrastructure determines the use of ICT. This includes facilities such as computers, electricity, internet connectivity, software and time as a resource which have a direct influence on employees' skills to use computers and their attitude towards the use of ICT.

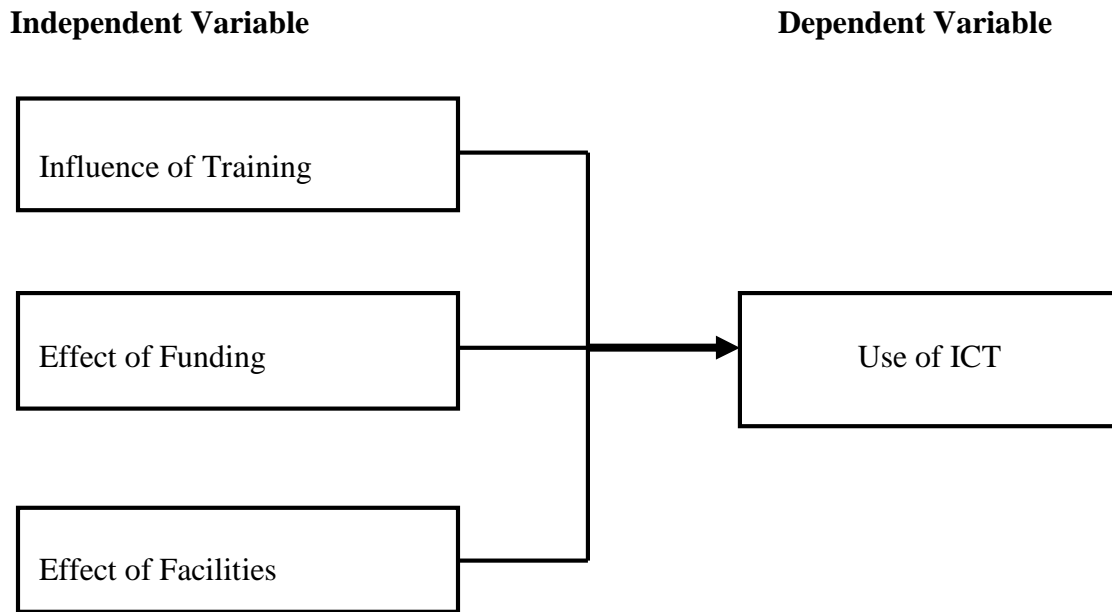


Figure 1: Conceptual Framework

Source: Researcher (2012)

Variables

The conceptual framework describes the independent variables which include the influence of training, effect of funding and effect of facilities. ICT usage is measured in three constructs; influence of training, effect of funding and effect of facilities while the number of applications used captures the variety of use. These are measures of self-reported usage chosen since they are practical measures of usage. They are typical of the kinds of measures often used by researchers to operationalize ICT usage, particularly in cases where objective usage metrics are not available.

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter gives details of the methodology that was used in conducting the study such as research design, population, sampling design and procedures, and data collection procedures and data analysis.

3.2 Research Design

The study used descriptive design to determine how the use of ICT influence service delivery in government parastatals. This research design was chosen because it will allow the study to establish the outcomes of the effect of the use of ICT. Descriptive survey is a method of collecting information by interviewing or administering a questionnaire to a sample of individuals (Orodho, 2003). It was used when collecting information about people's attitudes, opinions, habits or any of the variety of education or social issues (Orodho and Kombo 2002). A case study was important for analyzing information in a systematic way to enable the researcher arrive at some useful conclusions and recommendations (Mugenda and Mugenda 1999).

3.3 Research Population

According to Nachmias (1996) a population is the "aggregate of all cases that conform to some designated set of specifications". The study targeted 240 employees working at NEMA, Kenya. A stratified sample was chosen to represent staff working in various departments and as spread in forty seven (47) counties. The study sought to get respondents from all cadres of employees ranging from top management level, middle level and operational/support level.

3.4 Sampling Design and Procedures

Sampling is a systematic selection of representative cases from the larger population. The purpose of sampling is to get accurate empirical data at a fraction of the cost examining all possible cases. The sample chosen represented staff working in various departments in NEMA, Kenya offices. The sample was stratified on the basis of grades and the sample size comprised of 120 respondents selected randomly (Table 1). The researcher applied correlational design to assess the degree of relationship that existed between the variables.

Table 1: Sampling Frame

Categories of Population Units	Target population	50% Sample size
Top Management Staff	40	20
Technical Staff	120	60
Operational/Support Staff	80	40
Total	240	120

Source: Researcher (2012)

3.4.1 Sources and Types of Data

The study used primary data, which was the original data collected by the researcher and tailored to meet the exact needs of a decision-maker. The researcher had direct control over the data collection process which informed decision-making after the analysis. Advantages of primary data were: firstly, it permitted measurement of actual behaviour of the respondents; secondly, there was uniformity in data collection as data was collected by the same person; thirdly, the most current and required data was collected; fourthly, collection of primary data entailed the use of personal approach and interview methods, and this was helpful in overcoming the reluctance of sample population; fifthly,

primary data had a high degree of flexibility in the enquiry as the variable could be manipulated to achieve more reliable results.

3.4.3 Sampling Methods and Techniques

Sampling is the process by which a relatively small number of individuals, objects, or events are selected, analyzed in order to find out something about the entire population from which it was selected. The sampling technique used in this study was stratified random sampling which involved all categories of elements having some common characteristic and a large population was analyzed because the sample size was from a group of all elements with common characteristics. A sample refers to one element, which means that all in the study population had an equal and known chance of being selected and included in the study with minimal bias.

3.5 Data Collection Instruments and Procedures

In order to ensure that data collected included all facts, the research used survey questionnaire for data collection. The survey questionnaire comprised of various parts which focused on personal background information and closed questions. Sub-titles were provided to ensure that there was no confusion. The research used questionnaire because this would conveniently cover a large number of respondents. The questionnaires were administered through drop and pick method for NEMA employees within Nairobi and the rest were channeled through staff email account. The sequence of the questions was designed to be random in nature to preclude any guessing of the underlying factors being sought. Questions were articulated in such a way that they contained multiple-choices. They required the respondents to tick choices from the options provided.

3.5.1 Piloting

Piloting is testing of the questionnaires by trying them in the field this will enhance validity and reliability of the instruments. A pilot study was conducted and responses from selected respondents in the pilot study were collected. The comments of the respondents who participated in the pilot study and modifications in the wording of questions were incorporated in the final instrument revisions. Appearance of the survey instrument and general flow of the questionnaire were reviewed accordingly. Finally, the

questionnaire, suitably coded, and a covering letter explaining the purpose of the study and guaranteeing confidentiality were given to respondents sampled for the study.

4.5.2 Validity

According to (Borg et al 1989) validity is the degree to which a test measures what it purports to measure. All assessment of validity is subjective opinions based on the judgment of the researcher (Wiersma 1995). Creswell (2009) suggests that, to use an existing instrument, describe the established validity and reliability of scores obtained from past use of the instrument. The pilot study assisted in improving face validity and content the questionnaire and the interview tools.

4.5.3 Reliability

Gay (1992) asserts that, reliability is the degree to which a test consistently measures what it measures, while Mugenda and Mugenda (1999) defines reliability as a measure of the degree to which a research instrument yields consistent results or data after repeated trial. The pilot study was done to enhance reliability. Literature review of research done by other people, journals and books demonstrated reliability for the author's quoted report, and measures of consistency with topic which was studied.

3.6 Data Analysis

Data analysis was done systematically starting with data cleaning. Questionnaires with incomplete or incorrect responses were excluded from the sample and response rate was then computed. Statistical Package for Social Sciences (SPSS) was used as an aid to analyze data through Microsoft Excel spreadsheets. Qualitative and quantitative analysis were used whereby numbers about a situation were analyzed by choosing specific aspects of that situation. Thereafter descriptive statistics was used to analyze the quantitative data that was obtained through correlation analysis.

Correlation coefficient (r) was calculated using the Spearman rank order.

$$\text{Rho (r)} = \frac{1 - 6 \sum d^2}{n(n^2 - 1)}$$

Where

r = Spearman's coefficient of correlation

d = difference between ranks of pairs of the variables

n = the number of pairs of observation

Appropriate descriptive statistics such as frequency counts, means and percentages were employed. Finally data interpretation were done using frequency tables, line graphs, pie and bar charts and the frequency of responses to various questions were displayed.

3.7 Ethics of Research

The researcher ensured that the respondents were guaranteed maximum confidentiality on the information they divulged and that the information given was strictly used for research and academic purposes. The principle of anonymity was applied in order to guarantee privacy to respondents. The researcher adhered to all the ethical standards set and no respondent was coerced into participating in the research.

CHAPTER FOUR

DATA ANALYSIS, PRESENTATION AND DISCUSSION

4.1 Introduction

This chapter outlines the findings, analysis and presentation of the results of a research carried out to solicit information concerning the use of Information and Communication Technology in government parastatals.

