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COSTING OF GOVERNMENT FUNCTIONS

FINAL REPORT

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ABBREVIATIONS AND ACRONYMS

ACP	African Caribbean Pacific
ACU	Aids Control Unit
ADO	Agribusiness Development Officer
AGOA	African Growth Opportunity Act
A-I-A	Appropriations in Aid
AIDS	Acquired Immune Deficiency Syndrome
AIDS	Acquired Immuno deficiency syndrome
AIDIU	Agro-Industries Development and Investment Unit
AIE	Authority to Incur Expenditure
AIRC	Agricultural Information Resource Centre
AMCEN	African Ministerial Conference on Environment
AMISOM	African Union Mission in Somalia
APRM	African Peer Review Mechanism
APSA	African Peace and Security Architecture
ASEAN	Association of Southeast Asian Nations
ATC	Agricultural Training Centre
ATDC	Agricultural Technology Development Centre
AU	African Union
BMUs	Beach Management Unit
BRICS	Brazil, Russia, India, China & South Africa
CAN	Corrective Action Notice
CDA	County Director of Agriculture
CDC	Chef de Cabinet
CFTA	Continental Free Trade Area
COMESA	Common Market for Eastern and Southern Africa
CoP	Chief of Protocol
CPPMD	Central Planning & Project Monitoring Division
CPPMU	Central Projects Planning and Monitoring
CRA	Commission on Revenue Allocation
CS	Cabinet Secretary
CTBTO	Comprehensive Nuclear-Test Ban Treaty Organization
D/CRAMD	Director Crop Resources, Agribusiness and Market
D/E & T	Director Extension and Training
DD, Policy	Deputy Director Agricultural Policy Coordination
DD/PRD	Deputy Director, Policy Research Division
DDA/ESD	Deputy Director of Agriculture/Extension Services Division
Director DPR&R	Director Department of Policy Research and Review
DFS	Directorate of food security
DHIS	District Health Information System
Director, PCR&R	Director Agricultural Policy, Crop Research and Regulations

DLRMD	Director Livestock Resources and Market Development
DRC	Democratic Republic of Congo
EAC	East African Community
ECA	Economic Commission for Africa
EFMIS	Electronic Fish Market Information System
EHPT	Essential health products and technologies
EIA	Environmental Impact Assessment
EMCA	Environment Management Coordination Act
EMCA	Environmental Management and Coordination Act
EPAs	Economic Partnership Agreements
ERP	Enterprise Resource Planning
ERS	Economic Recovery Strategy
EU	European Union
FBOs	Faith Based Organizations
FDI	Foreign Direct Investments
FOCAC	Forum on China-Africa Cooperation
FSI	Foreign Service Institute
FSR	Foreign Service Regulations
FTA	Free Trade Area
GATS	General Agreement on Trade in Services
GCC	Gulf Cooperation Council
GDP	Gross Domestic Product
GHRIS	Government Human Resource Information System
GNI	Gross Natural Income
GoK	Government of Kenya
H/ARMD	Head Animal Resources Management Division
H/APU	Head Animal Products Unit
HAVAD	Head Agribusiness and Value Addition Division
HEW&SPD	Head Early Warning &Special Programmes Division
HFSS&PMD	Head food security systems and program management Division
H/LPRR	Head Livestock Policy Research and Regulations
H/LR	Head Livestock Research
H/LRMD	Head Livestock Resources and Market Development
H/PPSU	Head P
H: API&DMU	Head, Agricultural Policy Information and Data Management Unit
HIV	Human Immunodeficiency Virus
HOD	Head of Department
HPT	Health Products and Technologies
HQ -	Headquarter
HRD	Human Resource Development
HRD	Human Resource Development
HRH	Human Resources for Health
HRM	Human Resource Management
HRMO	Human Resource Management Officer

ICAO	International Civil Aviation Organisation
ICC	International Criminal Court
ICGLR	International Conference on the Great Lakes Region
ICT	Information Communication Technology
IFC	International Finance Corporation
IGAD	Inter-governmental Authority on Development
IGOs	Inter-governmental Organisations
IMF	International Monetary Fund
IPAs	Investment Promotion Agencies
IPMIS	Integrated Protocol Management Information System
IRMIS	Integrated Records Management Information System
ISO	International Organization for Standardization
ITC	International Trade Cooperation
ITOs	International Trade Organizations
JCC	Joint Commission for Cooperation
JETRO	Japan External Trade Organisation
JMC	Joint Ministerial Commission
JTC	Joint Technical Commission
KAM	Kenya Association of Manufacturers
KDF	Kenya Defence Forces
KEMRI	Kenya Medical Research Institution
KEMSA	Kenya Medical Supplies Authority
KEPSA	Kenya Private Sector Alliance
KITCA	Kenya International Technical Cooperation Agency
KNCCI	Kenya National Chamber of Commerce and Industry
KOTRA	Korea Trade-Investment Promotion Agency
KPIs	Key Performance Indicators
LAPSSET	Lamu Port Southern Sudan-Ethiopia Transport
LAPSSET	Lamu Port & Lamu - Southern Sudan – Ethiopia Transport Corridor
M&E	Monitoring & Evaluation
M&E	Monitoring and Evaluation
MDAs	Ministries, Departments and Agencies
MDGs	Millennium Development Goals
MEA	Multilateral Environmental Agreement
MEAs	Multilateral Environmental Agreements
MIST	Mexico, Indonesia, South Korea and Turkey
MOALF	Ministry of Agriculture, Livestock and Fisheries
MoF	Ministry of Finance
MOU	Memorandum of Understanding
MOU	Memorandum of Understanding
MPER	Ministerial Public Expenditure Review
MSME	Micro Small & Medium Enterprises
MTEF	Medium Term Expenditure Framework
MTEF	Medium Term Expenditure Framework

MTP	Medium Term Plan
NADICOK	National Diaspora Council of Kenya
NCWTO	National Committee on World Trade Organizations
NEPAD	New Partnership for African Development
NGOs	Non-Governmental Organizations
NIMES	National Integrated Monitoring and Evaluation System
NSAC	National Security Advisory Committee
NSAs	Non-state-Actors
NT	National Treasury
ODA	Official Development Assistance
PAC	Public Affairs & Communications
PAS	Performance Appraisal System
PPP	Public Private Partnership
PS	Principal Secretary
PSCK	Public Service Commission of Kenya
PWDs	People with Disabilities
QMS	Quality Management System
RMO	Record Management Officer
RRI	Rapid Results Initiative
SADC	Southern Africa Development Community
SAGA	Semi-Autonomous Government Agency
SCMU	Supply Chain Management Unit
SHF	Stake Holders Forum
SIDA	Swedish International Development Agency
SSC	South-South Cooperation
STC	Strategic Trade Controls
TA	Transition Authority
TFG	Transition Federal Government
TICAD	Tokyo International Cooperation for African Development
TOR	Terms of Reference
UAE	United Arabs Emirate
UK	United Kingdom
UN	United Nations
UNCTAD	United Nations Conference on Trade and Development
UNDP	United Nations Development Programme
UNEP	United Nations Environmental Programme
UNESCO	United Nations Educational Scientific & Cultural Organization
UNGA	United Nations General Assembly
UNIDO	United Nations Industrial Development Organization
UNON	United Nations Office in Nairobi
UNOV	United Nations Office of Vienna
USA	United States of America
USAID	United States Agency for International Development
VLANS	Virtual Local Area Networks

VPN	Virtual Private Network
VSAT	Very Small Aperture Terminal
WHO	World Health Organization
WRMA	Water Resources Management Authority
WTO	World Trade Organization

EXECUTIVE SUMMARY

The Government's central priority, at national and county level, is to provide basic services to all within the constraint of available resources. This is the objective set out in the Constitution of Kenya, 2010 under the Bill of Rights and is a fundamental responsibility of the government. The functions of national and county governments are outlined in Articles 186 and 187, and detailed in the Fourth Schedule of the Constitution of Kenya 2010. These were unbundled by the Transition Authority. Article 187 (2) also provides that if a function or power is transferred from a government at one level to a government at the other level then arrangements shall be put in place to ensure that the resources necessary for the performance of the function or exercise of the power are transferred in line with the 'finance follows functions ' principle. In response to this, this study on costing of government functions was commissioned. The scope of study, in terms of the broad functions, constituted foreign affairs, foreign policy and international trade; transport and infrastructure; agriculture, livestock, and fisheries; health; and water, environment and natural resources;

The main purpose of the study was to estimate the costs of resources necessary the performance of the functions assigned to the National and County Governments. The specific objectives included review of relevant documents, review of norms and standards in service delivery, identify services provided by both levels of government, cost the services, and provide trends in past expenditure on the functions.

This study utilized two research designs. These were cross-sectional design and longitudinal design. In the cross-sectional design, a survey of all the 20 County Governments and the National Government was carried out. In the longitudinal design-, time series data on expenditure by selected departments and ministries, over a period of 10 years, were collected. The study used two approaches that are used in costing studies. These were activity based costing approach that builds unit costs of service by taking into account inputs used to provide the service and macro costing approach that relied on past expenditure to estimate cost of the services. Primary data from National Government and County Governments were collected to accomplish the objectives of the study. Additionally, secondary data were also collected from the two levels of government, but at the relevant departments, semi-autonomous government agencies and ministries. The data collected included expenditure data over 10 years for the functions, list of services under each government function; List of activities for each type of service where it was possible; type of inputs required for each activity and service; and norms and standards in service delivery where they were available.

The costing of norms and standards was also done using the Excel. The data analysis was carried out in five steps. In step one, the inputs to provide a unit of service will identified based on norms and standards. In step two, the inputs to provide one unit of service was quantified. In step three, the input will be valued in Kenya shillings. In step four, a total unit cost was determined based on both top-down and bottom-up methods. Lastly, in step five, the total cost of survive or function was estimated using expenditure where it was not possible to carry out activity-based costing.

The costing of health functions was done using norms for service delivery developed by the Ministry of Health. The costing of inputs was carried out in terms of human resources, general operations costs, and costs of drugs, commodities and medical supplies for different levels of health care. The total annual cost of service provision, excluding cost of drugs and health commodities, was estimated be KES 35 million for community level, KES 14 million for dispensary, KES 91 million for health centre, KES 530 million for county level hospital

(level 4), KES 1.4 billion for county referral hospital (level 5), KES 89 million for Port Health, KES 247 million for Spinal Injury Hospital, KES 1.3 billion for Mathari Mental Hospital. However, for the two national referral hospitals, full cost, including drugs, commodities and supplies, was computed. The full cost of service delivery at Moi Teaching and Referral Hospital and Kenyatta National Hospital was KES 6.7 billion and KES 14 billion, respectively. The costs of different health services per person per episode were also estimated. Additionally, other costs at national level totalled KES 21 billion annually.

The roads functions for both levels of governments were estimated per two-lane kilometre and where applicable it was done per one-kilometre lane. The costing analysis considered construction, rehabilitation and maintenance. The costing analysis was informed by norms and standards for developed by the State Department of Roads. Although costs vary in different regions, average costs were considered in this report. The estimated costs of construction were KES 133 million per two-lane kilometre for standard urban road in a flat. However, a road traversing a mountainous terrain, underlain by suitable sub grade material with no profound drainage structures, and there is no relocation of services cost KES 63 million per KM or KES 126 million per two-lane kilometre. The cost of construction and upgrading of standard urban paved road with minor arteries was estimated at KES 186 million per two-lane kilometre. The unit cost of constructing or upgrade a standard paved road (collectors) to bituminous standards in an urban setting is KES 128 million per two-lane kilometre.

The cost per two-lane of upgrading a class C road to bitumen standards was KES 198 million. Furthermore, the average cost of constructing class D roads to bitumen standards was estimated KES 57 million per kilometre. Cost per kilometre of construction class E roads was estimated at KES 23 million. The unit cost of gravelling an urban road is estimated at KES 43 million per two-lane kilometre. Road maintenance is classified as routine maintenance or periodic maintenance. The cost per km for routine maintenance of a class D or class E road of mixed surface is KES 855,983 while the cost per KM of routine maintenance of earth surface road and gravel surface road is KES 1,718,668 and KES 2,218,179, respectively. However, for class B and class C, periodic maintenance would cost KES 21 million and KES 8 million, respectively.

The functions of transport are implemented by different semi-autonomous government agencies. The costing of services entailed costs of required as oppose to actual human resources and operating costs. The operating costs were estimating based on expenditure in the financial year 2014/15. The total cost for the state agencies was about KES 39 billion annually. This total cost was distributed as follows: KES 26 billion (Kenya Port Authority), KES 1.3 billion (Kenya Ferry Services), KES 994 million (Kenya Railways), KES 701 million (Kenya Maritime Authority), KES 54 million (Kenya National Shipping Line), KES 10.4 billion (Kenya Airport Authority), KES 361 million (Aircraft Accident Investigation).
The costing of functions related to agriculture, livestock and fisheries was based on information obtained from Quality Management Systems Procedures and Guidelines of the Ministry of Agriculture, Livestock and Fisheries. The data collected at national and county level were used to calculate unit costs of the services. The activities and their costs excluding human resources at national level are development and review of agriculture, livestock and fisheries related policies and regulations (KES 80,540,000), Setting standards for agriculture, livestock and fisheries products in collaboration with relevant regulatory bodies (KES 4,680,000), development of technical materials and packages for dissemination (KES 18,460,000), capacity building of stakeholders on policy development, best practices in

agriculture, livestock development, fisheries and other related topics (KES 17,240,000), development and maintenance of crops, livestock and fish species and agriculture, livestock and fish products data bank (KES 31,460,000), development of agriculture, livestock and fisheries development strategies and guidelines (KES 23,740,000), promotion of investment and trade in agriculture, livestock and fisheries and their products (KES 60,000,000), research and extension liaison (KES 13,500,000), Coordination and supervision of national livestock stations (KES 3,100,000), range management and development (KES 41,200,000), Development of programmes and proposals (KES 3,194,000), budget preparation and coordination (KES 8,080,000), coordination of performance contracting function (KES 2,100,000), bilateral and multilateral cooperation (KES 8,280,000), mapping and development of stock routes (KES 4,800,000), support and establishment of livestock marketing infrastructure (KES 4,000,000), support to index based livestock insurance (KES 105,600,000), human resource development (KES 33,500,000), promotion of *Climate Smart* farming (KES 5,200,000), sheep and goat station (KES 280,943,000), livestock improvement farm (KES 76,400,000).

The total costs of human resources at national level are KES 914 million (agriculture), KES 4.4 billion (livestock) and 231 million (fisheries). Additionally, total recurrent cost of state corporations in this sector is KES 4.7 billion.

The costs of activities at county level are provision of agricultural extension services or farmer advisory services (200 farmers in the catchment areas) (KES 4,984,186), development and implementation of programmes in the agricultural sector to address food security in the County (KES 733,505) construction of grain storage structures (KES 3,897,233), enforcement of regulations and standards on quality control of inputs, produce and products from the agricultural sector (KES 560,544), availing farm inputs such as certified seeds, fertilizer and other planting materials, such as cassava cutting or potato vines, to farmers (KES 726,655), development of programmes to intervene on soil and water management and conservation of the natural resource base for agriculture (KES 1.4 million), promotion of market access for agricultural products (KES 1.07 million), provision of infrastructure to promote agricultural production and marketing as well as agro-processing and value chains (KES 29 million), enhancing accessibility to affordable credit and insurance packages for farmers (KES 1.18 million), control of plant pests, diseases and noxious weeds that are specific to counties (KES 551,076), management of agricultural training centres and agricultural mechanization stations (KES 54 million), land development services such as construction of water pans for horticultural production for food security (KES 5.4 million), formulation and review of county specific policies (KES 1.28 million), developing and enacting legislation and regulatory frameworks for county specific policies (KES 1.6 million), implementing of national and county specific policies and legislation (KES 2.5 million)

Other activities and their costs are fish quality and safety assurance and routine inspection (KES 613,000), fish trade licensing and fish movement permits (KES 3.1 million), demarcation of fish breeding grounds (KES 3.5 million), county fish seed bulking units (KES 3.2 million), development and maintenance of fish landing stations, jetties and fish auction centres (KES 14 million), enforcement of fisheries regulations and compliance with management measures (KES 371,200), establishing fish hatcheries (KES 10 million), fisheries extension services (KES 2.4 million), fish stock assessment (KES 5 million), fish trade licensing and fish movement permits (KES 1.4 million), up scaling finfish culture (promoting aquaculture) (KES 16 million) and on farm trials (KES 534,130).

The costs of activities with human resource costs are field demonstrations for agriculture and livestock (KES 165,180), dipping and spraying operations for livestock (KES 113,02), vaccination campaign for livestock (per county) (KES 41 million), veterinary public health service (KES 17 million), extension services on herd health management and animal welfare issues (KES 1.85 million), artificial insemination service (KES 13 million), provision of livestock extension services (KES 31 million), development of animal welfare regulation KES (31 million), Livestock disease control (KES 102 million), livestock branding, identification and traceability (KES 2.5 million), development of local tanneries (KES 16 million). Average cost of human resources per county per region for fisheries is KES 11 million

Costing of the functions under the foreign affairs, foreign policy and international trade were based solely on the work done by the ministry which estimated the total requirements for the three financial years 2015/16, 2016/17 and 2017/18. The total annual requirements are foreign missions services at KES 13 billion, protocol and diplomatic services (KES 4.2 billion), capacity development and policy advisory services (KES 396 million), planning and administration services (KES 2.4 billion), parliamentary and county liaison services (KES 55 million), international trade and investment promotion (KES 3.7 billion). Total recurrent cost per is then KES 24 billion.

Unit costs of water technologies are provided for urban and rural areas. In the urban areas, bore hole source with chlorination costs KES 178 per m^3 (KES 0.8 per capita annually), river source slow sand filtration at KES 167 per m3 (KES 0.47 per capita annually), river source chlorination + rapid sand filtration + sedimentation for 10,000 population at KES 163 per m3 (KES 0.66 per capita annually), river source chlorination + rapid sand filtration + sedimentation for 20,000 population at KES 169 per m3 (KES 0.76 per capita annually), river source chlorination + rapid sand filtration + sedimentation for 100,000 population at KES 126 per m3 (KES 2.47 per capita annually), river source chlorination + rapid sand filtration + sedimentation for 400,000 population at KES 114 per m3 (KES 0.46 per capita annually), river source chlorination + rapid sand filtration + sedimentation for 1,000,000 population at KES 112 per m3 (0.46 per capita annually). In addition, Cost of urban sanitation technologies would cost KES 111,903 (KES 1119 investment cost per capita per year) for lined double pit VIP latrine, Ecosan at KES 299,672 (KES 2,997 investment cost per capita per year), septic tank with soak away at KES 261,739 (KES 2,617 investment cost per capita per year), 4-stance public latrine at KES 333,812 (KES 0.33 investment cost per capita per year), sewerage system KES 1,2 billion (KES 398 investment cost per capita per year).

The cost of rural water technologies are spring protection (KES 16,296 per m^3 or KES 0.76 per capita per year), rock catchment (KES 1.4 million per m^3 or (113 per capita per year), roof catchment1,333,466 (266), hand-dug up well with hand pump (KES 44,397 per m^3 or 30 per capita per year), bore hole with hand pump (KES 234,831 per m^3 or 51 per capita per year), sub-surface dam with HDW (KES 71,995 per m^3 or KES 3.5 per capita per year), sand-dam with standpipe (KES 398,454 per m^3 or 9 per capita per year), and piped system bore hole source (KES 240,902 per m^3 or 282 per capita per year)

The annual cost of operations for water, environment and natural sources at county level are estimated, for different components as human resources (KES 188 million), forestation (KES 21 million), biodiversity conservation (KES 237,000), wetland protection (KES 1 million), solid waste management and disposal (KES 95 million), noise pollution and excessive

vibration control (KES 311,600), air pollution control (KES 15 million), policy development (KES 1.5 million), and other operating costs KES 117 million).

At the national level, recurrent cost for water, environment and natural sources Environmental are KES 3.6 billion for policy management, KES 155 million for environmental governance, KES 2.5 billion national environment management, KES 5.2 billion for forests conservation and management, KES 1.3 billion for forestry research and development, KES 5.6 billion for wildlife security, national parks and reserves management, KES 2.4 billion for meteorological services, KES 6.5 billion for water and regional authorities.

The trend in expenditure over the past ten years shows steady increase generally across the sectors considered in this report.

The study was one of pioneering studies on cost of government functions. The study of this magnitude requires extensive data collections at the different levels of government. It requires the support of all the levels of government for successful implantation. A costing study is much easier in case where norms and standards are available. The norms and standards were not available for most of the functions that were included the study. The norms and standards were only available for health services, and road construction and maintenance.

The study used normative costing for most of the services It was revealed that normative costs of services far exceeded available resources in the country for the health services. For instance, the norms for human resources are very ambitious, resulting in huge resource requirements that the country may not afford in the short-term. Furthermore, the required resources for foreign affairs, water, environment and natural resources far exceed what has availed to these sectors.

The two approaches are activity based costing and top-down approach that relies on expenditure. It can be concluded the activity based approach, while it is more accurate in reflecting resources requirements, it requires adequate time.

SECTION 1: INTRODUCTION

1.1 Introduction

The central priority of the government is to provide basic services to all within the constraints of available resources. This is the objective set out in the Constitution of Kenya, 2010 (CoK) under the Bill of Rights and is a fundamental responsibility of the government. Responsibilities in respect to providing these basic services are shared between the county and the national government with each charged with fulfilling the assigned functions. However, providing these basic services is challenging because the need for social services is great and the current service levels and capacity to deliver effective services varies considerably across and within counties.

1.2 Devolution Context

Devolution is a political concept and device for involving lower-level units of government in policy decision-making and implementation on matters that affect those levels. Devolution thus entails transferring political, administrative, financial and legislative authority and functions from the national to sub national level units of government – with the powers of the constituent units mostly determined by either legislation, the constitution or by both. In a devolved political system, the sub national level units of government to which power, authority and responsibility have been transferred (devolved) are more or less autonomous from each other and also enjoy autonomy from the national level government. This means that they are not under any obligation to refer to or seek authority from the national level in order to make and/or implement decisions that fall within their jurisdiction. It further means that some functions are exclusive to each level of government. Each of these levels of government must, however, recognize that they are part of the larger state. This means that in practice, there must be some mechanisms that establish a relationship between the national government and sub national level units. Similarly, a mechanism that establishes a relationship between the national and sub national units, and among the sub national level units must also be put in place because some issues of public concern will cut across any one level of government and their efficient and effective performance will require the cooperation of the different levels of government.

Broadly, some standards for effective devolved government include autonomy and independence of sub-national units from the national government; legally recognized geographical boundaries; devolved power to local governments and the local people; political framework for the electoral process to facilitate direct participation of the people in governance and management of public affairs and in the elections of political leaders; public devolved services to the extent possible; and clearly defined chain of accountability. In addition, fiscal devolution should effectively assign expenditure and revenue responsibilities based on the principles of efficiency, cost effectiveness, equity and redistribution, subsidiarity, fiscal discipline, equitable share of available resources, accountability and promotion of internal common market.

The Constitution of Kenya 2010 establishes a devolved system of government which assigns sovereignty both vertically and horizontally by distributing power and resources between national and county governments. Article 1(4) of the Constitution assigns sovereignty at both the national and county levels of government. Article 6 on the other hand, provides for the division of Kenya into 47 Counties as provided in the First Schedule and defines the nature of the two levels of government including their responsibility to ensure access to services

throughout the country. It provides that national and county governments are distinct and interdependent and are to conduct their mutual relations on the basis of cooperation and consultation. Distinct implies that national and county governments are equal to each other; neither is subordinate to the other. They are both created by the constitution, and so neither level of government can abolish the other level of government. The two levels are also interdependent and are therefore called upon to make decisions in consideration of each other. This implies that intergovernmental mechanisms should provide for ongoing dialogue and continual consultation between the two levels of governmental. Kenya's devolution is therefore neither unitary nor federal but a combination of the two that requires unique institutions to execute. The Constitution therefore does not create a hierarchy of government but locations for the exercise of the delegated sovereignty of the People of Kenya. Article 6 therefore puts emphasis on functional distinctiveness and interdependence of both levels of Government. It also puts emphasis on mutual respect between the two levels of Government thereby creating a 'working' system that is mutually complementary and beneficial rather than one that is hierarchical and competitive in nature.

Article 174 of the Constitution of Kenya identifies the objects of devolved government as the promotion of democratic and accountable exercise of power; fostering of national unity by recognizing diversity; giving of powers of self-governance to the people and enhancing of the participation of the people in the exercise of the powers of the state and in making decisions affecting them; recognition of the right of communities to manage their own affairs and to further their development; protection and promotion of the interests and rights of minorities and marginalized communities; promotion of social and economic development and the provision of proximate, easily accessible services throughout Kenya; ensuring of equitable sharing of national and local resources throughout Kenya; the facilitation of the decentralization of state organs, their functions and services, from the capital of Kenya; and enhancement of checks and balances and the separation of powers. It is clear that the devolved system therefore not only brings government and resources closer to the people, but also gives powers and responsibilities to the them and their leaders at the county level in decision making and determining the direction they want to go in development and politics. The objects of devolution in Kenya are designed to redress historical inequalities and failures of the centralized government in Kenya.

The functions of national and county governments are addressed in Articles 186 and 187, and detailed in the Fourth Schedule of the Constitution of Kenya 2010. These are further elaborated in various devolution laws including The County Government Act 2012 (CGA 2012); The Urban Areas and Cities Act 2011 (UACA, 2011); The Intergovernmental Relations Act 2012 (IGRA 2012); The Transition to Devolved Government Act 2012 (TDGA 2012); and The Public Finance Management Act 2012 (PFM 2012). The functions are classified as exclusive functions which are assigned to one level of government, to the exclusion of the other level of government, concurrent functions which are conferred on more than one level of government, and residual functions which previously resided with national government and so remain so. A review of the functions as articulated in Fourth Schedule points to the fact that national government is largely assigned policy, regulatory, technical assistance and capacity building functions while county governments are mainly responsible for the service delivery. Where a function cannot be explicitly distinguished as exclusive or concurrent, it is classified as residual and therefore a national government function.

Article 187 allows for transfer of functions from one level of government to another. A function or power of government at one level may be transferred to a government at another

level by agreement between the governments if the function or power would be more effectively performed or exercised by the receiving government; and the transfer of the function is not prohibited by the legislation under which it is performed or exercised. Article 187 (2) also provides that if a function or power is transferred from a government at one level to a government at the other level then arrangements shall be put in place to ensure that the resources necessary for the performance of the function or exercise of the power are transferred in line with the principle of 'funds must follow and match functions.' This invariably requires clear linkages between assigned functions, planning, budgeting, revenue generation and resource allocation at either level of government. Article 220 of the Constitution lays down the principle of common content for national and county level structure of the budget and development plans.

Implementation of the devolved government system so far had exposed a number of practical and inherent risks and challenges key of which include functional overlaps and responsibility conflicts between the county and national governments; structural overlaps between national and county governments; management of cross county planning and service delivery; inadequate human resource and institutional capacity in counties to execute their mandates; political resistance to devolution commonly exhibited in delays in transfer of funds by the national government to the counties; weak sources of revenue and low economic viability of devolved units; weak planning and budgeting capacity; inefficiency due to poor administrative structures; weak accountability systems, corruption and cronyism; and elite capture. Devolved government systems may also serve to further alienate marginalised communities and to re-centralise power at the local level thereby undermining democratic representation and citizen participation in devolved government structures.

1.3 Rationale for the Costing of Functions

The Constitution of Kenya 2010 stipulates that the national and county governments have the responsibility of providing services to the people of Kenya. These services make tremendous contribution to the quality of life of the citizens which translates to their socioeconomic well-being. Citizens demand services in equal measure be it Health, Education, Security amongst others without taking into account the cost of delivering the services. However, concerns over the quantity and quality of service delivery and production have been a challenge. The service delivery challenges are as a result of lack of fiscal space experienced by the governments. This makes it hard for governments to maintain the current level of services amidst increasing population. The lack of fiscal space have forced both the national and county governments to seek other ways of increasing revenues including; increasing the tax base, new revenue sources, and reduction and elimination of unnecessary expenditures and including alternative ways to deliver public services.

One of the major causes of increases in government spending is how the public demand for government services is expressed imperfectly through the political institutions. This is because in most cases the political processes and systems are used to determine the extent of demand for government goods and services. This therefore means that the demand for government services and goods is not well transmitted and informed through the political process. Unlike in the private markets where the individuals are fully aware of the cost of a particular good or service, the cost of public services or goods is at times very difficult to ascertain in the public sector.

It is against this background of lack of fiscal space that has forced governments to analyze and evaluate their expenditures on the services being delivered and determine the costs of functions and services delivered. The costing of these public services and goods have assisted governments to better understand the actual service delivery costs, which services could be outsourced through public private partnerships or which ones to be eliminated.

In Kenya, allocation of resources to different sectors, over the years, has been influenced by historical expenditure and resource envelope at the time. Using the historical expenditure approach, ministries are allocated increasing budget based on then previous expenditure but adjusted for increase in government budget every year. The allocations have never been based on actual costs of the services provided by government. Worst, the allocation of the funds to the county level is also not informed by the costs of the services delivered by the county governments. Article 187 (2) provides that if a function or power is transferred from a government at one level to a government at the other level, then arrangements shall be put in place to ensure that the resources necessary for the performance of the function or exercise of the power are transferred in line with the 'finance follows functions ' principle. Costing of functions is then a necessary condition for fair allocation of resources. This will ensure that there is no mismatch between the resources and service delivery on responsibilities assigned to the county and national governments hence improvement in service delivery.

