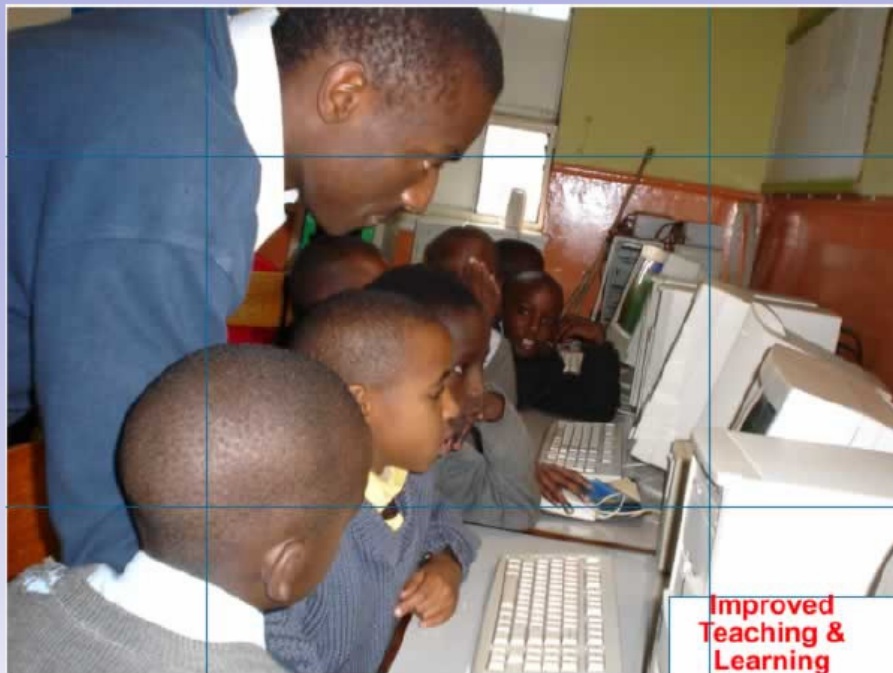




MINISTRY OF EDUCATION

NATIONAL INFORMATION AND COMMUNICATION TECHNOLOGY (ICT) STRATEGY FOR EDUCATION AND TRAINING



June, 2006

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ABBREVIATIONS

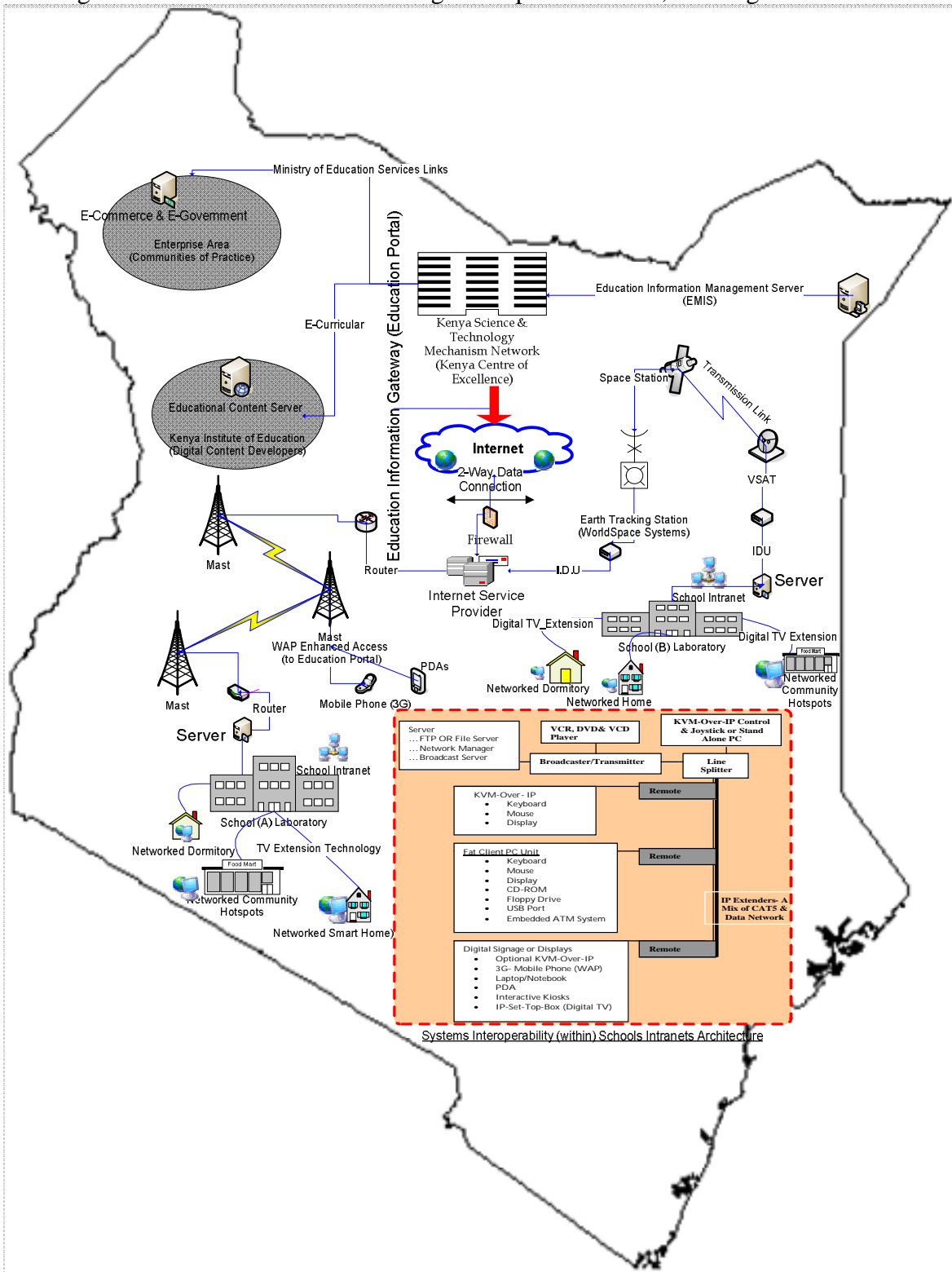
ASAL	Arid and Semi Arid Lands
CPD	Continuous Professional Development
EFA	Education For All
ERS	Economic Recovery Strategy
ERSWEC	Economic Recovery Strategy on Wealth and Employment Creation
GITS	Government Information Technology Services
GoK	Government of Kenya
ICT	Information and Communication Technology
KESSP	Kenya Education Sector Support Programme
LAN	Local Area Network
MAN	Metropolitan Area Networks
MDGs	Millennium Development Goals
MOEST	Ministry of Education Science & Technology
NEPAD	New Partnership for African Development
NGOs	Non-Governmental Organizations
NICE	Network Initiative for Computers in Education
ODE	Open and Distance Education
PPP	Public & Private Partnership
SAGAs	Semi-Autonomous Government Agencies
TIVET	Technical, Industrial, Vocational and Entrepreneurship Training
WAN	Wide Area Networks
WSIS	World Summit on the Information Society
WWW	World Wide Web

VISION

“ICT as a universal tool in education and training”

MISSION

“To integrate ICT in education and training for improved access, learning and administration”



FOREWARD

The Ministry of Education in collaboration with partners developed Kenya Education Sector Support Programme (KESSP), where Information and Communication Technology (ICT) featured in 2005 as one of the priority areas identified in this sector programme.

ICT in the education sector can broadly be categories in: **E-Government** which aims at mainstreaming ICT in all government operations and service delivery; **EMIS** (Education Management Information Systems) which aims at facilitating education managers and administrators with accurate and timely data for better and informed decision-making; and **E-Learning** which aims at mainstream ICTs in the teaching and learning process (ICT as a tool).

For the last one year, the Ministry has been working in close consultation with various stakeholders to develop of a comprehensive roadmap to guide the sector in the adoption of appropriate technology in all the three categories of ICTs. The first draft ICT strategy was completed in August 2005. In the same year, USAID facilitated a team of consultants to evaluate the various possible options which the Ministry could consider in integrating ICTs in the sector. This was captured well in the ICTs in Education Options Papers of 2005.

With the development and approval of Ministry's policy through the Sessional Paper No. 1 of 2005 and the approval of National ICT Policy in 2006, this strategy becomes a vehicle through which policy objectives can be realized.

This strategy should act as a guide for investors, partners, implementers and all beneficiaries in the sector. The strategy gives a snapshot of what is required for ICTs not only to have an impact in reducing the digital divide but also as a tool for curriculum delivery and learning. With adoption of this strategy, I hope that the sector initiatives will be implemented with due regard to sustainability, cost-effectiveness, local ownership, high added-value to services and above all coordination hence eliminating duplication.



HON. DR. NOAH WEKESA
MINISTER FOR EDUCATION

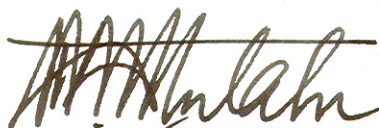
PREFACE

The Ministry, sector partners and stakeholders have developed this National ICT Strategy for Education and Training aimed at guiding the sector in the adoption of ICTs across all levels of education and training. The strategy has been developed taking into consideration the policy environment captured in the National ICT Policy of 2006 and sector policy in Sessional Paper No. 1 of 2005. The strategy has also been developed in line with the E-Government Strategy of 2004 and the wider Economic Recovery Strategy Paper for Wealth and Employment Creation (ERSWEC). Over the last six months, stakeholders have been submitting their comments on the implementation matrix and costing of the various items envisaged in the strategy. Draft strategy was subjected to stakeholder scrutiny and validation in workshops held on 17th January 2006 and 6th February 2006. The strategy identifies the following strategic pillars for sector ICT implementation:

- Establishment of a policy framework
- Digital equipment
- Connectivity and network infrastructure
- Technical support
- Harnessing emerging technologies
- Digital content development
- Integration of ICTs in education
- Training (capacity building including professional development)
- Research and development
- Partnerships and resource mobilization
- Legal and regulatory framework, and
- Monitoring and evaluation.

This strategy fits into the Kenya Education Sector Support Programme (KESSP) which is the sector investment programme aimed at achieving Education for All and Millennium Development Goals. The strategy has adopted the same time-frame as KESSP, for ease of monitoring and review in line with changing priorities in the sector.

ICT is a cross-cutting issue and requires heavy investments ownership and commitment by all. Only then can the infrastructure (digital equipment and connectivity), Training and Digital Content attract adequate level of funding. It is my hope that all sector stakeholders will buy into this strategy.



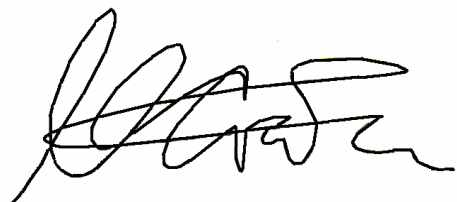
PROF. KAREGA MUTAHI, CBS
THE CHAIR, KENYA ICT TRUST FUND
PERMANENT SECRETARY
MINISTRY OF EDUCATION

ACKNOWLEDGEMENT

The Ministry has developed this National ICT Strategy for Education and Training through collaboration with all sector stakeholders. Without the support from each and every member from private and/or public, academia and/or civil society organizations, would not have been possible to realize this course. I would like to thank all staff, development partners, public and private corporate, implementers of ICTs in education initiatives for your contributions. Special thanks go to Kenya ICT Trust Fund for supporting the development process including stakeholder mobilization and final technical drafting team. I also thank the development partners led by USAID for facilitating technical experts to come with the initial sector status assessment realized through ICTs in Education Options paper. The dedication of the Ministry management as demonstrated by the Minister, Permanent Secretary, Education Secretary, all Directors and their staff including the Chief Executives of SAGAs is highly appreciated for their contribution on the content and inputs in various stages.

It is therefore my hoped that this document will form the next stage of coordination and lead to converged monitoring of all ICT initiatives in the sector. The duplications of implementers in various sites are expected to be greatly reduced, while resources will be channeled as per prioritized pillars of the strategy.

This document is now an active document requiring each stakeholder to take lead in the implementation. I believe resource mobilization towards the actualization of this strategy and subsequent implementation will lead to attainment of ICT objectives both in the National ICT Policy and the Sessional Paper No. 1 of 2005.



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EXECUTIVE SUMMARY

This Strategy undertaking was prepared by the Ministry of Education (MoE) in collaboration with stakeholders from the public, private, civil society and development partner sectors. It outlines how Information and Communication Technologies (ICTs) will be adopted and utilized to improve access, quality and equity in the delivery of education services in Kenya.

The Strategy is based on the vision that: “ICTs is a universal tool in education and training”. The mission statement that inspires it is: “to integrate ICTs in education and training to improve access, learning and administration.”

The overall objective of the plan is to ensure that systematic efforts are made towards strengthening adoption and use of ICT in the education sector with appropriate attention given to education development priorities as outlined in the Economic Recovery Strategy for Wealth and Employment Creation (ERSWEC, 2003-2007); Sessional Paper No. 1 of 2005 entitled “A Policy Framework For Education”, Training and Research and the United Nations’ Millennium Development Goals (MDGs).