4.2 Background Information

The research targeted the National Environment Management Authority and sought to find out the factors affecting the use of ICT in government parastatals in Kenya. Information concerning the individual characteristics, levels of education and training, the availability and effect of ICT equipment among others was collected through administration of questionnaires to a sample of 120 staff members including top management, technical and operational staff members within the Parastatal. Data was gathered from the population sample and analyzed in order to derive the necessary information. Out of the 120 respondents targeted by the study, 104 responded, giving a response rate of 86.6%.

4.3 Descriptive Statistics

Descriptive statistics such as frequency counts, means and percentages are employed to analyze data. Data is presented in form of tables, pie charts and graphs. Each objective is presented and interpretation given to validate the research questions.

4.3.1 Employees' Gender

The researcher sort to find out gender distribution within NEMA staff. This was of essence because gender is perceived to be among factors that affect how people embrace such developments as those in Information and Communication Technology. It was found out that 58.7% of the interviewed respondents were male and 41.3% female. This was a clear indication that the study received a mixed view on the responses for making unbiased inferences as shown in table 2.

Table 2: Gender Distribution

	Frequency	Percentage	Cumulative Percentage
Male	61	58.7	58.7
Female	43	41.3	100.0
Total	104	100.0	

4.3.2 Age

The researcher wanted to know the trend in age in the office. This was supposed to enable the researcher to get varied responses from different age groups in a bid to understanding any link that exists between age and ICT adoption among employees in the parastatal. It was found out that 35.6% of the respondents were 30 years and below, 32.7% between 30 and 40 years and the remaining 31.7% made up of people above 40 years of age. From the findings of the study, it can be said that most of NEMA employees within county offices and headquarters fell within the bracket of 30 years and below. This is stipulated in Table 3.

Table 3: NEMA Staff Age Bracket as at year 2013

	Frequency	Percentage	Cumulative Percentage
30 and below	37	35.6	35.6
31-40 Yrs	34	32.7	68.3
Above 40	33	31.7	100.0
Total	104	100.0	

4.3.3 Education Level

Among the people interviewed, the researcher wanted to know their education levels to establish the relationships between education levels and the use of ICT in the office. As depicted by research findings; 69.9% had attained university education, 26.9% having college education qualifications and 2.9% with secondary school academic qualification. From the findings of the study, it can be said that most employees in NEMA were degree holders. This is shown in the following table 4.

Table 4: Staff Education Levels

	Frequency	Percentage	Cumulative Percentage
University	72	69.9	69.9
College	28	27.2	97.1
Secondary	4	2.9	100.0
Total	104	100.0	

4.3.4 Training

Various competencies of workers were also examined in order to establish how training and ownership of such competencies could influence employee's adoption and use of ICT. To this end, the researcher would establish the kind of training skill that should be imparted in the workers in order to enhance or boost ICT performance in the office. The results showed that only 1% of the workers had computer science skills, 6.7% had GIS training, 1.9% had taken part in ICT training, 16.3% with IT training and 14.4% having competency in Information Management Systems (IMS). However, 8.7% of employees had training in Financial Management Systems (FMS), 1% had Library and Information Science skills while 5.8% had training in Environmental Studies. 1% of them had undergone Graphics Design training while 43.2% had undergone no training in any one or more fields above. From the findings, it can therefore be noted that majority of the employees had no training on ICT field. This is depicted in table 5.

Table 5: ICT Training Competencies

	Frequency	Percentage	Cumulative Percentage
Computer Science	1	1.0	1.0
GIS	7	6.7	7.7
ICT	2	1.9	9.6
IT	17	16.3	26.0
IMS	15	14.4	40.4
FMS	9	8.7	49.0
Library and Information Science	1	1.0	50.0
Environmental Studies	6	5.8	55.8
Graphics Design	1	1.0	56.7
None	45	43.2	63.5
Total	104	100.0	

4.3.5 Work Experience

The Researcher established the experience of employees based on the number of years they have worked in order to make deductive conclusions on working experience and ICT use among the staff at the NEMA offices, the researcher found out that 41.3% of the employees in the office had more than 10 years working experience with 18.3% having either less than one year or between 6 and 10 years' experience. The research also established that 22.1% of the workers had working experience ranging from one to five years. This is shown in Table 6. Therefore, from the findings of the study, it can be said that most of the workers had more than 10 years working experience.

Table 6: Employees' Work Experience

	Frequency	Percentage	Cumulative Percentage
<1 Yr	19	18.3	18.3
1-5 Yrs	23	22.1	40.4
6-10 Yrs	19	18.3	58.7
>10 Yrs	43	41.3	100.0
Total	104	100.0	

4.3.6 Level of Operation

The researcher found out the operation levels of the workers in the office which include top management (6.7%), operational (44.2%) and technical/support staff (49%). Based on this information, the researcher would link job level and ability to use ICT in NEMA office. The following Table 7 stipulates the levels sampled employees' operation. It can be noted from the study that most members of staff operate within technical/support level.

Table 7: Level of Operation

	Frequency	Percentage	Cumulative Percentage
Management	7	6.7	6.7
Operational	46	44.2	51.0
Technical/Support	51	49.0	100.0
Total	104	100.0	

4.3.7 NEMA Operational Departments

It was important for the researcher to know the departments under which the staff operated. This information was deemed crucial because the level at which the staff are expected to use ICT will depend on the type of work which is dictated by the department. It is apparent that some departments may require the use of ICT more than others depending on the nature of the work. As indicated in Table 8, large proportions of the interviewed staff fell under the categories of Financial and Administration (F&Admin.), 28.2%, Compliance and Enforcement (C&E), 21.4% and Environmental Planning and Research Coordination, (EP&RC), 21.4%. As well, 12.6% were from the Directorate, 9.7% from the Department of Environmental Education Information and Public Participation (EEI&PP), 3.9% from the Legal Department and 2.9% from the Coastal Marine and Fresh Waters department (CM&FW). The study established that the Department of Finance and Administration had the largest proportion of employees who required the use of ICT to perform their jobs.

Table 8: NEMA Operational Departments

	Frequency	Percentage	Cumulative Percentage
Directorate	13	12.6	12.6
EE&PP	10	9.7	22.3
C&E	22	21.4	43.7
EP&RC	22	21.4	65.0
CM&FW	3	2.9	68.0
Legal	4	3.9	71.8
F&Admin.	30	28.2	100.0
Total	104	100.0	

4.4 Training on ICT

Research on computer training was as well conducted on the workers. This was to identify the mode and level of computer training among the staff. This insight was important in making any inferences concerning the level and efficiency in use of ICT as well as the underlying constraints as a result of inadequate training.

Results showed that 25% of the workers attained computer training at university level, 51% at college level, and 3.8% at the vendor training level while 5.8% of them trained themselves, however, 14.4% of the workers went through in-house computer training as indicated in figure 3. From the findings of the study, it can be said that majority of workers attained computer training at college level.