Moreover, costing of the functions for both the levels of government will help the governments analyze the efficiency of their services, make budget decisions, set fees for services and determining intergovernmental charges, and choose among alternative methods of providing services, such as contracting or regionalization.

1.4 Objectives of the Costing Assignment

In order to undertake costing of the government ministries and state departments, the primary objective of this assignment is to determine the realistic quantum or proportion of funds and other resources necessary for the performance of the functions assigned to the National and County Governments. This will ensure that there is no mismatch between the resources and service delivery on responsibilities assigned to the county and national governments hence improvement in service delivery. However the specific objectives are:

a) To review all relevant documentation and reports;
b) To generate clear definitions of functions to be costed
c) To provide detailed description of services and products to be costed
d) To generate and specify sector-wide norms and minimum standards for delivery of functions.
e) To develop a rank of all the services provided by both levels of government so as to identify areas of double expenditure.
f) to collect historical data sets with both national and county governments characteristics and itemized expenditures for the past (10) years
g) To use both the county and national government functions in defining their cost structures. This will involve identification of costs that will entail listing of the likely resource effects of providing the service or intervention as comprehensively as possible from the perspective of the expert. The costs to be considered are direct indirect, fixed, variable, stepped and controllable and uncontrollable cost
h) To identify and classify resource items/ elements of service costs that will include: human resources, goods and services (equipment, disposables, pharmaceuticals, diagnostics); fittings, fixtures and equipment (office furniture, computer hardware and

software); buildings; land; accommodation expenses; administration/management (printing, posting, rents, security, cleaning, utilities, Information Technology services, repairs and renewals); environment [extreme climatic conditions]; acceptability of the service; terrain; population [population density, age structure, and people with special needs]; peace, governance and security.

i) To collect both quantitative and qualitative data from all key stakeholders and development partners using triangulation method.
j) To quantify the resources used in providing the particular service (units of service). Costs should be measured in relevant physical units such as hours of staff time, quantity of medication, equipment usage and number of patients being treated.
k) To cost services by placing monetary value on the resources (items/goods, activities and/ or services) using Target Based, Standard, Equivalence Costing Approach [TBSECA].

1.5 Review of Literature on Costing

Costing concepts

According to Theodore (2009), cost can be an elusive concept if not properly defined. For an accountant, it translates into the financial value of producing a good or service; for a consumer, it is the price paid for a good or service and for the economist it refers to the opportunity cost or the value of the next best alternative. Therefore, depending on its ultimate use and purpose, the cost of a good or service can vary as different cost concepts and costing methodologies are applied.

One may sometimes be tempted to use the terms expenditure and cost interchangeably. However, whilst this may be acceptable in certain cases, it is often misleading. For instance, health expenditure refers to the amount of financial resources spent on health goods and services and therefore does not necessarily represent the cost of production (Theodore, 2009).

Cost can be distinguished as either financial or economic. Financial cost is a measure of the amount of money spent on a resource on a programme. Economic cost refers to the entire cost borne by all of society and as such is based on the concept of opportunity cost. Opportunity cost in turn is defined as the value of the next best forgone alternative use for a resource. For example a volunteer community health worker may provide her services free of charge, but she places an opportunity cost on society. She could have spent this time tending crops—the value of this output would represent the opportunity cost of her voluntary community health work. If this volunteer were to become a refugee, then the possibility of cultivating land would no longer exist and the opportunity cost of her voluntary work would fall. Economic costs comprise prices paid for inputs, plus donations (including donations in kind such as volunteer time) and subsidies. If there is no market price for an input in a given situation, an imputed price can be used (WHO, 2003).

Programme costs can be analysed from a number of perspectives. It is important to understand the perspective from which a particular cost analysis is being undertaken, because different perspectives include different items. The broadest perspective is the societal perspective. This incorporates all costs borne by all parties in a programme: beneficiaries, and their families, donors, government, the private sector, and any other group that is incurring any of the costs of the programme (Theodore, 2009). Other perspectives are provider and consumer/client/beneficiary.

A cost object is any input, component, activity, output or other item for which a separate measurement of cost is desired. Cost objects are usually selected to help in decision-making. Thus, a cost object can be anything from a department to an activity. Cost drivers are directly related to cost objects. A cost driver is any factor, a change in which brings about a change in the level of cost of a cost object (Theodore, 2009). The drivers are the different components of the costs.

That is, direct costs refer to those costs that can be easily identified with the production of a good or service. Indirect costs, as implied, refer to those costs which, although generated from the production process, cannot be easily directly linked to the production of a particular good or service.

A fixed cost is one which remains constant in the short run, despite changes in a cost driver. A fixed cost is fixed over some range of the cost driver. This is called the relevant range and it is usually relatively wide. A variable cost is one which varies with a cost driver in the short run.

A full cost analysis looks at all of the costs associated with a programme. An incremental cost analysis for a programme or project will only consider the costs associated with adding the project or programme to ongoing activities. Therefore many types of overhead costs such as administration, land and buildings may not enter into an incremental cost analysis where pre-existing resources are shared with the new project or programme. Marginal cost is the cost associated with adding one more unit of output of a programme. This differs from incremental cost in that the latter relates to an entire programme or project (such as a new public diabetes testing drive) whereas marginal cost is concerned with one more unit of output of an already- existing programme or project.

Costing techniques/methods

The **Step-down allocation** employs a technique through which input costs of support or indirect services are transferred across the range of direct or final services/cost centres. This enables the determination of the full and average costs of service outputs. One of the key assumptions of the Step-down Methodology is that expenditure is a proxy for cost. Essentially, we assume that these budgets reflect the ideal resource to service mix and adequately indicate the true cost of the inputs. In attempting to arrive at the nearest 'true' cost, whilst using what is essentially accounting based technique, it may be prudent to make adjustments to the actual reported expenditure for any given year.

The **Bottom-up approach** referred to as **micro-costing** is contrasted with the top-down approach, as costs are computed from the levels of individual, departments or focus areas, and then extrapolated to the population which is being targeted by the health care programme. In some cases, costs are derived through a sample survey, where questionnaires concerning the costs of services and treatment are completed by health care personnel. Major steps in the bottom-up approach may include identification of activities which have a cause-and-effect relationship with the service for which costs are to be calculated, detailed description of the elements of the particular activity, monetary measurement of quantities of each element associated with the implementation of the activity, identification of unit costs of the elements, and allocating fixed costs/ overheads. This approach tends to be more accurate, as the exact expenses associated with all the resources in the care or a particular patient

enduring a specific medical condition can be generated on the basis of precise clinical cost recording systems. This suggests that data is gathered from primary sources.

Activity Based Costing Activity Based Costing (ABC) is a bottom up approach in which the fundamental cost objects are activities. The costs of these activities are then assigned to other cost objects such as services, regions or patient groups. Costs are assigned in two stages under ABC: from resources to activities and then from activities to output related cost objects

Marginal Costing is based on the identification of variable and fixed costs of initiating a project or programme, whereby any additional costs accrued from implementing a new segment of the programme, known as marginal costs, are measured. These marginal costs of the last unit produced then act as a basis on which decisions are made to proceed with the project, completely shelve it, or make alterations which must then undergo marginal costing assessment. Marginal costs are thus the summation of the variable costs of direct labour, direct material, direct expenses, and variable overheads. Marginal costing is thus not an approach to costing but rather a technique which allows the costs of any new components of a programme to be separated, through which decisions critical to budget constraints, can be made.

SECTION 2: METHODOLOGY

2.1 The Research Design

This study utilized two research designs. These were cross-sectional design and longitudinal design. A cross-sectional study measured the relationship of variables at a specified time, either to describe the incidence of a phenomenon or how variables were related. In the cross-sectional design, a survey of all the 20 County Governments and the National Government was carried out. In the longitudinal design-, time series data on expenditure by selected departments and ministries, over a period of 10 years, were collected. This allowed measurement of change in expenditure and its components over time.

The research approaches adopted were both qualitative and quantitative. Quantitative approach entailed collecting numerical data on the expenditures and outputs during the past years as well as current fiscal year budgets by the sample of department and ministries considered in study. In addition inputs in service delivery and implementation of activities were collected. The quantitative approach encompassed both the longitudinal design and cross-sectional design. The qualitative approach was employed to collect non-numerical data on type of services and activities are undertaken by the ministries at both national and county levels. Additionally, norms and standards in service delivery were obtained as part of qualitative data for some functions.

2.2 Costing Approaches

The study adopted the two approaches that are used in costing studies. These are micro costing (bottom-up approach) and gross costing (top-down approach). Top-down costing involved disaggregating total expenditure to units of services for each ministry at county and national levels. This was accomplished by allocating expenditure to "cost centres" (units of service activity), determining the amount of units of service per cost centre, and finally allocating costs to units of service.

In micro-costing or bottom-up, detailed service delivery process were established (identified) and all the relevant resource items identified and measured separately. All the inputs to provide a unit of service were costed. This approach was used to cost health services, road construction and maintenance, activities for agriculture, livestock and fisheries, and water services. For instance, the drugs and supplies to provide a given health service to one patient or person were quantified and the cost determined by placing monetary value on these quantities using price list from KEMSA. In costing activities agriculture, livestock and fisheries services, actual budget items and their cost prices were considered. Furthermore, detailed activities for road construction and their prices were obtained for costing the construction of a KM of a road.

In the top-down, approach expenditure for the financial year 2014/13 and budgets for 2014/15 were used to estimate cost for broad categories of services. This approach was applied to foreign affairs, foreign policy and international trade as well environment and natural resources.

Lastly, analysis was carried for expenditure data over a period of 10 years. The analysis entailed examining the trends and growth of expenditure per relevant ministry over time.

2.3 Broad Functions for Costing

The following section presents broad government functions that were costed.

- Health
- Transport;
- Infrastructure;
- Agriculture;
- Livestock;
- Fisheries;
- Foreign affairs, foreign policy and international trade; environment and natural resources;
- Water and sanitation.

2.4 Population and Sampling

The population of interest were the ministries and departments at both national and county levels. This notwithstanding, a sample of the counties based on representation from each region and poverty rate and national level was selected (Table 2.1).

Table 2.1: Sample included in the study

Serial number	National and County Governments
1	National
2	Nyeri
3	Muranga
4	Mombasa
5	Lamu
6	Kitui
7	Makueni
8	Meru
9	Marsabit
10	Garissa
11	Mandera
12	Nairobi
13	Kisumu
14	Kisii
15	Homa Bay
16	Bomet
17	Turkana
18	Uasin Gishu
19	Nakuru
20	Kakamega
21	Bungoma

2.5 Data Collection and Sources

Both primary and secondary data were collected in order to cost the services at the selected ministries. The consultants and research assistants made field visits to the selected counties and national levels to obtain the secondary and primary data required for costing analysis. The consultants employed the following methods to obtain data:

Desk Review: The sectors' expenditure data over 10 years were collected to inform both expenditure reviews, top-down costing and to some extent bottom-up costing. Data sources were the National Treasury, respective ministries at the county and national level.

In-depth Interviews: In-depth interviews and discussions were held with relevant key informants from the selected ministries and departments. The interviews revealed issues around types of services for costing and activities that make up the services at both national and county levels.

D**ata collection instruments:** in line with these data collection techniques, secondary data collection fact sheet, and interview schedule were developed. The fact sheet captured historical expenditure and services outputs while the guides were used to obtain qualitative data on services, standards and norms.

The data collected included the following:

- List of services under each government function;
- List of activities for each type of service;
- Type of inputs required for each activity and service;
- Unit costs of services;
- Norms and standards in service delivery;
- Detailed expenditure data for the period for the last 10 years in terms of the following:
    - Staff (employees): direct employee expenses – salaries, employer's National Insurance contribution, employer's retirement benefit cost, agency staff and employee expenses, indirect employee expenses – relocation, interview, training, advertising, severance payments and employee-related schemes, contributions to employee-related provisions;
    - Premises-related expenditure: Repairs, alterations and maintenance of buildings, energy costs, rents, rates, water services, fixtures and fittings;
    - Transport-related expenditure: direct transport costs (repairs and maintenance, running costs and contributions to provisions), recharges for vehicles hired from a central pool, contract hire and operating leases, public transport (staff travelling expenses), transport insurances, car allowances and contributions to transport-related provisions.;
    - Supplies and services: Equipment, furniture and materials (all items used in the operation or administration of the service, unless specifically contained in another subgroup, catering, clothes, uniform and laundry, printing, stationery and general office expenses, services (expenditure on services not otherwise distinguished in the standard classification, communications and computing (includes postage, telephones, radio and computer costs. Operational leases and charges for central computing facilities), expenses, grants and subscriptions etc.

2.6 Data Quality Control

The quality assurance was done based on a number of ways including:

- Obtaining data on prices for drugs, and medical supplies from KEMSA;
- Discussing the units cost with relevant departments and ministries;
- Reviewing unit costs with the technical team consisting of representatives from all the concerned ministries.

2.7 Data Analysis

The quantitative data collected were entered using Excel programme. The costing of norms and standards was also done using the Excel. The data analysis was carried out in five steps. In step one, the inputs to provide a unit of service were identified based on norms and standards. In step two, the inputs to provide one unit of service was quantified. In step three, the inputs were valued in Kenya shillings. In step four, a total unit cost was determined based on both top-down and bottom-up methods. Lastly, in step five, the total cost of service or function was estimated using expenditure where it was not possible to carry out activity-based costing.

2.8 Limitations of the Study

The study did not consider costs of capital investments that are undertaken by government entities. This was partly because there were no norms and standards for such investment. Such investments are carried out in periodically and are not recurrent. Additionally, for some government functions, depreciation costs were not determined. The norms for equipment and fixed assets were not available. The Ministry of Health's norms and standards for service delivery, however, were clear about norms for equipment and hence costing included replacement value for the equipment at different levels of care. Furthermore, the study included cost of maintenance of building and equipment in place of depreciation.

The study adopted a combination of unit costing and total costing, and therefore for some services, total cost per service is not available. Lastly, the perspective of costing was that of government and therefore payment to third parties as indicated in TOR was not relevant, as this a payment activity and not a cost activity.

SECTION 3: HISTORICAL EXPENDITURE ANALYSIS

The historical expenditures of the different sectors or ministries are presented in the following tables. Table 3.1 presents the historical expenditure of the Ministry of Health.

Table 3.1: Historical expenditure for the Ministry of Health

FISCAL YEAR	EXPENDITURE (KES)					
	RECURRENT	Growth (%)	DEVELOPMENT	Growth (%)	TOTAL	Growth (%)
2003/2004	15,489,355,193	-	1,331,062,394	-	16,820,417,587	-
2004/2005	17,478,792,050	13%	1,993,834,893	50%	19,472,626,943	16%
2005/2006	19,791,228,059	13%	3,211,724,07	61%	23,002,952,131	18%
2006/2007	21,600,448,764	9%	8,615,724,633	168%	30,216,173,397	31%
2007/2008	22,968,819,979	6%	3,160,877,894	-63%	26,129,697,873	-14%
2008/2009	27,176,654,245	18%	7,907,580,291	150%	35,084,234,536	34%
2009/2010	30,424,409,174	12%	11,465,199,402	45%	41,889,608,576	19%
2010/2011	33,185,459,849	9%	19,307,925,829	68%	52,493,385,678	25%
2011/2012	27,704,500,000	-17%	23,951,241,435	24%	51,655,741,435	-2%
2012/2013	59,987,756,788	117%	37,653,000,000.	57%	97,640,756,788	89%
2013/2014	64,706,391,450	8%	43,397,441,401	15%	108,103,832,851	11%
	340,513,815,551.	-	161,995,612,244	-	502,509,427,795	

Table 3.1 reveals that the development expenditures have been growing at a higher rate than their recurrent counterpart with the exception of fiscal year 2012/13, where recurrent expenditure doubled by growing at a rate of 117%. Development expenditures grew by 168% in 2006/07 fiscal year, which was the year that development expenditures increased significantly. However, in fiscal years 2011/12 and 2013/14, the recurrent expenditure shrank by 17% and 60% respectively. The average growth rate for recurrent expenditure for the period was 12%. As for the development expenditures, the growth rates have been higher compared to the recurrent expenditures with an average of 52%. In fiscal years 2007/08 and 2013/14, the development expenditure shrank by 63% and 38% respectively. This could be attributed to the elections in the respective years. The average growth rate of the total expenditures of the Ministry of Health was 17%.

The historical expenditures of the Ministry of Foreign Affairs and International Trade are presented in Table 3.2.

Table 3.2: Historical expenditure for the Ministry of Foreign Affairs and International Trade

FISCAL YEAR	EXPENDITURE (KES)					
	RECURRENT	Growth (%)	DEVELOPMENT	Growth (%)	TOTAL	Growth (%)
2003/2004	5,397,602,145.00		94,157,467.00		5,491,759,612.00	
2004/2005	6,693,979,537.35	24%	26,019,023.85	-72%	6,719,998,561.20	22%
2005/2006	7,226,820,962.50	8%	79,219,289.65	204%	7,306,040,252.15	9%
2006/2007	6,951,648,464.60	-4%	681,488,898.85	760%	7,633,137,363.45	4%
2007/2008	6,991,401,497.85	1%	823,083,128.95	21%	7,814,484,626.80	2%
2008/2009	8,076,220,573.95	16%	2,595,268,367.50	215%	10,671,488,941.45	37%
2009/2010	7,779,102,820.00	-4%	495,225,100.00	-81%	8,274,327,920.00	-22%
2010/2011	8,952,984,236.00	15%	339,412,220.00	-31%	9,292,396,456.00	12%
2011/2012	9,996,000,000.00	12%	771,000,000.00	127%	10,767,000,000.00	16%
2012/2013	11,143,903,617.00	11%	445,000,000.00	-42%	11,588,903,617.00	8%
2013/2014	12,267,528,598.00	10%	341,513,852.00	-23%	12,609,042,450.00	9%
2014/2015	13,414,814,217.00	9%	1,625,700,000.00	376%	15,040,514,217.00	19%
	104,892,006,669		**8,317,087,347.80**		**113,209,094,017**	

The table shows that the development expenditures have been growing at a higher rate than their recurrent counterpart in all the fiscal years. The average rate of growth of recurrent expenditures is 9% while that of development expenditures is 132%. In financial years 2006/07 and 2009/10, the recurrent expenditure shrank by 4% each. The growth in the recurrent expenditure was the highest in 2004/05 at 24%. On the hand, development expenditures increased by the largest proportion in 2006/07 at 760%. Compared to the Ministry of Health, the average growth in total expenditure is lower at 11%.

Table 3.3 presents the historical expenditure for the Ministry of Agriculture.

Table 3.3: Historical expenditure for the Ministry of Agriculture

FISCAL YEAR	EXPENDITURE (KES)					
	RECURRENT	Growth (%)	DEVELOPMENT	Growth (%)	TOTAL	Growth (%)
2003/2004	3,394,266,889.84	-	3,598,441,904.75	-	6,992,708,795	-
2004/2005	3,978,615,128.90	17%	2,339,318,441.04	-35%	6,317,933,570	-10%
2005/2006	5,537,312,259.14	39%	2,943,753,514.03	26%	8,481,065,773	34%
2006/2007	7,028,588,096.63	27%	4,359,393,367.02	48%	11,387,981,463	34%
2007/2008	9,621,683,988.28	37%	4,732,412,737.58	9%	14,354,096,726	26%
2008/2009	7,647,760,807.34	-21%	6,665,402,668.62	41%	14,313,163,476	0%
2009/2010	8,080,216,665.00	6%	5,648,869,211.00	-15%	13,729,085,876	-4%
2010/2011	8,558,312,269.00	6%	9,504,578,402.00	68%	18,062,890,671	32%
2011/2012	8,377,471,760.00	-2%	9,210,786,951.00	-3%	17,588,258,711	-3%
2012/2013	9,285,634,797.00	11%	-	-	9,285,634,797	-47%
2013/2014	12,669,907,724.00	36%	33,316,177,849.00	-	45,986,085,573	395%
2014/2015	9,965,995,200.00	-21%	29,119,054,851.00	-13%	39,085,050,051	-15%
	94,145,765,585	-	**111,438,189,897**	-	**205,583,955,482**	

N/B: Figures for the financial years 2013/2014 and 2014/2015 include that of the former ministries of Fisheries and Livestock development.

The table shows that development expenditures have been growing at a slightly higher rate than the recurrent expenditures, which is an exception compared to Ministry of Health and Foreign Affairs and International Trade. The recurrent expenditures increased by the largest proportion in 2007/08 at 37%. The increase in the year 2013/14 was also close with 36%. The average growth rate for recurrent and development expenditures was 12% and 14% respectively. As for the total health expenditures, they grew by the highest proportion in fiscal year 2013/14 by 395%, and this was attributed to the fact that there was no development allocation in 2012/13, where in 2014/15, they got an allocation of 33,316,177,849.00. In fiscal years 2008/09, 2011/12 and 2014/15, the recurrent expenditure shrank by 21%, 2% and 21% respectively.

Table 3.4 presents the expenditure for the Ministry of Fisheries and Livestock between fiscal years 2003/04 and 2012/13.

Table 3.4: Historical expenditure for the Ministry of Fisheries and Livestock Development

FISCAL YEAR	EXPENDITURE (KES)					
	RECURRENT	Growth (%)	DEVELOPMENT	Growth (%)	TOTAL	Growth (%)
2003/2004	2,469,774,966.30		355,799,533.80		2,825,574,500.10	
2004/2005	2,397,292,179.85	-3%	560,100,296.10	57%	2,957,392,475.95	5%
2005/2006	2,611,152,321.40	9%	742,922,133.05	33%	3,354,074,454.45	13%
2006/2007	3,213,488,725.71	23%	1,345,431,780.25	81%	4,558,920,505.96	36%
2007/2008	3,282,567,942.93	2%	1,062,410,024.60	-21%	4,344,977,967.53	-5%
2008/2009	4,340,817,354.38	32%	2,333,092,624.51	120%	6,673,909,978.89	54%
2009/2010	5,919,863,714.00	36%	2,304,089,198.00	-1%	8,223,952,912.00	23%
2010/2011	4,608,106,311.00	-22%	5,722,166,348.00	148%	10,330,272,659.00	26%
2011/2012	7,302,981,698.00	58%	2,994,830,381.00	-48%	10,297,812,079.00	0%
2012/2013	5,853,185,782.00	-20%	4,414,971,426.00	47%	10,268,157,208.00	0%
	41,999,230,995	-	**21,835,813,745**	-	**63,835,044,741**	

The recurrent expenditures grew by the highest rate in 2011/12 at 58% and decreased by the lowest rate in 2010/11 at -22%. As for the development expenditure, the highest rate of growth was witnessed in 2010/11 at 148%, while the lowest growth rate was at -48% in 2011/12. On average, recurrent expenditures have grown by 13% and development expenditures by 46% over the period of analysis. Growth in development expenditures always shows that there is an increase in capital expenditures, whereas growth in recurrent expenditures shows that either there is an increase in the number of workers or salaries and wages have been increased. On average, total expenditures increased by 17%.

Table 3.4 presents the expenditures for the Ministry of Transport and Infrastructure from 2003/04 to 2014/15.

Table 3.4: Historical expenditures for the Ministry of Transport and Infrastructure

FISCAL YEAR	EXPENDITURE (KES)					
	RECURRENT	Growth (%)	DEVELOPMENT	Growth (%)	TOTAL	Growth (%)
2003/2004	19,435,896,172.13		5,435,238,334.30		24,871,134,506.43	
2004/2005	22,713,693,332.72	17%	8,218,174,965.70	51%	30,931,868,298.42	24%
2005/2006	23,760,426,673.15	5%	18,822,092,912.68	129%	42,582,519,585.83	38%
2006/2007	5,372,176,970.35	-77%	4,783,507,322.35	-75%	10,155,684,292.70	-76%
2007/2008	40,079,556,120.65	646%	34,932,285,963.91	630%	75,011,842,084.56	639%
2008/2009	5,154,094,442.00	-87%	2,176,257,355.60	-94%	7,330,351,797.60	-90%
2009/2010	45,735,883,229.00	787%	46,434,875,082.00	2034%	92,170,758,311.00	1157%
2010/2011	45,963,941,701.60	0%	63,729,069,304.40	37%	109,693,011,006.00	19%
2011/2012	3,230,846,213.00	-93%	36,661,616,136.00	-42%	39,892,462,349.00	-64%
2012/2013	38,507,379,084.00	1092%	99,121,080,880.00	170%	137,628,459,964.00	245%
2013/2014	32,026,749,454.00	-17%	102,475,855,704.00	3%	134,502,605,158.00	-2%
2014/2015	31,605,001,300.00	-1%	181,869,972,246.00	77%	213,474,973,546.00	59%
	313,585,644,693	-	604,660,026,207	-	918,245,670,900	

1. *Figures of the years 2006/2007 and 2008/2009 does not include actual expenditures for the ministry of roads and public works.*
2. *Figures for 2011/2012 do not include actual expenditures for ministry of transport.*

The average growth of recurrent, development and total expenditures was 207%, 266%, and 177% respectively. Development expenditures grew the fastest over the period of analysis, with the highest growth occurring in 2009/10 at 2034%. This was attributed to an increase from 2,176,256,355.60 (2008/09) to 46,434,875,082.00 (2009/10), which accounted for this high proportion. As for the recurrent expenditures, the highest increases occurred in 2012/13, 2009/10 and 2007/08. However, reductions in expenditures reduced by 93% in 2011/12.

The expenditures for the Ministry of Water and Natural Resources are presented in Table 3.5 for the period 2003/04 to 2013/14.

Table 3.5: Historical expenditure for the Ministry of Water and Natural Resources

FISCAL YEAR	EXPENDITURE (KES)					
	RECURRENT	Growth (%)	DEVELOPMENT	Growth (%)	TOTAL	Growth (%)
2003/2004	4,538,559,016		5,073,299,670		9,611,858,686	
2004/2005	4,461,953,952	-2%	5,416,468,131	7%	9,878,422,083	3%
2005/2006	4,770,900,470	7%	5,473,491,501	1%	10,244,391,971	4%
2006/2007	3,222,275,613	-32%	8,989,241,411	64%	12,211,517,024	19%
2007/2008	4,432,930,965	38%	13,408,896,670	49%	17,841,827,635	46%
2008/2009	5,524,832,963	25%	20,943,550,441	56%	26,468,383,404	48%
2009/2010	6,774,947,297	23%	24,350,008,266	16%	31,124,955,563	18%
2010/2011	10,278,505,403	52%	30,915,264,658	27%	41,193,770,061	32%
2011/2012	3,783,945,532	-63%	18,206,889,666	-41%	21,990,835,198	-47%
2012/2013	9,341,618,764	147%	-		9,341,618,764	-58%
2013/2014	13,463,561,952	44%	32,941,623,206		46,405,185,158	397%
2014/2015	15,341,084,454	14%	41,732,039,316	27%	57,073,123,770	23%
	85,935,116,381		207,450,772,936		293,385,889,317	

The highest increase in recurrent expenditure was witnessed in 2012/13 at 147%, with decreases in 2004/05 (-2%), 2006/07 (-32%) and 2011/12 (-63%). The highest increase in development expenditure was in 2006/07 at 64%, with the highest decrease occurring in 2011/12 at 41%. The average increase in recurrent, development and total expenditures was 23%, 23% and 44% respectively.

The expenditure analysis in this section does not provide evidence of consistent expenditure growth over the years. It seems that the allocations of the funds were not based on actual cost of services but other consideration including available funds. The analysis, in general, did not inform costing of activities since the expenditure data were aggregated.

SECTION 4: COSTING RESULTS

4.1 Introduction to Costing Results

This section presents costing of functions in the following order: health, transport and infrastructure, agriculture, livestock, fisheries foreign affairs, foreign policy and international trade, water and natural resources.

4.2 Costing Results of Health Functions

4.2.1 Health Functions According To CoK

According to Schedule 4 of the Kenya Constitution 2010, the national government function with respect to health services is given as health policy. However, cross-cutting function in terms of capacity building and technical assistance to the counties also applies to the health function at the national level.

4.2.2 Unbundled Health Functions for National Government

The health functions have been unbundled further by the Transition Authority (TA, 2015). The unbundled functions for the national government are health services offered at the following institutions:

a) Kenyatta National Hospital (KNH);
b) Moi Teaching and Referral Hospital(MT&RH);
c) Kenya Medical Training College (KMTC);
d) Kenya Medical Supplies Agency (KEMSA);
e) National Hospital Insurance Fund(NHIF);
f) National Quality Control Laboratory (NQCL);
g) National Blood Transfusion Services;
h) Pharmacy and Poisons Board;
i) National Public Health Laboratory;
j) Government Chemist;
k) Radiation Protection Board;
l) Kenya Medical Research Institute (KEMRI);
m) Mathari Mental Health Hospital;
n) Spinal Injury Hospital;

In addition, the health functions at national level include provision of stewardship in policy development (including policy formulation, analysis, national surveillance, monitoring, evaluation and review); developing national strategies, developing norms and standards, regulation of health services.