The challenges that are outlined in these policy documents include; the need to achieve Education For All (EFA) by 2015 in tandem with the national and international commitment, Universal Primary Education (UPE) by 2010, and to increase transition rate from primary to secondary schools from 47% to 70%.

Policy documents in the education sector have given considerable attention to priorities related to access, quality, equity and relevance at all levels. This strategic plan considers and proposes that ICT can contribute substantially towards realization of these objectives. In addition, ICT has considerable potential to support implementation of Free Primary Education (FPE) and to address emerging challenges such as; overcrowded classrooms, high Pupil Teacher Ratios (PTRs) particularly in densely populated and semi-arid areas, shortage of teachers on certain subjects or areas, and relatively high cost of learning and teaching materials.

This strategy outlines areas for integration of ICT in education in Kenya in order to address the above-mentioned challenges and to secure the position of the nation as concerns the rapidly expanding education requirements and the global economy. The areas of priority are:

- Establish policy framework
- Digital equipment
- Connectivity and network infrastructure
- Technical support
- Harnessing emerging technologies
- Digital content development
- Integration of ICTs in education
- Training (capacity building including professional development)
- Research and development
- Partnerships and resource mobilization
- Legal and regulatory framework, and
- Monitoring and evaluation.

Each of these areas is reviewed in the plan to determine challenges, appropriate responses and expected outputs.

1. BACKGROUND AND POLICY FRAMEWORK

Background

Since the 1980s integration of ICTs in education has been compulsory in the developed nations. This is not so in developing nations such as Kenya, where ICT integration in education is considerably more recent, small-scale and experimental in most of the developing countries including Kenya.

It is however, generally recognized that adoption of computers in education has progressed, in nearly identical pattern, from acquisition of basic computer skills, computer aided teaching, communications and research, to usage in every subject. This has been accelerated by convergence of the computer and telecommunication technologies, particularly e-mail and Internet.

This progression has been a result of various efforts, and a wide variation on the levels of ICTs integration to education curriculum, as determined by social and economic conditions of individual countries and regions. It is worthwhile pointing out that most developing countries including Kenya are largely at the basic levels of integration. Furthermore, most developing countries currently place emphases, on new dimensions, pedagogical approaches and teaching and learning that would enhance knowledge in interactive and self directed ways. This is commonly referred to as interactive education.

Whereas the impact of ICTs on the education goals is still inconclusive, reported observations include rapid expansion of knowledge, improved examination outcomes, enhanced communication and technical efficiency, as well as greater decentralization in the delivery of education services. It is not in doubt, however, that ICT has the potential to play a more powerful role in increasing resources and improving the environment for learning. ICTs can also play a role in preparing students to acquire skills, competencies and socio skills that are fundamental for competing in the emerging global “knowledge” economy.

With respect to the great concern about the digital divide, it will be noted that access to ICT facilities is currently one of the major challenges in Africa Kenya is no exception. While the ratio of one computer to 15 students is the norm in most developed countries, the ratio in Africa stands at one computer to 150 students. This ratio is even wider in disadvantaged regions and areas. It will also be recognized that access to ICTs varies according to the various sub-sectors of education. In Kenya, the ratio for university and colleges is one computer to 45 students, one computer to 120 students at secondary school level while access at the primary school level remains much more limited at one computer to 250 students.

In addition, the limited and uncoordinated approach to imparting appropriate ICT skills and competencies to teacher’s remains a major barrier in the integration of ICT in education in Africa generally, and in Kenya in particular.

While equal opportunities for access to ICT are provided in Africa, girls are disadvantaged through a wide range of constraints that include choice of subjects, limited computers, and increasing attrition at various levels of education. However, recent observations indicate that

ICTs facilities, notably email and Internet, have had the effect of reducing gender disparities leading to increased interest in computer education by girls.

Besides limited access, unavailability of ICT teachers, and gender disparities, relatively high costs of ICT components and limited access to electricity are other challenges that continue to hamper adoption of ICTs in most parts of Africa and particularly so in education sector. Indeed, a recent survey by Digital International indicated that the proportion of schools without electrical power range from 58% to 96% in some rural areas. This makes the use of available ICTs considerably difficult.

Education Policy Framework

According to Sessional Paper No. 1 of 2005, entitled “A Policy Framework For Education, Training and Research”, the overall goal of education is to achieve EFA by 2015 in tandem with national and international commitments. The short-term goal is to attain UPE by 2010 and to increase the transition rate, from primary to secondary schools, from 47% to 70%. In addition, the policy envisages expansion of capacity for universities to enroll an average of 5,000 students annually. In addition, the policy provides commitment for enhancement of access, quality and equity in delivery of education services at all levels. Equally important, the policy provides commitment to ensure that learning needs for all are met through appropriate learning and life long skills by 2015. In order to realize these policy objectives, commitment is made to integrate ICTs in the delivery of the education curricula, to strengthen Open and Distance Education (ODE) and to promote effective and efficient administration at all levels of education.

In pursuit of the policy objective for UPE, the Government introduced FPE in 2003 that has led to an 18% increment in enrolment, from 5.9 million pupils in 2002 to 7.2 million in 2004 in public schools. However, the challenges arising from the increased enrollment rates include overcrowded classrooms and high Pupil Teacher Ratios (PTRs) particularly in densely populated and semi-arid areas. Although not adequately equipped in all subjects, teachers are required to teach seven (7) subjects of the primary school curriculum. ICTs can contribute considerably to addressing these challenges.

A limited transition rate from primary to secondary schools remains a major challenge. While there are 20,000 primary schools, there are only 4,302 secondary schools, of which 3,661 are public and 641 private. This has limited the transition rate is less than 47%. The other challenge is the high cost of learning and teaching materials and persistent poverty in some areas. Furthermore, the student-textbook ratio remains substantially high in most areas. In addition, poor performance in mathematics and science has been observed in the national examinations. It is considered in this strategy that ICT has potential to address these and other challenges.

2. NATIONAL ICT POLICY & E-GOVERNMENT STRATEGY

The Government has put in place the National ICT Policy and E-Government Strategy that provides guidelines for transformation of the Kenyan into a digital society. In both documents the Government recognizes that an ICT literate workforce is the foundation on which the nation will become a knowledge-based economy. Against this background the government will make education a platform for equipping the nation with ICT skills in order to create dynamic and sustainable economic growth.

E-Government Strategy

The E-Government Strategy, which was adopted in 2004, emphasizes transformation of Government services from manual to digital-based operations. The Government's specific objectives include improved coordination of government agencies to reduce duplication of efforts and to enhance efficiency in utilization of resources, to improve the competitive position of the country through provision of timely information and delivery of services. Other objectives are to reduce transaction costs, and to engage citizens and the private sector through digital and on-line service provision.

In pursuing these objectives, the Strategy gave considerable emphasis on the use of education to equip the nation with appropriate ICT competencies and skills and related innovations.

In addition, the Strategy outlined information systems to be driven by the education sector that include operationalization of the Education Management Information System (EMIS). EMIS, the Strategy envisages, will be used to collect and process data required for improvement of education policy, planning, implementation and monitoring. It also encompasses provision of online examinations, processing admissions for primary and secondary schools and online dissemination of school and other educational curricula.

National ICT Policy

The principal objective of the National ICT Policy is to facilitate sustainable economic growth and development, and poverty eradication through productive and effective technologies. The Policy also aims at pursuing progress towards full socio-economic inclusion of citizens through universal access. Further, the Policy looks to stimulate investment in ICT sector while at the same time encouraging the spirit of innovation through research and development.

The policy envisages harnessing the potential of ICTs and related emerging technologies to eradicate poverty, support universal primary education, improve maternal health, combat diseases, maximize agricultural production, ensure food security, promote trade and industry, ensure environmental sustainability, develop global partnerships for national development, and incorporate technology in mainstream implementation of development policies.

In the area of human resource development, the policy emphasizes integrating ICTs in teaching curriculum at all levels of education; establishing e-educational networks for sharing educational resources and promoting e-learning at all levels; encouraging and supporting ICT training for decision-makers, community and civil society leaders; creating opportunities and providing assistance for the disadvantaged, women and the youth to acquire ICT competencies and skills; and enhancing capacity for research and development in ICT sector.

World Summit on the Information Society (WSIS) - MDG

The objective of the WSIS Plan of Action includes the building of an inclusive information society and the promotion of use of ICT towards achievement of internationally agreed development goals that are contained in the millennium declaration captured in WSIS Plan of Action. The Plan also seeks to address new challenges of the Information Society, at the national, regional and international levels.

Specific targets for the WSIS Plan of Action to be achieved by 2015 include connecting villages with ICTs through establishment of community access points; linking universities, colleges, secondary schools and primary schools with ICT; connecting scientific and research centres with ICTs. Other targets include connecting public libraries, cultural centres, museums, post offices and archives with ICT; linking health centres and hospitals with ICTs; fast tracking ICTs to all local and central government departments and establishing websites and email addresses; adapting all primary and secondary school curricula to meet the challenges of the Information Society, taking into account national circumstances. Indeed the Plan aims at ensuring that the entire world population has access to television and radio services.

The fundamental objective of the Plan is to ensure that everyone has necessary skills to benefit fully from the fruits of the information society.

NEPAD E-Schools Programme

New Partnership for Africa Development (NEPAD) was initiated to address challenges facing African countries and has identified ICT infrastructure as a priority area of action for inducement of conditions for sustainable development. NEPAD policies and programmes related to ICTs are implemented by E-Africa Commission, which was established in 2002.

In 2003, NEPAD prioritized efforts towards bridging of the digital divide between Africa and the developed world. This fast tracking of ICTs identified 6 areas of high priority. One of these is NEPAD e-Schools Programme whose objective is to integrate ICT in the delivery of education curriculum at secondary and primary school levels in order to improve access, quality and equity in education among member states. The implementation plan envisaged coverage of secondary schools in 5 years and primary schools in 10 years.

3. STRATEGIC COMPONENTS

3.1 ICT IN EDUCATION POLICY

The vision of the MoEST is to facilitate ICT as a universal tool for education and training. In order to achieve this vision every educational institution, teacher, learner and the respective community should be equipped with appropriate ICT infrastructure, competencies and policies for usage and progress. It calls for recognition of the fact that ICT provides capabilities and skills needed for a knowledge-based economy. It also calls for transforming teaching and learning to incorporate new pedagogies that are appropriate for the 21st century

MoEST's mission is to facilitate effective use of ICT to improve access, learning and administration in delivery education programmes and services. The principal objective will be to integrate ICT in the delivery of education and training curricula.

The existing education policy on ICT is imbedded in three documents namely; e-Government Strategy, National ICT Policy and Sessional Paper No. 1 of 2005 (A Policy Framework for Education, Training and Research). Need therefore arises for consolidation of these documents into one. The overall objective of the consolidation will be to merge and integrate education policy on ICT including the scope, usage, administration and ways to address innovations and attendant Intellectual Property Rights (IPR).

Strategic objective

- To provide a framework for the review of the ICT policy and ICT strategy in the education sector.

Benefits

- Maintain the relevance and currency of ICT policies and strategies
- Achieve a broader base for ownership by involving all stakeholders.

Expected outcomes

- Up-to-date ICT policy and strategy
- Sustainable ICT driven programmes that are properly evaluated

3.2 DIGITAL EQUIPMENT

Although not exhaustive, the range of ICT that have been used in the delivery of education to improve access, teaching, learning, and administration includes: Electric Board, Audio Cassette, Radio for Interactive Radio Instructions (IRI), Video/TV-Learning, Computer, Integrated ICT infrastructure and Support Application Systems (SAS).

These systems are in use, at various degrees, in most parts of Africa. This plan envisages use of these digital components to improve access and quality in the delivery of education in Kenya.

The major challenge in respect to this component is limited digital equipment at virtually all levels of education. While the average access rate is one computer to 15 students in most of the developed countries, the access rate in Kenya is approximately one computer to 150 students. In addition, it is noted in the Education Policy Framework (EPF) that there are a number of challenges concerning access and use of ICT in Kenya. These include high levels of poverty that hinder access to ICT facilities, limited rural electrification and frequent power disruptions.

Where there is electricity, hindrances to application of ICT include, high costs of Internet provision, costs associated with digital equipment, inadequate infrastructure and support. The policy makes a commitment for provision of digital equipment to educational institutions, particularly colleges, secondary and primary schools.

Whereas most secondary schools in Kenya have some computer equipment, only a small fraction is equipped with basic ICT infrastructure. In most cases equipment of schools with ICT infrastructure has been through initiatives supported by the parents, government, development agencies and the private sector, including the NEPAD E-Schools programme. Attempts to set up basic ICT infrastructure in primary schools are almost negligible.

Strategic Objectives

- To equip education institutions with digital equipment to stimulate integration of ICT in education in various regions of the country.
- To support initiatives that provides digital equipment to educational institutions, with priority to secondary and primary schools.
- To establish a national PC assembly centre in Kenya to build computers specifically designed and earmarked for educational institutions.
- To support refurbishment of ICT equipment.
- To support establishment of mechanisms for disposal of obsolete digital equipment taking into consideration environmental concerns and regulations.