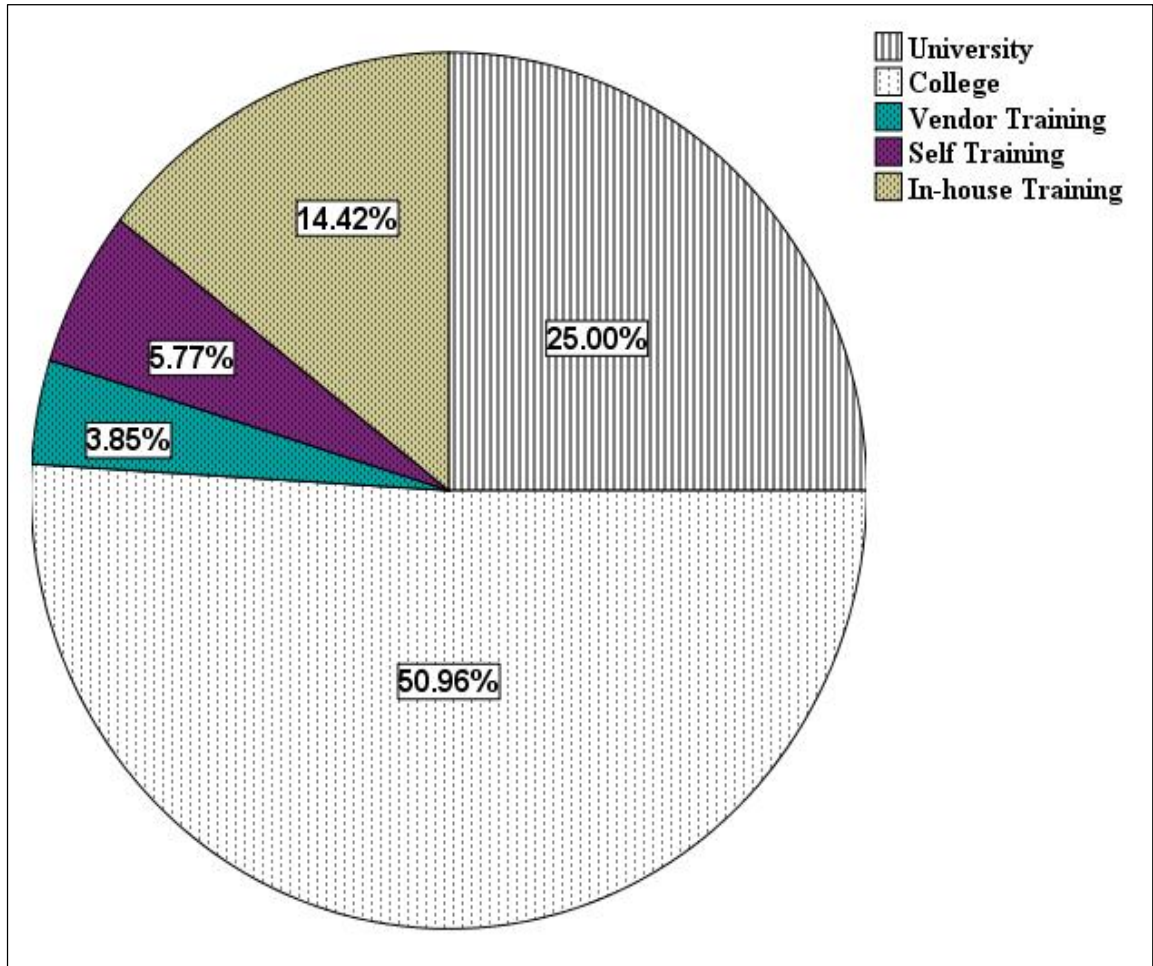


Figure 2: Training on Computers

4.4.1 Computer applications competency

Apart from the mode of training through which the staff acquired their computer skills, the researcher sought to know the extent to which the staff understood relevant computer applications necessary for effective utilization of ICT in the parastatal. The respondents were therefore required to highlight the applications that they were familiar with. This would enable the researcher to know the level to which ICT technology is being utilized in the institution. Moreover, this knowledge was useful as part of the research to find out why some of these basic applications are not in use. From the findings, it was deduced that 101 out of 104 respondents interviewed had training in the MS Office suite. This constituted 97.1% of the respondents. MS Office is therefore the most important popular computer application in the institution.

At least 50% of the respondents are competent in page maker applications. Majority of the respondents confirmed not to be competent in Quick books (58.7%), Sage (62.5%), Pastel (61.5%), AutoCAD (63.5%), SYS (58.7%), ArcGIS (59.6%), Cloud Computing (63.5%), Human Resource Information Systems (HR Info Sys) (58.7%), IFMIS (71.2%), Graphic Design (68.3%), Programming (65.4%), and Desktop Publishing (58.7%). The rest of the respondents confessed to have some competence in using the applications. Table 9 indicates the proportions of the respondents with and without competence in the named computer applications.

Table 9: Computer Application competency

		Frequency	Percentage
MS Office	Yes	101	97.1
	No	3	2.9
Quick books	Yes	43	41.3
	No	61	58.7
Sage	Yes	39	37.5
	No	65	62.5
Pastel	Yes	40	38.5
	No	64	61.5
AutoCAD	Yes	38	36.5
	No	66	63.5
SYS	Yes	43	41.3
	No	61	58.7
ArcGIS	Yes	42	40.4
	No	62	59.6
Cloud Computing	Yes	38	36.5
	No	66	63.5
HR Info Sys	Yes	43	41.3
	No	61	58.7
IFMIS	Yes	30	28.8
	No	74	71.2
Graphic Design	Yes	33	31.7
	No	71	68.3
Programming	Yes	36	34.6
	No	68	65.4
Desktop Publishing	Yes	43	41.3
	No	61	58.7
PageMaker	Yes	52	50.0
	No	52	50.0

A glance at the graph below is enough to draw a conclusion that a majority of the staff have no competence in most of the named computer applications except for MS Office and PageMaker.

Figure 3: Competency in Computer Applications

4.4.2 ICT Usage

In order to attain the objectives of the study, the researcher required the respondents to give a personal opinion on some of the activities and steps that have been taken to enhance the usage of ICT in the institution. Varied responses on personal contentions concerning the same were received. All the respondents agreed that at one point or the other, ICT is useful in their job; whether by making work easier or improving efficiency to client service.

In order to determine the effect of training on the use of ICT, the researcher sought to find out the activities that NEMA undertake in order to enhance or promote the use of ICT through capacity building. 96.2% of the interviewed responded positively to the statement that NEMA encourages its staff to use ICT in their work; 3.8% were not convinced about this. On the same note, it was reported by 65.4% of the interviewed employees that NEMA also organizes specialized instructions on the use of ICT while 34.6% disputed this. In addition, it was agreed by 79.8% of the respondents that NEMA provides guidance in ICT applications, 20.2% of them disagreed. As reported by 73.1% of the respondents, the management of NEMA influences training for ICT users. 26.9% of them did not, however, agree with this contention. However, it was among the objectives of the researcher to find out the influence of training on the use of ICT.

The attainment of this objective necessitated gathering of information concerning staff competency and frequency of use of computers. 88.5% of the respondents confirmed that they find the learning of ICT operation easy. This may be attributed to the quality of training the NEMA offers its staff as well as the facilities available for the same. Therefore, 11.5% of the respondents do not find it easy. Moreover, 103 out of the 104 staff interviewed affirm that the use of ICT can increase flexibility in job performance. This implies that the use of ICT is a good thing when it comes to improving the efficiency of service delivery in government parastatals. Only one of them disagreed with this. 96.2% of the respondents agreed to the statement that monitoring and evaluation requires the involvement of all concerned stakeholders in the use of ICT while the rest did not agree. While 84.6% of the respondents affirmed that NEMA had skilled users of ICT, 100% of the interviewed confessed that ICT is useful in their jobs. However, only 16.3% of them

use computers in their duties and the rest (83.7%) do not use it at all. This is indicated in the following table 10.

Table 10: ICT Usage

		Frequency	Percentage
ICT is useful in my job	Yes	104	100
NEMA encourages staff to use ICT	Yes	100	96.2
	No	4	3.8
NEMA organizes specialized instruction on use of ICT	Yes	68	65.4
	No	36	34.6
Management influences training for ICT users	Yes	76	73.1
	No	28	26.9
I find learning to operate ICT easy	Yes	92	88.5
	No	12	11.5
I use ICT frequently	Yes	98	94.2
	No	6	5.8
NEMA provides guidance in ICT applications	Yes	83	79.8
	No	21	20.2
The use of ICT can increase flexibility in job performance	Yes	103	99.0
	No	1	1.0
NEMA has skilled users of ICT	Yes	88	84.6
	No	16	15.4
Monitoring and evaluation requires involvement of all concerned stakeholders in use of ICT	Yes	100	96.2
	No	4	3.8
Use of computers to carry out duties	Yes	17	16.3
	No	87	83.7

4.5 Funding

Factors affecting the use of ICT in NEMA offices were sought as well. These would be helpful since the researcher would make various recommendations on how best these factors could be harmonized to better embrace ICT use in the office. It was found out that the main factor was inadequate or total lack of funding which was placed at 52.4% while lack or inadequate technical skills in computer use contributed 36.9%. Wrapping up the list of factors were other factors that contributed 10.7% of the total. The outcome is shown in the following figure 5.