4.2.3 Unbundled Health Functions for County Governments

The unbundled functions for the county government are county health facilities and pharmacies including:

a) County health facilities and pharmacies including:-

- County health facilities including county and sub-county hospitals, rural health centres, dispensaries, rural health training and demonstration centres. Rehabilitation and maintenance of county health facilities including maintenance of vehicles,

medical equipment and machinery. Inspection and licensing of medical premises including reporting

- County health pharmacies includes specifications, quantification, storage distribution, dispensing and rational use of medical commodities:

b) Ambulance services includes emergency response and patient referral system;
c) Promotion of primary health care which entails health education, health promotion, community health services, reproductive health, child health, tuberculosis, HIV, malaria, school health program, environmental health, maternal health care, immunization, disease surveillance, outreach services, referral, nutrition, occupational safety, food and water quality and safety, disease screening, hygiene and sanitation, disease prevention and control, ophthalmic services, clinical services, rehabilitation, mental health, laboratory services, oral health, disaster preparedness and disease outbreak services. Planning and monitoring, health information system (data collection, collation, analysis and reporting), supportive supervision, patient and health facility records and inventories;
d) Licensing and control of undertakings that sell food to the public including food safety and control;
e) Veterinary services to carry out, coordinate and oversee veterinary services including clinical services, artificial insemination, and reproductive health management; but excluding regulation of the profession; and
f) Enforcement of waste management policies, standards and regulations; in particular- refuse removal (Garbage) including, provision of waste collection bins, segregation of waste at source, licensing of waste transportation; refuse dumps including zoning waste operational areas, conducting environmental impact assessment for the sitting of dumps, fencing of dumps, controlling fires, monitoring waste characteristics and monitoring of waste water from the dumpsite (leachate); and solid waste disposal including enforcement of national waste management policies, standards and laws with respect to land filling , incineration with energy recovery, compositing, recycling and operation of transfer stations.

According to TA (2015), the unbundled concurrent functions are:

a) Health financing (resource mobilization, policy and regulation;
b) Financial management; planning and budgeting;
c) Quarantine administration;
d) Disease prevention & control (policy & coordination), including surveillance;
e) Partnerships, including public and private; intergovernmental relations;
f) Procurement of health products and technologies;
g) HRH management and development;
h) Monitoring and evaluation;
i) Health research (regulation and implementation);
j) Health information systems.

4.2.4 Norms and Standards for Health Services

The service delivery norms and standards developed by the Ministry of Health (MOH, 2014) informed the costing of the health functions. The norms in terms of the population served by level of facilities are given as 5,000 for community level (level 1), 10,000 for dispensary (level 2), 30,000 for health centre (level 3), 100,000 for county hospital (level 4), 1,000,000 for county referral hospital (level 5), and 5,000,000 for national referral hospital (level 6). The distribution of human resources according to the norms is given in Appendix 1. The standards for treatment and management of common health conditions are derived from

Clinical Management and Referral Guidelines Volume I (Republic of Kenya, 2009a), Clinical Management and Referral Guidelines Volume II (Republic of Kenya, 2009b), and Clinical Management and Referral Guidelines Volume III (Republic of Kenya, 2009c).

4.2.5 Costs of Health Functions at National Level

Table 4.1 shows the estimated cost of health services at facilities assigned to the national level.

Table 4.1: Costs of services at health facilities at national level

Facility	Human resources (KES)	Operations and maintenance (O&M) (KES)	Annual Training (KES)	Total (KES)
Port Health	46,823,592	31,536,819	10,573,333	88,933,745
Spinal Injury Hospital	149,451,955	90,862,819	6,506,667	246,821,441
Mathari Mental Health Hospital	976,520,277	178,935,000	91,662,667	1,247,117,944
Moi Teaching and Referral Hospital (MT&RH)	4,400,476,867	2,129,772,776	144,851,778	6,675,101,421
Kenyatta National Hospital (KNH)	8,925,144,000	4,811,620,079	214,458,222	13,951,222,301
Total	**14,498,416,691**	**7,242,727,493**	**468,052,667**	**22,209,196,852**

Table 4.1 shows health service provision at national level costs about KES 22.21 billion annually. The highest cost is borne by Kenyatta National Hospital followed by Moi Teaching and Referral Hospital, and Mathari Mental Health Hospital. The cost of operations and maintenance include overhead costs, drugs and supplies, maintenance of building, vehicles, and equipment among other running costs. The costs shown in Table 4.1 were mainly based expenditure for the period 2014/15.

The costs of other national functions are shown in Table 4.2. Table 4.2 shows that the costs of other functions of the national government are huge, estimated at about KES 21 billion. As shown, human resources constitute a larger portion of the costs of these functions. Kenya Medical Research Institute will accounts for about KES 8.2 billion followed by Kenya Medical Training College at about KES 7.5 billion. The expenditure from the previous financial year were used to proxy the costs of these functions. The estimated costs of other functions at the county

Table 4.2: Annual costs of other national health functions

Function	Annual cost of human resources (KES)	Annual cost of operations and maintenance (KES)	Total annual cost (KES)
Stewardship (policy development)	1,522,010,020	1,716,336,585	3,238,346,605
Health Standards and Regulatory Service	102,355,184	62,932,384	165,287,568
Kenya Medical Training College (KMTC)	5,268,204,068	2,207,653,344	7,475,857,412
Kenya Medical Supplies Agency (KEMSA)	522,510,591	283,613,926	806,124,517
National Quality Control Laboratory (NQCL)	141,750,370	59,298,269	201,048,639
National Blood Transfusion Services	123,026,268	32,746,000	155,772,268
Pharmacy and Poisons Board	11,077,164	6,560,000	17,637,164
National Public Health Laboratory	92,771,951	39,504,500	132,276,451
Government Chemist	188,321,046	310,913,123	499,234,169
Radiation Protection Board	2,622,794	50,024,223	52,647,017
Kenya Medical Research Institute (KEMRI)	4,689,802,468	3,464,165,274	8,153,967,742
Tobacco Control Board	4,667,240	3,650,000	8,317,240
Total	**12,669,119,164**	**8,237,397,628**	**20,906,516,792**

4.2.6 Costs of Health Functions at County Level

Table 4.3 shows cost of health care services at county level facilities.

Table 4.3: Cost of human resources and operations by level of care

	Human resources (KES)	Operations and maintenance (O&M) (KES)	Annual Training (KES)	Total (KES)
Community unit (level 1)	13,114,357	19,978,841	2,332,017	35,425,214
Dispensary (level 2)	12,257,754	240,668	1,543,950	14,042,372
Health centre (level 3)	84,935,662	831,146	4,801,067	90,567,875
County hospital (level 4)	481,783,851	25,549,024	22,416,850	529,749,725
County referral hospital (level 5)	1,206,931,515	117,191,091	51,491,083	1,375,613,689

Note: These costs exclude costs of medicines, commodities, reagents for laboratory and radiology for all facilities. The costs of medicines, commodities, reagents for laboratory and radiology are included in costs of the services below.

The costing of health functions was done using norms for service delivery developed by the Ministry of Health (MOH). Additionally, the unit costs of operations and maintenance were also estimated, based on past expenditure but adjusted to current period using inflation rate. The results, for health facilities, are presented in Table 4.3. Details of the computations of human resources costs are shown in Appendix 1, Table A1.1, Table A1.2, Table A1.3, Table

A1.4, and Table A1.5 for community unit, dispensary, health centre, county hospital, and county referral hospital, respectively.

Table 4.3 shows that the total annual normative cost of human resources, O&M and training increases with level of care, from about KES 14 million at dispensary level to KES 1.3 billion at County Referral Hospital (level 5). The costs of other county functions are shown in Table 4.4.

Table 4.4: Costs of other county health functions

	Total annual cost (KES)
Human resource at county HQs	9,274,189
Annual cost of operations and maintenance at county HQs	14,001,972
Health policy and planning	15,464,953
Health standards, quality assurance	26,811,000
Health information	12,738,763
Referral	20,154,000
Supervision cost per facility	20,000
Public health O&M	33,981,902

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These costs were based on the survey data collected at the counties during the costing survey.

4.2.7 Cost of Drugs, Commodities and Medical Supplies for Health Service Delivery

Costing of the health conditions were informed by the leading causes of deaths and disability adjusted life years (DALYs) in Kenya as documented in the MOH Strategic Plan 2014-2018 (Republic of Kenya, 2014). The causes of death are HIV/AIDS (29.3%), conditions arising during the peri-natal period (9%), lower respiratory infections, (8.1%), tuberculosis (6.3%), diarrheal diseases, (6%), malaria (5.8%), cerebral-vascular disease (3.3%), ischemic heart disease (2.8%), road traffic accidents (1.9%), and violence (1.6%). The total burden for these conditions is 74%.

The causes of morbidity are HIV/AIDS (24.2%), conditions arising during the peri-natal period (10.7%), malaria, (7.2%), lower respiratory infections (7.1%), diarrheal diseases (6%), tuberculosis (4.8%), road traffic accidents (2%), congenital anomalies (1.7%), violence (1.6%), uni-polar depressive disorders (1.5%). These conditions contribute 69% of the morbidity burden.

In provision of health services, health facilities require commodities, drugs and supplies. The costing of these inputs was carried out mainly using OneHealth Tool (OHT) developed UN Inter-Agency Working Group on Costing (World Health Organization, UNICEF, World Bank, UNAIDS, UNFPA, and UNDP). The unit costs of these inputs are presented Table 4.5 through to Table 4.12. Costing details are provided in Appendix 2, but within the specific tables.

Table 4.5: Family planning commodities and supplies

Service	Average annual cost per person (KES)
FP pills	288
FP Condoms	582
Injectables	287
IUCD	130
Implants	983

Table 4.5 shows the annual cost of drugs and supplies for the provision of family planning services at health facilities. In Table 4.5, the annual cost of pills for a woman of reproductive age is KES 288 while implant insertion costs KES 983, Injectables to last for a year per woman of reproductive age cost KES 287. Appendix 2, Table A2.1 shows details of the cost of family planning commodities.

Table 4.6 shows costs of immunization and nutrition interventions.

Table 4.6: Immunization and nutrition costs

Service	Average cost per case (KES)
Measles vaccine	52
Pneumococcal vaccine	919
Polio vaccine	44
BCG vaccine	44
Pentavalent vaccine	467
Care for women with low body mass index	2,489
Supplementation (folic acid, multivitamins, calcium, ferrous sulphate)	221
Management of severe acute malnutrition	6,865
Management of moderate acute malnutrition	1,458
Vitamin A supplementation	6
Micronutrient supplementation (MNPs)	190
Iron fortification of staple foods	48
Salt iodization	24

In the table, the cost of full BCG immunisation per child is KES 52 while pneumococcal vaccine per child costs KES 919. Table 4.6 also shows cost of nutrition management, the cost of managing a severely malnourished child is KES 6,865.

The costs of drugs and supplies to provide various maternal and new-born services to a woman are given in Table 4.7

Table 4.7: Drugs and supplies for maternal and new-born health services

Service	Average cost per case (KES)
Post-abortion case management	1,924
Ectopic case management	4,803
Tetanus toxoid (pregnant women)	23
Syphilis detection and treatment (pregnant women)	51
Hypertensive disease case management	12
Management of pre-eclampsia (Magnesium sulphate)	433
Management of other pregnancy complications	43
De-worming (pregnant women)	15
Labour and delivery management	204
Active management of the 3rd stage of labour	24
Pre-referral management of labour complications	5,046
Management of eclampsia (Magnesium sulphate)	433
Management of obstructed labour	2,386
Treatment of local infections (Newborn)	60
Feeding counselling and support for low-birth-weight infants	620
Antenatal corticosteroids for preterm labour	361
Antibiotics for pPRoM	66
Maternal sepsis case management	6,889
Newborn sepsis - Full supportive care	170
Newborn sepsis - Injectable antibiotics	118
Clean postnatal practices	8
Mastitis	147
Treatment of postpartum haemorrhage	1,026
Chlorhexidine	31
Treatment of syphilis	471
Treatment of gonorrhoea	38
Treatment of chlamydia	293
Treatment of trichomoniasis	36
Treatment of PID (Pelvic Inflammatory Disease)	501
Treatment of urinary tract infection (UTI)	29
Cervical cancer screening	36
Vitamin A supplementation for treatment of xerophthalmia in women of reproductive age	27

Table 4.7 shows, for instance, that the cost of drugs and supplies for the management post-abortion care per patient is KES 1,924 while those for management of maternal sepsis would be KES 6,889. The costs of drugs and medical supplies for the other services or conditions in Table 4.6 should be interpreted in a similar manner, where the costs are given per one person treated. The details of the costing of drugs and supplies are given in Appendix 2, Table A2.2.

Table 4.8 shows the costs per child of the treatment of the various health diseases. These costs are for drugs and supplies only.

Table 4.8: Costs of drugs and supplies for child health services

Service	Cost per average case (KES)
Diarrhoea (ORS)	21
Diarrhoea (Zinc)	43
Mild pneumonia	12
Severe pneumonia	1,303
Malaria	182
Severe malaria	706
Measles treatment	13
Upper respiratory tract infections (URTI)	131
Ear, nose and throat (ENT)	54
Burns	20,635

Note: Cost of burns also apply to adults

In Table 4.8, the cost of drugs and supplies for treatment of severe pneumonia is KES 1,303. Treatment of severe malaria for an inpatient child costs KES 706 in terms of drugs and medical supplies. The cost of drugs and supplies for malaria prevention and treatment are shown in Table 4.9.

Table 4.9: Drugs, commodities and supplies for malaria

Service	Average cost per case (KES)
Insecticide treated materials	128
Insecticide treated bed net (ITN)	383
IPT (pregnant women)	6
Malaria treatment (adults)	182
Treatment of malaria (pregnant women)	182

Table 4.10 presents cost per person for various HIV services. Prevention of mother to child transmission (PMTCT) of HIV costs KES 12,871 in terms antiretroviral drugs, rapid HIV tests and other supplies. This is the cost for both mother and the infant. Antiretroviral therapy (ART) with first-line drugs costs KES 10,365 annually and with second-line drugs, it costs KES 54,492 annually per person on treatment. These costs include antiretroviral drugs, drugs for prophylaxis against opportunistic infections, and related laboratory monitoring tests.

Table 4.10: Antiretroviral therapy (ART) and PMTCT drugs and supplies

Service	Annual cost per person (KES)
PMTCT	12,871
First line ART (adults)	10,365
Second line ART (adults)	54,492
Child ART	28,929

Table 4.11 presents costs of various tuberculoses (TB) services including treatment and diagnostic tests.

Table 4.11: Drugs and tests for tuberculosis

Service	Average cost per case (KES)
Diagnosis: Microscopy	
Microscopy: diagnostic test for passive TB case finding	52
Microscopy: diagnostic test for active TB case finding	52
Microscopy: test to monitor treatment for pulmonary TB cases	52
Diagnosis: Culture	
Culture: diagnostic test for passive TB case finding	911
Culture: diagnostic test for smear negative or Xpert negative	911
Culture: monitoring treatment for Multi-drug resistant MDR or re-retreatment (RR-TB)	911
Diagnosis: Molecular	
Xpert molecular testing: presumptive TB cases	859
Xpert molecular testing: resistance testing for new cases	859
Xpert molecular testing: retreatment cases	859
Xpert molecular testing: HIV+	859
Xpert molecular testing: children	859
Xpert molecular testing: extra pulmonary	859
LPA (molecular) testing	6,370
First-line treatment	
First-line TB drugs	2,663
First-line TB treatment for children	2,076
First-line TB drugs for Category II patients	8,514
Multi-drug resistant (MDR) and extremely drug resistant (XDR) TB	
Second-line TB drugs	160,660
XDR treatment	654,437
HIV testing and counselling	103
Isoniazid preventive therapy for adults and children with HIV and on ART without TB	467
Isoniazid preventive therapy for adults and children with HIV and not on ART without TB	467

In Table 4.11, drugs for first-line treatment of TB cost KES 2,663 per patient for the entire treatment of six month period. Furthermore, the cost of drugs for treatment of multi-drug resistant TB is KES 160,660 per person for complete treatment.

Table 4.12 outlines cost of drugs and tests for non-communicable diseases obtained using OneHealth Tool.

Table 4.12: Drugs for non-communicable diseases

	Average cost per case (KES)
Screening for risk of CVD/diabetes	208
Follow-up care for those at low risk of CVD/diabetes (absolute risk: 10-20%)	208
Treatment for those with very high cholesterol but low absolute risk of CVD/diabetes (< 20%)	1,465
Treatment for those with high blood pressure but low absolute risk of CVD/diabetes (< 20%)	1,140
Treatment for those with absolute risk of CVD/diabetes 20-30%	2,852
Treatment for those with high absolute risk of CVD/diabetes (>30%)	2,873
Treatment of new cases of acute myocardial infarction (AMI) with aspirin	4,667
Treatment of cases with established ischaemic heart disease (IHD) and post MI	3,719
Treatment for those with established cerebrovascular disease and post stroke	3,719
Treatment of cases with rheumatic heart disease (with benzathine penicillin)	746
Standard glycemic control	15,943
Intensive glycemic control	20,899
Retinopathy screening and photocoagulation	89
Neuropathy screening and preventive foot care	1,511
Mammography	226
Breast cancer treatment: Stage 1	10,099
Breast cancer treatment: Stage 2	33,287
Breast cancer treatment: Stage 3	38,898
Breast cancer treatment: Stage 4	28,310
Asthma: Inhaled short acting beta agonist for intermittent asthma	1,555
Asthma: Low dose inhaled beclometasone + SABA	4,214
Asthma: High dose inhaled beclometasone + SABA	6,872
Asthma: Theophylline + High dose inhaled beclometasone + SABA	8,694
Asthma: Oral Prednisolone + Theophylline + High dose inhaled beclometasone + SABA	10,731

The costs of injuries are shown in Table 4.13. The conditions covered general injuries, burns and road traffic injuries.

Table 4.13: Medical cost of injuries

Condition	**Cost per case (US$)**	**Cost per case KES**
Injury	178.5	17,850
Burn	1390	139,000
Violence	285	28,500
Road traffic injuries	140	14,000

Source: Hadley KH Wesson, Nonkululeko Boikhutso, Abdulgafoor M Bachani, Karen J Hofman Adnan A Hyder (2013). The cost of injury and trauma care in low and middle-income countries: a review of economic evidence. Health Policy and Planning; 1–14.

These costs, in Table 4.13, were adapted from a systemic review of 41 studies from low and middle income countries. These costs were given in US dollars and were converted to KES using an exchange rate of KES 100 per US$. The costs are total costs, which include human resources, drugs, medical supply and overhead.

4.3 Costing of Transport and Infrastructure Functions

4.3.1 Transport and Infrastructure Functions According to CoK

The fourth schedule (*Article 185 (2), 186 (1) and 187 (2)*) assigns the National Government the following broad functions related to transport and infrastructure:

- road traffic;
- construction and operation of national trunk roads;
- standards for the construction and maintenance of other roads by counties;
- railways;
- pipelines;
- marine navigation;
- civil aviation;
- space travel;
- and National public works.

The fourth schedule also outlines the functions to be performed by the County Governments as follows:

- county roads;
- street lighting;
- traffic and parking;
- public road transport; and
- ferries and harbours, excluding the regulation of international and national shipping and matters related thereto.

4.3.2 The Unbundled Functions for Infrastructure and Transport

The unbundled functions to be undertaken by the National Government and the County are shown in Table 4.14.

Table 4.14: Unbundled National and County functions for transport and infrastructure

National functions	**County functions**
National trunk roads1 classified as Roads class S, A, B, and C	Management, development of county roads2 (Classified as Class D ,E and other Unclassified Roads according to Roads Classification as agreed between the National and County Governments
Road traffic Management	Construction of county roads
Construction and operation of National trunk roads	Upgrading of County roads
Standards for the construction and maintenance of county roads	Rehabilitating and maintaining County roads
Capacity building and technical assistance to the counties	Controlling reserves for County roads and access to roadside developments;
Public investment and disaster management –SAGAs (KPA, KFS, KR etc.)	Control of axle load on County roads
Control of axle load on National Trunk roads	Implementing road policies in relation to County roads;
	Ensuring that the quality of County road works is in accordance with nationally set standards
	Collecting and collating all such data related to the use of County roads as may be necessary for efficient forward planning
	Monitoring and evaluating the use of County roads;
	Planning the development and maintenance of County roads
	Liaising and co-coordinating with other authorities in planning and operations respect of County roads
	Resource Mobilization for development of County Roads Management of Mechanical and transport equipment Fund
Likoni Channel	Ferries and Harbours
Likoni channel links a National Trunk Road, (A104) namely Lunga Lunga–Lamu Road. Most of the crossings made are to Kwale County, the Republic of Tanzania and beyond.	Development of infrastructure for landing facilities to facilitate water transport linking inter/intra counties
The ferry service operates on international water and water resources as part of the country's marine navigation system	Acquiring, operating ferry crafts, boats and other water transport systems for water transportation operating and connecting inter/intra counties
	Transport of vehicles, cargo and passengers linking county roads or water services within a county

[1] National Trunk Roads are the main roads linking Kenya to her neighbours, directly connecting various county headquarters and interconnecting the entire country in an equitable and well distributed manner.

[2] County Roads are public roads running primarily within the county including primary roads linking all sub county headquarters, secondary and minor roads linking markets, administrative centres and local important centres.

In addition, the executive order No. 2/2013 specifies the functions under transport and infrastructure as shown in Table 4.15:

Table 4.15: Transport and infrastructure functions as per the executive order No. 2/2013

Functions
National road development policy management
Transport policy management
Maritime management policy
Rail transport and infrastructure management
Development, standardisation and maintenance of roads
Mechanical and transport services
Reinforcement of axle load control
Materials testing and advice on usage
Standardisation of vehicles, plant and equipment
Civil aviation management and training
Registration of engineers
Registration of road contractors
Protection of road reserves
Maintenance of security roads
National road safety management
Registration and insurance of motor vehicles
Motor vehicles inspection
Development and maintenance of airstrips
Government clearing and forwarding service
National transport and safety policy
Implementation of LAPSSET project

4.3.3 Norms and Standards for Constructing Roads

The estimation of the unit cost of constructing new or upgrading of roads to paved to standard/or bitumen standards, routine maintenance of paved roads, re-graveling or periodic maintenance of unpaved roads and in rehabilitation of paved roads, was based on Ministry of Transport and Communications (1986) standard specification for road and bridge construction, the road design manual part I (Geometric design of Rural Roads-1979), road design manual part III (Road design Manual Part IV-Bridge Design-1982), Road design manual part V (pavement rehabilitation and overlay design, 1988) and Road design guidelines for urban roads (2001). Based on these guidelines, and depending on the scope of work required, part or all the activities outlined below should be included in the construction, maintenance and rehabilitation of roads.

- **Preliminary and supervisory services:** This includes all preliminary requirements that ought to be established to facilitate the smooth running of the project. The other activity is testing of materials, which involves selection of suitable materials to use in the road project as well as testing of their properties and setting out tolerance, an act of transferring the designed specifications to the ground by use labour and survey equipment.
- **Site clearance and topsoil stripping:** This involves removal of vegetation and top soil up to a chosen depth to clear the corridor where further works are to be done.
- **Earthworks:** Includes all the construction works up to the sub grade layer. This also includes cuts, fills and benches.

- **Excavation and filling for structures:** Involves excavating materials and filling to preferred depth, to enable establishment of structures.
- **Culverts and drainage works:** Excavation and construction works involving laying of culverts and providing drainage systems.
- **Passage of traffic:** Includes provision of signs and barriers for safe passage of traffic
- **Natural sub base and base:** Provision, placement and compaction of natural material as base or sub base of the road.
- **Graded crushed stone sub base and base:** Provision, placement and compaction of Graded Crushed Stone (GCS) for Sub-base/Base layers.
- **Cement and lime treated material:** Provision, spreading and compaction of cement and lime treated materials for sub-base and base.
- **Bituminous treatment and surface dressing surface**: Providing, heating and spraying of bituminous materials as well as cleaning and preparing the surfaces upon which the application is to be made.
- **Bituminous mixes bases/binder courses and wearing courses:** Preparation of surfaces, provision, mixing, laying and compaction of Dense Bitumen Macadam (DBM) for base layer and Asphaltic Concrete (AC) as wearing course of a road.
- **Concrete works:** Provision, placement and compaction of concrete materials on road works and structures.
- **Structural steel:** Design, submission of orders, fabrication drawings, details and supply, of structural steel works.
- **Road furniture:** Involves works relating to kerbs, channels, road markings, road signs and other road furniture.
- **Pre-stressed concrete reinforcement:** Provision of pre-stressed concrete decking e.g. to bridges and diaphragm walls and all other necessary materials.
- **Miscellaneous bridge works:** Important structures that are placed for reinforcements or for corrective measures on bridges.
- **Day works:** Ground activities carried out by motorized machinery, as well as human/physical labour on works other than the main works. It also includes the materials used for such works
- **Street lighting:** Supplying, delivering, installation and setting to work on the street lights along the entire road section.
- **HIV/AIDS mitigation:** Implementation of HIV/AIDS awareness campaign amongst the workers for the duration of the contract and supplying of relevant HIV prevention materials.
- **Road safety education:** Provision of a road safety training platform for children and the general public.

4.3.4 *Estimating Unit Cost of Constructing Roads*

The estimation of unit cost was based on the norms and standards for delivering each service or activity (see Appendix 3 for details costs of road construction activities). The data for estimating the unit cost of constructing roads was derived bill of quantities from different performance based contracts which provided information on the rates for each item used, quantity used and the corresponding unit cost for each item. The projects obtained from the roads and infrastructure resulted in the compilation of databases on road projects undertaken at the national and county levels. These contained cost data that allowed categorization of the type of work conducted.

The "unit cost" applied in this section is the cost per two lane kilometre[3]. The unit cost of road construction in KES per kilometre is the sum of the sub unit costs of the road construction activities. Road construction unit costs are estimated by dividing the total cost of the various activities involved in road construction and the total number of kilometres. As noted, the study sampled several road projects and contracts to build new paved roads, to rehabilitate paved roads, to maintain paved roads, and to re-gravel unpaved roads in urban areas. The estimation of the unit cost per two-lane kilometre took into account the inputs used in each project, the quantity of each input, the rates per each input and the length of the road in kilometres including the loops and the number of lanes.

It is imperative to note that the estimation of unit costs excluded cost of land compensation, environmental impact assessment which is a mandatory exercise that is carried out on all construction works; the exact cost is dependent on the overall cost of the project. The cost is 0.01% of the overall project cost, reallocation of project affected persons, whose actual cost depends on the level of encroachment within the road corridor and cost of relocating services (including the sewer lines, water lines, power lines and communication lines. The cost depends on the services to be relocated and the level of encroachment of the services into the road corridor.

Unit cost of constructing an urban road

In estimating the unit cost of constructing an urban road, activities/services provided, the quantity of each input used in the delivery of the service[4], and the price of each activity in line with the specified norms and standards were taken into account. Table 4.16 shows that the unit cost per two-lane kilometre is KES 132,576,785 for a standard paved urban road in a flat terrain.

[3] A lane-kilometre is the product of the number of lanes and the road length

[4] The estimation of unit cost excludes cost of land compensation and environmental impact assessment which is a mandatory exercise that is carried out on all construction works.

Table 4.16: Unit cost of constructing a standard paved urban road in a flat terrain (major arteries)

Description of activity	**Cost per activity (KES)**
Preliminary and supervisory services	132,576,784
Site clearance and topsoil stripping	33,433,049
Earthworks	365,414,050
Excavation and filling for structures	85,831,884
Culverts and drainage works	298,463,379
Passage of traffic	191,068,527
Natural gravel for base and sub base	91,249,151
Graded crushed stone sub base and base	264,690,000
Cement and lime treated material	199,028,675
Bituminous surface treatments and surface dressing	171,568,000
Bituminous surface treatments and surface dressing	974,576,890
Concrete works	1,628,219,643
Pre-stressed concrete	234,653,193
Structural steel	234,781,686
Road furniture	484,749,026
Miscellaneous bridge works	408,833,259
Day works	14,222,200
Street lighting & in installation	104,008,771
Land scaping and environmental mitigation measures	39,007,615
HIV awareness	20,860,396
Road safety education	11,447,080
Personnel	470,515,867
Total cost	6,549,293,120
Cost per two-lane kilometre	132,576,785

The main cost drivers are concrete works followed by bituminous surface treatments and surface dressing, road furniture and miscellaneous bridge works.

Unit cost of constructing a standard paved urban road traversing a mountainous terrain (major arteries)

The road description is for a road traversing a mountainous terrain, underlain by suitable sub grade material. The road has no profound drainage structures, there is no relocation of services, the road is standard 2 kilometre lane, each 3.5 metre wide with lined, covered drains on either side, 1.5 metre wide foot paths on either side and 9-metre, single arm solar street light (60w luminaire) unit. The summary cost for each activity costed and the unit cost is presented in Table 4.18. The results show that the unit cost per two-lane Kilometre is KES 62,743,284. This unit cost was obtained by dividing total costs of the activities in Table 4.17 by the total number of kilometres. The cost of bituminous mixes, binder and wearing course account for the largest share of the cost per two lane kilometre, followed culverts and drainage works.