Expected Outcome

The above-mentioned measures will improve equipping of educational institutions with digital infrastructure up to 80% in secondary schools and up to at least 10% in primary schools. The average access will be expected to improve from the current one computer for 150 students to one computer for at least 50 students in secondary schools.

3.3 CONNECTIVITY AND NETWORK INFRASTRUCTURE

The major challenge in respect to this component is inadequate connectivity and network infrastructure. As reported in the “ICTs in Education Options Paper”, one of the main problems is limited penetration of the physical telecommunication infrastructure into rural and low-income areas. Specifically, the main challenge is limited access to dedicated phone lines and high-speed systems or connectivity to access e-mail and Internet resources.

The EMIS Survey (2003/2004) indicated that over 70% of secondary schools and a much larger proportion of primary schools require functional telephones. Indeed, many parts of Kenya cannot easily get Internet services because of the poor telephone networks. About 90% of secondary schools need to establish standard Local Area Networks (LANs) in order to improve sharing of learning resources.

Alternative and appropriate technologies for access to Internet resources, including wireless systems remain quite expensive. Indeed, a small proportion of schools have direct access, through Internet Service Providers (ISPs), to high-speed data and communication systems. Furthermore, very few schools in the rural areas use wireless technology such as VSAT to access

e-mail and Internet resources. Nearly all of the 6 NEPAD e-Schools are in rural areas and will soon have connectivity through VSAT technology.

Strategic objectives

- To encourage establishment of cost effective and functional networked computer laboratories in educational institutions.
- To develop and administer Computer Laboratory Design and Standards (CLDS).
- To facilitate provision of connectivity to education and training institutions through an e-rate established with service-providers.
- To support sharing of connectivity infrastructure and costs by educational institutions and communities in order to ensure sustainability.
- To leverage the E-Government initiative of networking public institutions countrywide to facilitate connectivity for the educational sector.

Expected Outcomes

The above-mentioned measures will improve connectivity and network infrastructure in secondary schools with functional telephone reaching over 70% and primary schools to improving at least 10%. In addition 90% of the secondary schools will have established standard LANs. There will also be improved compliance to CLDS. Economies of scale will be achieved by leveraging the use of high-end connectivity and network systems.

3.4 ACCESS AND EQUITY

Our country is characterized by a wide variation in resource endowment and leading to the attendant disparities. Accordingly, this plan will give attention to the use of ICT to expand access and equity in the delivery of education services and curricula. The overall objective will be to give priority to disadvantaged areas, communities, educational institutions, teachers and learners.

Efforts that will be made include establishing mechanisms to support infrastructural development in remote areas, implementation of policy provisions that are favorable to special needs groups, budgetary provisions for adequate supply of ICT equipment and facilities, establishment of ways for cost effective capacity building for teachers and learners and facilitating ICT centres that allow youth groups to access learning resources.

The overall objective is to facilitate use of ICT to access learning resources by disadvantaged areas, communities, educational institutions, teachers and learners.

Strategic objectives

- To facilitate universal access and equitable distribution to ICT infrastructure in both the formal and non-formal education sectors, including affirmative action for gender and youth, Arid and Semi Arid Lands (ASAL) areas, Islands, rural and urban-poor schools, as well as institutions with special needs.
- To promote access to ICT infrastructure by connecting all remote educational institutions through the Internet and support establishment of a National Educational Portal (NEP).

- To develop a project under the rural electrification programme that will lead to educational institution accessing power to facilitate wider use of ICT and to evaluate alternative power sources, to be used especially in ASALs, on Islands and rural schools that are remote schools which are far from the national grid.
- To establish an ICT resource centre at the MOEST headquarters for use by MOEST staff and to source, in collaboration with relevant stakeholders including KISE, special hardware (computers) and software for learners with special needs.
- To improve access to ICT facilities for the educational purposes of pupils, parents and local community, in partnership with libraries and other services, and through the use of school ICT facilities after school hours.

Expected outcomes

The main outcome will be extension of ICT facilities to disadvantaged areas, communities, educational institutions, teachers and learners. It will include improved equitable distribution of ICT resource, increased access to learning resources through the Internet, improved communication, use of e-mail and other electronic media. More importantly, students with disabilities, including those with impaired hearing and vision will have an expanded access to ICT and Internet resources.

3.5 TECHNICAL SUPPORT AND MAINTENANCE

Currently, there is limited capability for effective use and maintenance of ICT infrastructure at the educational institutions. Most schools use less than 40% of the available ICT infrastructure and therefore there is need to ensure optimum use of ICT resources by students, teachers and administrators in order to exploit the educational potential of the technology. Furthermore, very few schools are using ICT as an alternative method for the delivery of the education curriculum.

Strategic Objectives

- To facilitate and support establishment of national ICT support centre, where technical support will be provided to educational institutions.
- To set up regional ICT support centres equipped with necessary tools addressing issues related to technical support, maintenance, and related capacity building at educational institutions.

Expected Outcomes

The recommended measures will improve institutional and professional capacity for use and adaptation of ICT resources. It will also improve use of ICT infrastructure to over 70% at the educational institutions and ensure expanded use of ICT as alternative method for the delivery of the education curriculum and administration. In addition, there will be improved access and sustainability to ICT support services.

3.6 HARNESS EMERGING TECHNOLOGIES

While there is a wide range of innovations in ICT to support effective and quality delivery of education services and curricula, there is a considerable technology lag in educational institutions. Most institutions still use nearly obsolete systems and are consequently unable to exploit the educational potential of the emerging technologies. In this plan, the aim will be to facilitate mechanisms that would encourage educational institutions to keep abreast and harness emerging technologies to enhance the process of teaching, learning and acquisition of knowledge and skills in tandem with the modern world.

There will be need to come up with mechanisms to encourage educational institutions to keep abreast and to harness emerging technologies to improve effective and quality delivery of education services and curricula by promoting the establishment of centres of excellence, education exhibitions and science congress.

Strategic Objective

- To establish an education, innovation and technology centre, that will maintain a database for emerging ICT technologies, inventory for costs, suppliers and appropriate use.
- To carry out sensitization on benefits such as effective teaching and learning emerging from the use of new technologies and recommend an e-rate to be applied to importation of emerging ICT technologies in education.
- To create and maintain a quarterly ICT education magazine that will inform educators especially those in rural areas about emerging trends and use of new technologies in schools.

Expected Outcomes

The expected outcome will include a greater and wider use of modern and emerging ICT technologies to improve delivery of education services and curricula. It will include more informed selection of affordable and emerging technologies for educational institutions. It will also include selection of appropriate technologies to address poverty and disadvantaged areas, communities, educational institutions, teachers and learners. Indicators will include an increase in the number of education institutions using emerging technologies such as e-blackboard, LCD projectors, flush disks etc. Another indicator will be a reduction of the gap (in terms of years) between Kenya and the rest of the world in the use of emerging technologies.

3.7 DIGITAL CONTENT

It is recognized in various documents that the national curricula developed at the Kenya Institute of Education (KIE) needs to be transformed from text to digital format in order to facilitate integration of ICT in delivery of education programmes. It is also recognized in the EPF that there is limited technical expertise and infrastructure for transformation of the national curricula to digital education curricula. It is also recognized that education software are varied and obtained from various manufacturers.

The principal challenge therefore is to customize or develop education software to meet local education requirements in teaching, learning and administration.

A much more important and critical component is the licensing of education software and related costs, which are prohibitive given the high levels of poverty in the country.

Furthermore, most textbooks, particularly local published ones, are not available in a digital format and are consequently not available for use in digital media.

Strategic Objectives

- To support capacity building of technical expertise to address the digitization of the entire curricula in order to supplement the efforts of KIE secondary education digitization.
- To provide digital content to schools in various forms including interactive CDs for the purposes of integration with the teaching and learning.
- To establish a mechanism for development, localization, and standardization of educational software.
- To pursue concession on software licenses for education institutions.

Expected Outcomes

The above-mentioned measures will facilitate transformation of the National Curricula to digital format, which will support integration of ICT in education. It is expected that quality and performance of teaching will improve considerably, particularly in mathematics, science and technology subjects. It will also lead to increased participation of students, particularly girls, in the subjects that have been perceived to be difficult in the past.

3.8 INTEGRATION OF ICT IN EDUCATION

While other countries have reported up to 41% of integration of ICT to teaching and learning, the proportion remains substantially low in Africa, Kenya included. Integration aims at the use ICT to support teaching and learning in the delivery of the various curricula to achieve improved education outcomes. Because ICT is interactive media, it facilitates students to develop diversified skills needed for industrialization and a knowledge-based economy. It also allows teachers and learners to proceed at different paces depending on the prevailing circumstances.

It is recognized in this plan that integration of ICT to teaching and learning will also play an important role in preparing students for the demanding job market. It is recognized further that the education sector needs to be proactive in meeting the requirements for ICT skills.

Strategic Objectives

- To establish model institutions that will be used to demonstrate integration of ICT to teaching and learning.
- To train at least 20 master integrators to support integration at the national and district levels
- To train teachers on integration techniques and sensitize education managers on ICT integration.

Expected outcomes

The expected outcome will include an increased rate of educational institutions that have integrated ICT in the delivery of education curricula. There also will be improved performance in education and examinations as well as enhanced transition rates at all levels of education.

3.9 TRAINING (CAPACITY BUILDING AND PROFESSIONAL DEVELOPMENT)

Training programmes for the education management sector comprising the entire MoEST, its agencies and institutional managers, will all require training in EMIS. The rapid change in ICT demands continuous training at all levels.

The teaching staff force of 197,000 primary school teachers; 38,000 secondary school teachers will be trained in ICT literacy and integration.

Strategic objectives

- To build basic capacity in ICT-skills for all players in the education sector.
- To build capacity of education sector managers to use ICT tools to enable better delivery of educational services
- To sensitize all stakeholders on ICT-integration
- To build capacity for use and maintenance of ICT equipment

Teachers/ Trainers

- To build capacity for at least one teacher in each school to teach ICT, support ICT literacy and integration and basic maintenance of ICT equipment.
- To build the capacity of universities and colleges to equip teachers with ICT skills up to certificate, diploma and degree level.

Curriculum and content developers:

- To develop sufficient capacity for curriculum and content developers to appropriately infuse ICT in the curriculum and develop digital content to support the curriculum.

Universities and colleges:

- To build the capacity of TIVET trainers and university lecturers, to promote the development, adoption and use of ICT tools of production in all sectors of the economy.

Expected outcomes

All levels of the education sector will be ICT-literate. Education sector personnel will have the capacity to improve the delivery of services and accountability and to make the information flow and data processing more efficient. This will improve information sharing and decision-making. Administrators will have the capacity to use appropriate tools to create a less cumbersome bureaucracy and deliver services more efficiently. Education managers will be able to support ICT-integration in the institutions. The ministry will have qualified technicians to take care of the maintenance of the ICT equipment.

Teachers/ Trainers: Teachers/trainers will have the ability to improve teaching and learning in schools and training institutions

Curriculum and content developers: The capacity of curriculum and content developers to develop digital content and infuse ICT in the curriculum will improve

Universities and colleges: They will have improved capacity in development, adoption and use of ICT tools of production in all sectors of the economy.

3.10 RESEARCH AND DEVELOPMENT

It is well recognized that there is limited research in Africa and specifically in Kenya to identify and address key challenges that stand in the way of adoption and use of ICT in general and particularly in education sector. It is also recognized that there is need to promote local contexts and adapt global solutions.

Strategic objectives

- To facilitate research and development in ICTs in education and training.
- To facilitate dissemination of research and development outcomes
- To facilitate development of a legal framework for innovations and related intellectual property rights issues

Expected outcomes

There will be a link between the public and the private sector to promote local solutions and to contextualise global innovations to the local challenges. The creation of a legal framework to protect innovations will motivate people to invest in research and development. Using a research portal for sharing research findings, the outcomes of the research and development will be more readily available to the public

3.11 EDUCATION MANAGEMENT INFORMATION SYSTEMS (EMIS)

Currently, MoEST and its agents use a wide range of instruments to collect data. This data is captured, processed and analysed at the headquarters. The large volume of data, as well as inability to handle such volumes, causes the processing and analysis to be substantially delayed, and/or never carried out. This leads to ad-hoc decision-making, planning and resource allocation.

Strategic objectives

- To develop an electronic-based infrastructure to support processing, use, sharing and dissemination of available data and information at all levels
- To procure and customize specialized data processing and analysis software application systems.
- To improve access to education data for effective planning and interventions
- To avail education indicators for monitoring and evaluation of education goals and programmes

Expected outcomes

Harmonized data collection instruments will capture the same data all over the country. A specialized processing and analysis software application has been procured, installed and tested. The data will be keyed in this system at the district level, agencies and headquarters and will be consolidated at the headquarters. EMIS reports will be availed to districts, agencies and headquarters. This data can be used for the monitoring and evaluation of education goals and programmes. In short, the implementation of the goals will result in the establishment of a high quality, sustainable, secure, easily supportable and flexible infrastructure that will meet a wide range of education needs.