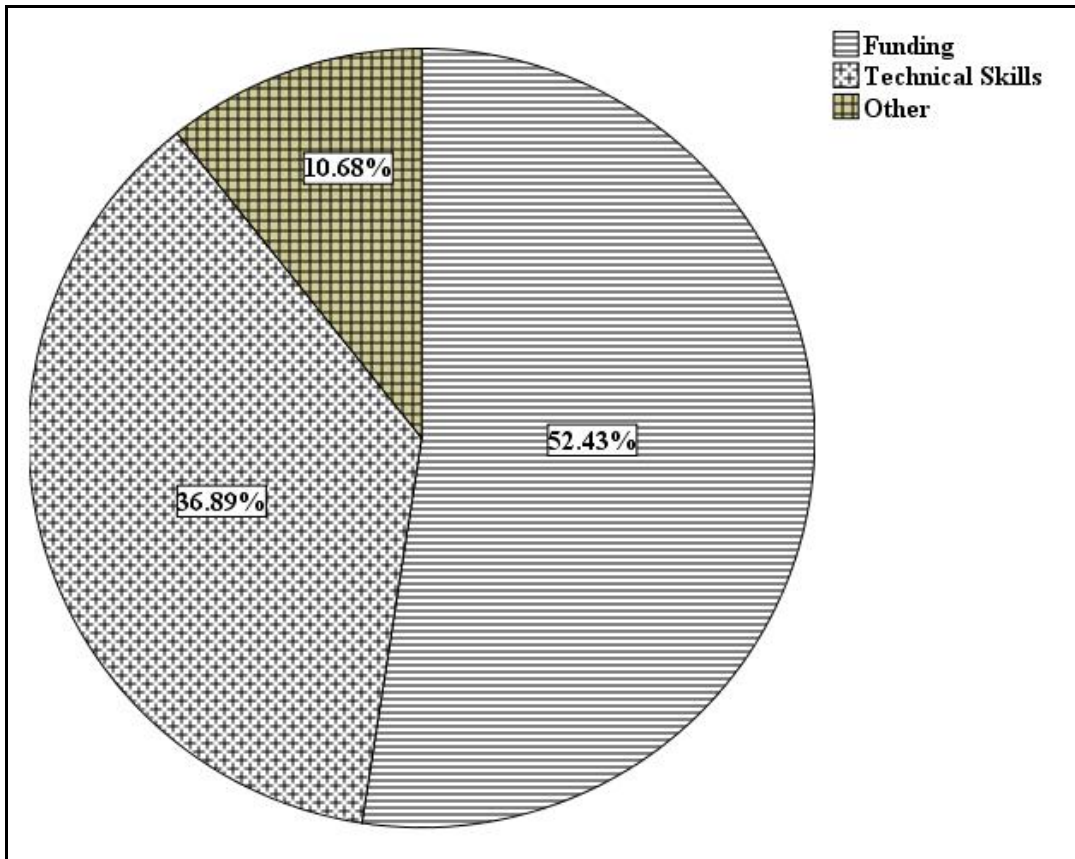


Figure 4: Funding and use of ICT

4.5.1 Allocation of adequate funds for ICT in NEMA

The roles played by NEMA in order to enhance computer use in the offices had also been researched on. The results would assist to determine whether NEMA has adequate funds allocated for ICT use. In terms of NEMA's provision of adequate funds for ICT use, results showed that 5.8% of the respondents said nothing concerning the issue, 9.6% strongly disagreed, 18.3 .9% of them disagreed with the statement, 46.2% fairly agreed with it while 16.3% agreed that NEMA provides adequate funding for use of ICT. Only 3.8% of them strongly agreed beyond no doubt that NEMA is doing its fair part in funds provision for ICT adoption and use. Therefore, from the findings of the study, it can be said that majority of workers fairly agreed that NEMA has adequate funds allocated for ICT use. This is shown in table 11.

Table 11: NEMA allocates adequate funds for ICT

	Frequency	Percentage	Cumulative Percentage
N/A	6	5.8	5.8
Strongly Disagree	10	9.6	15.4
Disagree	19	18.3	33.7
Fair	48	46.2	79.8
Agree	17	16.3	96.2
Strongly agree	4	3.8	100.0
Total	104	100.0	

4.5.2 Availability of resources for upgrading ICT infrastructure

Resource availability in the organization to upgrade ICT infrastructure was found out as fairly available (34.6%) according to the information provided by respondents. 7.7% of the respondents said nothing concerning the issue, 11.5% strongly disagreed about the perceived statement of affairs while 21.2% disagreed about it. Those who agreed that there were enough resources for ICT upgrade were 19.2% as only 5.8% strongly agreed about this issue. Table 12 indicates the level of agreement on availability of resources.

Table 12: Resources for upgrading ICT infrastructure

	Frequency	Percentage	Cumulative Percentage
N/A	8	7.7	7.7
Strongly disagree	12	11.5	19.2
Disagree	22	21.2	40.4
Fair	36	34.6	75.0
Agree	20	19.2	94.2
Strongly agree	6	5.8	100.0
Total	104	100.0	

4.5.3 Stakeholders involvement in ICT implementation

The researcher wanted to know the respondents' views on the involvement of all stakeholders in implementation of ICT activities. This was important in order to know if to include some or all stakeholders in an implementation activity. 3.8% had nothing to

say, 7.7% strongly disagreed that they should all be included as 3.8% of them disagreed about this statement. 10.6% of these respondents fairly agreed on the importance of involving all stakeholders in an ICT implementation programme while 21.2% of them gave a positive opinion about this issue. From the findings majority of the respondents (52.9%) strongly asserted that the involvement of all stakeholders is critical in ensuring a successful implementation of ICT activities. The outcome is indicated in the following Table 13.

Table 13: Stakeholders involvement in implementation of ICT activities

	Frequency	Percentage	Cumulative Percentage
N/A	4	3.8	3.8
Strongly disagree	8	7.7	11.5
Disagree	4	3.8	15.4
Fair	11	10.6	26.0
Agree	22	21.2	47.1
Strongly agree	55	52.9	100.0
Total	104	100.0	

4.5.4 ICT unit is well funded with enough computers

The researcher wanted to know if the ICT unit in NEMA is well funded. This was driven by the need to know if funding in the unit was adequate to keep up with ICT needs of the organization. A good percentage fairly agreed (33.7%) that it was fully funded, 4.8% hardly said anything concerning it as 17.3% of the respondents strongly disagreed that the ICT unit is well funded in the organization. 26% of the people interviewed disagreed about the funding issue as 11.5% and 6.7% of them agreed and strongly agreed respectively. Table 14 demonstrates the results.

Table 14: Funding and facilities for ICT unit

	Frequency	Percentage	Cumulative Percentage
None	5	4.8	4.8
Strongly disagree	18	17.3	22.1
Disagree	27	26.0	48.1
Fair	35	33.7	81.7
Agree	12	11.5	93.3
Strongly agree	7	6.7	100.0
Total	104	100.0	

4.5.5 Furnishing of NEMA ICT Laboratories

Need to check on the availability of ICT equipment in the office was also considered. This was meant to help the researcher to make deductions on whether inadequacy of the equipment could be the driver of the state of affairs as it pertains to ICT use in the office. It was found out that 6.7% of the respondents had no idea concerning the topic, 16.3% strongly disagreed, 27.9% disagreed that the laboratories were well furnished while a better percentage (28.8%) agreeing fairly on this issue. 14.4% and 5.8% of the respondents agreed and strongly agreed respectively about the issue of ICT laboratory furnishing. This is shown in the following figure 6.

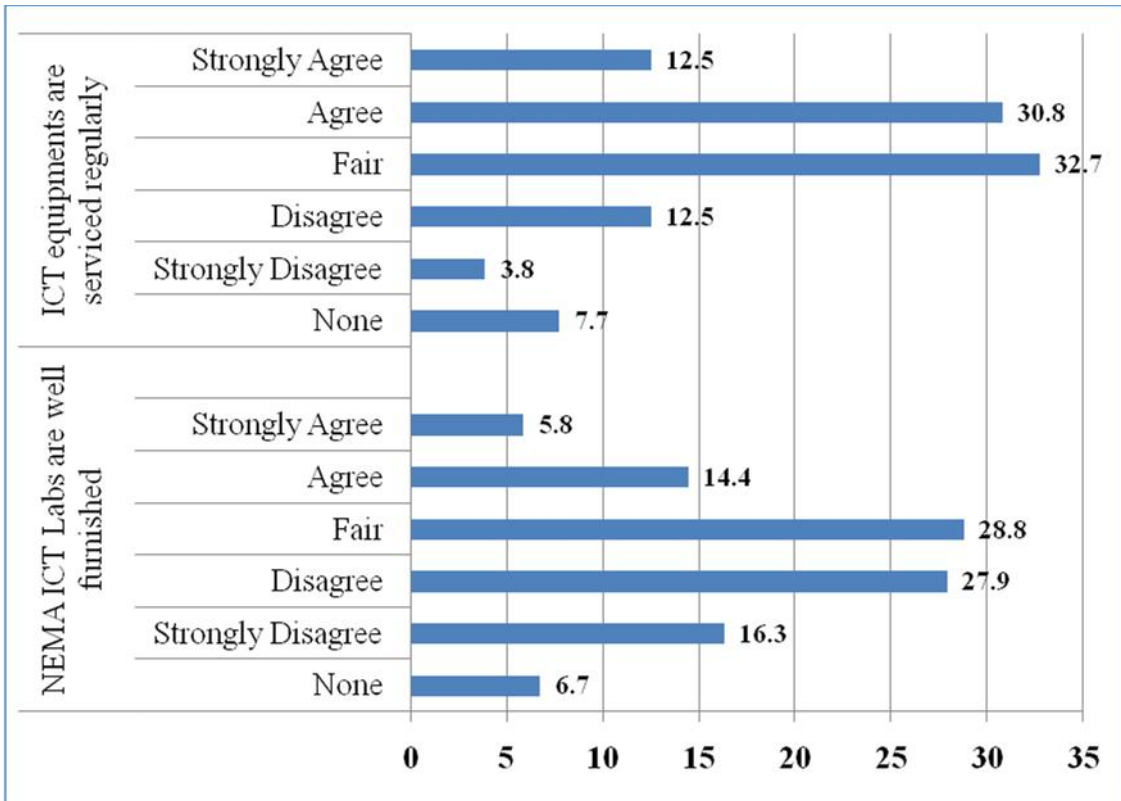


Figure 5: Furnishing of NEMA ICT Laboratories

4.5.6 Internet connectivity

In view of the availability of ICT infrastructure, the researcher sort to know their efficiency by looking at how the internet connectivity responded in the office. This information would be used in recommendation of way forward towards achieving efficient ICT use in the organization. However, results depicted that 6.7% of the respondents did not have any idea about this, 9.6% strongly disagreed about this as 16.3% of them disagreed on the same issue. There was fair consent from 36.5% of the respondents concerning the excellence of internet connectivity response. 20.2% agreed as 10.6% of them strongly agreed that connectivity was excellent. The findings therefore demonstrated that majority of the respondents fairly agreed with excellence of internet connectivity response. This is shown in table 15.