Table 4.17: Unit cost of constructing a standard urban road in a mountainous terrain

Description of activity	**Cost (KES) at City**
Preliminary and supervisory services	4,563,148
Site clearance and topsoil stripping	407,772
Earthworks	4,434,637
Excavation and filling for structures	1,041,648
Culverts and drainage works	8,739,238
Passage of traffic	2,319,335
Natural material sub base and base	1,107,393
Graded crushed stone	3,212,257
Cement and lime treatment	2,415,401
Bituminous surface treatment and surface dressing	2,082,136
Bituminous mixes, binder and wearing course	11,827,390
Miscellaneous bridge works	5,882,877
Day works	172,600
Street lighting	1,262,242
Landscaping and environmental mitigation measures	473,393
HIV awareness and education	253,160
Contingencies	5,019,463
Variation in prices (15%)	7,529,194
Cost per KM length	**62,743,284**

Unit cost of constructing and upgrading of a standard urban road (minor arteries)

The construction and upgrading of standard urban paved road (minor arteries), entails the upgrading of gravel roads to paved standard, or the addition of lanes to existing paved roads. The estimate of unit cost for the minor arteries was based on completed projects in Nairobi and other towns in the country. The results show that the unit cost per two-lane kilometre amounts to KES 268,113,903 for an urban paved road and KES 103,888,562 in other urban towns respectively. The average unit cost per two-lane KM for the two projects is KES 186,001,232. The main drivers of the unit cost are the cost of concrete works, cost of road furniture, cost of preliminary activities, earth works, and cost of bituminous mixes bases/binder courses and wearing courses. Table 4.18 shows unit cost for a road at city and other urban areas in Kenya.

Table 4.18: Costs of upgrading urban paved road (minor arteries)

Description of services/activities	**Cost(KES) at a city**	**Cost(KES) at other urban areas**
Preliminary and supervisory services	264,374,980	143,951,080
Site clearance and topsoil stripping	19,176,120	30,950,000
Earthworks	108,062,764	239,620,000
Excavation and filling for structures	34,389,735	56,870,000
Culverts and drainage works	158,285,340	84,950,000
Passage of traffic	66,692,000	24,900,000
Natural sub base and base	30,904,849	100,045,000
Graded crushed stone sub base and base	63,771,911	
Cement and lime treated material	67,841,698	211,815,000
Bituminous treatment and surface dressing surface	31,799,500	53,840,000
Bituminous mixes bases/binder courses and wearing courses	248,955,730	342,500,000
Concrete works	329,430,990	300,000,000
Structural steel	36,771,911	
Road marking	11,273,500	
Road furniture	270,191,498	96,555,200
Service ducts	1,755,000	
Miscellaneous bridge works	14,473,771	4,246,000
Day works	12,440,508	10,286,000
Street lighting	102,281,088	10,875,000
HIV/AIDS awareness and education	3,924,425	4,080,000
Road safety education		4,650,000
Personnel		773,192,200
Total	**1,876,797,320**	**2,493,325,480**
Cost per km per 2-lane KM	**268,113,903**	**103,888,562**

Unit cost of constructing/upgrading urban road (collectors) to bitumen standards

Table 4.19 presents unit costs of constructing a standard urban paved road (collectors) to bituminous standards. Data for estimating unit cost of this type of roads was based on two road projects, namely Nairobi Eastern Missing links project and Nairobi Western ring roads project. The results indicate that the unit cost of constructing or upgrade a standard paved road (collectors) to bituminous standards in an urban setting is KES 127,980,549. The main cost drivers are earthworks, concrete works and street lighting and installation.

Table 4.19: Unit cost of constructing/upgrading urban road (collectors) to bitumen[5] standards

Description of activity	**Cost (KES)**
Preparation	147,944,364
Site clearance and topsoil stripping	90,789,500
Earthworks	383,136,745
Excavation and filling for structures	183,184,924
Culverts and drainage works	189,188,520
Passage of traffic	85,594,082
Natural gravel for base and sub base	115,966,760
Cement and lime treated material	165,490,935
Bituminous surface treatments and surface dressing	141,119,920
Bituminous surface treatments and surface dressing	309,123,790
Concrete works	317,302,605
Road furniture	124,844,700
Miscellaneous bridge works	19,395,320
Day works	2,798,260
Street lighting & installation	331,908,118
Concrete paving	165,031,700
HIV awareness	11,020,446
Personnel	31,731,390
Total	**2,815,572,079**
Cost per 2 lane KM	**127,980,549**

Unit cost of Unit cost of constructing/upgrading urban road (local roads)

The estimation of unit cost for road construction or upgrading to bitumen standards (local roads) within urban centres was based on two projects (upgrading of Kapsoya road in Eldorect Municipality and upgrading to bitumen standards of Githurai-Kimbo road. The unit cost per 2 lane kilometre varied from KES 61,519,625 (Eldorect) to KES 425,565,891.68 (Nairobi). The results reveal that the unit cost is almost seven times higher in Nairobi compared to the unit cost of upgrading a road to bituminous standards in Eldoret. In both cases, the major cost drivers are concrete and earthworks.

[5] Based on data derived from Nairobi west ring road consisting of main road with a length of 17.2 km, 4 lanes, service road consisting of 1 inter-change and 3 bridges, and upgrading to bitumen standards of Githurai Kimbo road

Table 4.20: Unit cost of constructing/upgrading of standard urban paved road (local)

Description of activities	**Cost (KES) at City**	**Cost (KES) at other urban areas**
Preliminary	110,663,200	123,290,000
Site clearance and topsoil stripping	20,076,630	7,479,400
Earthworks	225,097,000	47,597,700
Culverts and drainage works	98,009,500	40,076,000
Excavation	60,900,000	32,564,230
Passage of traffic	19,815,500	11,800,000
Natural gravel for base and sub base	78,754,500	52,736,000
Graded crushed stone sub base and base		
Cement and lime treated material	207,942,250	22,826,600
Bituminous surface treatments and surface dressing	47,940,000	18,116,370
Bituminous surface treatments and surface dressing	298,210,000	102,161,000
Concrete works	299,496,000	34,020,000
Road furniture	112,414,860	100,364,000
Day works		10,164,950
Miscellaneous bridge works	5,315,160	
HIV/AID awareness		12,000,000
Personnel	117,628,967	
Total cost	1,702,263,567	615,196,250
Unit cost per two-lane KM	**425,565,891.68**	**61,519,625**

Unit cost of gravelling roads in an urban area

For unpaved roads, the major intervention is re-graveling of roads for providing access to mixed residential and commercial zone[6.] This activity involves reinstating[7] the surface layer of gravel roads. The activities costed are as per the guidelines for constructing and upgrading roads (see Appendix 3 for details). The unit cost of gravelling an urban road is estimated at KES 43,426,949 as shown in Table 4.21. However, the cost may vary depending on the quantity of inputs used and the type of surface.

[6] The "unit rate" applied in this study is the cost per lane-kilometre. The lane-kilometre is the product of the number of lanes and the road length.

[7] This term was also applied when there were substantial gravel road rehabilitation activities.

Table 4.21: Unit cost of gravelling roads in an urban area

Description of activity	**Costs (KES)**
Preliminary and supervisory/support services	27,580,000
Site clearance and topsoil stripping	1,720,000
Earthworks	15,900,000
Culverts and drainage works	62,942,500
Passage of traffic	3,000,000
Natural material sub base and base	14,544,000
Cement and lime treatment	14,724,000
Bituminous surface treatment and surface dressing	17,280,000
Bituminous mix bases, binder courses & wearing courses	75,816,000
Road furniture	66,911,000
Day works	3,080,000
HIV AIDS awareness and education	1,200,000
Personnel	42,718,094
Total with personnel	347,415,594
Cost per two-lane KM	**43,426,949**

Cost of upgrading class C roads to bitumen standards

Table 4.22 shows variation in cost per km of upgrading class C roads to bitumen standards. The estimates are based on data obtained from KeNHA and covered 13 projects. Details of inputs as the standard specifications are in Appendix 3. The cost per two-lane KM varies widely, with an average cost of 197,951,940. The cost of construction per 2-lane KM ranges from KES 68,321,381 to KES 431,360,695.

Table 4.22: Cost of upgrading class C roads to bitumen standards

Project name	**Cost per 2 lane KM (KES)**
Homa Bay-Mbita	68,321,381
Londiani – Fortenan	118,440,333
Enjinja-Bumala	36,227,389
Modika – Nuno	24,481,554
Kaloleni – Kilifi	78,623,933
Chebilat – Ikonge – Chabera	157,112,366
Chepterit – Kimondi (Baraton)	126,103,544
Kangema – Gacharage	431,360,695
Chiakariga – Meru	370,084,409
Oljo Orok - Dundori Road	137,654,515
Rumuruti – Maralal Road	252,910,875
Siaya - Ruambwa Road	171,708,190
Average cost per 2 lane KM	**197,951,940**

Costs of rehabilitation and upgrading of roads

The data used to estimate the unit cost of constructing, upgrading or rehabilitating class D type of roads (secondary roads) came from Kenya Rural Roads Authority (KeRRA). The construction and upgrading of paved roads covers the upgrading of gravel roads to paved standard, or the addition of lanes to existing paved roads. The "unit rate" applied in this study is the cost per lane-kilometre. The lane-kilometre is the product of the number of lanes and the road length. Several projects implemented in different parts of the country were included in the sample. It costs on average KES 30,608,052 to rehabilitate a road with a range of KES 19,725,985 to KES 41,490,119. The cost of upgrading of roads is higher in Meru at KES 95,659,513 followed by Nairobi at KES 90,123,844. The lowest cost per km of upgrading class D roads amounts to KES 19,725,985 in Elgeyo – Marakwet. Table 4.23 presents a summary of the average cost per km of rehabilitating and upgrading class D type of roads.

Table 4.23: Costs of rehabilitation and upgrading of roads at county level

County	**Service**	**Cost per KM (KES)**
Uasin Gishu	Rehabilitation	41,490,119
Elgeyo - Marakwet	Rehabilitation	19,725,985
Bomet/ Kericho	Upgrading	73,226,006
Bungoma	Upgrading	76,084,427
Busia	Upgrading	53,154,976
Elgeyo - Marakwet	Upgrading	56,947,756
Embu	Upgrading	56,031,149
Kakamega	Upgrading	51,332,359
Kiambu	Upgrading	42,570,263
Kisii	Upgrading	68,985,807
Laikipia	Upgrading	66,067,491
Machakos	Upgrading	59,608,899
Meru	Upgrading	95,659,513
Muranga	Upgrading	56,308,040
Nairobi	Upgrading	90,123,844
Nakuru	Upgrading	64,034,104
Nandi	Upgrading	72,412,432
Nyamira	Upgrading	62,297,049
Nyeri	Upgrading	51,900,291
Siaya	Upgrading	59,442,936
Uasin Gishu	Upgrading	38,036,345

Cost of constructing class D roads to bitumen standards

Table 4.24a and Table 4.24b show the cost per kilometre of constructing class D roads to bitumen standards. The details of the standard specifications for constructing the roads are

shown in Appendix 3. The average unit cost per KM is KES 56,999,055. The cost per KM ranges from KES 26,509,427 to KES 137,156,414.

Table 4.24a: Cost of constructing class D roads to bitumen standards

Project name	**Cost per KM (KES)**
Sotik - Cheborge - Roret - Kebenet - Sigowet Road (D226)/Litein - Cheborge	77,483,332
Kamukunywa - Kaptama – Kapsokwony – Sirisia (D275) Road	40,292,893
Kimilili - Misikhu Road	45,355,152
Nabengele -Rwambwa - Port Victoria	49,611,311
Tirap - Embobut - Chesogon	50,795,053
Iten - Kapsowar Phase I	54,709,208
Embu – Mutunduri - Kianjokoma Road	27,890,383
Sigalagala -Musoli-Sabatia- Butere Road	51,259,651
Ngorongo - Githunguri	52,805,940
Thogoto – Gikambura – Mutarakwa (D411) Road (Phase II)	42,516,700
Ndumberi – Kiawaroga – Limuru (D409)/Nduota – Gathanga - Kigwaru (E1518) Roads	123,786,269
Keroka – Nyangusu (Loop Roads) (Phase II)	47,116,125
Daraja Mbili – Nyatieko – Eronge – Kegogi – Miruka (E216 / E208) Roads	50,590,781
Kamagambo - Nyasembe - Mogonga (D205/D204)	66,332,506
Keroka-Kebirigo	47,166,706
Mwingi - Tseikuru Road	70,539,297
Jua Kali - Akorino - Maili Sita (D462)	47,191,065
Mathatani-Kaloleni-Kaseve Road	59,608,899
Kimutwa – Makutano – Kikima – Tawa (D516 / D517) Roads	65,348,088
Meru-Marimba (D472) Marimba-Nkubu (D476) and Nkubu - Mitunguu (D475) Roads	75,172,088
Imenti-Kionyo(T52/E779) Kionyo-Chogoria (D474) and Ndagene Loop (T51) Roads	75,982,787
Ruiri – Isiolo (D490), Amos Loop and Isiolo – Muriiri – Michimikuru Tea Factory (D485 / E814) Roads	42,250,801
Meru – Mikinduri – Maua (D482) Road (Phase II)	21,469,716
Access to Igoji TTC/Kanyakine Market	74,657,770
Mihuti - Kayu – Wanjerere - Rwathia (E543) & Githiga - Kibutha – Kanyenyaini (E523) Roads	59,056,848
Mutheru – Mareira (D416/E518/JnC71) Roads	31,157,461
Muranga - Gitugi	58,657,928

Table 4.24b: Cost of constructing class D roads to bitumen standards -continuation

Project name	**Cost per KM (KES)**
Moi North Lake Road Naivasha	74,886,256
Mosoriot - Chepterwai - Kipkaren River	79,653,675
Manga-Kemera-Amabuko (D223/D221)	34,305,610
Kagere-Munyange-Gitugi E571, Ndunyu - Miirini -Gituiga - Kiriaini (D428)	97,530,450
Miiri – Itundu (D452 / E604 / E599 / E600) Roads	33,504,665
Othaya – Konyu (D433)/ Jn C70 (Kariki) – Kairo (E549/547)/ Gachami – Thuti Primary School (E567) Roads	14,128,486
Giakanja -Tetu Mission Road(D4340	40,884,896
Naro Moru - Munyu - Karisheni	137,156,414
Mweiga-Brookside-Kimathi University (D449/D450A)	26,509,427
Bondo Misori/Kipasi Owimbi Road (D246 / E126 / E139)	44,295,769
Luanda-Akala Road (phase I)	74,303,670
Average cost	**56,999,055**

Class E (minor) roads are also classified as low volume roads located mainly in the rural areas. The sample of projects used in estimating the unit cost came from KeRRA and covered projects implemented in Murang'a and Nyandarua. The average cost per km is estimated at KES 25,285,142 in Muranga with costs per KM of a 2-lane road ranging from KES 17,271,966 to KES 28,544,081. In Nyandarua, the average cost per km is KES 27,267,808 The results are summarised in Table 4.25.

Table 4.25: Cost of constructing class E roads (low volume roads)

Project	**Cost per KM**
Muranga	
Ngaburi - Maragua	20,476,119
Ngaburi - Maragua	17,271,966
Kagaa - Maragua river	21,293,212
Kangondu - Nginda	29,611,102
Kangondu - Nginda	28,544,081
Average cost	**23,439,296**
Nyandarua	
Nyahururu - Charagita	25,951,838
Nyahururu - Charagita	30,812,561
Nyahururu - Charagita	24,263,798
Maili 4- Kariamu	29,337,628
Maili 4 -Kariamu	30,767,171
Maili 4 - Kariamu	24,649,913
Average cost	**27,630,485**

Unit cost for road construction per km (various soil conditions)

The unit cost of road construction varies widely by type of surface and soil conditions. The estimation of unit cost of constructing a km of road under different soil conditions was based on bill of quantities from contracted suppliers. The costing took into account the different activities as per the norms and standards, the quantity supplied for each activity and the cost of services provided. Table 4.26 presents a summary of cost of each activity and the average unit cost per km. The cost per km of constructing a road in red soil condition is KES 79,793,410 while unit cost is KES 118,211,610 in black cotton soil. Thus, constructing a road in surface area with black cotton soil is more expensive than a surface area with red soil. The cost of earth works is more expensive in a black cotton soil surface. In both cases the main cost driver is bituminous mix bases, binder courses and wearing courses which cost KES 35,890,000 in a red soil surface and KES 40,302,500 in a black cotton soil surface.

Table 4.26: Unit cost for road construction per KM per type of soil

Summary of bills of quantities	**Red soil**	**Black cotton soil**
Description	Amount (KES)	Amount (KES)
General	2,050,000	2,050,000
Site clearance	1,646,500	1,646,500
Earth works	2,096,000	19,016,000
Culverts and drainage works	5,400,000	7,100,000
Passage of traffic	360,000	360,000
Walkways	1,480,000	1,480,000
Quarry fill stone for sub-base and quarry chips for base	9,585,000	17,361,000
Bituminous mix bases, binder courses and wearing courses	35,890,000	40,302,500
Road furniture	4,721,600	4,721,600
Day works	759,200	759,200
Sub-total	**63,988,300**	**101,906,560**
Add 7.5% contingencies	4,799,123	7,109,760
Add 16% VAT	11,005,988	16,305,049.60
Cost per km	79,793,410	118,211,610

4.3.5 Road Maintenance Costs

Road maintenance is classified as routine maintenance or periodic maintenance. Routine works are works that are undertaken each year. Maintenance activities can be grouped into cyclic and reactive works types. Cyclic works are those undertaken where the maintenance standard indicates the frequency at which activities should be undertaken. Examples are culvert cleaning, which is dependent on environmental effects rather than on traffic levels. Reactive works are those where intervention levels, defined in the maintenance standard, are used to determine when maintenance is needed. An example is patching, which is carried out in response to the appearance of cracks or pot-holes. The road maintenance costs, derived using the average of available valuation rates, are shown in Table 4.27 for routine maintenance. The norms and standards for routine maintenance of roads (mixed surface), Earth surface and gravel is shown in Appendix 4. The results show that the cost per km for routine maintenance of a class D or class E road of mixed surface is KES 855,983 while the cost per KM of routine maintenance of earth surface road and gravel surface road is KES 1,718,668 and KES 2,218,179, respectively.

Table 4.27: Summary unit costs for routine maintenance of roads

Type of surface	Unit cost per KM (KES)
Maintenance (mixed surface)	855,983
Maintenance (earth surface)	1,718,668
Maintenance (gravel)	2,218,179

Periodic maintenance activities are undertaken at intervals of several years to preserve the structural integrity of the road, or to enable the road to carry increased axle loadings. The category normally excludes those works that change the geometry of a road by widening or realignment. Works can be grouped into the works types of preventive, resurfacing, overlay and pavement reconstruction. Examples are resealing and overlay works, which are carried out in response to measured deterioration in road conditions. Periodic works are expected at regular, but relatively long, intervals. The services required for periodic maintenance of roads by type of surface road are presented in Table 4.28. The unit cost of periodic maintenance of a road of paved surface is KES 21,021,952 while maintenance of a road of mixed surface and gravel surface costs KES 7,996,823 and KES 1,117,899 respectively.

Table 4.28: Unit costs for periodic maintenance of urban roads

Type of service	Unit cost per KM (KES)
Maintenance (paved surface)	21,021,952
Maintenance (Mixed surface)	7,996,823
Gravel	1,117,899

Periodic maintenance of class B and C roads (national trunk roads and primary roads is guided by the standard specification shown in Appendix 4. The cost per KM of maintaining this type of roads is shown in Table 4.29, with an average of KES 365,315,150. The main cost drivers are bituminous surface treatment and surface dressing and bituminous mixes.

Table 4.29: Cost of maintenance of class B and C roads

Description of activity	Cost (KES)
General-office administration and overheads/preliminaries	47,456,000
Site clearance	2,070,000
Earthworks	20,215,200
Excavation and filling for structures	1,662,000
Culvert and drainage works	6,620,800
Passage of traffic	4,000,000
Paved roads-shoulder maintenance and repair	7,255,000
Natural material bases and sub base	12,068,000
Cement and lime treated sub grade, sub base and base	14,797,500
Bituminous surface treatment and surface dressing	117,616,050
Bituminous mixes	121,395,600
Road furniture repair and maintenance	10,160,000
Cost per KM	**365,315,150**

Table 4.30 shows the cost of maintaining a KM of urban road by the national government. The costs were estimated from the activities shown in Appendix 4. For roads of mixed surface, it costs KES 3,184,619.51 per km while the unit cost of roads of earth surface and gravel costs KES 1,609,335.41 and KES 826,123.88 respectively. Period maintenance of urban roads of mixed and paved AC surface costs KES 7,996,823.05 and KES 18,416,926.24 respectively.

Table 4.30: Unit cost of routine maintenance of urban roads

Type of surface	**Cost per km**
Mixed	3,184,619.51
Earth	1,609,335.41
Gravel	826,123.88
Paved AC	1,977,110.72
Periodic maintenance	
Mixed	7,996,823.05
Paved AC	18,416,926.24

Costing of Transport Functions

The State department of transport consists of various divisions and technical departments namely:

Air transport division: The department issues approvals for scheduled flights, develops and formulates policies and regulations which govern operations in the air transport industry including negotiation for relevant MoU's, BASA and International Conventions in the aviation industry. The department also facilitates rehabilitation and maintenance of airstrips and airport expansion and modernization;

Air accident investigations division: Aircraft Accident Investigation is a state function, obligated by the International Civil Aviation Organization (ICAO) Convention to which Kenya is a signatory. The department is responsible for investigating air accidents and incidents in the country.

Railways division: The division is responsible for facilitating provision of efficient rail transportation services through policy and regulation development; oversighting role on service delivery in railway sub-sector; coordinating railway planning and investment programmes; and implementation of LAPSSET (railway and Lamu port components).

Government clearing services: The Government Clearing Services (GCS) is mandated to clear, forward and facilitate the handling and warehousing of public goods. It is also charged with the responsibility of offering passage services for Government officers travelling out of the country.

The corporations under the State Department of Transport include:

Kenya Civil Aviation Authority (KCAA): KCAA is responsible for regulation and provision of air navigation services in the aviation industry in order to ensure safe, efficient and

effective civil aviation systems in Kenya and management of the East African School of Aviation.
Kenya Airports Authority (KAA): KAA manages commercially viable aerodromes in the country to facilitate air transport services, maintains, rehabilitates and constructs airstrips on an agency basis. KAA main service is to facilitate the movement of Passengers, Aircraft and Cargo in all our airports

Kenya Ports Authority (KPA): KPA manages the ports along the coastline that provides the expansive hinterland of mainland Kenya, Rwanda, Burundi, Sudan and Uganda with transport link to the outside world. KPA also manages Bandari College.
Kenya Ferry Services (KFS): KFS provides free ferry services to pedestrian public across the Likoni and Mtongwe channels on the Indian Ocean. KFS remains an important Agency for providing the only link between the mainland and the island

Kenya Maritime Authority: The department is responsible for formulating maritime and shipping policies and development of legislation for maritime safety, prevention of marine pollution, coordination of seafarers training, coordinating and monitoring of ports development and facilities improvement, ratification of International Maritime conventions and maritime related agreements. In addition, it exercises oversight responsibility over Kenya Maritime Authority, Kenya Ports Authority, Kenya National Shipping Line and the Kenya Ferry Services

Air Accident Investigation

Aircraft Accident Investigation is a state function, obligated by the International Civil Aviation Organization (ICAO) Convention to which Kenya is a signatory. The division is responsible for investigating air accidents and incidents in the country. The main functions undertaken by the AA department include i) investigation of aircraft accidents and serious incidents that occur to any civil aircraft within the Kenyan boarders and; ii) Promotion of Air Accident Prevention. Air Accident Investigation is in two categories: basic Aircraft accident and incidents investigation and large aircraft accident investigations.

The main activities costed include human resources (according to norms and standards), equipment required for investigation, leasing of helicopters, construction of a hangar and laboratory, equipment required for the hangar and training investigators. The costs are shown in Tables 4.32, 4.33, 4.34, 4.35, and 4.36.

Personnel requirement

Table 4.31 presents a summary of the personnel required for carrying out air accident investigation. The total cost of personnel required for basic investigation of air accident was estimated at KES 105,347,579.

Table 4.31: Cost of basic investigation of air accidents-(personnel costs)

Staff	Job group	Required	Annual salary	Total
Technical/operational staff	P-S	15	3,900,000	58,500,000
Support staff	J/G	5	729,516	3,647,579
Promotion of Air Accident Prevention staff	L-S	15	2,880,000	43,200,000
Total				105,347,579

During the air accident investigation, the team of investigators require helicopters to access hard to reach crash areas and also transport the team and their equipment to the crash site. Table 4.32 shows the cost of leasing a helicopter is estimated at KES 200 million per year while the cost of hiring pilots costs KES 5,400,000.

Table 4.32: Lease of helicopters

Type	Number	Hiring Cost/year (KES)	Investigations/year (KES)	Cost/year (KES)
B406/AS350	1	200,000,000	12	200,000,000
Pilots	2	450,000	12	5,400,000

Equipment required

The cost of equipment required for basic air accident investigation is shown in Table 4.33. According to the norms provided by the division of air accident investigation, the equipment includes vehicles, personal kits, investigation equipment and personnel protective equipment. The total cost of equipment and personal kits amounts to KES 18,393,000 per year.

Table 4.33: Equipment required for investigation

Equipment	Number	Cost per equipment (KES)	Cost (KES)
Vehicle 4x4	3	6,000,000	18,000,000
Personal Issue Kit	2	20,000	40,000
Tool Kit (hand tools)	1	100,000	100,000
Bio-hazard Kit	2	10,000	20,000
Investigation Equipment	1	200,000	200,000
Personnel Protective Equipment	2	10,000	20,000
Personal First Aid Kit	2	3,000	6,000
Vehicle First Aid Kit	1	7,000	7,000
Total			**18,393,000**

For complete air accident investigations and incidents, the department is expected to have a hangar and a fully equipped laboratory. A hangar should have at least one of the following features and operating conditions: an aircraft access door height over 28ft, a single fire area in excess of 3716 m2 (40,000 ft^2), provision for housing an aircraft with a tail height over 28 ft.

(8.5 m). Currently, the division of air accident investigation does not have a hangar. The estimated cost of constructing a hangar and a laboratory is estimated at KES 687,764,400**.**

Table 4.34: Cost of hangar and laboratory requirements

Requirements	**Cost (KES)**
Equipment	500,000,000.00
1.Wreckage Recovery	12,000,000.00
2.Reconstruction	500,000.00
Training	6,136,400.00
Counselling	900,000.00
Total cost	**687,764,400**

The required personnel according to the norms and standards are given in Table 4.35. Overall, the total cost of personnel required to work in the hangar and in the laboratory is estimated at KES 22,276,702 per year**.**

Table 4.35: Personnel required for hangar and laboratory requirements

Technical personnel	**Number**	**Job Group**	**Salary* (KES)**	**Total (KES)**
Workshop manager	1	Special "Q"	250,000	3,000,000
Workshop technicians	4	Special "P"	180,000	8,640,000
Laboratory technicians	3	Special "P"	180,000	6,480,000
Support staff				
Secretary	1	G	179,550	2,154,602
Messenger	1	F	104,632	1,255,587
Cleaners	2	E	31,105	746,514
Total cost				**22,276,702**

Cost of training investigators

The staff in the Air Accident Investigation is expected to continuously undergo specific skills upgrading training in air accident investigation. Table 4.36 presents a summary of training and respective costs of training. The total cost per year is estimated at KES 3,604,000**.**

Table 4.36: Cost of training investigators

Training type	Number of Staff	Frequency per year	Total Cost (KES)
a) Basic training			
Aircraft Accident Investigation Course	3	1	260,000
Government Safety Inspector Courses	3	1	336,000
ECCAIRS	2	1	200,000
Safety Management Systems	2	2	260,000
Human Factors	2	2	188,000
Crew Resource Management	2	2	176,000
b) Advanced training			
Aircraft Accident Investigation Techniques & Management	2	1	256,000
Flight Data Analysis and Monitoring	2	1	148,000
Safety Oversight Systems	2	2	360,000
Aviation Quality Systems and Auditing Techniques	2	1	200,000
Aviation Medicine	1	1	320,000
Dangerous Goods	1	1	320,000
Integrated and Advanced SMS	2	1	284,000
Aviation Safety Promotion Course/Workshops	4	2	148,000
Administrative/Management Courses	2	1	148,000
Total cost			**3,604,000**

The costing of the services provided by the SAGAs at the Department of Transport took into account the cost of personnel required to deliver the services and the operating costs. The annual costs are shown In Table 4.37.

Table 4.37: Cost of transport SAGAs

	Human resources cost per year (KES)	Annual operating costs (KES)	Total annual cost (KES)
Government Clearing Agency	26,810,484	104,677,925	131,488,409
Kenya Port Authority	14,733,000,000	10,780,000,000	25,513,000,000
Kenya Ferry Services	527,827,000	784,338,000	1,312,165,000
Kenya Railways	383,156,194	611,180,934	994,337,128
KMA	236,500,000	464,539,075	701,039,075
Kenya National Shipping Line	22,812,569	31,104,920	53,917,489
Kenya Airport Authority	3,788,981,910	6,580,656,840	10,369,638,750
Kenya Maritime Authority	236,500,000	464,539,075	701,039,075
Kenya National Shipping Line	22,812,569	31,104,920	53,917,489
Kenya Airport Authority	3,788,981,910	6,580,656,840	10,369,638,750
Total	**23,767,382,635**	**26,432,798,529**	**50,200,181,165**

4.4 Agriculture, Livestock and Fisheries

4.4.1 Functions of Agriculture, Livestock and Fisheries according to CoK

The relevant functions for agriculture and livestock as presented in the Fourth Schedule of the Constitution of Kenya 2010 (Republic of Kenya, 2010) are

- Agricultural Policy
- Veterinary Policy
- Capacity building and technical assistance to the counties

The CoK outlines functions and powers of the county to include:

- crop and animal husbandry;
- livestock sale yards;
- county abattoirs;
- plant and animal disease control; and
- fisheries

The Transition Authority in January 2015 presented the unbundled functions for both national and county governments (TA, 2015). The unbundled functions are presented in the succeeding section for both the national and county governments.