3.12 PARTNERSHIPS AND RESOURCE MOBILIZATION

ICT integration at all levels in the education sector is capital intensive, requiring the participation of other partners for tangible impact to be felt. Current ICT initiatives have covered an estimated 4% of the sector, with most initiatives concentrated in the urban centres.

Public – Private Partnership (PPP)- Help in rolling out a comprehensive ICT strategy with substantial impact. The overall objective for ICT development in this component is to foster a favourable environment and provide leadership for public/private/development partner collaboration. This would lead to effective sector-wide ICT initiatives and coordination.

Resource mobilization - Mobilize human, technological, and financial resources for the implementation of ICT in education projects and programmes.

Linkages with global initiatives- Align national ICT in education initiatives with, regional and global initiatives to achieve relevancy.

Strategic objectives

- To promote public and private sector investments in ICT-in-education sub sector.
- To facilitate annual budgetary provisions for ICT-in-education activities.
- To develop a resource mobilisation strategy for provision of ICT projects and initiatives in education.
- To develop modalities for cost-reduction of ICT products and services.
- To align ICT initiatives in education with Millennium Development Goals (MDGs) under the World Summit for the Information Society (WSIS) plan of action and New Partnership for Development (NEPAD) e-Schools.
- To encourage cost sharing in which parents and communities contribute in establishing digital infrastructure in schools.

Expected outcomes

Increased level of resources availability through government allocation for ICTs in education and partner contributions will be achieved. Also clear coordination of ICT initiatives in the education sector will lead to efficiency in service provision. In addition a strong partnership of public and private sector for ICT in education through ownership of ICT initiatives will be enhanced.

3.13 LEGAL AND REGULATORY FRAMEWORK

Education and training in Kenya is governed by the Education Act (1968) and other related Acts of Parliament, including TSC Act, KNEC Act, Adult Education Act, University Acts, and various other acts and charters of universities. Confidence and security are among the main pillars of ICT. As such, the Ministry shall promote cooperation with all stakeholders at appropriate forums to enhance user confidence, build trust, and protect both data and network integrity. This would also lead to consideration of existing and potential threats to ICT and address other information security and network safety issues.

The Ministry in collaboration with other government departments such as Directorate of e-Government, Government Information Technology Services (GITS) and the private sector shall detect, respond to and prevent cyber-crime and misuse of ICT. This will be done through various ways such as developing guidelines that take into account ongoing efforts in these areas and considering legislation that allows effective investigation and disciplinary action in case of misuse. Other measures to be put in place will include promotion of effective mutual assistance efforts and strengthening institutional support at the national, provincial and district levels. MoEST will encourage education and awareness creation about online privacy and the means of protecting the said privacy.

Strategic objectives

- To establish guidelines governing acquisition and use of ICT resources in education, for instance equipment, privacy, copyright laws, patents, licenses etc.
- To develop mechanisms for disaster recovery of information/data and sensitize the staff at all levels in the Ministry on legal, safety, privacy, and security of ICT equipment, data and information.
- To establish standards for protection of user privacy and community values.
- To stipulate minimum hardware specifications adequate for educational use.
- To evaluate and assess appropriate software and related applications that meet basic education needs.
- To regulate accreditation of institutions offering examinations and certification of ICT learning programmes in all relevant institutions.

Expected Outcomes

Legal, safety, security and strategies to protect ICT systems at all levels of education will be well documented in addition to development of a specification manual for use in deployment of ICT equipment. A uniform platform that allows integration and interoperability of most applications useful in the content delivery and ICT education will be developed. Also institutions offering ICT training will be accredited and a clear strategy for course transitions from one level to another will be followed.

4. MONITORING AND EVALUATION

The implementation of the ICT strategy is an enormous endeavor. There is a need for a systematic Monitoring and Evaluation (M&E) of all activities. This will help us to learn from past experience, improve service delivery, plan and allocate resources, and demonstrate results as part of accountability to key stakeholders.

Objectives

- Check the progress of implementation
- Assess if performance indicators are accomplished
- Improve on the implementation

Expected outcomes

Annual and quarterly performance reports on ICT interventions will indicate whether or not the performance indicators are being achieved. An impact evaluation will help assess the transformation in the educational sector to embrace ICTs.

Within the development community there is a strong focus on results – this helps explain the growing interest in M&E. Yet there is often confusion about what M&E entails. We will therefore discuss some of the tools and methods we will use.

Methods and tools

The logical framework: The logical framework sets the objectives and performance indicators for any program. Performance indicators are measures of inputs, processes, outputs, outcomes and impacts for development, programmes or strategies. When supported with sound data collection, involving formal surveys, analyses and reporting, indicators enable managers to track progress, demonstrate results, and take corrective action to improve service delivery. Participation of key stakeholders in defining indicators is important because they are then more likely to understand and use indicators for management decision-making.

The logical framework will aid in the identification of the expected causal links – the “program logic” – in the following results chain: inputs, processes, outputs (including coverage or “reach” across beneficiary groups), outcomes, and impact. It will lead to the identification of performance indicators at each stage in this chain, as well as risks, which might impede the attainments of the objectives.

The log frame is also a vehicle for engaging partners in clarifying objectives and designing activities. During implementation, the log frame will serve as a useful tool to review progress and take corrective action.

Theory-based evaluation: will allow a much more in-depth understanding of the workings of a programme or activity – the “program theory” or “program logic”. By mapping out the determining or causal factors judged important for success, and how they might interact, it can then be decided which steps should be monitored as the program develops, to see how well they are in fact borne out. This allows the critical success factors to be identified. Where data show that these factors have not been achieved, a reasonable conclusion is that the program is less likely to be successful in achieving its objectives.

Formal surveys: will be used to collect standardized information from a carefully selected sample of people or households. Surveys often collect comparable information for a relatively large number of people in particular target groups.

Rapid appraisal methods: are quick, low-cost ways to gather the views and feedback of beneficiaries and other stakeholders, in order to respond to decision-makers' needs for information.

Participatory methods: will consider involvement in decision-making for those with a stake in a project, program, or strategy and generate a sense of ownership in the M&E results and recommendations.

Public Expenditure Tracking Surveys (PETS): will track the flow of public funds and determine the extent to which resources actually reach the target groups. The survey will examine the manner, quantity, and timing of releases of resources to different levels of government, particularly to the units responsible for the delivery of social services such as health and education.

Cost-benefit and cost-effectiveness analysis: are tools for assessing whether or not the costs of an activity can be justified by the outcomes and impacts. Cost-benefit analysis measures both inputs and outputs in monetary terms. Cost-effectiveness analysis will estimate inputs in monetary terms and outcomes in non-monetary quantitative terms (such as improvements in student reading scores).

Impact evaluation: will systematically identify the effects – positive or negative, intended or not – on the target group caused by a given development activity such as a program or project. The impact evaluation spirit help to better understand the extent to which activities reach the poor and the magnitude of their effects on people's welfare. Impact evaluations can range from large scale sample surveys in which project populations and control groups are compared before and after, and at several points during program intervention; to small-scale rapid assessment and participatory appraisals where estimates of impact are obtained from combining group interviews, key informants, case studies and available secondary data.

Monitoring and evaluation instruments will be developed based on the above outlined methods.

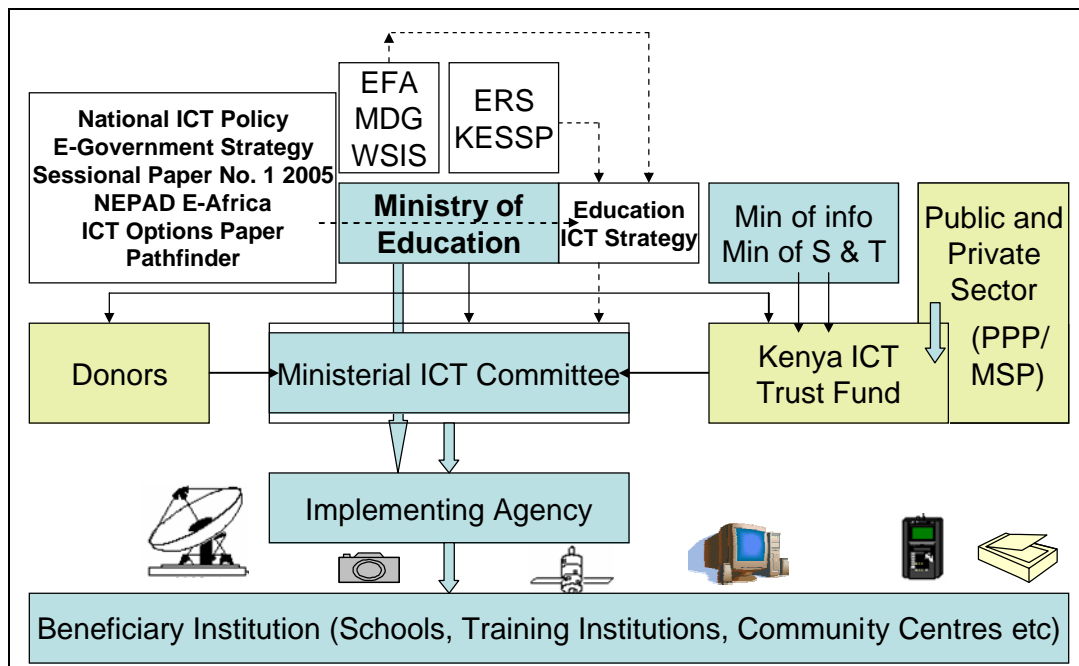
Major areas of concern

- Ü Acquisition procedures
- Ü Challenges experienced in usage and usage rates
- Ü Repairs and maintenance
- Ü Existence of WAN & LAN and Internet connectivity.
- Ü Impact on quality of teaching and learning
- Ü Impact to the local community
- Ü No. of students taking computer classes
- Ü Laboratory designs
- Ü Security of equipment.

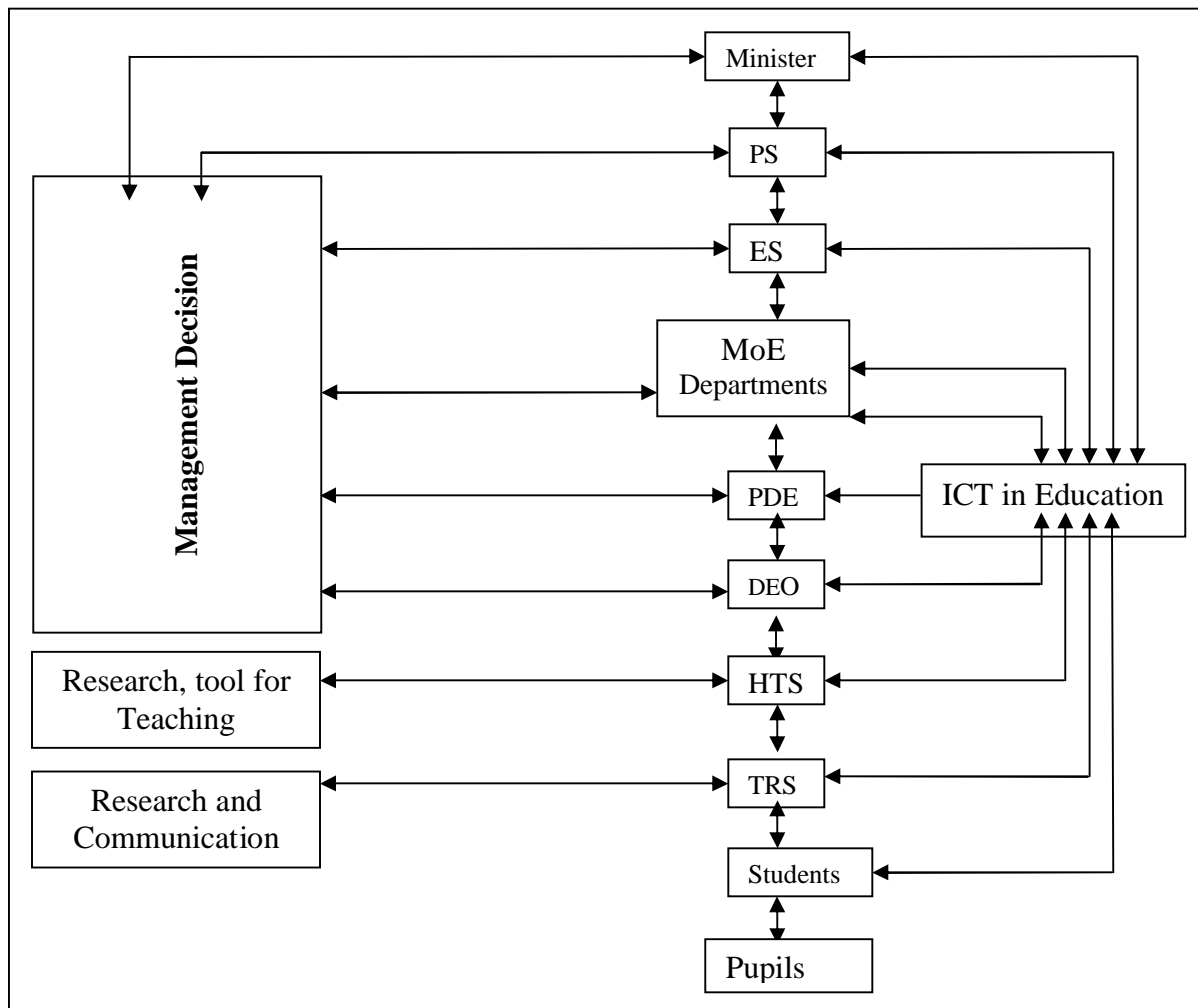
A combination of customer surveys and outcome data to test the extent to which objectives have been achieved will be used.