Table 15: Response to Internet connectivity

	Frequency	Percent	Cumulative Percent
N/A	7	6.7	6.7
Strongly disagree	10	9.6	16.3
Disagree	17	16.3	32.7
Fair	38	36.5	69.2
Agree	21	20.2	89.4
Strongly agree	11	10.6	100.0
Total	104	100.0	

4.5.7 Response time for fixing problems

Trying to look at the efficiency of management system, the researcher wanted to know how fast the management responded to ICT problems and failure. This was significant since it could be linked to the trend of ICT use in the organization. Results on this issue demonstrated 6.7% of the respondents saying nothing about it, 9.6% strongly disagreeing while 35.6% fairly agreeing with the issue. 22.1% of the respondents agreed that response and fixing of problems in the office was instant while 8.7% of them gave a very strong assertion concerning this. From the findings of the study, majority of the workers expressed fair agreement with fast response in fixing ICT problems. This is tabulated in the following table 16.

Table 16: Response time for fixing problems

	Frequency	Percentage	Cumulative Percentage
N/A	8	7.7	7.7
Strongly Disagree	10	9.6	17.3
Disagree	17	16.3	33.7
Fair	37	35.6	69.2
Agree	23	22.1	91.3
Strongly Agree	9	8.7	100.0
Total	104	100.0	

4.5.8 ICT equipment servicing

To examine the organization's efficiency again, the researcher wanted to find out if the ICT equipment were serviced regularly to enhance their efficiency and effectiveness. It was important to do this because the organization is perceived to be key in embracing and maintaining ICT services. 7.7% of the people interviewed had no idea concerning this practice, 3.8% of them strongly disagreed while 32.7% of them gave a fair consent that equipment are serviced regularly in the organization. 30.8% and 12.5% of the respondents agreed and strongly agreed respectively, concerning the issue under study. The findings of study depicted a fair opinion from most workers on regular servicing of ICT equipment. This information is well explained in the following table 17.

Table 17: Servicing of ICT equipment

	Frequency	Percentage	Cumulative Percentage
N/A	8	7.7	7.7
Strongly disagree	4	3.8	11.5
Disagree	13	12.5	24.0
Fair	34	32.7	56.7
Agree	32	30.8	87.5
Strongly agree	13	12.5	100.0
Total	104	100.0	

4.5.9 NEMA ICT staff competency

The researcher sort to find out whether the ICT staff in the organization were competent and qualified. The significance of this was that he would then link it to the existing performance of the ICT sector in the organization. This would serve as a basis for various ICT upgrading activities in the organization. Results showed that of all the interviewed people, 5.8% did not have anything to say and only 2.9% of them strongly disagreed about it. 9.6% disagreed on this issue as 17.3% of them fairly agreed about the qualification and competence of the staff. 43.3% of the respondents said yes to the

question while 21.2% of them strongly said that the staff was competent and qualified. From the findings of the study, it can be said that majority of the respondents agreed that, NEMA ICT staff are competent and qualified to discharge their duties. The information is captured in the following table 18.

Table 18: NEMA ICT staff qualification and competency

	Frequency	Percentage	Cumulative Percentage
N/A	6	5.8	5.8
Strongly disagree	3	2.9	8.7
Disagree	10	9.6	18.3
Fair	18	17.3	35.6
Agree	45	43.3	78.8
Strongly agree	22	21.2	100.0
Total	104	100.0	

4.6 ICT Budget for facilities

The researcher wanted to know if NEMA regularly budgets for ICT facilities. This was important for linking the budgetary information to ICT performance and recommend a better way forward to enhance ICT use in the organization. Majority of the respondents (71.2%) consented that there is regular budgeting for ICT facilities in the organization. 22.1% of them said there was no regular budgets and only 6.7% of them had no idea about the issue. The following table 19 shows this information.

Table 19: ICT Budget for facilities

	Frequency	Percentage	Cumulative Percentage
Yes	74	71.2	71.2
No	23	22.1	93.3
I don't know	7	6.7	100.0
Total	104	100.0	

4.6.1 ICT equipment's performance

Information concerning ICT equipment's performance was sort as well. It was pointed out in response by 74% that its performance was good and 20.2% that it was not as impressive. A minority of the respondents (5.8%) said nothing concerning this matter. Therefore from the findings of the study, it can be said that majority accepted that ICT equipment's performance was generally good. This is shown in Table 20.

Table 20: ICT equipment's performance

	Frequency	Percentage	Cumulative Percentage
Yes	77	74.0	74.0
No	21	20.2	94.2
I don't know	6	5.8	100.0
Total	104	100.0	

4.6.2 Computer availability in NEMA offices

The researcher asked respondents whether they had computers in their offices. This would help in gauging computer availability and extent of ICT usage in the organization. It was found out that majority of them (93.3%) did have computers in their offices, 2.9% lacked them while only 3.8% of them did not know anything concerning this. This is shown in the following table 21.

Table 21: Employees computer availability

	Frequency	Percentage	Cumulative Percentage
Yes	97	93.3	93.3
No	3	2.9	96.2
I don't know	4	3.8	100.0
Total	104	100.0	

4.6.3 NEMA's financial support from donor projects

The researcher sort to know about availability of funds for ICT use. This would then be used to assess the availability of funds and the level of required funding in the premises. It was affirmed by 58.7% of the respondents that the organization receives funding as 27.9% of them said no to this statement. 13.5% of the respondents did not have an idea about funding for ICT use in the organization. The results are indicated in table 22 as follows.

Table 22: NEMA's financial support from donor projects

	Frequency	Percentage	Cumulative Percentage
Yes	61	58.7	58.7
No	29	27.9	86.5
I don't know	14	13.5	100.0
Total	104	100.0	

4.6.4 Organizational support from Management

Support for ICT programmes by the organization's management is very crucial in determining the success of such programmes. As such, the researcher wanted to know if NEMA management was giving the ICT facilities the support. It was pointed out by 79.8% that it was giving support, by 11.5% that it was not, with the remaining 8.7% saying they did not know anything concerning this subject. Therefore, it can be said that, from the findings majority agreed that management gave support to ICT programmes. Tabularly, this is explained in Table 23 as follows.

Table 23: Organizational support from Management

	Frequency	Percentage	Cumulative Percentage
Yes	83	79.8	79.8
No	12	11.5	91.3
I don't know	9	8.7	100.0
Total	104	100.0	

4.6.5 Upgrading of ICT systems

On a more individualized level, it was important for the researcher to know whether respondents' ICT systems were being upgraded regularly. This would help to gauge the organization's commitment to embracing latest developments in the ICT sector and thus keeping its systems up to date. Majority of the respondents (60.2%) assented to the fact that their ICT systems were undergoing regular upgrading. 34.0% of them said there was no regular upgrade to their systems while only 5.8% had no idea about this. The following figure 7 explains the results.