4.4.2 Unbundled National Functions for Agriculture

(a) Agricultural Policy: Capacity Building and technical assistance to the counties:

i. Formulate & review agricultural policies,
ii. Develop and enact bills and regulatory frameworks
iii. Capacity building for county governments
iv. Coordinating matters of international protocols and conventions
v. Liaise with other government agencies in development of sectoral and inter-sectoral policies and legal frameworks

(b) Support agricultural research and promote technology delivery

i. Development, adaptation and dissemination of new agricultural technologies,
ii. Linkage and coordination with international research agencies (CGIAR and other international and regional research organizations)
iii. Promotion of intellectual property rights through relevant agencies
iv. Resource mobilization for agricultural research

(c) Regulation and quality control of inputs, produce and products from the agricultural sector-in collaboration with other government agencies:

i. Develop a framework to increase accessibility of affordable agricultural inputs
ii. Set national standards
iii. Set enforcement Rules and Regulations
v. Monitor implementation of regulations and quality control standards

(d) Management and control of pests and diseases in crops

i. Control of plant pests and diseases (strategic/ migratory pests) that cut across counties and national borders.
ii. Coordinate and link with other national agencies to address cross-county disasters

(e) Promote Management and conservation of the natural resource base for agriculture

i. Develop standards and guidelines for implementation on soil and water

conservation, on-farm water management agricultural land use planning, agro-forestry and soil fertility, environmental management and biodiversity, agro-processing and structures;

ii. Build capacity on disaster management for county government
iii. Develop early warning system and programmes to address disasters

(f) Collate and manage information on agricultural sector

(g) ***Promote market access and product development***

i. Coordinate and enforce national and cross-county trade policies;
ii. Participate in development, implementation and coordination international trade protocols and agreements;
iii. Create linkages with other agencies to develop infrastructure to promote product development (under PPP arrangement)

(h) Enhance accessibility to affordable credit and insurance packages **for** ***farmers and incentives for investors***

4.4.3 National Functions for Livestock

(a) Policy formulation

i. Policy formulation, regulation, Coordination and Capacity building
ii. Animal and forage genetic conservation for small stock
iii. Disaster management
iv. Formulation of national programs and facilitation of state corporations
v. Coordination of bilateral and multilateral livestock related initiatives
vi. Promotion and regulation of the dairy industry
vii. Promotion of international dairy trade, advise on dairy policy
viii. Coordination of value addition and agribusiness activities , policy on value addition and agribusiness
ix. Support ASAL based livestock and rural livelihood
x. Support initiatives for sustainable land management in agro pastoral areas
xi. Support commercialization of smallholder dairy production

Directorate of Veterinary Services

Policy formulation and regulation of veterinary services

i. Development and review of policies for veterinary services.
ii. Development of national strategies for veterinary services.

(b) Application of sanitary measures

i. Development of guidelines for regulation of disease investigation,
ii. Surveillance, diagnosis and notification.
iii. Development of national disease management strategies.
iv. Import and export sanitary control of live animals and animal products.
v. Development of Trans-boundary Animal Diseases control strategies.
vi. Management of ports of entry veterinary services.
vii. Development of a national residue plan.
viii. Development of national zoonotic disease control programmes.
ix. Surveillance and response for food-borne zoonoses
x. Accreditation of service providers for Veterinary Services in collaboration with the Kenya Veterinary Board.

(c) Vector control and Zoological services

i. Regulation of use of acaricides
ii. Development of strategies for vector control.
iii. Management of national efficacy trials for acaricides.
iv. Regulation of zoological programmes, diagnostics, pest surveillance and
v. research
vi. Specialized technical capacity building for zoological services

(d) Regulatory services (standard)

i. Development of standards for inspection of meat, milk, eggs, honey, hides,
ii. Skins and other animal products.
iii. Development of standards for regulation of animal movement.
iv. Approval of export slaughterhouses.
v. Approval of national breeding farms, export establishments, semen and
vi. Embryo collection centres and quarantine stations.
vii. Regulation of veterinary medicines, vaccines, specimens and other biological products.
viii. Development of standards for inspection of Animal Health Service Providers.
ix. Development of standards for inspection of drug outlets (Agrovets).
x. Development of standards for inspection of drug manufacturing outlets.
xi. Development of standards for inspection of animal feedstuffs.

(e) Foreign policy implementation and facilitation of International Trade.

i. Collaboration with neighbouring countries and trading partners in the management of trans-boundary diseases of domestic animals, aquatic animals and game.
ii. Development and execution of joint programmes with neighbouring countries.
iii. The World Trade Organization (WTO) Enquiry Point on animal health measures.
iv. Risk analysis for imports of animals and animal products.
v. Harmonization, collaboration and integration of animal health measures, inputs and standards under the East Africa Community, Common Market
vi. for East and Southern Africa, Inter-African Bureau of Animal Resources of the African Union, the WTO, the World Organization for Animal
vii. Health (OIE), CODEX and any other regional or international cooperation arrangement Kenya assents to.
viii. Collaboration with the Foreign Affairs and Trade Sectors in resolution of trade disputes concerning animals and animal products.
ix. Participation in international standard-setting in the OIE.
x. Collaboration with other government agencies in negotiating treaties and agreements in matters of animals and animal products.

(f) Consumer protection- Quality assurance of animal products, inputs and services**.**

(g) Protection of animals and wildlife- Collaboration with other agencies in the development of policies for protection of animals and wildlife

(h) Assurance of Animal Welfare- Assurance of Animal Welfare Policy formulation for Animal Welfare.

(i) Disaster management

i. Development of capacity for animal disease early warning and rapid response;
ii. Development of policies, strategies, protocols and guidelines for animal diseases;
iii. Drought, floods and management other animal disaster incidents;
iv. Investigation and dissemination of information about suspected outbreaks of emerging zoonoses, foreign animal diseases and pests;
v. Establishment of Rapid Response Teams for major-impact epizootic and zoonotic diseases.

(j) Capacity Building

i. Capacity building and technical support to counties;
ii. Research and development liaison;
iii. Continuous Professional Development of veterinary surgeons and veterinary paraprofessionals;
iv. Management of national veterinary training institutions (Animal Health and Meat Training institutes).

(k) Regulation of veterinary profession- Review and enforcement of the regulatory framework for the veterinary profession.

(l) Veterinary extension service- Standardization of animal health and welfare advisory information.

(m)Conservation and management of animal reproductive
Development of animal reproductive technologies in collaboration with other stakeholders.

(n) Development of animal resource information and data system- Development and maintenance of a national animal resource information and data base.

(o) Development of national livestock programmes and Projects

i. Development of national livestock programmes and projects including Disease-Free Zoning (DFZ) under Vision 2030.
ii. Monitoring and Evaluation of national programmes and projects

(p) Oversight responsibility for State Corporations and management of National Institutions in the Animal Resource industry- Management of national veterinary institutions: Veterinary Efficacy Trial Centres (Kabete, Limuru, Machakos, Maseno, Ngong, Kiboko); veterinary laboratories (Central Veterinary Laboratories, Embakasi FMD laboratories, Karatina, Mariakani, Nakuru, Eldoret, Kericho, Witu, Ukunda, Garissa and Isiolo); tsetse fly field stations (Kiboko and Kiburine) and quarantine stations**.**

(q) Promotion of market access and product development.

i. Development of standards for value addition to animal products including meat, milk, eggs, hides, skins, wool and feathers.

(r) Development of standards for hides and skins improvement services.

Research

i. Research agenda setting in liaison with other agencies.
ii. Veterinary socio-economic and products' research.

4.4.4 Unbundled National Functions for Fisheries

The national functions for fisheries are listed below:

i. Formulate policies to guide fisheries extension service providers;
ii. Development and review of national extension manuals/ guides;
iii. Skills development of County extension staff;
iv. Salaries and gratuity for contracted fish framing extension staff;
v. Monitor implementation of guidelines;
vi. Formulate & review Oceans and Fisheries policies;
vii. Develop and enact bills and regulatory frameworks;
viii. Capacity building for County governments;
ix. Coordinating matters of international protocols and conventions;
x. Coordinate Joint patrols with Partner States of trans boundary shared waters;
xi. Digitization of gazette fish breeding areas;
xii. Digitization and gazettement of landing sites;
xiii. Deep sea fishing - observer program on board Distant Water Fishing Nations;
xiv. Liaise with other agencies to develop the 3 designated Ports Mombasa , Lamu and Vanga for foreign fishing vessels;
xv. Zonation for aquaculture-County specific Disease control;
xvi. Promotion of fish quality assurance and national inspections - National fish referral laboratories at Nairobi, Mombasa and Kisumu, Development and review of sanitary and phytosanitary fish standards and National Audits for fish industries;
xvii. Collection and management of National fish database.

4.4.5 Unbundled County Functions for Agriculture

(a) Crop husbandry including:

i. Provision of agricultural extension services or farmer advisory services;
ii. Development and implementation of programmes in the agricultural sector to address food security in the county;
iii. Construction of grain storage structures;
iv. Enforcement of regulations and standards on quality control of inputs, produce and products from the agricultural sector;
v. Availing of farm inputs such as certified seeds, fertilizer and other planting materials, such as cassava cutting or potato vinesto farmer;
vi. Development of programmes to intervene on soil and water management and conservation of the natural resource base for agriculture;
vii. Promotion of market access for agricultural products;
viii. Provision of infrastructure to promote agricultural production and marketing as well as agro-processing and value chains;
ix. Enhancing accessibility to affordable credit and insurance packages for farmers;
x. Management of agricultural training centres and agricultural mechanization stations **(Transferred under Legal No. No. 33 of 17th March, 2014),**
xi. Land development services such as construction of water pans for horticultural production for food security;
xii. Formulation and review of county specific policies,
xiii. Development and enactment of legislation and regulatory frameworks for county specific policies; and

xiv. Implementation of national and county specific policies.

(b) Plant and animal disease control including carrying out, coordinating and overseeing:-

i. Communal dipping and spraying operations and vaccination campaigns;
ii. Control of plant pests, diseases and noxious weeds that are specific to counties.

4.4.6 County Functions for Livestock

(a) Animal husbandry including:-

i. Livestock sale yards, county abattoirs/slaughter house services (Legal notice no. 1 of 1st Feb. 2013).
ii. Livestock extension services to deliver husbandry technologies to livestock farmers and pastoralists through farm demonstrations, farmer field days, farmer field schools, agricultural shows, individual farm visits, farmer training courses (residential and non-residential), *barazas*, farmer tours, posters, brochures or leaf lets.

Directorate of Veterinary Services

(a) Policies

i. Implementation of national veterinary policies, strategies and laws.
ii. Formulation of relevant county policies and laws.

(b) Sanitary measures

i. Disease investigation, surveillance, diagnosis, reporting and notification;
ii. Primary animal health care including vaccination campaigns.
iii. Veterinary clinical services.
iv. Livestock movement control (intra and inter-counties movement).
v. Implementation of national disease control programmes and strategies.
vi. Advisory services for construction, management and maintenance of
vii. County abattoirs.
viii. Local quality control, inspection and certification of animals, animal
ix. Products, feedstuffs and veterinary products

(c) Vector control- Vector surveillance and control including tick and tsetse control.

(d) Foreign policy and international treaties.

i. Implementation of international standards in animal health, production, welfare and food safety.
ii. Implementation of international treaties of veterinary importance

(e) Assurance of animal welfare

Animal control and welfare, including-

a) Licensing of dogs and
b) Facilities for the accommodation, care and burial of animals.

(f) Disaster management

i. Implementation of national animal disaster management strategies
ii. Development and review of county animal disaster management strategies.

(g) Veterinary extension services- Delivery of animal health, production, welfare and food safety advisory Services.

(h) Conservation and management of animal reproductive resources- Implementation of animal reproductive services including Artificial Insemination

(i) Animal resources' information- collection and synthesis of veterinary data for county planning and reporting to the National Veterinary Services

(j) Livestock programmes and project

i. Implementation of national livestock programmes and projects including disease free Zoning.
ii. Development of county-specific veterinary programmes and projects.

(k) Promotion of market access and product development

i. Development of markets and value addition infrastructure.
ii. Licensing of premises that sell meat, milk and other foods of animal origin.
iii. Veterinary technical responsibility for livestock sale yards, livestock markets and associated infrastructure.
iv. Hides and skins improvement services
v. Implementation of standards for value addition to animal products
vi. including meat, milk, eggs, hides, skins, wool and feathers

(l) Collaboration with other institutions

i. County Directors of Veterinary Service shall collaborate with the
ii. Department of Fisheries and Kenya Wildlife Service in matters of fish and Wildlife health respectively.

County Directors of Veterinary Service shall collaborate with the Ministry responsible for health services in their respective counties in matters of zoonoses and the 'One Health approach.

4.4.7 County Functions for Fisheries

The following are functions for fisheries at the county level:

i. Fisheries extension services;
ii. Up scaling sea weed;
iii. County fish seed bulking units;
iv. On-farm trials;
v. Fish health certification;
vi. Development and maintenance of fish landing stations and jetties, fish landing fees;
vii. Demarcation of all fish breeding areas and fencing of fish landing stations;
viii. Fish trade licensing and fish movement permits;
ix. Collection of fish production statistics;
x. Enforcement of fisheries regulations and compliance with management measures;
xi. Implementation of fisheries policy, fisheries management measures and regulation and limiting access to fishing;
xii. Fisheries monitoring, control and surveillance; and
xiii. Zonation for aquaculture county specific disease control and maintenance of fish auction centres which is limited to nine counties namely Nyeri, Meru, Migori, Kisumu, Homabay, Siaya, Busia, Kakamega, and Lamu.

4.4.8 Concurrent Functions for Agriculture, Livestock and Fisheries

There are functions that are shared between the national and county governments which include:

i. Resource mobilization for agricultural research;
ii. Coordination of value addition and agribusiness activities, policy on value addition and agribusiness;
iii. Support initiatives for sustainable land management in agro pastoral areas;
iv. Support commercialization of smallholder dairy production;
v. Sport fishing development.

4.4.9 Norms and Standards (Procedures as Provided in the Quality Management Manual)

This section details the standards as presented in the Quality Management Systems Procedures and Guidelines of the Ministry of Agriculture, Livestock and Fisheries (MOALF/QMS).

Policy development coordination

Policy development is triggered by a policy concern from any one of the following sources:

- Agricultural, Livestock, Fisheries and State Corporations;
- Feedback from any government arm implementing a national policy framework;
- Interested agricultural sector stakeholders.

In consultation with the Permanent Secretary (PS), the relevant director shall direct the Deputy Director in charge of Policy Co-ordination to commence the policy formulation process which involves the following key stages:

- Analysis of the Policy Concern or concerns;
- Development of a concept note;
- Constitution of a committee of key stakeholders;
- Planning meetings to review concept note;
- Retreats by technical committees to develop zero draft and refine draft policy documents
- Visits to key institutions to further analyze sector or subsector or specific industry current status, constraints to optimal performance and collect views on possible alternative policy interventions;
- Retreat to develop 1st draft;
- DD, Policy Co-ordination shall forward the zero draft to Director DPR&R for input, with the latter seeking further input from the other Technical Directors in the Ministry and initiate the convening of a stakeholder forum to subject the 1st draft to critique.

The Director DPR&R shall convene a stakeholders' forum to discuss the draft policy document. The Director DPR&R shall prepare an agenda and circulate the draft policy intervention to stakeholders for who shall study it to prepare for SHF. The Final Policy will be forwarded to the Cabinet by the CS.

Development and review of technical materials

The development and review of technical materials begins with the Head of Department (HOD) instructing their respective responsible officers to conduct various technologies needs assessment through County officers and farmers as per the Human Resources Department (HRD) procedures on Training Needs Assessment. The responsible officers embark on information gathering from various sources on the identified topic. When the information

source is from outside the station, the officer will apply for a field visit. Upon collection of information the responsible officer will collate, process and prepare a zero draft within one month for leaflets or brochures and 2 months for booklets and or manuals. The responsible officer shall convene a stakeholders meeting to validate the zero draft within 2 months after the zero draft is ready. Upon validation, the responsible officer shall prepare the first draft and forward it to the editorial team for editing within 2 months, where after editing the responsible officer shall prepare the final draft within one week and forward to the HOD for approval before publication. The final draft will, if not approved, be taken back and reviewed as per the HOD recommendations. If approved, the final draft is forwarded to the PS for verification and authorization for printing and publication. Upon publication the responsible officer shall distribute the technical material to relevant users. The responsible officer shall conduct various technology needs assessment per the State Department of Agriculture procedures and organize for capacity building for staff farmers and other stakeholders.

Development of technical packages

Development of technical packages begins with the H/LR requesting for a list of technologies that need packaging and dissemination from various sources including researchers, county officers, and farmers. This is then followed by the following:

- Upon receipt of the list the H/LR will constitute a team of officers, to prioritize the technologies to be packaged and disseminated according to immediate need and available resources.
- The responsible officers shall apply for a field visit to source information for preparation of a draft.
- Upon collection of information the responsible officers shall collate, process and prepare a zero draft within one month for leaflets or brochures and 2 months for booklets or manuals.
- The responsible officer shall convene stakeholders' workshop for staff farmers and other stakeholders to validate the zero draft within 3 months after the zero draft is ready.
- Upon validation the responsible officer shall prepare the first draft and forward it to the H/LR for editing within 2 months.
- After editing the responsible officer shall prepare the final draft within one month and forward to the HLRMD through the relevant head of division for approval before publication.
- Upon approval, the final draft is forwarded to the PS for verification and authorization for printing and publication where the responsible officer shall distribute the technical material to relevant users

Development and review of standards for animal feeds

This involves either the H/APU receiving request from stakeholders or officers in APU identifying the need for development or review of a standard. Then, the following activities have to be conducted:

- Upon receipt of the request or identified need, the H/APU shall study the request and forward within one week to H/ARM. If not approved the H/ARM shall communicate to the H/APU.
- If approved, the H/ARM shall forward to the H/LRMD within five days. Upon receipt of the request the H/LRMD shall communicate to KEBS on the need to develop or review the standard, as per the Administration procedures.
- KEBS will develop or review the standard and revert back to H/LRMD where it will be received and disseminated.

Development and Review of Standards for Animal Products

- The HAVAD receives request from stakeholders or officers in HAVAD identifying the need for development or review of a standard.
- Upon receipt of the request or identified need, the HAVAD studies the request and forwards to H/LRMD.
- Upon approval, the H/LRMD shall communicate to KEBS on the need to develop or review the standard.
- KEBS will develop or review the standard and revert back to H/LRMD where it will be received and disseminated.

Livestock production data management

- The H/ARMD informs the DLRMD on the need for livestock, livestock inputs and products data collection from the Counties.
- Upon receipt of the internal communication, the official shall communicate to the counties to provide the required data.
- Upon the receipt of the required data from the counties, the DLRMD shall forward the same to the responsible officer. Upon receipt of the data for the counties the officer shall collate, process and prepare a report within one month for biannual reports and two months for annual reports.
- Upon receipt of the report the DLRMD shall or shall not approve the circulation and publication of the report that shall be availed for circulation and publication.

Reporting on early warning indicators for food security preparedness

- This procedure starts with the CDA/L/F identifying early warning and food security indicators as per the current circulars and weather forecast.
- Upon identification, the CDA/L/F shall compile a report to warn on the food security status and submit the report to HEW&SPD.
- In the verification, HEW&SPD shall consider the Early Warning Indicators.
- Upon receipt of the reports, HEW&SPD shall verify and compile a report with recommendations to the HFS for action.
- Upon receipt of the report HFS, shall review, verify and compile a report to the PS.
- The HFS shall study the PS's recommendations, make comments and forward to the HEW&SPD for analysis and compilation of the National Early Warning and Food Security Report with recommendations for intervention measures.
- The HEW&SPD shall forward the report with recommendations to the HFS for review. Upon review of the report, the HFS shall forward the report to the PS for study.
- Upon receipt, PS shall forward the report to the CS for his information and approval. Upon receipt, the PS shall approve and forward the report to OP.

Food security assessment

This procedure shall start with the HFSS&PMD drawing food/feed assessments programme at the end of every rainy season (as per the Ministerial work plan and budget). Then the following procedures follow:

- HFSS&PMD shall forward the program to Director Food Security for review and approval.
- In the event of disapproval, the programme shall be returned to HFSS&PMD with recommendations.
- Upon approval, the HFSS&PMD shall communicate to relevant Counties three weeks prior to the assessment and send the programme as well as the check.

- The HFSS&PMD shall constitute a team of officers and make requisition for funds and transport as per the Accounts.
- The team shall Visit the County office to plan and proceed to the selected sub counties for the following:
    i. Collect the necessary food and feed data in the field,
    ii. Analyse the data and compile the food and feed situation repor,
    iii. Submit the compiled report to the HFSS&PMD for review and verification,
- The HFSS&PMD shall forward the report to the Director Food Security for information and appropriate action.
- The CS shall approve and disseminates the report to the Office of the President and other stakeholders for their appropriate action and this procedure is deemed complete**.**

Development and review of farm management handbook, guidelines and value chains

This procedure shall start with the H/AVAD identifying a need for development and/or review of farm management handbook, guidelines and value chains through but not limited to:

- Findings from surveys.
- Gaps in farm management handbook, guidelines and value chains.
- Requests for intervention, review from groups/entrepreneurs and other stakeholders.
- Customer requests
- Ministry mandate

This is followed by:

- The H/AVAD shall decide on appropriate interventions which could be, but not limited to Review of Farm Management Handbook and guidelines Value chain development.
- The H/AVAD shall detail the head FBACFU to organize for the review of the Farm Management Hand Book and Guidelines. The Head FBACFU shall in consultation with the H/AVAD constitute a team to undertake the review.
- The team shall develop a program and budget to enable them undertake the activity.

Management of Quelea Birds

Quelea birds pose a great threat to cereal production in Kenya. Management of these pests starts with PPO drawing a programme for colony survey in the historical breeding sites and forward it to the H/PPSU for verification and approval. This is followed by:

- In the event of disapproval, the H/PPSU shall return the programme to the PPO with recommendations for revision.
- Upon approval, and in case the breeding sites are in the game parks, the H/PPSU will seek authority to enter the National/Game Park from KWS.
- The KWS shall review the request and act accordingly.
- In the event of disapproval, the KWS shall communicate the decision with recommendations to H/PPSU.
- Upon approval by KWS, the H/PPSU shall request for the necessary resources for survey (aircraft from DLCO-EA if the survey shall be aerial).
- Upon approval, the PPO shall carry out the colony survey and write a back to office report.
- Upon receipt of the report, H/PPSU shall analyze the report and forward it to the H/DCRAMD with copies to DLCO-EA and IRLCO-CSA for information.

- This will end when the report has been forwarded to H/DCRAMD and copied to relevant stakeholders. This procedure shall start with CDA/Stakeholders/Survey report of outbreaks being forwarded to the H/PPSU for appropriate action. Upon receipt of the outbreak report, the H/PPSU shall mark the report to the relevant PPO who will study and recommend appropriate control action.
- The PPO shall draw a control programme and make requisition for funds, transport, pesticides and spray equipment and forward them to the H/PPSU for approval as per the availability of resources and urgency. Upon approval, the H/PPSU shall request for aircraft from DLCO-EA as is appropriate.

Agricultural trade promotion

- The procedure shall start with the HOU identifying the need based on but not limited to the following;
    i. Feedback from the counties on the agricultural commodities experiencing glut or deficiencies;
    ii. Request by stakeholders on need to promote trade of agricultural products
    iii. Reports on market surveys;
    iv. Invitation by organizers of scheduled trade fairs, exhibitions, conferences, trade missions;
    v. Information from the Kenyan missions abroad and agriculture attaché offices;
- Upon identification the HOU shall seek approval from the HOD to carry out the agricultural trade promotion.
- If the HOD disapproves, this is communicated with recommendations. In the event that the activity was from a customer/ stakeholder the HOU shall communicate the decision to the customer.
- If approved the officer shall then make a requisition for funding and transport, as per Accounts procedures manual Clause 1 payment process and Administration procedures manual Clause 2 Transport respectively.
- If the activity is an exhibition, the HOU shall identify all the other stakeholders, and convene the preparation meetings. The HOU shall communicate to the relevant County or the Kenyan mission in a foreign country as per Administration procedures manual Clause 2 External communication.
- The HOU and the team shall carry out the activity by exhibiting and promoting Kenyan products. Upon completion the HOU shall write a back to office report within one week and forward it to the HOD through the Head of Division.
- The HOD shall organize a post-mortem meeting within one month and come up with a comprehensive report as well as a plan of action based on the outcome. The HOD shall forward the report to the PS and file a copy.

Collection, processing, storage and dissemination of market information

This procedure starts with market enumerators visiting the designated markets on every working day. This is then followed by collection of prices of commodities by enumerators using the prescribed data collection sheets. Upon collection the enumerators shall then process the data using the prescribed formats. The enumerators shall then transmit the processed data from the designated markets to the H/MIDCU as per Administration procedures manual Clause 1 internal communication. The MIDCU staff shall then consolidate and process the data in the prescribed form. The MIDCU staff shall then disseminate the commodity market prices to end users, as per Administration procedures.

Annual Presidential Agro-Enterprise Competition Award Scheme

Agro-enterprises are requested to apply to participate in the competition. The head AVAD shall send the application forms to the CDAs. The agro-enterprises interested in participating in the competition shall collect the forms from the CDAs, fill them and return to the CDAs. Upon receipt of the filled forms, the CDA shall conduct judging to identify the best three agro-enterprises in the County as per the following categories:

i. Small scale farm gearing to commercialization
ii. Small Scale farms fully commercialized based on the level of investment and turnover per year (≤KES 50 million)
iii. Large scale fully commercialized farm (>KES 50million)
iv. Large scale Agro input dealers with an investment of more than KES 5million.
v. Small Scale Agro dealers at an investment level of less than KES 5million.

This is then succeeded by the CDA submitting the names of the best three agro-enterprises in each category to the Head/DCRAMD. The Head Farm Business, Agricultural Credit and Finance Unit shall write a detailed program and budget and forward it to the Head/DCRAMD for approval. The Head/DCRAMD compiles a list of the winners and forwards the same to ASK for awarding during the Nairobi International Trade Fair and this activity.

Capacity building for staff farmers and other stakeholders

The responsible officer will identify needs for capacity building by reviewing previous annual work plans, demands from CDAs and other stakeholders together with workshop reports. The responsible officer then prepares a proposal for consideration by the immediate supervisor at least two weeks before the intended date for approval by HOD. If approved the responsible officer shall seek an imprest to procure capacity building services and or materials, as per the SCMU procedures manual Clause 1 procurement.

Promotion of agro-industry development

This procedure begins with the Head AIDIU identifying a need for agro industry development through but not limited to:

i. Surveys as per the procedure for conducting surveys number 2 in this manual and using the standard survey questionnaire in place
ii. Agro-processing gaps in reports
iii. Requests for intervention and up scaling of agro-processing from groups/entrepreneurs

The Agro-industry promotion staff will decide on an appropriate intervention which could be, but not limited to the following:

i. Training
ii. Quality control
iii. Dissemination of Appropriate Technology

The Agro-industry promotion staff will raise a request to the HOD to carry out the intervention, as per Administration procedures manual Clause 1 internal communication. The HOD shall approve the request based on the following:

i. Availability of resources
ii. Commitment of the staff

The HOD shall communicate within three days, the decision to the Agroindustry promotion staff, where the promotion activities are scheduled to start on the basis of the activities in the budget.

Agricultural market surveys
This procedure begins with a need being identified by the HOU based on the following:

i. Gaps in field reports
ii. Emerging issues and enterprises
iii. Customer requests
iv. Ministry's planning needs

Upon identification of the need, the HOU will seek approval to carry out the survey from the relevant HOD. The HOU makes a requisition for funding, where s/he will communicate to the stakeholders in the target areas as per the communication (Administration procedures manual Clause 2 External communication). The survey team shall then collect data from primary and secondary sources analyse the data and compile a report. Upon compilation of the report, the HOU shall send the same to the HOD through the Head of Division for information, comments and approval.

Agriculture, livestock and fisheries projects and programmes development coordination
The Director, PCR&R receives proposals or project/programme documents from development partners, or from a technical department within the Ministry of Agriculture Livestock and Fisheries or other Government Departments and Development partners. Upon receipt, the Director, PCR&R makes comments and action the H: API&DMU for appraisal. The H: API&DMU in consultation with the Monitoring & Evaluation team shall appraise the proposal(s) and format them as per the Current Project preparation manual for funding. In case proposed projects/ programmes have already signed the project documents (and therefore funding), the H: API&DMU shall make a follow up with respective Directorate to ensure Project/Programme implementation is on schedule. Upon approval and funding the Director, PCR&R requests for an implementation Plan from project/ programme Coordinator. The Director, PCR&R will then instruct the H: API&DMU to prepare M&E tools. The M&E activity shall start by the Director, PCR&R receiving specific Work plans, M&E tools and Terms of Reference for the exercise to be carried out. Upon approval, the H: API&DMU notify the concerned project/programme coordinator to prepare for the planned M&E activity. The H: API&DMU with the M&E team will carry out M&E as per the NIMES Framework of the Ministry of Devolution and Planning and Kenya Vision 2030. The H: API&DMU will prepare M & E reports and give feedback to respective project coordinators, implementing Directorate(s) and to the Head of Central Projects Planning and Monitoring Unit for necessary action. Upon the H: API&DMU carrying out respective project/programme impact assessments Audits and preparing reports with recommendations and way forward to respective stakeholders this procedure is deemed complete. Thereafter, the procedure is disseminated through the standard channels.