5. POLICY AND INSTITUTIONAL FRAMEWORK

a) Policy and strategy framework



b) Institutional framework for greater ownership



The Ministry of Education (MoE): is the lead agency and is responsible for the monitoring and evaluation of the implementation of the strategy at all levels of the education sector. The Ministry has three sets of documentation guiding the strategy: policy documents which spells out the overall government policies on education and ICT; Specific education strategic documents for delivering of its mandate (ERS and KESSP); and the global goals and principles (EFA, MDG and WSIS).

Partners and Donors: comprise all the partners and development agencies that contribute towards the various ICT initiatives proposed in this strategy. They will provide guidance and support in kind or funding as well in the strategic planning, monitoring and evaluation. Private Sector might contribute resources (as donor) or participate as implementing agencies. The private sector will play an important role in the development and implementation of the strategy.

Kenya ICT Trust Fund: as a non-governmental organization under the Ministry of Education shall bring in the participation of the public and private corporates actively involved in the support of the various ICT initiatives in the sector. The Trust Fund has the mandate of resource mobilization for ICT in education initiative.

Ministerial ICT Committee: as indicated in the e-Government Strategy, each Ministry is expected to put in place an ICT Committee, which shall be coordinating the implementation of ICT strategies. The Committee shall comprise of all identified representatives of stakeholders helping in the resource mobilization and implementation. This committee shall make a quarterly report on the status of implementation of ICT initiatives in the sector. The Committee shall also be responsible for the approval of ICT projects and programmes stated in this strategy. The committee shall be meeting every month chaired by the Permanent Secretary, Ministry of Education, coordinated by Director of Higher Education and with the secretariat being ICT Unit.

Implementing agencies / individuals: will be responsible for the strategy implementation. This include the Semi-Autonomous Government Agencies (SAGAs) under the MoE, consortia of NGOs undertaking ICT in the education sector (such as Network Initiative for Computers in Education – NICE), Individual NGOs having sound principles (transparent with a wider mandate), Civil Society Organizations undertaking ICT in education activities, academia and / or individuals with experience in ICT in Education projects.

Beneficiary institutions: the strategy shall focus on all education institutions delivering education and training be they public or community led. They will be responsible to the MoE in the usage, protection and utilization of benefits provided via this strategy.

Stakeholders: are also critical and will be engaged from time to time in the review of all the initiatives in the sector and strategy evaluation in line with global and technological dynamics in the ICT filed.

Linkages of the institutional structures to the strategy are owing to the fact the ICT strategy has to be embraced at all sections of the Ministry (directorates and sections). As such, ownership is critical for success to be derived from any planned intervention.

5. APPENDIX A: IMPLEMENTATION FRAMEWORK

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
1	ICT EDUCATION POLICY							
1.1	Provide a framework for the review of the ICT policy and ICT strategies in the education sector.							
	<i>a) Conduct workshops / seminars</i>	<i>Workshop Reports</i>	<i>Every six months</i>	<i>MoE(DPP), Trust, Donors</i>	<i>10</i>	<i>1</i>	<i>125,000.00</i>	<i>1,250,000.00</i>
	<i>b) Engage a review team from time to time</i>	<i>ICT Strategy developed</i>	<i>Every 3 Years</i>	<i>MoE(DPP), Trust, Donors</i>	<i>1</i>	<i>1</i>	<i>1,200,000.00</i>	<i>1,200,000.00</i>
	<i>c) Review the policies and strategies as may be necessary</i>	<i>Input to policy and strategy development</i>	<i>Annual</i>	<i>MoE(DPP), Trust, Donors</i>	<i>5</i>	<i>1</i>	<i>650,000.00</i>	<i>3,250,000.00</i>
	<i>d) Faciliate the approval of zero-rate tax and duty on digital equipment for use in education institutions.</i>	<i>Inventory of ICT Equipment earmarked for zero-rate tax and duty exemption.</i>	<i>Annual</i>	<i>MoE(DHE,D PP,ICT), Trust, Donors</i>	<i>5</i>	<i>1</i>	<i>125,000.00</i>	<i>625,000.00</i>
	SUB-TOTAL							6,325,000.00
2	DIGITAL EQUIPMENT							
2.1	Provide ICT equipment to educational institutions (primary, secondary schools and tertiary institutions).							
	<i>a) Develop ICT equipment deployment mechanism</i>	<i>Developed criteria for deploying ICT equipment to education institutions.</i>	<i>Six months</i>	<i>MoE (DHE, DBE, ICT) / ICT Trust</i>	<i>1</i>	<i>1</i>	<i>450,000</i>	<i>450,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>b) Deploy ICT equipments to Schools/institutions</i>	<i>Primary Schools with access to multimedia equipment (video and radio)</i>	<i>5 Years</i>	<i>MoE (DHE, DBE, ICT) / ICT Trust, Donors</i>	<i>1</i>	<i>18,900</i>	<i>14,000</i>	<i>264,600,000.00</i>
		<i>Primary Schools with access to ICT equipment (computers and accessories)</i>	<i>5 Years</i>	<i>MoE (DHE, DBE, ICT) / ICT Trust, Donors</i>	<i>25</i>	<i>2,000</i>	<i>40,000</i>	<i>2,000,000,000.00</i>
		<i>Number of Secondary schools with adequate ICT Equipment.</i>	<i>5 Years</i>	<i>MoE (DHE, DBE, ICT) / ICT Trust, Donors</i>	<i>28</i>	<i>3,000</i>	<i>40,000</i>	<i>3,360,000,000.00</i>
		<i>Number of Secondary schools supplied with Solar Equipment.</i>	<i>5 Years</i>	<i>MoE (DHE, DBE, ICT) / ICT Trust, Donors</i>	<i>1</i>	<i>1,520</i>	<i>800,000</i>	<i>1,216,000,000.00</i>
	<i>c) Maintain ICT Equipments</i>	<i>Vote established for maintenance of equipment.</i>	<i>After 3 Years</i>	<i>Schools/Institutions</i>	<i>1</i>	<i>1</i>	<i>24,000,000</i>	<i>24,000,000.00</i>
2.2	Support initiatives that provide low cost digital equipment to education institutions.							
	<i>a) Expand capacity of existing Refurbishment centres</i>	<i>Expand the capacity of the existing Refurbishment Centres.</i>	<i>2 Years</i>	<i>MoE / ICT Trust</i>	<i>2</i>	<i>1</i>	<i>1,500,000</i>	<i>3,000,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>b) Support the Training of Refurbishment Centres Technicians</i>	<i>Number of Technicians Trained.</i>	<i>3 Years</i>	<i>MoE / ICT Trust</i>	<i>120</i>	<i>1</i>	<i>120,000</i>	<i>14,400,000.00</i>
2.3	Establish a national PC assembly centre in Kenya to assemble new computer specifically designed and earmarked for schools							
	<i>a) Secure a site for the assembly centre</i>	<i>Description and possible costings for each site (Report)</i>	<i>1 Year</i>	<i>MoE / ICT Trust</i>	<i>1</i>	<i>1</i>	<i>12,500,000</i>	<i>12,500,000.00</i>
	<i>b) Facilitating establishment of an assembly centre</i>	<i>Established assembly unit</i>	<i>2 Years</i>	<i>Schools / Institutions equipped with new ICT equipment.</i>	<i>1</i>	<i>1</i>	<i>30,000,000</i>	<i>30,000,000.00</i>
	<i>c) Develop business strategy for assembly plant</i>	<i>Existence of a business incubator</i>	<i>3 months</i>	<i>ICT Trust</i>	<i>1</i>	<i>1</i>	<i>250,000</i>	<i>250,000.00</i>
	<i>d) Develop a bankable document to secure funding of the plant</i>	<i>Business plan for the assembly line developed.</i>	<i>3 months</i>	<i>ICT Trust</i>	<i>1</i>	<i>1</i>	<i>150,000</i>	<i>150,000.00</i>
2.4	Encourage cost sharing in the establishment of schools and ICT infrastructure.							
	<i>a) Sensitisation of the community on the ICT mainstreaming in education institutions</i>	<i>Number of sensitisation done to encourage community to contribute to ICT in education.</i>	<i>Annual</i>	<i>MoE (DEB, BOGs, PTA), ICT Trust</i>	<i>5</i>	<i>1</i>	<i>3,500,000.00</i>	<i>17,500,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>b) Infrastructure constructed by community for ICT use.</i>	<i>Laboratories build by the community.</i>	<i>Sustained</i>	<i>MoE (DEB, BOGs, PTA), ICT Trust</i>	<i>5</i>	<i>1</i>	<i>250,000.00</i>	<i>1,250,000.00</i>
2.5	Facilitate public/private sector partnerships to mobilize resources to equip education institutions.							
	<i>a) Acquisition strategy on ICT equipment for education institutions and community learning centres.</i>	<i>Acquisition strategy for ICT equipment.</i>	<i>6 Months</i>	<i>MoE (DHE, DBE, ICT), ICT Trust</i>	<i>1</i>	<i>1</i>	<i>250,000.00</i>	<i>250,000.00</i>
	<i>b) Acquisition and distribution of ICT equipment for education institutions and community learning centres.</i>	<i>Number of educational institutions and community centres equipped with ICT equipment.</i>	<i>Annual</i>	<i>MoE (DHE, DBE, ICT), ICT Trust</i>	<i>28</i>	<i>800</i>	<i>40,000.00</i>	<i>896,000,000.00</i>
2.6	Establishment of a disposal mechanism taking into account environmental and regulatory framework.							
	<i>a) A disposal strategy shall be developed to guide schools in replacing obsolete ICT equipment.</i>	<i>A disposal strategy for ICT equipment developed.</i>	<i>6 Months</i>	<i>MoE (DQAS, DHE, ICT), ICT Trust</i>	<i>1</i>	<i>1</i>	<i>250,000.00</i>	<i>250,000.00</i>
	<i>b) Establishment of a disposal site, with capacity to recycle disposed ICT equipment for economic generation; environmental protection and employment creation.</i>	<i>Disposal site established.</i>	<i>2 Years</i>	<i>MoE (DQAS, DHE, ICT), ICT Trust</i>	<i>1</i>	<i>1</i>	<i>5,000,000.00</i>	<i>5,000,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>c) Facilitation of educational institutions and community centres to dispose off obsolete ICT equipment.</i>	<i>Number of educational institutions and community centres assisted to dispose of obsolete ICT equipment.</i>	<i>Annual</i>	<i>MoE (DHE, ICT, DQAS), ICT Trust</i>	<i>1</i>	<i>150</i>	<i>50,000.00</i>	<i>7,500,000.00</i>
	SUB-TOTAL							7,853,100,000.00
3	CONNECTIVITY AND NETWORK INFRASTRUCTURE							
3.1	Provide Networking facilities to education institutions (Computer Labs – LAN)							
	<i>a) Establish LABs</i>	<i>Number of computer LABs established.</i>	<i>5 Years</i>	<i>MoE / ICT Trust</i>	<i>1</i>	<i>5,800</i>	<i>250,000</i>	<i>1,450,000,000.00</i>
	<i>b) Establish Networking for LABs</i>	<i>Number of networked LABs</i>	<i>5 Years</i>	<i>MoE / ICT Trust</i>	<i>1</i>	<i>5,800</i>	<i>100,000</i>	<i>580,000,000.00</i>
	<i>c) Maintain LABs</i>	<i>Schools with a programme to maintain their LABs.</i>	<i>5 Years</i>	<i>Schools /Institutions</i>	<i>1</i>	<i>5</i>	<i>1,450,000</i>	<i>7,250,000.00</i>
3,2	Facilitate the provision of connectivity to education and training institutions through an e-rate established with Telkom (k).							
	<i>a) Established e-rate for connectivity in education sector.</i>	<i>e-Rate strategy developed with Telkom (k)</i>	<i>6 Months</i>	<i>MoE / ICT Trust</i>	<i>1</i>	<i>1</i>	<i>50,000</i>	<i>50,000.00</i>
	<i>b) Connecting Education offices to Internet.</i>	<i>Number of education offices country-wide connected to Internet.</i>	<i>1 Year</i>	<i>MoE / Telkom</i>	<i>1</i>	<i>84</i>	<i>156,000</i>	<i>13,104,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>c) Connect education institutions and community centres to Internet</i>	<i>Number of Technicians Trained.</i>	<i>3 Years</i>	<i>MoE / ICT Trust</i>	<i>1</i>	<i>7,500</i>	<i>90,000</i>	<i>675,000,000.00</i>
	SUB-TOTAL							2,725,404,000.00
4	ACCESS AND EQUITY							
4.1	Facilitate universal access to ICT infrastructure in both the formal and non-formal education sectors, including affirmative action for gender and youth, Arid and Semi Arid Lands (ASAL) areas, Islands, rural and urban-poor schools, as well as institutions with special needs.							
	<i>a) Engender ICT strategy and promote youth initiatives.</i>	<i>Number of proposed interventions in Education ICT Strategy aimed at supporting girls / women and youth access to ICTs</i>	<i>5 Years</i>	<i>MoE, ICT TRUST, CSO</i>				
	<i>b) ICT Equipping for Non-Formal Education Centres with capacity to be upgraded to be Community Learning Centres for both utilization by public and for e-learning delivery.</i>	<i>Number of Non-Formal Education Centres equipped.</i>	<i>4 Years</i>	<i>MoE (DBE, DQAS), UNICEF</i>	<i>1</i>	<i>200</i>	<i>1,200,000</i>	<i>240,000,000.00</i>
	<i>c) Facilitation of rural and urban-poor education institutions on ICTs</i>	<i>Number of rural and urban-poor education institutions equipped.</i>	<i>5 Years</i>	<i>MoE (DBE, DQAS), UNICEF</i>	<i>1</i>	<i>200</i>	<i>1,200,000</i>	<i>240,000,000.00</i>
4.2	Promote access to ICT infrastructure by connecting all remote educational institutions through the Internet.							