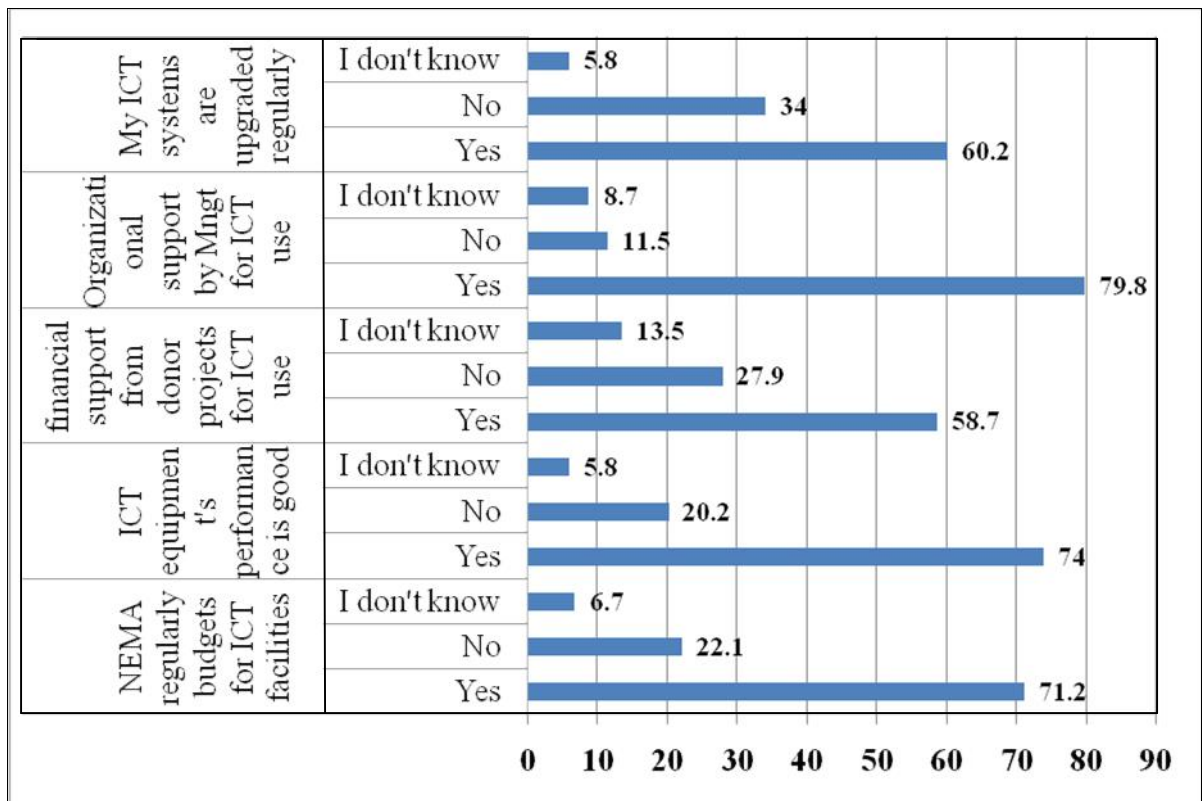


Figure 6: ICT systems upgrading

4.7 Correlation Analysis

When two variables are connected in such a way that when one variable changes, the other variable changes also then the connection is called a correlation. The strength of a relationship between two variables is measured by calculating a correlation coefficient. The value of the correlation coefficient indicates to what extent the change found in one variable relates to change in another. There are several types of correlation coefficients, but the one that is most widely used is called the Pearson Product-Moment Correlation Coefficient, or simply, the Pearson r. The lowest value that the Pearson r can have is $r = 0.00$. This means there is Zero correlation, and would indicate that variable X and Y are not related to one another. The highest value that the Pearson r can have is $r = 1.00$. This indicates a Perfect correlation and would indicate that X and Y are completely related to one another in the sample. Pearson r values can be either positive or negative. A positive value indicates that increases in X correspond to increases in Y. A negative value indicates that increases in one variable are associated with decreases in the other variable. The Pearson r correlation coefficient is calculated using the following formula:-

$$\text{Pearson } r = \frac{N(\sum XY) - (\sum X)(\sum Y)}{[\sqrt{N(\sum X^2) - (\sum X)^2}][\sqrt{N(\sum Y^2) - (\sum Y)^2}]}$$

However, Several variables were collated in the research in order to determine how changes made to one can affect the other. Spearman's Correlation coefficient (r_s) was calculated using the Spearman rank order.

$$\text{Rho } (r_s) = \frac{1 - 6 \sum d^2}{n(n^2 - 1)}$$

Where

r_s = Spearman's coefficient of correlation

d = difference between ranks of pairs of the variables

n = the number of pairs of observation

4.7.1 Correlation Analysis Results

This research had 104 respondents who filled up the questionnaires proficiently. Descriptive statistics was done to test the data distribution where the data was found to be normally distributed, parametric statistical tests such as ANOVA were done at 95% confidence interval and in cases of skewed distribution non-parametric tests such as the Spearman Correlation test were done at the same level of significance as above.

The results are discussed as follows:-

4.8 Correlation on Training and ICT Usage

		NEMA encourages staff to use ICT	NEMA organizes specialized instruction on use of ICT	I use ICT frequently	Do you use computers to carry out your duties	I have a computer in my office
Training	Pearson Correlation		-.130	-.004	-.282**	.165
	Sig. (2-tailed)		.189	.972	.004	.095
	N		104	104	104	104
Training on Computers	Pearson Correlation	.174	.092	.142	-.137	.112
	Sig. (2-tailed)	.077	.355	.152	.166	.260
	N	104	104	104	104	104
NEMA encourages staff to use ICT	Pearson Correlation					-.051
	Sig. (2-tailed)					.607
	N					104

** . Correlation is significant at the 0.01 level (2-tailed).

As depicted in the above table, correlating various training aspects with regard to use of ICT in the office gave the following results:-

Staff competence in various fields had a negative relationship with NEMA organizing specialized instruction on the use of ICT in the office. This means that as staff members got more and more trained in such fields as GIS, Computer use, IT and ICT among others, the less the organization of such fora on ICT use by the NEMA. Specifically, a unit improvement in training of the staff would reduce NEMA's organization of

specialized instruction on use of ICT by a factor of 0.130. As this happen, reference to the number of people trained as calculated earlier on showed that majority of the staff, 43.2% were untrained in whichever field. Only 16.3% of the respondents had training in IT while only 14.4% had been trained in Information Management Systems. Correlating training in such fields as GIS, Information Management Systems (IMS), IT and ICT among others with the frequency at which the staff members used ICT revealed a weak negative relationship. This means that although employees may have much training in these fields, they use ICT less frequently. However, earlier computations showed that 94.2% of the respondents used ICT frequently. With a factor as low as -0.004 correlating these two issues however, this kind of relationship was highly placed in terms of significance; at 0.972.

The competencies in the above fields among the staff were found to inversely affect their use of computers to carry out their duties. In this case, it was found that improved training in such fields does not guarantee use of computers among staff in their duties. The same kind of training in these fields had a positive influence on staff having computers in their offices. In this light, one unit improvement in training of staff in GIS, IMS, IT and ICT among other fields outlined would increase staff members' chances of having computers in their offices by a factor of 0.165.

The researcher found that training on computers had a positive correlation with NEMA encouraging its staff to use ICT. It depicted a 0.174 correlation factor between the two variables, indicating that improving the level and amount of training on computer use lead to NEMA trying to tap more of the human and intellectual resource from these trained workers. The relationship was also found to stand at a significance level of 0.077. It was noted that majority of the workers (50.96%) attained their computer use training in colleges.

In a bid to tap more of this resource, NEMA tended to organize more specialized instruction for ICT use in cases of improved training on computer use. This was shown by the positive correlation factor of 0.92 with a high significance level of 0.355 between these two variables. Similarly, trainings on computers at different levels impacted

positively on staff members' frequency at which they used computers, with a correlation factor of 0.142 and a significance level of 0.152. However, results depicted that training on computers did not necessarily mean that the staff members used ICT in carrying out their duties. This was shown by a correlation factor of -0.137 and a significance level of 0.166 between these two variables.

To wrap up correlations on training on computer use, it was found out that a unit improvement in training on computer use increased chances of workers having computers in their offices by a factor of 0.112. This relationship was ranked as very significant, with a significance level of 0.260. As much as NEMA encouraged its staff to use ICT, this was found to have a negative impact on the staff having computers in their offices. The correlation factor between these two variables was found to be -0.51 with a great significance established between the two; 0.607.

4.9 Correlation on ICT Funding and Usage

		Do you use computers to carry out your duties	Do NEMA allocate adequate funds for ICT	Are there enough resources for upgrading ICT infrastructure	ICT unit is well funded	NEMA regularly budgets for ICT facilities	NEMA receives financial support from donor projects for ICT use
I use ICT frequently	Pearson Correlation		.211*		.100		
	Sig. (2-tailed)		.032		.311		
	N		104		104		
The use of ICT can increase flexibility in job performance	Pearson Correlation	.044				-.058	
	Sig. (2-tailed)	.661				.558	
	N	104				104	
Do you use computers to carry out your duties	Pearson Correlation			.036	.200*		
	Sig. (2-tailed)			.716	.041		
	N			104	104		
Are there enough resources for upgrading ICT infrastructure	Pearson Correlation				.570**		-.324**
	Sig. (2-tailed)				.000		.001
	N				104		104

*. Correlation is significant at the 0.05 level (2-tailed)

**. Correlation is significant at the 0.01 level (2-tailed)

NEMA's allocation of adequate funds for ICT use was found to positively affect how frequent the staff used ICT in the office. This was shown by a correlation factor of 0.211 with a little significance level of 0.032. In cases where ICT was well funded, it positively affected frequency of ICT use by a factor of 0.100 with the relationship termed as very significant (with a level of 0.311). As this was thought as very significant, majority of the people (46.2%) agreed that the ICT unit was fairly funded.

Employees' belief that ICT use could increase job flexibility in the parastatal, had a positive (0.044) impact on their use of computers to carry out their duties. The

relationship was found to be having a strong significance level of 0.661. This was as well pointed out earlier by 103 of 104 respondents agreeing to the fact that indeed ICT could increase flexibility in job performance. There was a negative correlation between the ability of ICT to increase flexibility in job performance and NEMA regularly budgeting for ICT facilities. The correlation factor was -0.058 with a strong significance level of 0.558 existing between the two variables under discussion.

		I use ICT frequently	The use of ICT can increase flexibility in job performance	Do you use computers to carry out your duties	I have a computer in my office
NEMA ICT Labs are well furnished	Pearson	.139	-.035		-.310**
	Correlation	.159	.724		.001
	Sig. (2-tailed)				
	N	104	104		104
ICT equipment are serviced regularly	Pearson	.008	.065		
	Correlation	.938	.513		
	Sig. (2-tailed)				
	N	104	104		
ICT equipment's performance is good	Pearson			-.208*	
	Correlation			.034	
	Sig. (2-tailed)				
	N			104	
*. Correlation is significant at the 0.05 level (2-tailed)					
**. Correlation is significant at the 0.01 level (2-tailed)					

Correlation between availability of funds to upgrade ICT facilities in the organization and workers' use of computers to carry out their duties was found to be positive. As such, the more the funds, the more it was likely for workers to use computers in their offices. This relationship was as well found very significant at a level of 0.716. Computer use by workers was as well positively affected by the level of funding for the ICT unit in the organization, correlating at 0.200 although the relationship was regarded as insignificant. Resource availability and how it affects upgrading of ICT facilities was also considered and results showed a strong positive correlation of 0.570 between adequacy of funding

for the ICT unit and the adequacy of resources to upgrade the facilities. As this relationship existed, only 33.7% of the respondents agreed that the ICT unit was adequately funded. However, the relationship's significance was found neutral, at 0.00. However, there was an inverse relationship (-0.324) between NEMA receiving external funding for ICT and the adequacy of resources to upgrade the facilities. In essence, despite its receivership of funds, not much was happening in terms of upgrading ICT facilities, although the significance level of this link was minimal at 0.001. As such, the link was termed as insignificant.