Development and review of guidelines for sustainable environmental management
This starts with the PS receiving the project EIA report from NEMA or a stakeholder and marks it to CE DITIM for action. The CE DITIM studies the EIA report and marks it to the H: EMLUPBU. The H: EALUPBU shall convene a technical committee to study the EIA report, make recommendations in a technical report. The H: EALUPBU presents the technical report to the CE DITIM for approval and forwarding to PS. In the event of

disapproval the CE DITIM shall communicate appropriately. Upon approval CE DITIM will present the technical report to PS for concurrence. Upon concurrence the PS forwards the technical report to NEMA for action and the process shall be deemed complete.

Setting of national standards on agricultural structural designs for food storage and processing

This procedure begins with the CE conducting a baseline survey to establish status of agricultural structures, food processing and storage in the country in collaboration with CDAs and stakeholders. The H: AAS compiles, analyze, synthesize, consolidate the data, identify gaps and prepare status reports on agricultural structures, food processing and storage standards in the country. The H: AAS prepares guidelines to address the gaps and produce a draft standards document. The H AAS hands over the draft document to the CE for concurrence, where if not approved the CE will send back to H: AAS for correction. Upon approval, the CE convenes a stakeholders' forum to validate the document. This procedure will be deemed complete when the validated Standards document is distributed to CDAs for implementation.

Development, testing and promotion of agricultural, livestock and fisheries engineering technologies

This procedure shall start with the County Director for Agriculture/ Livestock/ Fisheries (CDA) /County Agriculture Engineer (CAE), Manager of Agriculture Technology Development Centre or Chief Engineer (CE) identifying gaps in the agricultural production value chain of various enterprises, or responding to farmers' or stakeholders demand for intervention. The Manager or CDA/CAE analyses options and prescribe a technical solution to address the problem. The Manager shall source for and procure or design and fabricate an appropriate technology. The Manager carries out necessary tests and modifications for validation and adaptation of the technology to the local situation. The Manager and the CDA will promote the technology. The manager develops the users /operator's manual, for the fabricated technology. The following will be followed as part of this procedure:

i. The manager of ATDC shall demonstrate the technology
ii. The manager of ATDC shall train entrepreneurs on production of the technology
iii. The manager of ATDC shall hand over the technology to the trained private entrepreneur for mass production.
iv. The manager of ATDC shall promote the technology for wide scale adoption through agricultural shows, field days, exhibitions and trade fairs.
v. The CE shall organize a National Technical Workshop where the developed technologies can finally be presented.

4.4.10 Costs of Functions/ Services of Agriculture, Livestock and Fisheries

The following section presents estimates of unit costs, staff costs and operational costs including those of semi-autonomous government agencies. Table 4.38a through Table 4.38m present the estimates of unit (activity) costs for the national functions. The tables indicate the functions, the associated activities and the costs of the activities. For instance, development and review of agriculture, livestock and fisheries related policies and regulations has many activities, one of which is setting of agenda and developing concept note. This activity would entail a three-day workshop at a cost of KES 600,000. This activity would be carried out twice per year. The costing of all other activities follows similar approach.

Table 4.38a: Costs of activities for agriculture, livestock and fisheries at national level

Function	Activities Undertaken	Inputs	Unit Cost (KES)	Number per Year	Total Cost (KES)
Development and review of Agriculture, Livestock and Fisheries related policies and regulations	Agenda setting and development of concept note	Retreat 3 days for 10 people (subsistence allowance, stationery & teas, transport, hire of venue)	600,000	2	1,200,000
	Literature review	Desk review, field consultative visits	500,000	2	1,000,000
	Retreat to develop zero draft	5 days retreat for 10 people (per diem, transport, hire of venue, stationery)	1,200,000	2	2,400,000
	First Publication in the media	Media space (print and electronic)	1,000,000	2	2,000,000
	Stakeholder Dialogue	Internal consultations, 7 regional stakeholders Workshops/Meetings (subsistence allowance, Lunches & transport refunds, hire of venues, stationery, teas)	15,000,000	2	30,000,000
	Retreat to incorporate stakeholders inputs	5 days retreat for 10 officers(subsistence allowance, transport, hire of venue, teas, stationery)	1,200,000	2	2,400,000
	Second Publication	Media space (print and electronic)	3,000,000	2	6,000,000
	National stakeholders validation workshop	1 day national workshop (Hire of venue, lunch & teas, stationery, transport refunds)	10,000,000	2	20,000,000
	Input of stakeholders comments	Lunches and teas, stationery	50,000	2	100,000
	Professional review by policy experts	Consultancy fees	5,000,000	2	10,000,000
	Preparation of cabinet memo	Stationery, teas	20,000	2	40,000
	Printing of policy document for submission to cabinet	Printing costs	1,000,000	2	2,000,000
	Preparation of implementation framework	Retreat 5 days for 10 people, Per diem, venue hire, transport, stationery & teas	1,200,000	2	2,400,000
	Monitoring and evaluation of policy implementation	Per diem, transport, stationery	500,000	2	1,000,000
				Cost	**80,540,000**

Table 4.38b: Costs of activities for agriculture, livestock and fisheries at national level - continue

Function	Activities Undertaken	Inputs	Unit Cost (KES)	Number per Year	Total Cost (KES)
Setting standards for agriculture, livestock and fisheries products in collaboration with relevant regulatory bodies	Technical committee meetings to draft and review standards	Fuel costs, stationery, per diem	150,000	4	600,000
	Consultative forums with stakeholders	Fuel costs, stationery, per diem, lunches, transport refunds	600,000	4	2,400,000
	Incorporation of stakeholders inputs	Fuel costs, stationery	10,000	4	40,000
	Approval-Participating in technical committee meetings for consensus building on standards and approval	Fuel costs, stationary	10,000	4	40,000
	Monitoring of Compliance to standards	Fuel costs, per diem stationary	400,000	4	1,600,000
				Cost	**4,680,000**
Development of technical materials and packages for dissemination	Literature review, data collection	Per diem, transport	300,000	4	1,200,000
	Retreat to develop materials/packages/production manuals	5 days retreat for 10 persons, transport, hire of venue	1,200,000	4	4,800,000
	Peer review of materials	Email, stationery	5,000	4	20,000
	Forum for input by County Technical staff	2 days retreat for 70 persons, transport, hire of venue	2,100,000	4	8,400,000
	Input of comments	Lunches and teas, stationery	10,000	4	40,000
	Printing and dissemination of materials	Printing & dissemination cost	600,000	4	2,400,000
	Monitoring and backstopping	Transport, Per diem	400,000	4	1,600,000
				Cost	**18,460,000**

Table 4.38c: Costs of activities for agriculture, livestock and fisheries at national level - continue

Function	Activities Undertaken	Inputs	Unit Cost (KES)	Number per Year	Total Cost (KES)
Capacity building of stakeholders on policy development, best practices in agriculture, livestock development, fisheries and other related topics	Situational analysis-Identification of needs and targeting of trainees	Teas, lunches, stationeries	10,000	4	40,000
	Preparation of dissemination materials and communicating invitations	Stationeries, email communications	10,000	4	40,000
	Capacity building	Transport, stationery, Per diem for resource persons, conference facilities, lunches &teas)	2,700,000	6	16,200,000
	Feedback and reporting	Preparation of feedback report and actionable areas	10,000	6	60,000
	Undertaking follow ups and evaluation of impact of training	Per diem, transport, stationery	450,000	2	900,000
				Cost	**17,240,000**

Table 4.38d: Costs of activities for agriculture, livestock and fisheries at national level - continue

Function	Activities Undertaken	Inputs	Unit Cost (KES)	Number per Year	Total Cost (KES)
Development and maintenance of crops, livestock and fish species and agriculture, livestock and fish products data bank	Development and validation of data collection tools	Per diem, transport and stationery	400,000	4	1,600,000
	Data collection, analysis and documentation	Field visit-subsistence, fuel cost, stationeries	4,530,000	2	9,060,000
	Development and maintenance of national livestock data bank system	Computers, information servers, data collection equipments, internet, mobile phones etc	10,000,000	2	20,000,000
	Reporting and dissemination	Internet and stationeries	200,000	4	800,000
				Cost	**31,460,000**

Table 4.38e: Costs of activities for agriculture, livestock and fisheries at national level - continue

Function	Activities Undertaken	Inputs	Unit Cost (KES)	Number per Year	Total Cost (KES)
Development of agriculture, livestock and fisheries development strategies and guidelines	Agenda setting and development of concept note	Retreat 3days for 10 people, stationery & teas	450,000	2	900,000
	Data collection	5 days field Visits (3 officers & driver, vehicle)	300,000	2	600,000
	Input of findings	3 days Retreat for 10 people	420,000	2	840,000
	Stakeholder Dialogue	5 regional stakeholders Workshops/Meetings (subsistence allowance, Lunches & transport refunds, hire of venues, stationery, teas)	8,000,000	2	16,000,000
	Input of stakeholders comments	5 days retreat for 10 officers	700,000	2	1,400,000
	Printing and dissemination of strategies and guidelines	printing costs & dissemination costs	600,000	2	1,200,000
	Publication through public media	Media Space,	1,000,000	2	2,000,000
	Monitoring of implementation	Per diem, transport, stationery	400,000	2	800,000
				Cost	**23,740,000**

Table 4.38f: Costs of activities for agriculture, livestock and fisheries at national level - continue

Function	Activities Undertaken	Inputs	Unit Cost (KES)	Number per Year	Total Cost (KES)
Promotion of investment and trade in agriculture, livestock and fisheries and their products	Hold symposiums, consultative forums and Trade fairs with stakeholders	Conference facilities, stationery, media coverage	30,000,000	1	30,000,000
	Participate in international trade fairs and conferences	Transport (Air Tickets), Per diem	10,000,000	2	20,000,000
	Creating frameworks for public private partnership	Consultative meetings, workshops	2,000,000	2	4,000,000
	Control and regulation of livestock and livestock products imports	Consultative meetings , sensitization workshops	1,000,000	2	2,000,000
	capacity building of stakeholders in agribusiness, value addition and other trade related issues	Stationery, Per diem, transport, media coverage	2,000,000	2	4,000,000
				Cost	**60,000,000**

Table 4.38g: Costs of activities for agriculture, livestock and fisheries at national level - continue

Function	Activities Undertaken	Inputs	Unit Cost (KES)	Number per Year	Total Cost (KES)
Research and extension liaison	Strengthen links with research institutions	Joint forums and research activities	2,000,000	2	4,000,000
	Joint technology validation exercises	Per diem, transport	500,000	2	1,000,000
	Packaging of technologies	5 days retreats (Per diem, stationery, transport, venue hire, teas)	850,000	2	1,700,000
	Printing and dissemination of technologies	printing costs, capacity building, distribution	1,200,000	2	2,400,000
	Monitoring and evaluation	Per diem, transport, stationery	400,000	1	400,000
	Participating in knowledge/research findings (local & international forums)	Per diem, transport, air tickets	2,000,000	2	4,000,000
				Cost	**13,500,000**
Coordination and supervision of national livestock stations	Supervision and backstopping of national stations (9 sheep & goats breeding stations, 4 farms, and 3 training institutions)	Per diem, transport, stationery	800,000	2	1,600,000
	Hold annual review workshop for the stations	Per diem, transport, venue hire, stationery, teas	1,500,000	1	1,500,000
				Cost	**3,100,000**
Range management and development	Range resource survey and monitoring	Per diem, transport, stationery	600,000	2	1,200,000
	Development of strategic feed reserves	Identification of sites, Construction of feed storage structures,	10,000,000	4	40,000,000
				Cost	**41,200,000**

Table 4.38h: Costs of activities for agriculture, livestock and fisheries at national level - continue

Function	Activities Undertaken	Inputs	Unit Cost (KES)	Number per Year	Total Cost (KES)
Development of programmes and proposals	Literature review	Stationery & teas	2,000	2	4,000
	Development of concept notes	3 days Retreat for 10 people	420,000	2	840,000
	Data collection	5 days field Visits (3 officers & driver, vehicle)	200,000	2	400,000
	Stakeholder consultations	Workshops/Meetings (subsistence allowance, Lunches & transport refunds)	120,000	2	240,000
	Proposal development	5 days retreat for 10 officers	850,000	2	1,700,000
	Sourcing for funding	Meetings, emails & correspondences	5,000	2	10,000
				Cost	**3,194,000**
Budget preparation and coordination	Program Performance Review(PPR)	Field visits, retreat to compile data (Per diem, transport, stationery, hire of venue)	1,200,000	1	1,200,000
	Preparation of Program Based Budget (PBB)Estimates	5 days retreat for 10 people, stationery, transport	850,000	1	850,000
	Preparation of subsector reports	10 days sector retreat for 2 officers, transport, Per diem	400,000	1	400,000
	Public Participation	Public Hearing to incorporate of the public input into the Sector Budget Proposals	2,000,000	2	4,000,000
	Preparation of itemized budget	Stationery, teas, lunches	10,000	1	10,000
	Preparation of annual work plans, procurement plans and cash flow projections	Stationery, teas, lunches	20,000	1	20,000
	Monitoring of budget implementation and reporting	Field visits, preparation of reports (Per diem, etc)	400,000	4	1,600,000
				Cost	**8,080,000**

Table 4.38i: Costs of activities for agriculture, livestock and fisheries at national level - continue

Function	Activities Undertaken	Inputs	Unit Cost (KES)	Number per Year	Total Cost (KES)
Coordination of performance contracting function	Development of performance contract targets	stationery, teas, lunches	20,000	1	20,000
	Preparation of quarterly reports	stationery, teas, lunches	20,000	4	80,000
	Monitoring of performance contract targets implementation	Per diem, transport, stationery	300,000	2	600,000
	Collection and compilation of evidence, evidence review , midterm and final evaluation	field visits (Per diem, transport, stationery) Retreat for 5 persons for two days (subsistence allowance, transport)	700,000	2	4,400,000
				Cost	**2,100,000**
Bilateral and multilateral cooperation	Development of proposals and MoUs on cooperation, implementation of action plans	Stationery, teas, lunches	20,000	4	80,000
	Participate in Joint Commissions on Cooperation	Transport (Air Tickets), Per diem	800,000	4	3,200,000
	Support to implementation of agreed areas of cooperation	Per diem, transport, stationery	2,500,000	2	5,000,000
			Cost		**8,280,000**
Mapping and development of stock routes	Tracking and assessing status of stock routes	Transport, Per diem, stationery	500,000	2	1,000,000
	Holding consultative fora with livestock traders and other stakeholders	Venue, teas, transport refund, lunch, transport for HQs team, Per diem	700,000	2	1,400,000
	Capacity building of stakeholders on business opportunities along the stock routes	Venue, teas, transport refund, lunch, transport for HQs team, Per diem	1,200,000	2	2,400,000
			Cost		**4,800,000**

Table 4.38j: Costs of activities for agriculture, livestock and fisheries at national level - continue

Function	Activities Undertaken	Inputs	Unit Cost (KES)	Number per Year	Total Cost (KES)
Support and establishment of livestock marketing infrastructure	Maintenance and updating of the National Livestock Information System	ICT equipment, smart phones, airtime, transport, Per diem	200,000	4	800,000
	Training and supervision of data monitors	Per diem, transport, hire of venue	300,000	4	1,200,000
	Maintenance and supervision of national livestock holding grounds	Civil works, routine maintenance, Per diem, transport	500,000	4	2,000,000
			Cost		**4,000,000**
Support to index based livestock insurance	Capacity building of livestock farmers and other stakeholders on livestock insurance	Venue, teas, transport refund, lunch, transport for HQs team, Per diem	1,200,000	2	2,400,000
	Purchase livestock premium	Tropical livestock unit (LTU) @2,000	50,000	1	100,000,000
	Sensitization and recruitment of beneficiaries	Per diem, transport, stationery	800,000	4	3,200,000
			Cost		**105,600,000**

Table 4.38k: Costs of activities for agriculture, livestock and fisheries at national level - continue

Function	Activities Undertaken	Inputs	Unit Cost (KES)	Number per Year	Total Cost (KES)
Human resource development	Strategic Leadership Development programme	Tuition Costs at the Kenya School of Government	130,000	40	5,200,000
	Senior Management Course	Tuition Costs at the Kenya School of Government	130,000	40	5,200,000
	Supervisory Skills Development programme	Tuition Costs at the Kenya School of Government	130,000	30	3,900,000
	Master's degree training	Tuition fees, research allowances	700,000	10	7,000,000
	PhD training	Tuition fees, research allowances	1,200,000	5	6,000,000
	Other tailor made short courses at other venues	Training fees	50,000	100	5,000,000
	Coordination, marking and moderation of institutional examinations (Dairy Training School, Animal Health Institutes)	Transport, Per diem, stationery	300,000	2	600,000
	Liaison between National and County Governments on training matters	Transport, Per diem, stationery	300,000	2	600,000
				Cost	**33,500,000**
Promotion of Climate Smart farming	Capacity building of stakeholders on climate smart technologies	Venue, teas, transport refund, lunch, transport for HQs team, Per diem	600,000	2	1,200,000
	Support to climate smart livestock initiatives	Demonstration equipment,	2,000,000	2	4,000,000
	Monitoring of climate change indicators				
				Cost	**5,200,000**

Table 4.38l: Costs of activities for agriculture, livestock and fisheries at national level - continue

Function	Activities Undertaken	Inputs	Unit Cost (KES)	Number per Year	Total Cost (KES)
Sheep and Goat Station	Providing best practise information about sheep and goat	Brochures (50,000), 12 monthly workshops (500 participants) and seminars, 12 training sessions (6 hours)	2,500,000 600,000 720,000	 12	3,820,000
	Sheep and goat extension services	Educational visits, trainer, assorted inputs used for demonstration	1,800,000	60	108,000,000
	Semen collection and evaluation	Artificial vagina, microscope, semen counting devices (IMV Micro reader, incubator or water bath, semen extender and antibiotics for extender, Fluid measuring tools, Thermometer, Other (Insemination pipette, syringes, disposable gloves,	40,000 240,000 70,000 40,000 1,000 4,000 1,000,000	1 1 1 1 1 1 1 1 1	40,000 240,000 70,000 40,000 1,000 4,000 1,000,000
	Wool and mohair evaluation	Livestock production and management inputs; feeds, breeding and improved animal health Wool and mohair processing and marketing; value chain based enterprise enhancement, cottage industry and niche market development; livestock auctions	16,200,000 111,000,000 35,400,000 1,506,000 168,000 254,000	1 1 1 1 1 1	16,200,000 111,000,000 35,400,000 1,506,000 168,000 254,000
	Ultra sounding	Ultra sound machine	1,200,000		1,200,000
	Laboratory including semen storage	Replacement cost of laboratory equipment	2,000,000	1	2,000,000
				Cost	**280,943,000**

Table 4.38m: Costs of activities for agriculture, livestock and fisheries at national level - continue

Function	Activities Undertaken	Inputs	Unit Cost (KES)	Number per Year	Total Cost (KES)
Livestock improvement farm	Record keeping/ buck performance, stock inspection, ear tagging, castration, reporting stock for sale, breeding animals,	Notebooks, writing materials, stationary, staff time, fuel, tagging gadgets,	600,000 800,000 2,000,000	2 2 2	1,200,000 1,600,000 4,000,000
	Supervision to ensure conformity, holding inter-unit shows and movements,	Staff time, fuel	800,000 3,000,000	12 12	9,600,000 36,000,000
	Providing linkages with extension, representing farmers at district levels	Staff time, expert time	2,000,000	12	24,000,000
		Cost			**76,400,000**

Source: Records at MOALF and discussions with staff on processes and procedures

Table 4.39 shows annual costs of different units at the national level for fisheries.

Table 4.39: Operating costs for fisheries function at national level

Function	Human resources (KES)	Training (KES)	Purchase of specialised equipment (KES)	Other operating (KES)	Total annual cost (KES)
HQs and administrative services	44,751,110	8,136,000	488,300	10,556,950	63,932,360
Finance, accounts and procurement	31,626,530	-	265,564	2,418,036	34,310,130
Marine and coastal fisheries	19,800,998	355,040	121,440	4,671,917	24,949,395
Inland and riverine fisheries	13,987,029	312,000	79,000	5,806,110	20,184,139
Aquaculture development	27,943,845	310,854	-	2,119,191	30,373,890
Quality assurance and marketing	24,883,084	-	-	6,127,494	31,010,578
Fisheries	19,498,024	-	424,655	15,549,498	35,472,177
Hatchery	16,863,694	-	87,345	21,709,010	38,660,049
Regional centres	18,170,196	-	354,950	8,611,627	27,136,773
Deep sea fisheries	3,785,479	-	6,240	6,180,219	9,971,938
Marine Fisheries Research Institute		-	-	410,331,632	631,641,621
	221,309,989	9,113,894	1,827,494	494,081,684	947,643,050

The human resources costs were estimated based on the required number of personnel in each of the units. In Table 4.39, the cost for headquarters and administrative services per year is KES 63.93 million, consisting of salaries (KES 44.75 million), training (KES 8.14 million), specialised equipment (KES 488,300), and other operating costs (KES 10.55 million). The costs of other units are provided in a similar manner in Table 4.39.

Table 4.40 presents the cost of providing services under different semi-autonomous government agencies. The costs were based on expenditure for the 2014/15.

Table 4.40: Operating costs of parastatals for agriculture, livestock and fisheries

Ministry of	
Parastatal	**Annual costs (KES) (including personnel emoluments)**
Kenya Agricultural and Livestock Organization	2,655,104,157.00
Kenya Dairy Board	283,736,394
Kenya Tsetse Trypanomiasis Eradication Council	400,000,000
Kenya Animal Genetic Resources Centre	262,763,000
Kenya Meat Commission	568,020,193
Kenya Veterinary Board	34,620,117
Kenya Veterinary Vaccines Production Institute	452,600,000

Source: Ministry of Agriculture, Livestock and Fisheries

Table 4.40 provides the estimated costs of running state corporations in the sector. These costs were estimated using expenditure of the parastatals. As shown, the total cost of Kenya Agricultural and Livestock Organization is about KES 2.66 billion per year.

Table 4.41 shows costs at county level (details of the activities, inputs, quantity of inputs and input prices presented in Appendix 5.

Table 4.41a: Costs of activities for agriculture, livestock and fisheries at county level

S.No	**Function/ Service**	**Operating costs (KES)**	**Labour costs (KES)**	**Total cost (KES)**
1	Provision of agricultural extension services or farmer advisory services (200 farmers in the catchment areas)	1,996,800.00	2,987,386.36	4,984,186.36
2	Development and implementation of Programmes in the agricultural sector to address food security in the County	294,700.00	438,805.27	733,505.27
3	Construction of grain storage structures	3,460,000.00	437,232.91	3,897,232.91
4	Enforcement of regulations and standards on quality control of inputs, produce and products from the agricultural sector.	84,500.00	476,044.04	560,544.04
5	Availing farm inputs such as certified seeds, fertilizer and other planting materials, such as cassava cutting or potato vines, to farmers.	168,000.00	558,654.68	726,654.68

Table 4.41a shows, for instance, that provision of agricultural extension services or farmer advisory services (200 farmers in the catchment areas) would cost KES 4,984,186 in terms of operating and human resource costs.

Table 4.41b: Costs of activities for agriculture, livestock and fisheries at county level - continuation

S.No	Function/ Service	Operating costs (KES)	Labour costs (KES)	Total cost (KES)
6	Development of programmes to intervene on soil and water management and conservation of the natural resource base for agriculture.	760,600.00	641,953.08	1,402,553.08
7	Promotion of market access for agricultural products	478,000.00	589,419.68	1,067,419.68
8	Provision of infrastructure to promote agricultural production and marketing as well as agro-processing and value chains.	28,000,000.00	585,172.27	28,585,172.27
9	Enhancing accessibility to affordable credit and insurance packages for farmers.	723,000.00	460,119.41	1,183,119.41
10	Control of plant pests, diseases and noxious weeds that are specific to counties	122,000.00	429,076.34	551,076.34
11	Management of agricultural training centres and agricultural mechanization stations.	53,394,500.00	505,366.84	53,899,866.84
12	Land development services such as construction of water pans for horticultural production for food security.	4,801,000.00	620,812.47	5,421,812.47
13	Formulation and review of county specific policies.	660,000.00	624,608.64	1,284,608.64
14	Developing and enacting legislation and regulatory frameworks for county specific policies.	840,000.00	712,827.01	1,552,827.01
15	Implementing of national and county specific policies and legislation.	1,732,000.00	714,692.54	2,446,692.54
16	Field demonstrations for agriculture and livestock (agriculture and livestock extension services)	165,179.73		165,179.73*
17	Dipping and spraying operations	113,022.38		113,022.38*
18	Vaccination campaign (per county)	41,005,000.00		41,005,000.00*
19	Veterinary public health	16,650,255.00		16,650,255.00*
20	Extension services on herd health management and animal welfare issues	1,850,000.00		1,850,000.00*
21	A.I. services	12,774,925.00		12,774,925.00*
22	Provision of livestock extension services	30,776,603.00		30,776,603.00*
23	Develop animal welfare regulation	31,093,200.00		31,093,200.00*
24	Livestock disease control	101,681,160.00		101,681,160.00 *

*Includes labour costs.

Source: Costing of Government Functions Survey Data.

Table 4.41c: Costs of activities for agriculture, livestock and fisheries at county level - continuation

S.No	Function/ Service	Operating costs (KES)	Total cost (KES)
25	Veterinary extension	7,290,000	7,290,000.00*
26	Livestock branding, identification and traceability	2,485,900	2,485,900*
27	Development of local tanneries	15,809,608	15,809,608*
28	Fisheries extension services (Per extension including pond preparation with the materials)	1,471,700	1,471,700*
29	Eat More fish campaign (1 campaign)	815,700	815,700*
30	Up-scaling fin fish culture	15,732,500	15,732,500*
31	Seed bulking	5,047,720	5,047,720*
32	On- farm trials (1 farm)	83,520	83,520*
33	Fish quality and safety assurance and routine inspection	613,000	613,000*
34	Fish trade licensing and fish movement permits	3,121,600	3,121,600*
35	Zonation for Aquaculture County specific disease control	2,000,000	2,000,000*

*Includes labour costs.
Source: Costing of government functions survey data.

Table 4.42 presents the estimated cost of human resources at the county fisheries departments. The costs were estimated based on existing human resources at country at the time of the survey. The amounts were estimated per county in each of the regions are shown in the table. For instance, the wage bill a county in central region of Kenya is about KES 14.11 million per year.

Table 4.42: Average cost of human resources per county per region for fisheries

Region	Total annual cost (KES)
Central	14,114,943
Central Eastern	13,307,236
Coast	13,864,488
Lower Eastern	5,366,629
South Rift	5,838,008
Nairobi	19,708,980
North Eastern	1,771,200
North Rift	6,697,294
Nyanza	18,734,626
Upper Eastern	4,472,538
Western	11,814,795

In addition to personnel costs as shown in Table 4.42, estimates of typical cost of activities for fisheries functions at county level were also done. The results are shown in Table 4.43.

Table 4.43: Cost of services per county for fisheries (excluding wages and salaries)

Services	**Total annual cost (KES)**
Administrative support services	7,392,750
Collection of fish production statistics	743,520
County fish seed bulking units	3,210,070
Demarcation of fish breeding grounds	3,550,400
Development and maintenance of fish landing stations, jetties and fish auction centres	14,016,580
Enforcement of fisheries regulations and compliance with management measures	371,200
Establish fish hatcheries	10,000,000
Fisheries extension services	2,432,070
Fish market infrastructure/fish value addition	20,000,000
Fish stock assessment	5,000,000
Fish trade licensing and fish movement permits	1,428,713
Frame survey	5,000,000
On farm trials	534,130
Up scaling finfish culture (promoting aquaculture)	8,733,410

Table 4.43 shows that administrative services for fisheries at the county level would cost KES 7.39 million per year in terms operations. Likewise, demarcation of fish breeding grounds would cost, on the average, KES 3,550,400 per county per year, exclusive of personnel salaries.