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>a) Connect institutions on-line</i>	<i>Number of remote education institutions connected to Internet.</i>	<i>5 Years</i>	<i>MoE / ICT Trust</i>	<i>250</i>	<i>1</i>	<i>240,000</i>	<i>60,000,000.00</i>
4.3	Facilitate and support establishment of a national educational portal.							
	<i>a) Create a national education portal</i>	<i>National education portal established</i>	<i>3 Years</i>	<i>MoE / ICT Trust</i>	<i>1</i>	<i>1</i>	<i>50,500,000</i>	<i>50,500,000.00</i>
	<i>b) Establish e-learning networks and discussion groups for teachers</i>	<i>E-learning network and discussion group established for teachers / tutors.</i>	<i>5 Years</i>	<i>MoE (ICT) / ICT Trust</i>	<i>1</i>	<i>1</i>	<i>10,000,000</i>	<i>10,000,000.00</i>
4.4	Develop a project under the rural electrification Programme that will help access power to educational institutions to facilitate wider use of ICT.							
	<i>a) Evaluate alternative power sources, to be used especially in ASALs, on Islands and rural schools that are remotely distanced from the national grid.</i>	<i>Report indicating the available alternative power for use in remotely distanced schools from national grid.</i>	<i>6 Months</i>	<i>MoE (DHE), ICT Trust</i>	<i>1</i>	<i>1</i>	<i>250,000</i>	<i>250,000.00</i>
	<i>b) Assess the learning institutions without electricity</i>	<i>Assessment report on all education institutions without electricity</i>	<i>6 Months</i>	<i>MoE / ICT Trust</i>	<i>1</i>	<i>1</i>	<i>250,000</i>	<i>250,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>c) Develop a detailed and coordinated electrification plan</i>	<i>Detailed electrification plan to cover the education institutions without electricity</i>	<i>6 Months</i>	<i>MoE, ICT TRUST, KPLC, KenGen</i>	<i>1</i>	<i>1</i>	<i>450,000</i>	<i>450,000.00</i>
	<i>d) Pilot innovative and sustainable alternative sources of electricity</i>	<i>Number of education institutions piloted with innovative and alternative sources of electricity.</i>	<i>5 Years</i>	<i>ICT Trust (MoE, Solar Firms)</i>	<i>500</i>	<i>1</i>	<i>850,000</i>	<i>425,000,000.00</i>
4.5	Source special hardware (computers) and software for learners with special needs.							
	<i>a) Research special needs requirements in learning institutes (infrastructural)</i>	<i>An assessment report detailing available and scope of special needs in the sector.</i>	<i>6 Months</i>	<i>MoE (DBE, DHE) / KISE / ICT Trust</i>	<i>1</i>	<i>1</i>	<i>500,000</i>	<i>500,000.00</i>
	<i>b) Facilitate ICT equipping for special needs education institutions.</i>	<i>Number of special needs education institutions equipped with ICT.</i>	<i>5 Years</i>	<i>MoE (DBE, DHE) / ICT Trust</i>	<i>80</i>	<i>1</i>	<i>1,500,000</i>	<i>120,000,000.00</i>
4.6	Promote Open and Distance Education (ODE), e-learning and virtual institutions, particularly in higher education and training.							
	<i>a) Train continuous learning educators on ICTs</i>	<i>Number of Trainers Trained</i>	<i>2 Years</i>	<i>MoE / ICT Trust</i>	<i>1</i>	<i>50</i>	<i>65,000</i>	<i>3,250,000.00</i>
	<i>b) Equip ODE centres with ICT facilities.</i>	<i>ODE Centres facilitated with ICT Equipment.</i>	<i>4 Years</i>	<i>MoE / ICT Trust</i>	<i>1</i>	<i>50</i>	<i>750,000</i>	<i>37,500,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
4.7	Establish an ICT resource centre at the MoE headquarters for use by staff.							
	<i>a) Identify site within Ministry building and equipping the facility.</i>	<i>Equipped ICT resource centre at the Ministry headquarter office.</i>	<i>6 Months</i>	<i>MoE, ICT Unit</i>	<i>1</i>	<i>1</i>	<i>4,500,000</i>	<i>4,500,000.00</i>
	<i>b) Facilitate security and maintenance facility.</i>	<i>Equipped ICT security and maintenance facility.</i>	<i>6 Months</i>	<i>MoE, ICT Unit</i>	<i>1</i>	<i>1</i>	<i>450,000</i>	<i>450,000.00</i>
4.8	Establish a community ICT resource centre at a public facility for use by general public.							
	<i>a) Identify and equip identified ICT resource centre.</i>	<i>ICT resource centre equipped for access by public.</i>	<i>4 Years</i>	<i>MoE (ICT Unit), ICT TRUST</i>	<i>76</i>	<i>1</i>	<i>1,250,000</i>	<i>95,000,000.00</i>
	<i>b) Facilitate security and maintenance ICT resource centres.</i>	<i>Well secured and maintained ICT resource centres.</i>	<i>4 Years</i>	<i>MoE (ICT Unit), ICT TRUST</i>	<i>76</i>	<i>1</i>	<i>500,000</i>	<i>38,000,000.00</i>
4.9	Improve access to ICT facilities for the educational purposes by pupils, parents and local community, in partnership with the library and other services, and through the use of school ICT facilities after school hours.							
	<i>a) Create awareness</i>	<i>Publicity activities to sensitized general public on available learning resources</i>	<i>6 Months</i>	<i>MoE (Directorates, KIE), ICT Trust</i>	<i>5</i>	<i>1</i>	<i>1,250,000</i>	<i>6,250,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>b) Sensitization on e-Government services and e-related services</i>	<i>Publicity activities to sensitized general public on available e-services delivered via ICTs in the sector.</i>	<i>6 Months</i>	<i>MoE (Directorates, KIE), ICT Trust</i>	<i>6</i>	<i>1</i>	<i>500,000</i>	<i>3,000,000.00</i>
	SUB-TOTAL							1,334,900,000.00
5	TECHNICAL SUPPORT AND MAINTENANCE							
5.1	Facilitate and support the establishment national ICT support centre, where ICT needs of Kenyan schools and communities are remotely addressed by telephone, e-mail and other communication means.							
	<i>a) Setup technical support centre</i>	<i>National ICT Support Centre established.</i>	<i>5 Years</i>	<i>MoE / ICT Trust</i>	<i>1</i>	<i>1</i>	<i>15,000,000</i>	<i>15,000,000.00</i>
	<i>b) Sensitise clientele on available support services</i>	<i>Number of education institutions reached-out and utilising the technical support centre services.</i>	<i>5 Years</i>	<i>MoE (Directorates)</i>	<i>20</i>	<i>1</i>	<i>200,000</i>	<i>4,000,000.00</i>
5.2	Facilitate and support establishment of regional ICT support centre, equipped with necessary tools to respond to schools and community centre inquiries (troubleshoot kid).							
	<i>a) Setup technical support centres</i>	<i>Number of technical support centres setup to respond to sector needs.</i>	<i>5 Years</i>	<i>MoE (Directorates)</i>	<i>1</i>	<i>8</i>	<i>500,000</i>	<i>4,000,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>b) Sensitize the clientele on the available support services</i>	<i>Number of education institutions reached-out to utilize the technical support centre services.</i>	<i>5 Years</i>	<i>MoE (Directorates)</i>	<i>5</i>	<i>1</i>	<i>200,000</i>	<i>1,000,000.00</i>
	<i>c) Facilitate an emergency support team</i>	<i>Number of technical support centres equipped to offer ICT emergency support (Helpdesk).</i>	<i>3 Years</i>	<i>MoE / ICT Trust</i>	<i>1</i>	<i>8</i>	<i>450,000</i>	<i>3,600,000.00</i>
5.3	Develop technical capacity of support (at point) institutional, regional and/or national level.							
	<i>a) Train technical support personnel at institutional, regional and national level</i>	<i>Number of trained technical support staff at institutional level (Technicians)</i>	<i>5 Years</i>	<i>MoE (Directorates)</i>	<i>1</i>	<i>5,800</i>	<i>5,000</i>	<i>29,000,000.00</i>
	<i>b) Facilitate Emergency backup tools, equipment and components</i>	<i>Number of educational institutions adequately equipped with backup tools</i>	<i>3 Years</i>	<i>MoE (Directorates)</i>	<i>1</i>	<i>5,800</i>	<i>4,500</i>	<i>26,100,000.00</i>
	SUB-TOTAL							82,700,000.00
6	HARNESSING EMERGING TECHNOLOGIES							
6.1	Facilitate the use of appropriate new and emerging technologies.							
	<i>a) Inventory recommended technologies in research and development</i>	<i>New technologies inventoried and piloted.</i>	<i>Annual</i>	<i>MoE, ICT Unit, ICT TRUST</i>	<i>5</i>	<i>1</i>	<i>5,000,000</i>	<i>25,000,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>b) Pilot new emerging technologies</i>	<i>Number of schools using emerging technologies</i>	<i>Annual</i>	<i>MoE, ICT Unit, ICT TRUST</i>	<i>5</i>	<i>1</i>	<i>6,250,000</i>	<i>31,250,000.00</i>
	<i>c) Develop acquisition framework for the Ministry/partners</i>	<i>Acquisition strategy for new and emerging technologies</i>	<i>Annual</i>	<i>MoE, ICT Unit, ICT TRUST</i>	<i>5</i>	<i>1</i>	<i>1,250,000</i>	<i>6,250,000.00</i>
	<i>d) Institute Education Technology magazine that will inform stakeholders on emerging trends and use of new technologies in education.</i>	<i>Magazine developed.</i>	<i>Annual</i>	<i>MoE, ICT Unit, ICT TRUST</i>	<i>2,500</i>	<i>1</i>	<i>3,000</i>	<i>7,500,000.00</i>
	<i>e) Establishment of National Centre for Education Technology</i>	<i>Centre established.</i>	<i>2 Years</i>	<i>MoE, ICT Unit, ICT TRUST</i>	<i>1</i>	<i>1</i>	<i>60,000,000</i>	<i>60,000,000.00</i>
6.2	Embrace appropriate technologies that can be universally examined at each level of education.							
	<i>a) Identification and provision of appropriate technologies for delivery of education content</i>	<i>Common ICT examinations administered at Primary Schools level.</i>	<i>5 Years</i>	<i>MoE (KIE, DHE, DQAS, ICT), ICT Trust</i>	<i>8</i>	<i>2,000</i>	<i>1,500</i>	<i>24,000,000.00</i>
		<i>Common ICT examinations administered at Secondary Schools level.</i>	<i>5 Years</i>	<i>MoE (KIE, DHE, DQAS, ICT), ICT Trust</i>	<i>4</i>	<i>3,800</i>	<i>1,500</i>	<i>22,800,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>b) Procurement, customization and Installation of identified technologies</i>	<i>Common education delivery systems and platforms adopted</i>	<i>Annual</i>	<i>DQAS, DPP), ICT Trust</i>	<i>5</i>	<i>1</i>	<i>650,000</i>	<i>3,250,000.00</i>
	SUB-TOTAL							180,050,000.00
7	DIGITAL CONTENT							
7.1	Facilitate ICT integration in curricula (ICT in education)							
	<i>a) Workshops to integrate ICT in the Curriculum</i>	<i>Workshops held on ICT integration.</i>	<i>Annual</i>	<i>MoE (KIE), ICT Trust</i>	<i>5</i>	<i>1</i>	<i>500,000</i>	<i>2,500,000.00</i>
	<i>b) Enable an ICT relevant curriculum development</i>	<i>e-Curriculum development team setup</i>	<i>5 Years</i>	<i>MoE (KIE), ICT Trust</i>	<i>10</i>	<i>1</i>	<i>360,000</i>	<i>3,600,000.00</i>
	<i>c) Curriculum review (in relation to ICT trends and relevance)</i>	<i>Number of curriculum reviews undertaken.</i>	<i>Bi-annual</i>	<i>MoE (KIE), ICT Trust</i>	<i>10</i>	<i>1</i>	<i>500,000</i>	<i>5,000,000.00</i>
	<i>d) Production of digital media for distribution to education institutions (CDs, Tapes and Sites)</i>	<i>Digital content materials produced and distributed to education institutions.</i>	<i>5 Years</i>	<i>MoE (KIE, DQAS, ICT), ICT Trust</i>	<i>14</i>	<i>7,500</i>	<i>1,500</i>	<i>157,500,000.00</i>
7.2	Facilitate and support ICT Education (ICT as a subject area)							
	<i>a) Review of ICT education curriculum at all levels</i>	<i>Number of reviews done in ICT Education curriculum</i>	<i>5 Years</i>	<i>MoE (KIE), ICT Trust</i>	<i>5</i>	<i>1</i>	<i>1,350,000</i>	<i>6,750,000.00</i>
	<i>b) ICT Education content Review (syllabus)</i>	<i>Developed ICT education syllabus.</i>	<i>Annual</i>	<i>MoE (KIE), ICT Trust</i>	<i>10,000</i>	<i>1</i>	<i>500</i>	<i>5,000,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>c) Stakeholder workshops</i>	<i>Number of workshops held on ICT education</i>	<i>Annual</i>	<i>MoE (KIE), ICT Trust</i>	<i>10</i>	<i>1</i>	<i>500,000</i>	<i>5,000,000.00</i>
	SUB-TOTAL							185,350,000.00
8	INTEGRATION OF ICT IN EDUCATION							
8.1	Facilitate establishment of model institution (s) for integration of ICT to teaching and learning.							
	<i>a) Identification of a model institution</i>	<i>Number of possible institutions with capacity to undertake integration of ICT in education.</i>	<i>6 Months</i>	<i>MoE (DHE, DBE, DPP), ICT Trust</i>	<i>1</i>	<i>1</i>	<i>25,000</i>	<i>25,000.00</i>
	<i>b) Identification of resource persons for the identified institution.</i>	<i>Number of staff identified to work on integration of ICT in education.</i>	<i>1 Year</i>	<i>MoE (DHE, DBE, DPP), ICT Trust</i>	<i>1</i>	<i>1</i>	<i>25,000</i>	<i>25,000.00</i>
8.2	Sensitization of education managers on ICT integration.							
	<i>a) Sensitization workshops held</i>	<i>Number of workshops on ICT integration</i>	<i>Annual</i>	<i>MoE (DHE, KIE), ICT Trust</i>	<i>5</i>	<i>1</i>	<i>1,350,000</i>	<i>6,750,000.00</i>
	SUB-TOTAL							6,800,000.00
9	TRAINING (CAPACITY BUILDING)							
9.1	Provide education sector managers with access to information and tools to enable them to better deliver educational services.							
	<i>a) Conduct ICT skills training for education managers</i>	<i>Number of education managers trained on</i>	<i>5 Years</i>	<i>MoE(DHE, ICT), Trust</i>	<i>2550</i>	<i>1</i>	<i>75,000.00</i>	<i>191,250,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
		<i>ICTs</i>						
	<i>b) Provide ICT equipment to education managers</i>	<i>ICT Equipment given to education managers</i>	<i>5 Years</i>	<i>MoE(DHE, ICT), Trust, Donors</i>	<i>2550</i>	<i>1</i>	<i>150,000.00</i>	<i>382,500,000.00</i>
	<i>c) Provide managers with access to information</i>	<i>Types and variety of information accessed</i>	<i>5 Years</i>	<i>MoE(ICT, EMIS), Donors</i>	<i>12</i>	<i>1</i>	<i>1,250,000.00</i>	<i>15,000,000.00</i>
9.2	Build capacity for master integrators and teachers to facilitate the use of ICT in education and ICT education at every level of education.							
	<i>a) Training of Master Integrators</i>	<i>Number of ICT integrators trained to support integration at the national and district levels (At least 20)</i>	<i>5 Years</i>	<i>MoE(DHE, DBE, Universities), Trust</i>	<i>20</i>	<i>1</i>	<i>75,000.00</i>	<i>1,500,000.00</i>
	<i>b) Training of Trainers</i>	<i>Number of Trainers Trained to under take the ICT Teacher Training (675 ToTs)</i>	<i>5 Years</i>	<i>MoE(DHE, DBE, Universities), Trust</i>	<i>15</i>	<i>45</i>	<i>90,000.00</i>	<i>60,750,000.00</i>
	<i>c) Conduct training of basic ICT skills to teachers</i>	<i>Number of Trained Teachers from the programme (3,600 new graduants)</i>	<i>5 Years</i>	<i>MoE (DBE, DHE, TSC and DQAS)</i>	<i>400</i>	<i>45</i>	<i>25,000.00</i>	<i>450,000,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>d) Conduct in-servicing for teachers</i>	<i>Number of in-serviced teachers both for Secondary and Primary (56,000).</i>	<i>5 Years</i>	<i>MoE (DBE, DHE, TSC and DQAS)</i>	<i>56,000</i>	<i>1</i>	<i>55,000.00</i>	<i>3,080,000,000.00</i>
		<i>Number of primary schools in-serviced teachers on Multimedia content (37,800)</i>	<i>5 Years</i>	<i>MoE (DBE, DHE, TSC and DQAS)</i>	<i>2</i>	<i>18,900</i>	<i>15,000.00</i>	<i>567,000,000.00</i>
9.3	Develop sufficient capacity for curriculum and content developers for appropriate integration of ICT within the education sector.							
	<i>a) Train curriculum and content developers on ICT skills</i>	<i>Number of Content Developers trained on ICT integration skills (56)</i>	<i>5 Years</i>	<i>MoE (KIE), ICT Trust</i>	<i>56</i>	<i>1</i>	<i>50,000</i>	<i>2,800,000.00</i>
	<i>b) Conduct curriculum review workshops</i>	<i>Number of workshops held (10)</i>	<i>5 Years</i>	<i>MoE (KIE), Trust</i>	<i>10</i>	<i>1</i>	<i>450,000</i>	<i>4,500,000.00</i>
	<i>c) Conduct content developers' workshops</i>	<i>Number of workshops held (10)</i>	<i>5 Years</i>	<i>MoE (KIE), ICT Trust</i>	<i>10</i>	<i>1</i>	<i>150,000</i>	<i>1,500,000.00</i>
9.4	Strengthen industrial and vocational ICT training.							
	<i>a) Stakeholders workshop on linkages of ICT training to industry</i>	<i>Number of workshops held between ICT Trainers and industry (players and consumers)</i>	<i>5 Years</i>	<i>MoE (DTE), ICT Trust</i>	<i>5</i>	<i>1</i>	<i>450,000</i>	<i>2,250,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>b) Development of in-servicing training mechanism</i>	<i>Development of in-servicing training programme / curriculum</i>	<i>1 Year</i>	<i>MoE (DTE), ICT Trust</i>	<i>3</i>	<i>1</i>	<i>1,500,000</i>	<i>4,500,000.00</i>
9.5	Build capacity in model institution for integration of ICT in education.							
	<i>a) Training staff identified in the model institution for ICT integration</i>	<i>Number of staff trained on ICT integration</i>	<i>2 Years</i>	<i>MoE (DHE), ICT Trust</i>	<i>10</i>	<i>1</i>	<i>450,000</i>	<i>4,500,000.00</i>
	<i>b) Development of training modules for use in ICT integration.</i>	<i>ICT Integration modules developed for training of teachers / lecturers.</i>	<i>1 Year</i>	<i>MoE (DHE), ICT Trust</i>	<i>8</i>	<i>1</i>	<i>1,500,000</i>	<i>12,000,000.00</i>
	<i>c) Review of Developed Modules for use in ICT integration</i>	<i>Number of reviews done in developed modules</i>	<i>Annual</i>	<i>MoE (DHE), ICT Trust</i>	<i>8</i>	<i>1</i>	<i>250,000</i>	<i>2,000,000.00</i>
	SUB-TOTAL							4,782,050,000.00
10	RESEARCH AND DEVELOPMENT							
10.1	Facilitate and support research and development							
	<i>a) Develop national databank of research materials.</i>	<i>Number of research materials digitized for access by general public.</i>	<i>5 Years</i>	<i>MoE (DHE, NCST, CHE), JICA</i>	<i>170,000</i>	<i>1</i>	<i>150</i>	<i>25,500,000.00</i>
	<i>b) Provide access to information that reside in the databank</i>	<i>Portal (site) developed to help facilitate access of research materials.</i>	<i>1 Year</i>	<i>MoE (DHE, NCST, CHE)</i>	<i>1</i>	<i>1</i>	<i>3,500,000</i>	<i>3,500,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>c) Monitoring and evaluation of implementation</i>	<i>Number of research undertakings as a means of checking evaluation of sector ICT initiatives.</i>	<i>5 Years</i>	<i>MoE (DHE, NCST, CHE)</i>	<i>10</i>	<i>1</i>	<i>1,250,000</i>	<i>12,500,000.00</i>
10.2	Promote innovations							
	<i>a) ICT-related contests at different levels of education (Cultivate ICT Champions)</i>	<i>ICT Contests held within the planned period (Total of 5 contests)</i>	<i>5 Years</i>	<i>MoE (Directorates, NCST)</i>	<i>5</i>	<i>1</i>	<i>3,500,000</i>	<i>17,500,000.00</i>
	<i>b) Coordinate implementation of key ICT products</i>	<i>Number of ICT products deployed to education institutions (programs)</i>	<i>5 Years</i>	<i>MoE (Directorates, NCST)</i>	<i>3,800</i>	<i>1</i>	<i>15,000</i>	<i>57,000,000.00</i>
	<i>c) Facilitate benchmarking to enable continuous innovation</i>	<i>Number of ICT products adopted and ratified (Standardized) as models for use in the sector.</i>	<i>5 Years</i>	<i>MoE (Directorates, NCST)</i>	<i>20</i>	<i>1</i>	<i>300,000</i>	<i>6,000,000.00</i>
10.3	Facilitate creation of legal framework for innovations (patenting, intellectual property, copyrights, electronic signatures and others)							
	<i>a) Conduct legal clinics on intellectual property rights</i>	<i>Number of legal clinics conducted in regard to protection of innovation and local ICT products</i>	<i>5 Years</i>	<i>MoE(DHE, DPP), Universities and Tertiary Institutions.</i>	<i>5</i>	<i>1</i>	<i>1,500,000</i>	<i>7,500,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>b) Facilitate the process of ICT innovations patenting</i>	<i>Number of ICT innovations patented.</i>	<i>5 Years</i>	<i>MoE, ICT TRUST (Legal Office)</i>	<i>20</i>	<i>1</i>	<i>50,000</i>	<i>1,000,000.00</i>
	SUB-TOTAL							130,500,000.00
11	EDUCATION MANAGEMENT INFORMATION SYSTEMS (EMIS)							
11.1	Facilitate establishment of an effective EMIS							
	<i>a) Acquisition of necessary infrastructure to allow dissemination and sharing of available data and information.</i>	<i>Server and associated software for access of data and information.</i>	<i>2 Years</i>	<i>MoE (DPP, ICT), World Bank</i>	<i>2</i>	<i>2</i>	<i>1,850,000</i>	<i>7,400,000.00</i>
	<i>b) Development of education statistical booklet on performance of education indicators.</i>	<i>Hard copy and softcopy availability of education statistical booklets.</i>	<i>Annual</i>	<i>MoE (DPP, CPU)</i>	<i>1,000</i>	<i>1</i>	<i>250</i>	<i>250,000.00</i>
	<i>c) Workshop forum on education data access, use and performance indicators.</i>	<i>Number of workshops held on EMIS</i>	<i>Annual</i>	<i>MoE (DPP, CPU)</i>	<i>5</i>	<i>1</i>	<i>250,000</i>	<i>1,250,000.00</i>
	<i>d) Monitoring and evaluation of EMIS</i>	<i>Monitoring and evaluation of the EMIS systems with necessary recommendation.</i>	<i>Annual</i>	<i>MoE(Director ates), World Bank</i>	<i>5</i>	<i>1</i>	<i>450,000</i>	<i>2,250,000.00</i>
	SUB-TOTAL							11,150,000.00
12	PARTNERSHIPS AND RESOURCE MOBILIZATION							
12.1	Recognize and support the role of MoE and its partners in facilitating ICT Initiatives in education.							