4.10 Correlation on Facilities and ICT Use

The researcher wanted to establish existing links between various aspects on ICT facilities and ICT use in the organization. It was found out that there was a positive correlation between furnishing of the organization's laboratories and the people's frequency of using ICT in the parastatal. In this sense, a unit improvement in the furnishing of labs would increase the frequency of them using ICT by a factor of 0.139. This link was significant at 0.159. However, it is worth to note that, as earlier deduced, only 14.4% of the respondents agreed that there is furnishing of NEMA labs with 27.9% disagreeing that such a thing happens. The same issue of furnishing labs is negatively affected by the belief on ability of ICT to increase flexibility in job performance. Thus, an improved unit ability of ICT to impact the flexibility in job performance would significantly reduce the level of furnishing of the labs by 0.035 and vice versa. The correlation significance is high, at 0.724. Still on the issue of furnishing of ICT labs, there was an established inverse relation between it and the respondents' ownership of a computers in their offices. The more furnished the labs became, the less the number of respondents there were with computers in their offices.

There was a weak link of 0.008 between regular servicing of ICT facilities and people's frequency in using them. No matter how much the organization did servicing of the facilities, it did not yield reasonable fruit in the frequencies of ICT uses in the office. Despite the weak influence between the two variables, this link is strongly significant, at a level of 0.938. The regular servicing of facilities was also greatly affected by the ICT's

ability to increase flexibility in job performance. This was placed at a positive correlation factor of 0.065 and a significance level of 0.513. Amid this, it was strongly assented by 12.5% of respondents that indeed ICT equipment are serviced regularly. Correlation between ICT performance and the respondents' use of computers to carry out their duties was also sort. The results came up with a negative relationship of 0.208. The link was as well found to be below the minimum significance level, at 0.034.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATION

5.1 Summary

The researcher sought to find out the factors affecting the use of ICT in government parastatals in Kenya. The research led the researcher into an interaction with NEMA staff in order to get the reliable and relevant information that would then help in making sound and valid conclusions about the subject. As analyzed and discussed in chapter 4 above, this is the summary of the findings.

ICT is useful in most jobs. This is a fact that was brought out synonymously by all the respondents, pointing out that ICT can change the way people work, the kind of performance they get, the efficiency and effectiveness of their work among other aspects. Also, it is deduced that ICT has the ability to increase flexibility in job performance among workers in an organization, on a general scale.

Inadequate funding is the greatest impediment to the adoption and use of ICT in government parastatals. This is strongly brought out in various instances where the NEMA allocates inadequate funding for ICT development, provides inadequate financial allocations for upgrading the ICT sector in the organization or in other situations where it does not have enough funds to furnish its ICT labs. It was as well found out that allocation of adequate funding for ICT leads an improved usage among workers in an organization. Similarly, availability of funds to upgrade ICT infrastructure in the organization is strongly related to how people embrace and use ICT in their work. An increase in such funding increases ICT use in the offices as there will be increased, better and upgraded ICT infrastructure. It was also noted that resource availability in NEMA positively affects ICT infrastructural upgrade.

Improvements in competencies in various fields by the staff negatively impacts on use of ICT in these fields. As people get more competent in their professional fields, they get more detached from ICT use and this has adversely affected ICT adoption and use.

Improved training in computer use on the other hand, was seen to improve NEMA's effort to tap the human and intellectual resource. In this sense, it is noted that NEMA encourages staff to use ICT facilities and even goes ahead to organize specialized instruction to enhance ICT use in the case where its workers have improved training in computer use. In the same light, improved training in use of computers lead to increase chances of computer use in offices. There is therefore, a significant link between training on computer use and ICT performance. Thus, improved training in computer use improves ICT performance. In an indifferent case encountered, training on computer use doesn't necessarily mean that people would apply such skills in their duties. However, this link was found to be less significant.

Another reason why NEMA staff members are not fully using the ICT facilities is because there's a shortage of these facilities in the organization. The availability of ICT facilities in organization labs determines people's level of use of these resources in their jobs. The shortage of ICT resources in NEMA has negatively impacted on ICT adoption and use in the organization. However, improving the furnishing of labs has a negative impact on the number of people using computers in the offices. This is because; many would prefer to make any necessary references, whenever required, to the computers in the organization labs rather than have them in their offices.

People who believe that ICT can improve flexibility in job performance are more likely to use it, as way of boosting their job performance. There exists a very strong relationship between these two factors and this can provide a better ground to enhance ICT adoption and usage in offices.

Poor attitude towards use of ICT facilities among workers greatly impacts ICT performance in government organizations. This has been shown by the fact that as much as an organization strives to service its ICT infrastructure, the number of people using the facilities is very minimal. In fact, workers tend to use the facilities less often in situations where the organization struggles hard to keep the facilities regularly serviced. This is one other reason why ICT performance in government offices is still low. This fact is also shown in situations where, despite ICT performance being quoted as good, fewer people

are using computers to perform their duties as clearly indicated by the correlation between ICT performance and the number of people using computers to carry out their duties.

5.2 Conclusion

ICT is a very promising tool in ensuring better professional performance among workers in any organization. As promising and beneficial as it is, it has not been fully tapped in government parastatals in order to realize maximum benefits from it. This arises from many factors ranging from financial, institutional, managerial, individual and mechanical among other factors. Parastatals should therefore develop capacities that ensure that the above challenges are promptly and conclusively dealt with. This will require everyone in the organization to take part as this will elevate programme success due to the perception that the programme is owned by all in that organization.

However, it should be remembered that ICT is a two-edged sword and thus, should be adopted with a lot of care lest it affects the adopters and users in an adverse manner. In any case, it is encouraged that organizations should only take up the beneficial aspects of ICT rather than the whole package. Care should be taken to balance between any perceived negative and positive attributes of this tool in the workplace and anywhere else where it is applicable. In light with the above, the organization management should thoroughly scrutinize an ICT product to establish its suitability in specific geo-cultural contexts and its effectiveness in enhancing job performance at a specific workplace. Considering all aspects and taking all precautions is one way of ensuring a sustainable ICT adoption in an organization.

5.3 Recommendations

Based on the above deductions, the researcher would like to make the following recommendations in a bid to improve the adoption and use of ICT in government parastatals:-

Government parastatals should come up with fora where they train all workers on how to use ICT facilities either during staffing or through provision of On-the-Job Training

among already absorbed employees. This keeps them updated and relevant all the time in terms of handling the many and continuous developments in global technology. As such, the employees are able to handle any technological and/or ICT product that is presented to them. It thus improves ICT performance as depicted by the research.

ICT use legislations and regulations should be formulated and integrated in the organization's laws and policies to give it a binding and more authoritative touch. This will strengthen the sector and ensure strict and efficient enforcement of ICT programmes in organizations without facing such impediments as lack of cooperation and/or coordination among the staff. Since investing in ICT is a beneficial endeavor, the organization management should ensure that it is fully integrated into many if not all sectors of the organization. These sectors may include human resource, finance, administration, legal sectors among others. Once mainstreamed in all the sectors or departments, ICT will perform better in government offices with the help of the legal enforcements accompanying it.

The government parastatals should as well come up with best mechanisms on how to inform their working staff about the relevance of ICT in job performance and every other aspect of their professional spheres. Through this, they will cut down on numbers of employees with poor or negative attitude about ICT use. This will help them to solve some of the problems associated with poor and negative perceptions in adoption and use of ICT in the parastatals. By these, people knowing the importance of ICT, they will be encouraged to use the facilities in order for them to tap the greatest benefits from the facilities.

All stakeholders should be involved in the ICT development programmes in parastatals. As shown by the research, there should be such a platform where every stakeholder is involved in these projects. Stakeholders in the public, non-governmental and private sectors are important to develop and implement ICT in organizations. This is of essence since some of them will provide technical support, financial assistance while others will ensure effectiveness and efficiency in the programme implementation process. By involving all stakeholders in the society, there are high chances of a boosted

accountability among programme personnel. The role of supervision to ensure greater levels of accountability is usually carried out by the civil society, an accountability watchdog in the current world full of unethical and self-centered people.

There is dire need for funding for ICT development and implementation in parastatals. Funding was found to be the main factor affecting ICT use in the parastatal. Therefore, for ICT infrastructure to be developed in the organizations there is a great need to look at how these organizations will access funding for ICT development and usage. Funds are needed to buy ICT facilities, service them, ensure their maintenance, and upgrade them among other services. The same funds need to train new and old staff on how to best embrace and integrate ICT services in their professional careers. The organizations should get more serious with looking for funds from the government, private and international parties in order to secure enough financial and institutional capital for this programme.