4.5 Costing of Foreign Affairs, Foreign Policy and International Trade Functions

4.5.1 Foreign Affairs, Foreign Policy and International Trade Functions

A review of the Fourth Schedule indicates that foreign affairs, foreign policy and international trade functions are exclusively assigned to the National Government vide the Fourth Schedule Part 1(1). TA (2015) provides the unbundling of these functions as follows:

- Management of Kenya's Foreign Policy;
- Management of Bilateral and Multilateral Relations;
- Liaison with International and Regional Organizations;
- Liaison with Foreign Missions in Kenya;
- Provision of Consular Services;
- Management of Joint Commissions with other Countries;
- Official Communications on Foreign Affairs and Global Issues; and
- Management of Kenya's Diaspora Issues
- Drafting and negotiation of host country agreements;
- Co-ordination of the activities of the Un Host Country Liaison Committee;
- Preparation of Gazette notices under the Privileges and Immunities Act (Cap 179);
- Legalization of public documents
- Assistance to Kenyan nationals and corporate entities in disputes with foreign missions and international organizations locally; and
- Coordinating media coverage for Ministerial functions;
- Facilitating the production of monthly bulletins;
- Coordinating the Ministry's participation in the Public Service Week;
- Organizing television and newspaper interviews;
- Preparation of press statements and media briefings;
- Preparation of information updates for the Ministry's website;
- Receiving and responding to general enquiries from the media and the public; and
- Overall liaison with the media.
- Facilitation of incoming/outgoing visits of State/Government;
- Advising Ministries and Government departments on protocol matters;
- Arranging appointments for visiting dignitaries;
- Organizing official luncheons, dinners, receptions and parties;
- Providing VIP courtesies to visiting dignitaries;
- Facilitating the presentation of credentials by Heads of Mission accredited to Kenya;
- Management of the list of diplomatic precedence;
- Management of the Directory for the Diplomatic Corps and International Organizations;
- Administration of privileges under the Privileges and Immunities Act (CAP 179);
- Taking custody and coordinating the protection of the premises of missions, including property and archives, of third States with which diplomatic relations have been broken off or whose missions are permanently or temporarily closed.
- Facilitating application for visas for Kenya Government officials travelling on official business
- Support the Ministry in the formulation and articulation of foreign policy;
- Facilitate institutional capacity building through forums for the exchange of ideas and experiences among directorates on foreign policy matters, change management, reforms, leadership and other pertinent issues;
- Organize seminars, workshops, and symposia for the diplomatic community on topical issues;
- Coordinate Foreign Service exchange programmes;
- Organize diplomatic training for officers from other Ministries and departments;
- Conduct training and capacity building for diplomats from countries within the region;
- Co-ordination of bilateral economic, trade and investment matters;

- Co-ordination of regional economic cooperation groups, including integration and aid for trade;
- Co-ordination of regional and global multilateral trade and finance issues, including World Trade Organization, United Nations, its agencies and affiliated organizations, African Union, East African Community, COMESA, European Union Indian Ocean Rim and matters related to South-South Co-operation;
- Technical and advisory support in the formulation and negotiation of multilateral trade policies;
- Liaison with missions, other Ministries and public institutions, on economic and external trade matters;
- Liaison with the private sector, business associations and business leaders on economic and external trade matters;
- Providing technical support to political divisions during official meetings locally and abroad, including JCCs and JPCs;
- Analysis of emerging issues in the international economic and trade environment, and their impact on Kenya's foreign policy;
- Analysis of developments in Kenya's economic and trade policies in relation to Kenya's foreign policy; and
- Administrative and support services

Through the Executive Order No. 2 of May 2013, the National Government has broken the three main constitutional functions into fifteen sub functions, which are consequently assigned to the Ministry of Foreign Affairs and International Trade. These are:

Foreign Affairs

- Management of Bilateral and Multilateral Relations;
- Liaison with International and Regional Organizations;
- Management of Kenya's Missions and Embassies Abroad;
- Liaison with foreign Missions in Kenya;
- Ratification of Treaties, Conventions and Agreements;
- Management of Diplomatic Privileges and Immunities;
- Coordination of State and Official Visits;
- Handling of Protocol Matters;
- Provision of Consular Services;
- Management of Joint Commissions and joint trade committees with other Countries;
- Official Communications on Foreign Affairs and Global Images;
- Management of Kenya's Diaspora issues

Foreign Policy

- Management of Kenya's Foreign Policy

International Trade

- International Trade Affairs;
- Trade Representative – Special Advisory/negotiation services

According to the Ministry's Sub- Sector Expenditure analysis, three service programmes are implemented namely: General Administration, Planning and Support Services, Foreign Relations and Diplomacy and International Trade and Investment promotion. General Administration, Planning and Support Services. The three programmes are further subdivided into six sub-programmes consisting of Planning and Administration Services; Parliamentary

and County Liaison Services; Foreign Missions Services; Protocol and Diplomatic Services; Capacity Development and Policy Advisory; and International Trade and Investment Promotion.

Norms and standard of service delivery were not available to the costing team and therefore they are outlined in this document.

4.5.2 Costing of the Functions of Foreign Affairs, Foreign Policy and International Trade

Costing of the functions under the foreign affairs, foreign policy and international trade were based solely on the work done by the ministry which estimated the total requirements for the three financial years 2015/16, 2016/17 and 2017/18. The costing done by the ministry considered was not based on government allocations over the years but on total needs for optimal provisions of services under the function. The costs are shown in Table 4.44.

Table 4.44: Costs of foreign affairs, foreign policy and international trade functions

Function	Human resources (KES million)	Operating cost (KES million)	Total (KES million)
Foreign Missions Services	5,056	8,113	13,169
Protocol and Diplomatic Services	0	4,158	4,158
Capacity Development and Policy Advisory Services	0	396	396
Planning and Administration Services	846	1,557	2,403
Parliamentary and County Liaison Services	0	55	55
International Trade and Investment promotion	0	3,676	3,676
Total	**5,902**	**17,955**	**23,857**

Note: Development costs not included

Table 4.44 provides cost of proving services. The optimum human resources cost an estimated of KES 5.9 billion in the period 2015/16. The human resources provide services across under area consisting of capacity development and policy advisory services, parliamentary and county liaison services, and international trade and investment promotion. It should be noted that costs of these functions are susceptible to foreign exchange fluctuations, with foreign exchange losses being the norm.

4.6 Water, Environment and Natural Resource Functions

4.6.1 Water, Environment and Natural Resources Functions According to CoK

Schedule 4 of the Kenyan constitution (2010) outlines functions of National Government as protection of the environment and natural resources with a view to establishing a durable and sustainable system of development, including, in particular—
(a) fishing, hunting and gathering;
(b) protection of animals and wildlife;
(c) water protection, securing sufficient residual water, hydraulic engineering and the safety of dams; and
(d) energy policy.

In addition, CoK states that the function of county governments is the implementation of specific national government policies on natural resources and environmental conservation, including—
(a) soil and water conservation; and
(b) forestry.

4.6.2 Unbundled Water, Environment and Natural Resources Functions for National Government

The functions of national government according to TA (2015) are:

i. national public works;
ii. protection of the environment and national resources with a view to establishing a durable and sustainable system of development, in particular including:
   - water protection
   - securing sufficient residual water
   - hydraulic engineering
   - safety of dams
iii. public investment
iv. capacity building and technical assistance to the counties
v. consumer protection

4.6.3 Unbundled Water, Environment and Natural Resources Functions for County Governments

The TA (2015) explains the functions for county governments to consist of the following:

(a) Implementation of county specific water conservation and forestry policies through water resource users:

i. Local water catchment protection;
ii. Implementation of sub-catchment management plans;
iii. Participation in water allocation and issuance of permits flood mitigation and land reclamation at county levels.

(b) Water pollution control:

i. Monitoring of water quality
ii. Enforcement of water quality standards

(c) Borehole site identification and drilling:

i. Planning of rural water supply
ii. Development of rural water points
iii. Maintenance of water points

(d) Forestry:

i. implementation of national policies that is applicable to the county forests.
ii. formulation of county level specific by- laws and legislations.
iii. development and implementation of county forest management plans.
iv. identification and setting a part of lands for forest reservation, development and creation of county forests.
v. development of nature based enterprises within the county forests.
vi. forestation and rehabilitation of fragile and degraded ecosystem/ forest in community lands.
vii. liaison with lead agencies / stakeholders in forest sector at the county.
viii. issuance of operation license within the private farms and the county forests in the community lands.
ix. intra-county conflict management on the county forest resources and farm forestry.
x. promotion of public private partnership management practice in county forests.
xi. maintenance of county forests and farm forestry records, database and information.
xii. collection and management of county forests and farm forestry revenue.
xiii. community awareness creation.
xiv. promotion of tree planting in community, private and county lands.
xv. increasing tree cover in private, community and county lands.
xvi. provision of forestry extension services in the county.
xvii. development and maintenance of county forest infrastructure.
xviii. development of charcoal industries (promotion/use) within the county forests and private farms.
xix. development of urban forestry programs within the counties.
xx. enforcement of forest legislation within the county forests and private farms.
xxi. management of county forest

(e) Water and sanitation services:

i. rural water and sanitation services
ii. provision of water and sanitation service in small and medium towns without formal service providers
iii. urban water and sanitation services with formal service provision- sanitation includes sewerage
- licensing of service provision
- planning for infrastructure
- implementation of water infrastructure
- management of water utilities

iv. monitoring and reporting of service provision
v. coordination of water sector stakeholders
vi. resource mobilization for infrastructure development
vii. enforcement of standards
viii. capacity building

4.6.4 Norms and Standards for Water, Environment and Natural Resources

While the specific norms and standards for service delivery were not available, the costing of water and sanitation services were adopted from a unit costing study undertaken by then Ministry of Water and Irrigation in 2005 (PEM Consultants, 2005). This study used standard specifications for the different water and sanitation facilities. Within each component/ technology, a consistent Bill of Quantities (BoQ) was developed based on engineering estimates. The study used BoQs from existing designs documents used in Kenya, typically from contract documents.

4.6.5 Costing of Water, Environment and Natural Resources Functions

The cost of water and sanitation services was undertaken using the similar framework used in the costing of other government functions. The costs of basic services were derived from PEM Consultants (2005). The costs were adjusted for inflation using civil engineering cost index obtained from statistical abstracts from the Kenya National Bureau of Statistics. The index for 2005 was 3827.06 and an estimate of 7258.62 for 2015. Taking 2005 as the base, this translates to an inflation rate of 189.67% between 2005 and 2015. This inflation rate was then used to adjust the costs in 2005 to 2015. The inflation-adjusted costs are shown in Table 4.45, Table 4.46, Table 4.47 and Table 4.48.

Table 4.45 shows cost results for urban water systems.

Table 4.45: Costs of urban water technologies

Water sources	Investment cost (KES, 000)	Investment cost per M^3 (KES)	Investment cost per capita (KES, 000)	(O&M) (KES, 000)	O&M costs per M^3 (KES)	Annual O&M cost per capita (KES)
Bore Hole Source Chlorination for 10,000 population	168,803	31	16.88	8,000	44	800
River Source Slow Sand Filtration for 20,000 population	166,906	30	8.35	9,483	26	474
River Source Chlorination + Rapid Sand Filtration + Sedimentation for 20,000 population	163,113	15	8.16	13,277	36	664
River Source Chlorination +Rapid Sand Filtration + Sedimentation for 20,000 population	168,803	15	8.44	15,173	42	759
River Source Chlorination + Rapid Sand Filtration + Sedimentation for 100,000 population	631,587	12	6.32	49,313	27	493
River Source Chlorination + Rapid Sand Filtration + Sedimentation for 400,000 population	2,289,267	10	5.72	185,873	25	465
River Source Chlorination + Rapid Sand Filtration + Sedimentation for 1000,000 population	5,600,832	10	5.6	460,888	25	461

Table 4.45 shows the unit costs for different piped water systems in urban areas. These water systems consist of:

a) Small piped water systems for 10,000 people from a borehole source with electrical submersible pump powered by a diesel generator operating for 15 hours. The components of the piped system include chlorination treatment, transmission main, and reservoir and distribution system.
b) Small piped water supply system for 20,000 people from a river sources with a slow sand filter treatment plant. The components of the piped system include river intake with raw water pumping station, slow sand filtration plant, clear water pumping station, transmission main, reservoir and distribution system.
c) Small piped water supply system for 20,000 people from a river sources with a rapid filtration treatment plant. The components of the piped system include river intake with raw water pumping station, rapid filtration plant, chlorination treatment, clear water pumping station, transmission main, reservoirs and distribution system.
d) Piped water supply system of different capacities for 20,000 to 1,000,000 people from a river sources with full treatment. The components of the piped system include river intake with raw water pumping station, rapid filtration plant, flocculation and sedimentation, chlorination treatment, clear water pumping station, transmission main, reservoirs and distribution system

Design life for all systems is 30 years with an average borehole depth of 104 metres. The cost of investment varies as shown in Table 4.45, For instance, investment cost of Bore Hole Source Chlorination for 10,000 population is KES 168,803,000, while River Source Chlorination + Rapid Sand Filtration + Sedimentation for 1000,000 populations would cost KES 5,600,832,000 .

The borehole has an average capacity of 500 M^3 of water supply per day. Given the useful life of 30 years, the investment cost per M^3 is KES 31 as shown in Table 4.45. As shown in the table piped water with full treatment serving a population of one million people has the least investment cost of KES 10 per M^3

Investment costs include construction costs and related capital expenditure. Operation and maintenance costs (O&M) consist of wages and salaries, energy, chemicals, general administrative costs, preventive and routine maintenance and breakdown maintenance costs. The estimated annual cost of O&M is KES 8,000,000 for a Bore Hole Source serving 10,000 populations, KES 9,483,000 (River Source Slow Sand Filtration for 20,000 populations) and KES 460,888,000 (River Source Chlorination + Rapid Sand Filtration + Sedimentation for 1000,000 populations) among others.

The O&M unit costs were also derived by M^3 and per capita. Taking into consideration the supply of water per day[8] per the type of water source, the cost per M^3 is lowest for River

[8] The supply of water is 500 M^3 per day for borehole ,1000 M^3 per day for River Source Slow Sand Filtration for 20,000 population, 1,000 M^3 per day for River Source Chlorination + Rapid Sand Filtration + Sedimentation for 20,000 population, 1000 M^3 per day for River Source Chlorination +Rapid Sand Filtration + Sedimentation for 20,000 population, 5,000 M^3 per day for River Source Chlorination + Rapid Sand Filtration + Sedimentation for 100,000 population, 20,000 M^3 per day River Source Chlorination + Rapid Sand Filtration + Sedimentation for 400,000 population and 50,000 M^3 per day River Source Chlorination + Rapid Sand Filtration + Sedimentation for 1000,000 population

Source \Chlorination + Rapid Sand Filtration + Sedimentation for 1000,000 populations (KES 25) and highest for borehole sources at KES 44.Similarly, cost per person is KES 461 and KES 800 for these two sources, respectively.

Rural water systems included the following:

a) Spring Protection: the cost estimate is prepared for a simple spring protection with pipe bringing water to a collection platform constructed with a collection platform of 4.5m² and a 3 m² supporting wall. The average depth of the excavation for the spring is 3.5m over an area of excavation of 10m². The pipe length or the distance from spring to collection point has been set to 6m.
b) The rock catchment is with a collection wall on rock surface leading water to a collection tank and from there to a standpipe. The height of the collection wall is 0.4 m and the length and the area of the catchment will vary between WSBs according to rainfall data. The volume of collection tank also varies between WSBs according to rainfall data. Distance from catchment to collection tank is 20m and the distance from collection tank to standpipe is 50m.
c) Roof Catchment is a rainwater catchment system with gutters and collection tank in ferro-cement with collection point. The roof area and length of gutters varies between WSBs according to rainfall data. The volume of storage tank to provide year round supply of water will also vary between WSB areas according to rainfall data.
d) Hand dug well equipped with Afridev Hand Pump. The depth of well typically 12 m but varying per WSB. The well is constructed with concrete rings with one permeable ring with no-fines concrete. Height of rings is 1 m with a diameter of 1.45 m and wall thickness of rings 0.1 m. The well is surrounded by a concrete apron with a radius of 3m.
e) Borehole equipped with Afridev Handpump. The average borehole depth and the drilling success rate varies across the WSB areas. The average depth is typically 80m and varies in different WSB areas. The length of Screen is 20m. The standard borehole development time is 6 Hours and standard Test Pumping Time 24 Hours, Standard Recovery Test Time 8 Hours. The handpump is an Afridev Hand pump with Stainless Steel columns.
f) The sub-surface dam is a simple sub-surface dam build with soil in a trench across a sandy river bed with a hand dug well with windlass as water abstraction device. The width of the river varies from 20m to 100m for different designs capacities and average depth to impermeable layer varies from 2m to 6m. The depth of the hand dug well is 2m below the impermeable layer. The available water has been calculated based on a throwback of water in riverbed of 10 times the width of river and the volume of extractable water based on medium coarse sand with 25% water. The design is based on a width of the top of the dam of 1m and 45 deg sloping up-streams and down-streams sides of the dam.

g) The sand dam is constructed with stone masonry in a sandy river bed. Water abstraction is through a filter pipe in the sand and piped to collection platform below dam wall. The width of the river varies from 20m to 100m and the height of sand-dam varies from 3m to 5m for different sizes of designs.
h) The piped water supply is a simple piped system with borehole source with electrical submersible pump powered by a diesel generator operating for 15 hours. There is no treatment included. The components of the piped system include transmission main, reservoir and distribution system.

The estimated unit costs are presented in Table 4.46.

Table 4.46: Costs of rural water technologies

Source	Investment cost (KES,)	M^3 per day	Investment cost per M^3 (KES)	Investment cost per capita (KES)	O&M costs per year (KES)	O&M costs per M^3 (KES	Annual O&M cost per capita (KES)
Spring protection (500 population)	114,071	500	0.02	228	379	0	0.76
Rock catchment (200 population)	3,864,576	200	1.76	19,323	22,515	3.31	113
Roof catchment (10 population)	186,686	10	1.70	18,669	2,655	0.73	266
Hand-dug up well with hand pump (500 population)	310,781	500	0.06	622	15,039	0.08	30
Bore hole with hand pump (500 population)	1,643,860	500	0.30	3,288	25,442	0.14	51
Sub-surface Dam with HDW(500 population)	503,969	500	0.06	1,008	1,762	0.01	3.52
Sand-dam with standpipe (500 population)	2,789,171	500	0.31	5,578	4,525	0.02	9.05
Piped system BH source (5000 population)	16,863,189	5000	0.31	3,373	1,410,329	0.77	282

The investment costs as given in Table 4.46 vary across the different sources with the lowest for spring protection amounting to KES 114,071 to the highest for piped system borehole source at KES 16,863,189.The table also shows that the costs per M^3 are very small given the useful life of the investment which ranges between 30 and 50 years. O&M cost per M^3 are less than one KES except Rock catchment with a cost of KES 3.31 per M^3.

Rural sanitation

PEM Consultants (2005) provided the following typical technologies for rural sanitation:

a) Lined double pit VIP latrine. The latrine is constructed with 2m deep pits (0.9m x 1.2m) lined with concrete blocks and a superstructure (1.4m x 1.2m) build in concrete block with timber door, corrugated iron roof and ventilation pipe.
b) Un-lined VIP latrine with a 5 m deep (1m x 1m) pit and a concrete slab and concrete block superstructure (1m x 1m) with timber door, corrugated iron roof and ventilation pipe.
c) Ecosan latrine build with concrete blocks with squatting pans, urine separation and evaporation increased by solar heating. The latrine has dimensions of 1m x 1m and a 1m high sub-structure. Sub- and super-structure build with concrete blocks with corrugated iron roofing.
d) Abor-loo with shallow pit and superstructure constructed with corrugated iron sheets
e) Abor-loo similar to 4 but with the superstructure constructed with local available materials.
f) Septic tank with soak away. The septic tank is sized for a household with dimensions 3m x 1.5m x 1.8m deep and with a 1.5m x 1.5m x 2m deep soak away. The tank is constructed in concrete and concrete blocks. 50m of piping to the septic tank and 20 m from the septic tank to the soak away are included in the cost estimate.
g) The design of the public latrine is a pit latrine with 4 stances and 5 pits to allow alternate use of pits to facilitate emptying. The pits are 1.2m x 0.9m and 2m deep and rooms in the superstructure are 1.4m x 1.2m. The latrine is constructed in concrete and concrete blocks.
h) The design of the school latrine is a pit latrine similar to the public latrine but with 6 stances and 7 pits to allow alternate use of pits to facilitate emptying. The pits are 1.2m x 0.9m and 2m deep and rooms in the superstructure are 1.4m x 1.2m. The latrine is constructed in concrete and concrete blocks.

The unit costs of the rural sanitation systems are shown in Table 4.47.

Table 4.47: Cost of rural sanitation technologies

Technology	Useful life years	Persons served	Investment cost (KES)	Investment cost per capita for the entire useful life (KES)	Investment cost per capita per year (KES)
Lined double pit VIP	20	5	111,903	22,381	1,119
Unlined VIP	20	5	166,906	33,381	1,669
Ecosan	20	5	299,672	59,934	2,997
Abor-loo GI	10	5	39,830	7,966	797
Abor-loo local	10	5	7,587	1,517	152
Septic tank with soak away	20	5	261,739	52,348	2,617
4-stance public latrine	20	1000	333,812	334	17
Stance public latrine	20	600	493,131	822	41

The useful life years of the technologies are between 10 and 20 years. The population served by each of the technologies is also shown. As shown in Table 4.47, cost of lined double pit latrine is KES 111,903 with a useful life of 20 years, serving a population of 5 people. This translates into cost of KES 22,381 per person for the entire 20 years of life of the latrine or KES 1,119 per person per year. Similarly, 4-stance public latrine costs KES 333,812 in terms on initial investment, with KES 334 per person for the entire 20 years of life of the latrine or KES 17 per person per year. Similar interpretations apply to other sanitation technologies given in Table 4.47.

Urban sanitation

The typical designs for on-site urban sanitation are similar structures as for the rural technologies. In addition the cost estimate has been prepared for a sewerage system for 100,000 people. The components of the sewerage system include the conveyance system and the sewerage treatment system based on a design with trickling filters and primary, secondary and tertiary settling ponds (PEM Consultants, 2005). Estimated costs are shown in Table 4.48.

Table 4.48: Cost of urban sanitation technologies

Sanitation technology	Useful life	Investment cost (KES)	Investment cost per capita for the entire useful life (KES)	Investment cost per capita per year (KES)
Lined double pit VIP (5 people)	20 years	111,903	22,381	1,119
Ecosan (5 people)	20 years	299,672	59,934	2,997
Septic tank with soak away (5 people)	20 years	261,739	52,348	2,617
4-stance public latrine (1000 people)	20 years	333,812	334	0.33
Sewerage system (100,000 people)	30 years	1,194,894,730	11,949	398

Investment cost as shown in Table 4.48 is highest for a sewerage system at KES 1.19 Billion and lowest for VIP latrine at KES 111,903. The cost per capita or per person for the useful life is KES 11,949 for sewerage system, with an annual investment cost of KES 398. Table 4.48 shows that the lowest cost per person is given by the 4-stance public latrine meant to serve a population of 1000 people.

The typical of environment and natural resources at the county level is presented in Table 4.49. These are annual costs, which are average expenditure for one county, were derived from expenditure reports obtained from the counties during the survey.

Table 4.49: Costs of environment and natural resources activities at county level

Activity	Total annual cost (KES) per county
Human resources	188,000,000
Aforestation and reafforestation	21,011,000
Biodiversity conservation	237,000
Wetland protection	1,001,000
Solid waste management and disposal	95,040,000
Noise pollution and excessive vibration control	311,600
Air Pollution Control	14,652,000
Policy development	1,528,000
Other operating costs	117,152,000

Table 4.49 shows the total cost of human resources in the ministry of water, environment and natural resources in atypical county level. The amount was based on current wage bill in the sampled counties. Additionally, the annual cost amounting to KES 117,152,000 per county was also obtained from the actual expenditure of the counties. The details of some of the costs contained in Table 4.49 are shown in Table 4.50.

Table 4.50a: Costs of activities related to environment and natural resources

Function	Activities for each service delivery	Inputs	Quantities of Inputs	Unit price of each input (KES)	Total current cost (KES)
Aforestation and reafforestation	School greening programmes	Stationery	10	500	5,000
		Fuel	80	100	8,000
		Seedlings	1,000,000	20	20,000,000
	Education and sensitization of the youth groups on reafforestation measures	Stationery	360	500	180,000
		Transport	360	2000	720,000
		Others			2,000
	Planting of trees in the designated areas within the county and replacement of trees damaged	Labour	80	500	40,000
		Fuel	80	100	8,000
		Subsistence allowance	10	3000	30,000
		Fuel	50	100	5,000
		Stationary	2	500	1,000
	Inspection of all the existing structures and facilities emitting effluent to surface water bodies	Subsistence allowance	2	1500	3,000
		Fuel	50	100	5,000
		Stationary	2	500	1,000
	Total				**21,008,000**

Table 4.50b: Costs of activities related to environment and natural resources-continuation

Function	Activities for each service delivery	Inputs	Quantities of Inputs	Unit price of each input	Total current cost
Noise pollution and excessive vibration control	Carrying out feasibility study to survey the County in order to identify the set up& location of different institutions, urban centres, market centres, quarrying/ mining sites and industrial areas.	Stationery	6	100	**600**
		Subsistence allowances	6	2500	**15,000**
		Transport	80	100	**8,000**
	Categorising the mapped areas according to the levels of noise generated	Stationery assorted	50	1000	**50,000**
	Staff for specific mismanagement trainings are identified	Stationery	50	1000	**50,000**
		ATC charges	10	2000	**20,000**
		Transport	10	200	**2,000**
		Material	10	100	**1,000**
	Information is sort on emerging issues and new technologies.	Stationery	20	500	**10,000**
		L/Allowance	5	10,000	**50,000**
		Transport	5	2000	**10,000**
		Material	20	1000	**20,000**
	Licensing and issuing permits,	Stationery	2	500	**1,000**
	Preparation of reports on noise data	Stationery	20	1500	**30,000**
		L/Allowance	20	500	**10,000**
		Transport	20	500	**10,000**
	Total				**287,600**
Air Pollution Control	Identifying areas and different operation with the potential of causing air pollution in the entire County	Stationery	3	500	**1,500**
		Stationery	3	1500	**4,500**
		s/Allowance	3	1000	**3,000**
		Transport	10	1000	**10,000**
	Zone the areas as industrial, quarrying and mining sites.	Material	2	500	**1,000**
		Stationery	3	40000	**120,000**
		s/Allowance	1	50000	**50,000**
		Transport	2	1000	**2,000**
	Monitoring to apprehend those who are violating the provisions of air quality as provided for y the law	Material	60	500	**30,000**
		Stationery	100	40000	**4,000,000**
		Subsistence allowance	100	50000	**5,000,000**
		Transport	0	0	**-**
	Preparation of reports on noise data and keeping a well organised record for the same	Material	60	500	**30,000**
		Stationery	60	40000	**2,400,000**
		s/Allowance	60	50000	**3,000,000**
	Total				**14,652,000**

Table 4.50c: Costs of activities related to environment and natural resources-continuation

Function	Activities for each service delivery	Inputs	Quantities of Inputs	Unit price of each input (KES)	Total current cost (KES)
Biodiversity conservation	stock taking of the natural resources within the county	Fuel	80	100	8,000
		Subsistence allowance	10	1500	15,000
		Stationery	10	500	5,000
	Planting of trees in the designated areas within the county and replacement of trees damaged.	Labour	40	500	20,000
		Fuel	80	100	8,000
		Subsistence allowance	10	3000	30,000
	Identifying suitable places that can serve as conservation areas within the county	Subsistence allowance	10	3000	30,000
		Fuel	80	100	8,000
		Stationery	10	500	5,000
	Fencing of the affected areas or provision of adequate security to the endangered species	Labour	20	500	10,000
		Fuel	80	100	8,000
		Material (posts)	120	500	60,000
		Subsistence allowance	10	3000	30,000
	Total				**237,000**
Wetland protection	Stock taking of the available wetlands and the number of trees in those wetlands	Stationery	10	500	**5,000**
		fuel	80	100	**8,000**
		subsistence allowance	10	3000	**30,000**
	Identifying the indigenous trees suitable to be planted in the affected wetlands and carrying out the planting exercise	fuel	80	100	**8,000**
		subsistence allowance	10	3000	**30,000**
		labour	40	500	**20,000**
	identifying the interested groups within the community and training them on how they can use wetlands sustainably.	transport	360	2000	**720,000**
		Stationery	360	500	**180,000**
	Total				**1,001,000**

Table 4.51 shows the cost of different broad functions for water, environment and natural resources at national level.

Table 4.51: Recurrent cost for water, environment and natural resources at national level

Environment and Natural Resources Sub-sector	**Annual costs KES (millions)**
Environmental Policy Management	3,583
Environmental Governance	155
National Environment Management	2,449
Forests Conservation and Management	5,205
Forestry Research and Development	1,287
Wildlife Security, National Parks and Reserves Management	5,546
Meteorological Services	2,417
Sub-total	**20,642**
Water and Regional Authorities Sub-sector	
General administration, Planning and Support Services	1,063
Water Resources Conservation and Protection	937
Water Storage and Flood Control	767
Water Supply Infrastructure Development	2,537
Integrated Basin Based Development	1,112
Land Reclamation	56
Sub-total	**6,472**

These amounts in Table 4.51 were derived from Republic of Kenya (2014), which provided the financial requirements for the different functions. This source, however, did not provide detailed costing that was carried. The study, therefore adopted the reported costs without the details. The recurrent[9] costs are shown in Table 4.51. Table 4.51 shows the highest amount of KES 5.546 billion is accounted for by wildlife security, national parks and reserves management mainly through Kenya Wildlife Services. The cost includes both personnel emolument and other operating costs.

[9] Capital costs were much more than the recurrent costs but that was not included in this report.

SECTION 5: LESSONS LEARNED

The study was one of pioneering studies on cost of government functions. The study of this magnitude requires extensive data collections at the different levels of government. It requires the support of all the levels of government for successful implantation. A costing study is much easier in case where norms and standards are available. The norms and standards were not available for most of the functions that were included the study. The norms and standards were only available for health services, and road construction and maintenance.

The study used normative costing for most of the services It was revealed that normative costs of services far exceeded available resources in the country for the health services. For instance, the norms for human resources are very ambitious, resulting in huge resource requirements that the country may not afford in the short-term. Furthermore, the required resources for foreign affairs, water, environment and natural resources far exceed what has availed to these sectors.

The two approaches are activity based costing and top-down approach that relies on expenditure. It can be concluded the activity based approach, while it is more accurate in reflecting resources requirements, it requires adequate time and extensive.