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>a) Develop resource mobilization strategy</i>	<i>Clear coordination of ICT initiatives in the education sector</i>	<i>Six months</i>	<i>ICT Trust</i>	<i>1</i>	<i>1</i>	<i>450,000</i>	<i>450,000.00</i>
	<i>b) Develop resource disbursement mechanism</i>	<i>Budget to reflect on ICT in education needs</i>	<i>Two Months</i>	<i>ICT Trust</i>	<i>1</i>	<i>1</i>	<i>300,000</i>	<i>300,000.00</i>
12.2	Promote and facilitate public and private sector partnerships to mobilize resources to equip education institutions and investment in ICT in education sector.							
	<i>a) Develop communication strategy for public/private sector partners</i>	<i>Strong partnership of public and private sector for ICT in education</i>	<i>Two Months</i>	<i>MoE, ICT Trust</i>	<i>1</i>	<i>1</i>	<i>200,000</i>	<i>200,000.00</i>
	<i>b) Acquisition strategy on ICT equipment for education institutions and community learning centres.</i>	<i>Acquisition strategy for ICT equipment.</i>	<i>6 Months</i>	<i>MoE (DHE, DBE, ICT), ICT Trust</i>	<i>1</i>	<i>1</i>	<i>250,000.00</i>	<i>250,000.00</i>
	<i>c) Stimulate interest in, and ownership over the resource through publicity</i>	<i>Strong ownership of ICT initiatives</i>	<i>Annual</i>	<i>MoE, ICT Trust, Donors</i>	<i>5</i>	<i>1</i>	<i>1,500,000</i>	<i>7,500,000.00</i>
	<i>d) Acquisition and distribution of ICT equipment for education institutions and community learning centres.</i>	<i>Number of educational institutions and community centres equipped with ICT equipment.</i>	<i>Annual</i>	<i>MoE (DHE, DBE, ICT), ICT Trust</i>	<i>28</i>	<i>800</i>	<i>40,000.00</i>	<i>896,000,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
12.3	The partners with the lead agency to fundraise for provision of ICT projects and/or initiatives in education.							
	<i>a) Develop fundraising strategy</i>	<i>Fundraising Strategy put in place</i>	<i>6 Months</i>	<i>ICT Trust</i>	<i>1</i>	<i>1</i>	<i>500,000</i>	<i>500,000.00</i>
	<i>b) Explore modes of commercial viability and sustainability</i>	<i>Assessment report on all proposed interventions.</i>	<i>Annual</i>	<i>ICT Trust</i>	<i>5</i>	<i>1</i>	<i>500,000</i>	<i>2,500,000.00</i>
12.4	Develop modalities for cost-reduction of ICT products and services.							
	<i>a) Leveraging on academic licenses offered to education institutions.</i>	<i>Reduced or cost effective acquisition of software for use in education sector.</i>	<i>Annual</i>	<i>MoE (Directorates), ICT Trust</i>	<i>1</i>	<i>1</i>	<i>630,000</i>	<i>630,000.00</i>
12.5	Align ICT initiatives in education with Millennium Development Goals (MDGs) under the World Summit for the Information Society (WSIS) plan of action and New Partnership for Development (NEPAD) e-Schools.							
	<i>a) Participate in NEPAD e-Schools task force committee</i>	<i>Membership in NEPAD e-Schools Technical Team</i>	<i>Annual</i>	<i>ICT Trust, MoE</i>	<i>5</i>	<i>1</i>	<i>100,000</i>	<i>500,000.00</i>
	<i>b) Participate in country WSIS task force committee</i>	<i>Membership in the National WSIS Technical Team</i>	<i>Annual</i>	<i>ICT Trust, MoE</i>	<i>5</i>	<i>1</i>	<i>100,000</i>	<i>500,000.00</i>
	<i>a) Prepare a documentary of ICT in education initiatives.</i>	<i>Documentary prepared of ICT in education initiatives.</i>	<i>Annual</i>	<i>ICT Trust, MoE</i>	<i>5</i>	<i>1</i>	<i>850,000</i>	<i>4,250,000.00</i>
12.6	Encourage cost sharing in the establishment of schools and ICT infrastructure with parents and communities.							