ICT is a very beneficial asset in an organization. The organization should therefore ensure that most of it, is tapped in its everyday running and execution of roles. By this, the organization should ensure that all computer literate employees are always using their skills in their duties. This will curb such scenarios where ICT trained workers or employees are spotted not using computers or other ICT facilities in the execution of their roles. But how can this happen? The parastatals should lay stringent rules and/or guidelines that ensure such employees use ICT lest they face punitive measures. These guidelines should be comprehensively laid down to the employees and management and integrated in the laws and policy frameworks.

5.4 Recommendation for further research

The study was carried out in focusing NEMA offices, representing all parastatals in Kenya. The researcher therefore recommends that similar study should be done in other government institutions to establish the factors affecting the use of ICT in the Kenyan public service.

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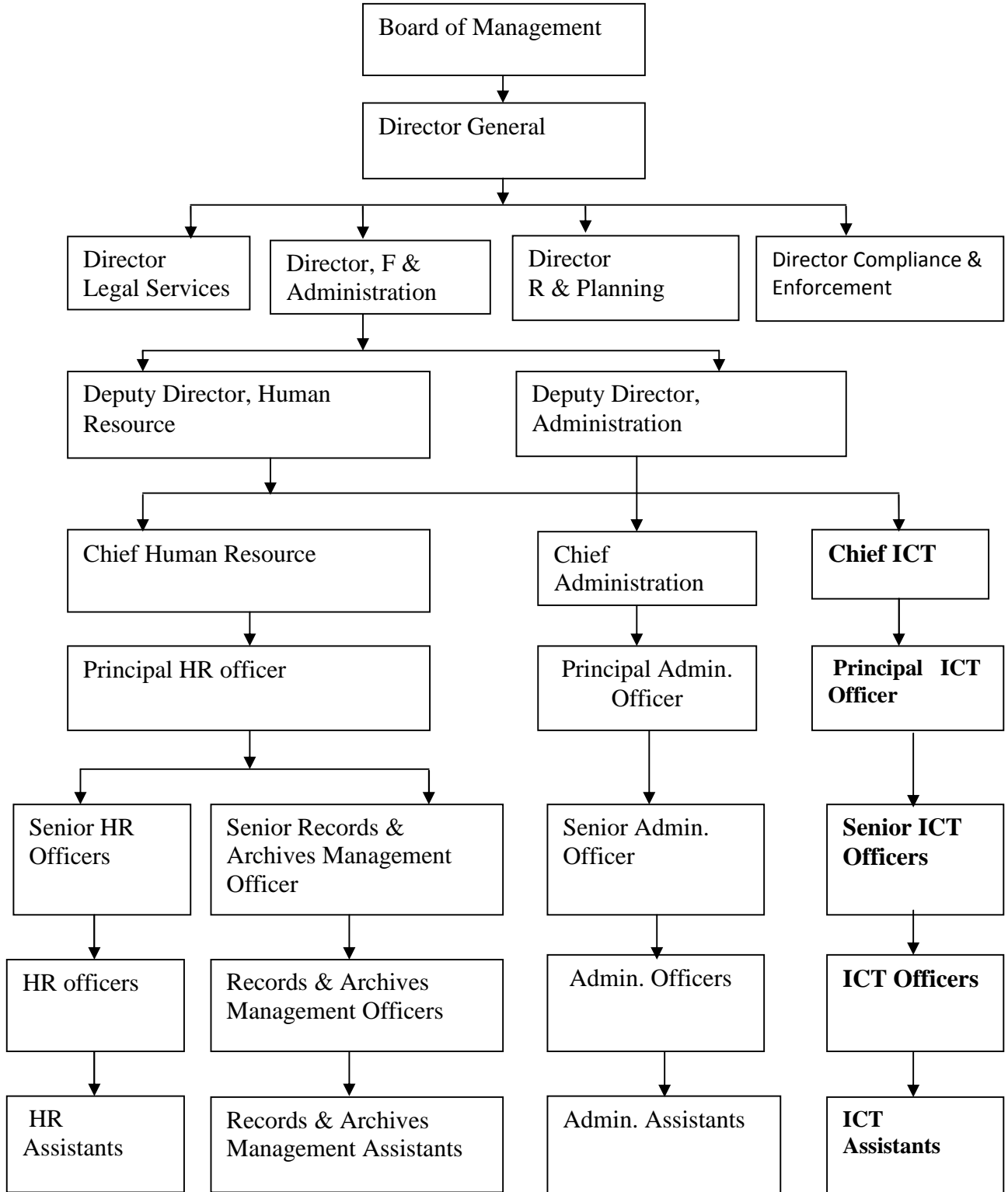
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APPENDICES

Appendix 1: Organizational structure for NEMA

NEMA ORGANIZATIONAL STRUCTURE



Appendix 2: Letter to Respondents

Beatrice Ongaki
P.O. Box 270 - 00618
NAIROBI

Dear Respondent,

RE: MBA (MIS OPTION) RESEARCH PROJECT

I am Beatrice Ongaki, a student at Kenyatta University, pursuing Masters Degree in Business Administration, Management Information Systems (MIS) Option. As part of my course work, I am required to undertake an independent primary research project on factors affecting the use of ICT in government parastatals with a particular focus at NEMA, Kenya.

The purpose of this letter therefore, is to introduce myself and request to be allowed to undertake research at NEMA.

I will ensure that all data and information collected from the respondents shall be treated with utmost confidentiality and only used for academic purposes, unless otherwise stated.

Assistance accorded to me will be highly appreciated.

Thank you.

Yours faithfully

BEATRICE ONGAKI
MANAGEMENT SCIENCE STUDENT
KENYATTA UNIVERSITY

- Environmental Education & Public Participation []
- Compliance & Enforcement []
- Environmental Planning & Research Coordination []
- Coastal Marine & Freshwaters []
- Legal Services []
- Finance & Administration []

Section II: Training & Use of ICT

Please express your agreement with the following statements on ICT training and usage

Please indicate the level of training you have on computers by ticking []		
	YES	NO
University Training		
College courses		
Vendor Training		
In-house Training		
Self-Training		
Indicate whether you are competent in using the following applications by ticking []		
	YES	NO
Ms. Word		
Ms. PowerPoint		
Ms. Access		
Ms. Excel		
Quick Books		
Sage		
Pastel		
AutoCAD		
Financial Management System		
ArchGIS		
Cloud Computing		
Human Resources Information System		

IFMIS		
Graphics Design		
Programming		
Desktop Publishing		
PageMaker		
ICT Usage		
I find ICT useful in my job		
NEMA encourages Staff to use ICT		
NEMA organizes specialized instruction on use of ICT		
Management influences training for ICT users		
Learning to operate ICT systems is easy for me		
I use ICT frequently		
NEMA provides guidance in ICT applications		
The use of ICT can increase flexibility in job performance		
NEMA has skilled users of ICT		
Monitoring and evaluation requires involvement of all concerned stakeholders in use of ICT		
I do not use computer to carry out my duties		

Section III : Funding & Use of ICT

What factors might affect the use of ICT

Funding [] Technical skills [] Other (specify)

Please indicate the extent you are satisfied with each of the following statements by Please tick []					
(1) Strongly disagree (2) Disagree (3) Fair (4) Agree (5) Strongly Agree					
	1	2	3	4	5
NEMA allocates adequate funds for ICT					
There are enough resources for upgrading ICT infrastructure					
In the implementation of ICT activities, all stakeholders should be involved					

ICT Unit is well funded and there are enough computers for use					
NEMA ICT laboratories are well furnished					
The response to internet connectivity is excellent					
Response time for fixing problems is instant					
Equipment for use of ICT are serviced regularly					
NEMA ICT staff are qualified and competent					

Section 1V: Facilities

Please express your agreement with the following statements by ticking []			
	YES	NO	I don't know
NEMA regularly budgets for ICT facilities			
ICT facilities in NEMA support office functions and equipment's performance is good.			
You have a computer in your office			
NEMA receives financial support from donor projects for ICT use			
There is organizational support e.g. finances for upgrading ICT facilities			
Your ICT systems are upgraded regularly			

Thank you for your cooperation

Appendix 4: Work Plan for the Project

Gathering the data on the study will commence with effect from September 2012 to February 2013. The entire study will be carried within the following time schedule.

ACTIVITY	OCT.	NOV.	DEC.	JAN.	FEB.	MAR.
Problem Statement						
Literature Review						
Writing Proposal						
Pilot Study						
Defense						
Data Collection						
Data Analysis						
Final Report Writing						
Final Report to Kenyatta University						

Appendix 5: Research Budget

The following is the estimated budget for the project research, which includes traveling around Nairobi between libraries and other information centers in search of literature review.

	ITEM	AMOUNT IN KSHS.
1.	Project Proposal and questionnaires	10,000
2.	Travelling Allowance	10,000
3.	Stationery	10,000
4.	Data Analysis	5,000
5.	Typing, editing and binding	5,000
	TOTAL	40,000