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>a) Sensitization of the community on the ICT mainstreaming in education institutions</i>	<i>Number of sensitization done to encourage community to contribute to ICT in education.</i>	<i>Annual</i>	<i>MoE (DEB, BOGs, PTA), ICT Trust</i>	<i>5</i>	<i>1</i>	<i>3,500,000.00</i>	<i>17,500,000.00</i>
	<i>b) Infrastructure constructed by community for ICT use.</i>	<i>Laboratories build by the community.</i>	<i>Sustained</i>	<i>MoE (DEB, BOGs, PTA), ICT Trust</i>	<i>5</i>	<i>1</i>	<i>250,000.00</i>	<i>1,250,000.00</i>
	SUB-TOTAL							932,330,000.00
13	LEGAL FRAMEWORK AND REGULATORY FRAMEWORK							
13.1	Establish laws governing acquisition and use of ICT resources in education e.g. equipment, privacy, copyright laws, patents, licenses etc.							
	<i>a) Develop laws (circulars) to guide in the acquisition and use of ICT resources.</i>	<i>Documented safety, security and strategies to protect ICT systems at all levels of education.</i>	<i>Six months</i>	<i>MoE (DQAS, DPP), ICT Trust</i>	<i>1</i>	<i>1</i>	<i>450,000</i>	<i>450,000.00</i>
	<i>b) Develop guidelines for donations for ICT equipment with safeguards against e-waste</i>	<i>Guidelines for handling donated ICT equipment.</i>	<i>Six months</i>	<i>MoE / ICT Trust</i>	<i>1</i>	<i>1</i>	<i>450,000</i>	<i>225,000.00</i>
13.2	Establish a legal authority to spearhead leadership in ICTs in education.	<i>Established Authority to spearhead ICTs in Education.</i>						

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>Establish controls at all levels of ICT integration to avoid abuse of school-based ICT systems and ICT related crimes.</i>	<i>Control guidelines on security measures in use of ICT infrastructure and content within data networks.</i>	<i>Annual</i>	<i>MoE (DQAS, DPP, ICT), ICT Trust</i>	<i>1</i>	<i>1</i>	<i>450,000</i>	<i>450,000.00</i>
13.3	Develop mechanisms for disaster recovery of information/data and sensitize the staff at all levels in the Ministry on legal, safety, privacy, and security of ICT equipment, data and information.							
	<i>a) Develop disaster recovery guidelines for information and data</i>	<i>Guidelines for recovering information and data.</i>	<i>Six months</i>	<i>MoE / ICT Trust</i>	<i>1</i>	<i>1</i>	<i>450,000</i>	<i>450,000.00</i>
	<i>b) Sensitization workshops held</i>	<i>Number of workshops on ICT integration</i>	<i>Annual</i>	<i>MoE (DHE) ICT Trust</i>	<i>5</i>	<i>1</i>	<i>350,000</i>	<i>1,750,000.00</i>
13.4	Establish standards by correctly balancing user privacy and the protection of community values, and establishment of and recognition of cyber laws within Kenya's legal framework.							
	<i>a) Development of standards on privacy and protection of community values.</i>			<i>MoE (DQAS, DPP), ICT Trust</i>	<i>1</i>	<i>1</i>	<i>250,000</i>	<i>250,000.00</i>
13.5	Stipulate the minimum hardware specifications adequate for educational use.							

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>a) Develop specification manual</i>	<i>Uniform platform that allow integration and interoperability of most applications useful in the content delivery and ICT education</i>	<i>Annual</i>	<i>MoE (DQAS, ICT), ICT Trust</i>	<i>3</i>	<i>1</i>	<i>120,000</i>	<i>360,000.00</i>
	<i>b) Specification review, choice of sustainable technology</i>	<i>Review team formed.</i>	<i>Every six months</i>	<i>MoE (DQAS, ICT), ICT Trust</i>	<i>10</i>	<i>1</i>	<i>120,000</i>	<i>1,200,000.00</i>
13.6	Evaluate and assess appropriate software and related applications that would meet the basic needs of education.							
	<i>a) Stock take existing software developments in the education sector</i>	<i>Inventorizing of education softwares</i>	<i>Annual</i>	<i>MoE (DHE, DQAS, ICT), ICT Trust</i>	<i>5</i>	<i>1</i>	<i>50,000</i>	<i>250,000.00</i>
	<i>b) Pilot selected software in education sector.</i>	<i>Workshop Reports</i>	<i>Every six months</i>	<i>MoE (DHE, DQAS, ICT), ICT Trust</i>	<i>10</i>	<i>1</i>	<i>125,000</i>	<i>1,250,000.00</i>
13.7	Regulate accreditation of institutions offering examinations and certification of ICT learning programmes in all relevant institutions.							
	<i>a) Accreditation of ICT training body formed</i>	<i>Accreditation of institutions offering ICT training</i>	<i>1 Year</i>	<i>MoE (KNEC, KIE, DHE, DQAS, DBE), ICT Trust</i>	<i>1</i>	<i>1</i>	<i>5,000,000</i>	<i>5,000,000.00</i>

	DESCRIPTION (Component/Objective/Tasks)	OUTPUTS INDICATOR /	TIMEFR AME	LEAD AGENCY	QTY	SITES	UNIT COST	TOTAL AMOUNT (Kenya Shillings)
	<i>b) Develop strategy on ICT training progression</i>	<i>Strategy for course transitions from one level to another</i>	<i>Six months</i>	<i>MoE (KNEC, KIE, DHE, DQAS, DBE), ICT Trust</i>	<i>1</i>	<i>1</i>	<i>450,000</i>	<i>450,000.00</i>
	SUB-TOTAL							12,085,000.00
14	MONITORING AND EVALUATION							
14.1	<i>Development of instruments to monitor all interventions proposed in the strategy</i>	<i>Instruments for monitoring developed.</i>	<i>6 Months</i>	<i>MoE (DHE, ICT), ICT Trust</i>	<i>20</i>	<i>1</i>	<i>450,000</i>	<i>9,000,000.00</i>
14.2	<i>Printing of instruments for Monitoring and evaluation.</i>	<i>Instruments printed</i>	<i>Annual</i>	<i>MoE (DHE, ICT), ICT Trust</i>	<i>250</i>	<i>1</i>	<i>250</i>	<i>62,500.00</i>
14.3	<i>Data processing and analysis</i>	<i>Data capture and analysis</i>	<i>Annual</i>	<i>MoE (DHE, ICT), ICT Trust</i>	<i>250</i>	<i>5</i>	<i>2,500</i>	<i>3,125,000.00</i>
14.4	<i>Report writing and printing</i>	<i>Monitoring and evaluation report</i>	<i>Annual</i>	<i>MoE (DHE, ICT), ICT Trust</i>	<i>100</i>	<i>5</i>	<i>2,500</i>	<i>1,250,000.00</i>
14.5	<i>Dissemination and stakeholder briefing of intervention status.</i>	<i>Dissemination of monitoring report and stakeholder forums.</i>	<i>Annual</i>	<i>MoE (DHE, ICT), ICT Trust</i>	<i>5</i>	<i>1</i>	<i>250,000</i>	<i>1,250,000.00</i>
	SUB-TOTAL							14,687,500.00
	TOTAL							18,257,431,500.00

6. APPENDIX B: LIST OF PARTNERS

1. KENYA ICT TRUST FUND.
2. MINISTRY OF EDUCATION
3. MINISTRY OF SCIENCE AND TECHNOLOGY
4. MINISTRY OF FINANCE (GOVERNMENT IT SERVICES)
5. OFFICE OF THE PRESIDENT (DIRECTORATE OF E-GOVERNMENT)
6. DEVELOPMENT PARTNERS
7. INITIATIVES (LOCAL, NATIONAL, GLOBAL)
8. BROADCASTING AND MEDIA ORGANISATIONS
9. EDUCATION PUBLISHING INDUSTRY GROUPS
10. EMPLOYER ORGANISATION
11. ICT INFRASTRUCTURE INDUSTRY GROUPS
12. LOCAL AUTHORITIES, DIRECTORS OF CHILDREN SERVICE, LOCAL EDUCATION AUTHORITY
13. LIBRARY AND INFORMATION SCIENCE GROUPS
14. OTHER GOVERNMENT DEPARTMENTS AND THEIR AGENCIES WITH E-PROGRAMME
15. TRADE UNIONS AND PROFESSIONAL ASSOCIATION
16. UNIVERSITY RESEARCH GROUPS WITH A FOCUS ON E-LEARNING AND RELATED DISCIPLINES
17. VOLUNTARY AND COMMUNITY ORGANISATIONS
18. PUBLIC-PRIVATE-PARTNERSHIPS OR PUBLIC-PRIVATE-INDUSTRIAL PARTNERSHIPS

7. APPENDIX C: MEMBERS OF THE PREPARATION TEAM

Rev. Mark Matunga	Chief Executive Officer	Kenya ICT Trust Fund
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Miss Alice Mumbi	Programme Officer	Kenya ICT Trust Fund
Mr. Andrew Limo	Senior Public Relations Officer	E-Government
Mr. Barnabas Sang	Head of ICT Unit	MOEST
Mr. Charles Juma	Education Programme Officer	USAID / Kenya
Mr. Dan Njiriri	Chairman, N.I.C.E	N.I.C.E
Mr. David Masafu	Education Officer	Ministry of Education
Ms. Inge Vervloesem	KESI Project coordinator	VVOB / Kenya
Mr. John Walubengo	Head of IT Services	KCCT
Mr. Jimmy Macharia	Ass. Prof. of Information Systems	USIU-Africa
Mr. Patrick Lacquan	IT Consultant and Developer	Kenya ICT Trust Fund
Mr. Owino Magana	Government Consultant	E-Kazi Africa
Mr. Tom Muga	Regional ICT Specialist	USAID-East Africa



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