BIBLIOGRAPHY

Financial and Fiscal Commission (2001).The Costed Norms Approach to the Division of Revenue. Pretoria: South Africa.

Guthiga, P.M., Mburu, J., Holm-M (2008) 'Costs and Benefits of Conserving Kakamega forest under three different management approaches. "Biodiversity of Africa - Observation and Sustainable Management for our Future!" A paper presented in International Congress, 29 September – 3 October 2008, at Spier, RSA

Government of Western Australia (2007). Costing and Pricing Government Services, Guidelines for use by agencies in the public sector. A Circular issued. Public Sector Commission.

Hadley KH Wesson, Nonkululeko Boikhutso, Abdulgafoor M Bachani, Karen J Hofman Adnan A Hyder (2013). "The Cost of Injury and Trauma Care in Low and Middle-Income Countries: A Review of Economic Evidence." *Health Policy and Planning*; 1–14.

PEM Consultants (2005). Assessing Unit Costs for Water Supply and Sanitation Services in Kenya: A report submitted to the Ministry of Water, Environment and Natural Resources, Nairobi.

Republic of Kenya (1986). Standard Specification for Road and Bridge Construction. Nairobi: Ministry of Transport and Communications.

Republic of Kenya (1988). Road Design Manual Part V, Pavement Rehabilitation and Overly Design. Nairobi: Ministry of Roads and Public Works.

Republic of Kenya (1987). Road Design Manual Part III, Materials and Pavement Design For New Roads. Nairobi: Ministry of Transport and Communications.

Republic of Kenya (1979). Road Design Manual, Part I, Geometric Design of Rural Roads. Nairobi: Ministry Of Works, Road Department.

Republic of Kenya (2009a). Clinical Management and Referral Guidelines Volume I. Nairobi: Ministry of Health.

Republic of Kenya (2009b). Clinical Management and Referral Guidelines Volume II. Nairobi: Ministry of Health.

Republic of Kenya (2009c). Clinical Management and Referral Guidelines Volume III. Nairobi: Ministry of Health.

Republic of Kenya (2010). The Constitution of Kenya – 2010: Nairobi: Government printer.

Republic of Kenya (2013a): Kenya Gazette Supplement No. 116 of 9th August, 2013. Government printer

Republic of Kenya (2013b). Ministry of Transport and Infrastructure Policy on the Roads Sub-Sector. Nairobi: Ministry of Transport and Infrastructure.

Republic of Kenya (2013c): Strategic Plan 2013 -2017 for MALF. Nairobi: Ministry of Environment, Water and Natural Resources.

Republic of Kenya (2013d): Strategic Plan 2013 -2017 for MALF. Nairobi: Ministry of Agriculture, Livestock and Fisheries.

Republic of Kenya (2014a): Kenya Gazette Supplement No. 30 of 17th August, 2014. Government printer.

Republic of Kenya (2014b): Medium Term Expenditure Framework (MTEF) Budget for the Period 2015/16-2017/18: Ministry of Water, Environment and Natural Resources.

Republic of Kenya (2014c). Ministry of transport and infrastructure, Mid-year performance contract evaluation report for the period 1st July – 31st December FY 2014/15.

Republic of Kenya (2014d). Performance Contract between the Government of the Republic of Kenya and The Cabinet Secretary, Ministry of Transport and Infrastructure for the Period 1st July 2014- 30th June 2015. Nairobi: Ministry of Transport and Infrastructure.

Republic of Kenya (2014e): Programme Based Budget of the National Government of Kenya for the Year Ending 30th June, 2015. Nairobi: Government Printer.

Republic of Kenya (2015a): Kenya Health Sector Strategic and Investment Plan (KHSSP) July 2014 – June 2018, Draft. Nairobi: Ministry of Health

Republic of Kenya (2015c): Assessing Unit Costs for Water Supply and Sanitation Services in Kenya. Nairobi: Department of Water.

Republic of Kenya (2015b): Draft Strategic Plan. Nairobi: Ministry of Transport and Infrastructure.

TA (2015). Unbundled Functions: National and County Governments. Nairobi: Transition Authority.

Theodore, Karl (2009). Costing of Health Programs in Small Island States: Issues and Challenges, Report submitted to CARICOM Secretariat Pan Caribbean Partnership against HIV/AIDS Guyana (PANCAP).

APPENDICES

Appendix 1: Costs of Normative Human Resources for Health

Table A1.1: Human resources cost for community level

Type of personnel as per the norms	Number as per the norms	Annual gross pay (KES)	Total cost (KES)
General Clinical Officers (diploma)	1	686,491	686,491
Kenya Enrolled Community Health Nurse	1	534,768	534,768
Kenya Registered Community Health Nurse	1	685,741	685,741
General Physiotherapist	1	664,536	664,536
Occupational Therapist	1	655,940	655,940
Community Oral Health Officers	1	663,576	663,576
Health Promotion Officers	2	634,619	1,269,237
Medical Social Work	1	610,740	610,740
Nutrition & Dietetic Technologists	1	694,260	694,260
Nutrition & Dietetic Technician	1	622,120	622,120
Public health Officers	2	684,022	1,368,043
Public Health Technician	4	634,619	2,538,475
Community Health Service Personnel (CHSP)	5	376,086	1,880,430
Community Health Volunteers (CHV)	10	24000	240,000
		Total	**13,114,357**

Table A1.2: Human resources cost for level 2 (dispensary)

Type of personnel as per the norms	Number as per the norms	Annual gross pay (KES)	Total cost (KES)
Clinical Officers (diploma)	2	686,491	1,372,982
Kenya Enrolled Community Health Nurses	4	534,768	2,139,070
Kenya Registered Community Health Nurses	2	685,741	1,371,482
Enrolled Nurses	2	685,741	1,371,482
Pharmaceutical Technologists	1	661,961	661,961
Orthopaedic Technologists	1	621,171	621,171
General Physiotherapists	1	664,536	664,536
Occupational Technologists	1	655,940	655,940
Community Oral Health Officers	2	663,576	1,327,152
Health Promotion Officers	2	634,619	1,269,237
Medical Social Workers	1	610,740	610,740
General Attendants	1	96,000	96,000
Watchman	1	96,000	96,000
Total			**12,257,754**

Table A1.3: Human resources cost for level 3 (health centre)

Type of personnel as per the norms	Number as per the norms	Annual gross pay (KES)	Total cost (KES)
Medical Officers	2	1,796,593	3,593,186
General Clinical Officers(Diploma)	6	686,491	4,118,945
Graduate Clinical Officers	1	1,244,733	1,244,733
Clinical Officers - ENT/audiology	1	1,244,733	1,244,733
Clinical Officers - lung & skin	1	1,244,733	1,244,733
Clinical Officers - Paediatrics	1	1,244,733	1,244,733
Clinical Officers - Reproductive health	1	1,244,733	1,244,733
Dental Nurse	2	685,741	1,371,482
Kenya Enrolled Community Health Nurse	12	534,768	6,417,211
Kenya Registered Community Health Nurse	8	685,741	5,485,927
Kenya Registered Nurse	2	885,363	1,770,727
Enrolled Nurse	4	885,363	3,541,453
Registered Midwives	6	534,768	3,208,606
Sign Language Nurse	1	534,768	534,768
Pharmacist	1	1,761,600	1,761,600
Pharmaceutical Technologist	4	661,961	2,647,843
plaster Technicians/Technologists	2	670,148	1,340,296
Orthopaedic Technologist	1	621,171	621,171
General Physiotherapist	3	664,536	1,993,608
Occupational Therapist	3	655,940	1,967,821
Dental Officers	1	1,796,339	1,796,339
Dental Technologists	2	633,461	1,266,922
Community Oral Health Officers	4	663,576	2,654,304
General Radiographer	2	653,926	1,307,851
Health Promotion Officers	4	634,619	2,538,475
Medical Social Work	2	610,740	1,221,480
Health Administrative Officers	1	418,850	418,850
Clerks	4	333,429	1,333,716
Supply chain Assistant	1	333,429	333,429
Health Records Information Management Officers-HRIMO	4	671,916	2,687,664
ICT Officer	1	671,916	671,916
Medical Engineering Technician	2	608,799	1,217,598
Medical Laboratory Technologists	10	680,724	6,807,235
Nutrition & Dietetic Officer	2	845,862	1,691,723
Nutrition & Dietetic Technologists	4	694,260	2,777,040
Nutrition & Dietetic Technician	2	622,120	1,244,239
Public health Officers	2	684,022	1,368,043

Public Health Technician	2	634,619	1,269,237
Cooks	2	231,789	463,577
Drivers	4	306,461	1,225,844
Support Staff	10	232,823	2,328,232
Mortuary Attendant	2	391,172	782,345
Security	4	232,823	931,293
		Total	**84,935,662**

Table A1.4: Human resources cost for level 4 (county hospital)

Type of personnel as per the norms	**Number as per the norms**	**Annual gross pay (KES)**	**Total cost (KES)**
Medical Officers	16	1,796,593	28,745,486
Anaesthesiologists	2	1,796,593	3,593,186
General Surgeons	2	3,067,597	6,135,193
Orthopaedic Surgeons	1	3,067,597	3,067,597
ENT Surgeons	1	3,067,597	3,067,597
Obstetrics / Gynaecology Specialists	2	3,067,597	6,135,193
Neonatologists	1	2,865,188	2,865,188
Nephrologists	1	2,865,188	2,865,188
Neurologists	1	2,865,188	2,865,188
Ophthalmologists	1	2,865,188	2,865,188
Optometrists	1	2,865,188	2,865,188
Dermatologists	1	2,865,188	2,865,188
Paediatricians	2	2,865,188	5,730,375
Pathologists	1	2,865,188	2,865,188
Psychiatrist	2	2,865,188	5,730,375
Radiologists	2	2,865,188	5,730,375
Specialist physician	2	2,865,188	5,730,375
Public Health physician	1	1,796,593	1,796,593
General Clinical Officers(Diploma)	30	686,491	20,594,727
Graduate Clinical Officers	14	1,244,733	17,426,262
Specialised Clinical Officers			-
Clinical Officers - ENT/audiology	2	1,244,733	2,489,466
Clinical Officers - lungs & skin	4	1,244,733	4,978,932
Clinical Officers - ophthalmology/cataract Surgery	4	1,244,733	4,978,932
Clinical Officers - paediatrics	2	1,244,733	2,489,466
Clinical Officers - reproductive health	2	1,244,733	2,489,466
Clinical Officers - dermatology/venereology	1	1,244,733	1,244,733
Clinical Officers - orthopaedics	1	1,244,733	1,244,733
Clinical Officers - anaesthetists	6	1,244,733	7,468,398
Clinical Officers - psychiatry/mental Health	1	1,244,733	1,244,733
Clinical Officers - oncology/palliative Care	1	1,244,733	1,244,733
BSC Nurse	4	885,363	3,541,453

Dental Nurse	8	685,741	5,485,927
Kenya Enrolled Community Health Nurse	100	534,768	53,476,760
Kenya Registered Community Health Nurse	50	685,741	34,287,043
Kenya Registered Nurse	20	885,363	17,707,266
Enrolled Nurse	6	885,363	5,312,180
Oncology Nurse	2	685,741	1,371,482
Ophthalmic Nurse	2	685,741	1,371,482
Paediatric Nurse	2	685,741	1,371,482
Palliative Care Nurse	4	685,741	2,742,963
Psychiatrist Nurse	6	685,741	4,114,445
Registered Midwives	20	534,768	10,695,352
Sign Language Nurse	1	534,768	534,768
Theatre Nurses	10	685,741	6,857,409
Anaesthetic Nurse	6	685,741	4,114,445
Accidents & Emergency Nurse	10	685,741	6,857,409
Pharmacist	4	1,761,600	7,046,401
Clinical Pharmacist	2	1,761,600	3,523,200
Pharmaceutical Technologist	8	661,961	5,295,686
plaster Technicians/Technologists	4	670,148	2,680,592
Orthopaedic Technologist	3	621,171	1,863,514
General Physiotherapist	6	664,536	3,987,217
BSc Physiotherapy	1	885,363	885,363
Specialised Physiotherapists	2	879,681	1,759,362
Occupational Therapist	10	655,940	6,559,403
Clinical Psychologists	1	885,363	885,363
Dental Officers	4	1,796,339	7,185,357
Oromaxillofacial Surgeon	1	3,067,597	3,067,597
Paediatric Dentist	2	1,796,339	3,592,678
Orthodontist	1	1,796,339	1,796,339
Dental Technologists	6	633,461	3,800,765
Community Oral Health Officers	2	663,576	1,327,152
General Radiographer	6	653,926	3,923,554
Ultrasonographer	1	653,926	653,926
Dental Radiographer	1	653,926	653,926
Health Promotion Officers	4	634,619	2,538,475
Medical Social Work	6	610,740	3,664,440
medical Superintendent	1	3,067,597	3,067,597
Health Administrative Officers	2	758,095	1,516,190
HRM Officer	2	758,095	1,516,190
Clerks	10	333,429	3,334,290
Secretaries	1	358,617	358,617
Accountants	2	566,628	1,133,256
Supply chain Assistant	4	333,429	1,333,716
Supply Chain Officer	2	552,674	1,105,348

Health Records Information Management Officers-HRIMO	8	671,916	5,375,328
ICT Officer	2	671,916	1,343,832
Medical Engineering Technologists	5	653,362	3,266,808
Medical Engineering Technician	2	608,799	1,217,598
Medical Laboratory Technologists	40	680,724	27,228,940
Nutrition & Dietetic Officer	10	845,862	8,458,617
Nutrition & Dietetic Technologists	8	694,260	5,554,080
Nutrition & Dietetic Technician	4	622,120	2,488,479
Cateress	2	409,928	819,856
Public health Officers	4	684,022	2,736,087
Cooks	10	231,789	2,317,886
Drivers	12	306,461	3,677,531
Support Staff	40	232,823	9,312,929
Mortuary Attendant	6	391,172	2,347,034
Security	10	232,823	2,328,232
Total			**481,783,851**

Table A1.5: Human resources cost for level 5 (county referral hospital- former PGH)

Type of personnel as per the norms	**Number as per the norms**	**Annual gross pay (KES)**	**Total cost (KES)**
Medical Officers	50	1,796,593	89,829,643
Anaesthesiologists	6	1,796,593	10,779,557
Oramaxillofacial anaesthesiologists	1	1,796,593	1,796,593
Cardiologists	2	3,067,597	6,135,193
General Surgeons	4	3,067,597	12,270,387
Orthopaedic Surgeons	2	3,067,597	6,135,193
Cardiothoracic Surgeons	1	3,067,597	3,067,597
Critical Care Physicians	1	2,865,188	2,865,188
ENT Surgeons	2	2,865,188	5,730,375
Gastroentologists	2	2,865,188	5,730,375
Obstetrics /Gynaecology specialists	3	2,865,188	8,595,563
Palliative Care Specialist	2	2,865,188	5,730,375
Neonatologists	2	2,865,188	5,730,375
Nephrologists	2	2,865,188	5,730,375
Neurologists	1	2,865,188	2,865,188
Plastic Surgeons (reconstructive surgeon)	1	3,067,597	3,067,597
Neuro-Surgeons	1	3,067,597	3,067,597
Oncologists	4	2,865,188	11,460,750
Ophthalmologists	2	3,067,597	6,135,193
Optometrists	1	3,067,597	3,067,597
Dermatologists	1	2,865,188	2,865,188
Paediatric Endocrinologists	1	3,067,597	3,067,597

Paediatric Nephrologists	1	3,067,597	3,067,597
paediatric neurologists	1	2,865,188	2,865,188
Paediatric Surgeons	1	3,067,597	3,067,597
Paediatricians	4	2,865,188	11,460,750
Pathologists	2	2,865,188	5,730,375
Psychiatrists	4	2,865,188	11,460,750
Radiologists	4	2,865,188	11,460,750
Rheumatologists	1	2,865,188	2,865,188
Specialist Physicians	4	2,865,188	11,460,750
Medical Endocrinologists	1	2,865,188	2,865,188
Public Health Physicians	2	2,865,188	5,730,375
Urological Surgeon	1	3,067,597	3,067,597
Child & Adolescent Psychiatrist	1	3,067,597	3,067,597
Community Psychiatrist	1	2,865,188	2,865,188
Forensic Psychiatrist	1	2,865,188	2,865,188
General Clinical Officers(Diploma)	44	686,491	30,205,599
Graduate Clinical Officers	7	1,244,733	8,713,131
Clinical Officer - ENT/audiology	4	1,244,733	4,978,932
Clinical Officers - lungs & skin	2	1,244,733	2,489,466
Clinical Officers - ophthalmology/cataract surgery	2	1,244,733	2,489,466
Clinical Officers - paediatrics	6	1,244,733	7,468,398
Clinical Officers - reproductive health	2	1,244,733	2,489,466
Clinical Officers - dermatology/venereology	2	1,244,733	2,489,466
Clinical Officers - orthopaedics	2	1,244,733	2,489,466
Clinical Officers - anaesthetists	15	1,244,733	18,670,994
Clinical Officers - psychiatry/mental Health	2	1,244,733	2,489,466
Clinical Officers - oncology/palliative Care	2	1,244,733	2,489,466
BSN Nurses	12	885,363	10,624,360
Cardiology Nurses	2	885,363	1,770,727
Critical Care Nursing	20	885,363	17,707,266
Dental Nurses	8	885,363	7,082,906
Forensic Nurses	2	885,363	1,770,727
Kenya Enrolled Community Health Nurses	250	534,768	133,691,900
Kenya Registered Community Health Nurses	260	685,741	178,292,625
Kenya Registered Nurses	80	885,363	70,829,065
Enrolled Nurses	10	885,363	8,853,633
Nephrology Nurses	10	685,741	6,857,409
Oncology Nurses	10	685,741	6,857,409
Ophthalmic Nurses	6	685,741	4,114,445
Paediatric Nurses	10	685,741	6,857,409
Palliative Care Nurse	6	685,741	4,114,445
Psychiatrist Nurses	20	685,741	13,714,817

Registered Midwives	60	685,741	41,144,452
Sign Language Nurses	2	685,741	1,371,482
Theatre Nurses	60	685,741	41,144,452
Anaesthetic Nurse	4	685,741	2,742,963
Accidents & Emergency Nurses	10	685,741	6,857,409
Pharmacists	6	1,761,600	10,569,601
Clinical Pharmacists	4	1,761,600	7,046,401
Oncology Pharmacists	1	1,761,600	1,761,600
Pharmaceutical Technologists	10	661,961	6,619,607
Plaster Technicians/Technologists	6	670,148	4,020,888
Orthopaedic Technologists	6	621,171	3,727,029
General Physiotherapists	12	664,536	7,974,434
BSc Physiotherapy	2	885,363	1,770,727
Specialised Physiotherapists	3	879,681	2,639,044
Occupational Therapists	12	655,940	7,871,284
Clinical Psychologists	2	885,363	1,770,727
Dental Officers	10	1,796,339	17,963,392
Oromaxilofacial Surgeons	2	3,067,597	6,135,193
Paediatric Dentists	6	1,796,339	10,778,035
Orthodontists	2	1,796,339	3,592,678
Dental Technologists	10	633,461	6,334,608
General Radiographers	10	653,926	6,539,256
Ultrasonographers	2	653,926	1,307,851
Mammographers	1	653,926	653,926
CT Scan/MRI Radiographers	3	653,926	1,961,777
Dental Radiographers	2	653,926	1,307,851
Therapy Radiographers	2	653,926	1,307,851
Nuclear Medicine Technologists	2	670,148	1,340,296
Radiation Monitoring & Safety Officers	1	670,148	670,148
Health Promotion Officers	6	634,619	3,807,712
Medical Social Workers	8	610,740	4,885,920
Medical Superintendent	1	3,067,597	3,067,597
Health Administrative Officers	2	758,095	1,516,190
HRM Officer	2	758,095	1,516,190
Clerks	20	333,429	6,668,580
Secretaries	2	358,617	717,233
Accountants	6	566,628	3,399,768
Supply chain Assistants	6	333,429	2,000,574
Supply Chain Officers	2	552,674	1,105,348
Health Records Information Management Officers-HRIMO	12	671,916	8,062,992
ICT Officers	4	671,916	2,687,664
Medical Engineers	2	1,648,575	3,297,150
Medical Engineering Technologists	8	653,362	5,226,893
Medical Engineering Technicians	6	608,799	3,652,793

Medical Laboratory Technologists	50	680,724	34,036,176
Nutrition & Dietetic Officers	20	845,862	16,917,233
Nutrition & Dietetic Technologists	12	694,260	8,331,120
Nutrition & Dietetic Technician	4	622,120	2,488,479
Cateress	2	409,928	819,856
Public health Officers	4	684,022	2,736,087
Cooks	20	231,789	4,635,771
Drivers	15	306,461	4,596,913
Support Staff	60	232,823	13,969,394
Mortuary Attendants	10	391,172	3,911,723
Security	16	232,823	3,725,172
Total for county referral hospital			**1,206,931,515**

Appendix 2: Costs of Drugs, Commodities and Supplies for Health Conditions and Services

Table A2.1: Family planning commodities and supplies

	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Pills	Levonorgestrel 0.0375 mg, cycle	10%	12	28.50	34.20
	Levonorgestrel 0.15 mg + Ethinyl estradiol 30 mcg (Microgynon), cycle	90%	11	25.65	253.94
	Unit cost (per client)				**288.14**
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Condoms	Condom, female	5%	120	50.07	300.39
	Condom, male	95%	120	2.47	281.28
	Total cost				**581.67**
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Injectables	Depot-Medroxyprogesterone Acetate 150 mg - 3 monthly	100%	4	58.54	234.16
	Gloves, exam, latex, disposable, pair	100%	1	6.40	6.40
	Povidone iodine, solution, 10 %, 5 ml per injection	100%	4	1.50	6.00
	Syringe, Autodisable SoloShot IX	100%	4	6.05	24.20
	Water for injection, 10 ml ampoule	100%	4	4.00	16.00
	Unit cost (per client)				**286.76**
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
IUCD	Gloves, exam, latex, disposable, pair	100%	3	6.40	19.20
	IUD, Copper T-380A	100%	1	95.00	95.00
	Povidone iodine, solution, 10 %, 5 ml per injection	100%	4	1.50	6.00
	IUCD insertion set	100%	1	10.00	10.00
	Unit cost (per client)				**130.20**
	Drug/Supply	Percent receiving this aspect of the	Units per person	Unit cost (KES)	Cost per average case (KES)

		treatment			
Implants	Gloves, exam, latex, disposable, pair	100%	3	6.40	19.20
	Implant, two rod - 75 mg levonorgestrel per rod	100%	1	807.50	807.50
	Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	100%	2	29.70	59.40
	Povidone iodine, solution, 10 %, 5 ml per injection	100%	2	2.50	4.99
	Syringe, needle	100%	2	6.05	12.10
	Trocar	100%	0.1	688.70	68.87
	Surgical Blades Size 23	100%	1	6.00	6.00
	Elastoplast	100%	1	5.00	5.00
	Unit cost (per client)				**983.06**

Table A2.2: Maternal and new born commodities and supplies

	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Post-abortion care	Misoprostol, tablet, 200 mcg	100.0	4	17.83	71.33
	Paracetamol, tablet, 500 mg	100.0	9	0.40	3.60
	Sepsis management				-
	Ampicillin, powder for injection, 500 mg, vial	100.0	24	48.86	1,172.72
	Gentamycin, injection, 40 mg/ml in 2 ml vial	100.0	6	15.93	95.56
	Metronidazole, injection, 500 mg in 100 ml vial	100.0	8	54.92	439.39
	Tetracycline, tablet, 500 mg	100.0	40	0.31	12.47
	Blood and urine				-
	Foley catheter	-	-	43.90	-
	Uterine evacuation				-
	Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	100.0	1	29.70	29.70
	Misoprostol, tablet, 200 mcg	100.0	2	16.43	32.85

	Syringe, needle + swab	100.0	1	4.30	4.30
	Uterine lacerations				-
	Methylergometrine, Injection 0.2 mg/ml, 1 ml amp	100.0	3	7.75	23.24
	Pain management				-
	Paracetamol, tablet, 500 mg	100.0	12	0.62	7.50
	Pethidine, 50 mg/ml, 2 ml ampoule	100.0	2	17.51	35.02
	Shock/Rehydration				-
	Sodium chloride, injectable solution, 0,9 %, 500 ml	100.0	-	75.76	-
	After stabilized				-
	Sodium chloride, injectable solution, 0,9 %, 500 ml	100.0	-	75.76	-
	Unit cost (per client)				**1,924.08**
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Ectopic case management	Anaesthesia				
	IV giving/infusion set, with needle	100.0	1.0	17.98	17.98
	Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	100.0	1	29.70	29.70
	Sodium lactate injection (Ringer's), 500 ml, with giving set	100.0	2	61.42	122.85
	Syringe, needle + swab	10.0	1	4.30	0.43
	Epinephrine, ampoule, 1 mg/ml	10.0	1	46.77	4.68
	Surgery				
	Suture, absorbable, synthetic, 2/0, curved needle	1.0	1	43.62	0.44
	Suture, catgut, chromic, 0, 150 cm	1.0	1	58.54	0.59
	Suture, non-absorbable, synthetic, 3/0, curved needle	1.0	1	19.90	0.20
	Gauze pad, 10 x 10 cm,	1.0	3	10.33	0.31

	sterile				
	Infection control				
	Ampicillin, powder for injection, 500 mg, vial	100.0	64.0	48.86	3,127.25
	Gentamycin, injection, 40 mg/ml in 2 ml vial	100.0	12.0	15.93	191.11
	Metronidazole, injection, 500 mg in 100 ml vial	100.0	12.0	54.92	659.09
	Sodium chloride, injectable solution, 0,9 %, 500 ml	100.0	8.0	75.76	606.06
	Pain management				
	Paracetamol, tablet, 500 mg	100.0	12.0	0.62	7.50
	Pethidine, 50 mg/ml, 2 ml ampoule	100.0	2.0	17.51	35.02
	Unit cost (per client)				**4,803.19**
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Basic ANC Care	Ferrous Sulphate Tab 200mg,x1000s	1.0	1.0	360.0	360
	Folic Acid Tablets 5mg	0.8	0.8	120.0	96
	Tetanus vaccine, injection	100	2	7.14	14.28
	Syringes 10ml with G21 Needle	1.0	2	4.20	8.40
	Latex Exam Gloves, L/Size, N/S	1.0	1.0	4.61	4.61
	Sulfadoxine +Pyrimethamine Tab	1.0	1.0	6.0	6.0
	Unit cost (per client)				489.29
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)

	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Management of pre-eclampsa	Severe pre-eclampsia				
	Bag, urine, collecting, 2000 ml	100.0	1	26.69	26.69
	Foley catheter	100.0	1	43.90	43.90
	Test strips, urine analysis	100.0	8	2.32	18.59
	High blood pressure (if diastolic BP > 0mmHg)				

	Hydralazine, powder for injection, 20 mg ampoule	100.0	1	144.63	144.63
	IV giving/infusion set, with needle	100.0	1	17.98	17.98
	Sodium lactate injection (Ringer's), 500 ml, with giving set	100.0	1	61.42	61.42
	Misoprostol, tablet, 200 mcg	40.0	2	16.43	13.14
	Oxytocin, injection, 10 IU in 1 ml ampoule	40.0	2	19.54	15.63
	Sodium chloride, injectable solution, 0,9 %, 500 ml	40.0	1	75.76	30.30
	Convulsions				
	Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	10.0	1	8.26	0.83
	Sodium lactate injection (Ringer's), 500 ml, with giving set	10.0	4	61.42	24.57
	Syringe, needle + swab	10.0	1	4.30	0.43
	Water for injection, 10 ml ampoule	10.0	2	6.67	1.33
	If pregnancy < 7 months monitor blood pressure and urine)				
	Test strips, urine analysis	50.0	5	2.32	5.81
	Continued convulsions				
	Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	10.0	1	29.70	2.97
	Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	10.0	1	8.26	0.83
	Delayed labour or late referral				
	Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	5.0	12	29.70	17.82
	Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	5.0	12	8.26	4.95
	Recurring conversions				
	Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	10.0	1	8.26	0.83

	Unit cost (per client)				**432.65**
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Labour and delivery management	Clean delivery kit	100.0	1	117.94	117.94
	Delivery record	100.0	1	-	-
	Gloves, surgeon's, latex, disposable, sterile, pair	100.0	4	18.94	75.76
	Paracetamol, tablet, 500 mg	100.0	12	0.62	7.50
	Partograph	100.0	1	-	-
	Povidone iodine, solution, 10 %, 5 ml per injection	100.0	1	2.50	2.50
	Unit cost (per client)				203.69
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Active management of 3rd stage of labour	Oxytocin, injection, 10 IU in 1 ml ampoule	100.0	1	19.54	19.54
	Syringe, needle + swab	100.0	1	4.30	4.30
	Unit cost (per client)				23.85
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
	General				
Pre-referral management of labour complications	Cotton swab	50.0	1	1.39	0.70
	Gloves, surgeon's, latex, disposable, sterile, pair	100.0	2	18.94	37.88
	IV giving/infusion set, with needle	100.0	1	17.98	17.98
	Povidone iodine, solution, 10 %, 5 ml per injection	50.0	1	2.50	1.25
	Cannula, IV, 18G, sterile, disposable	100.0	1	12.05	12.05
	If shock, hypertension or heavy bleeding				
	Bag, urine, collecting, 2000 ml	100.0	1	26.69	26.69
	Foley catheter	100.0	1	43.90	43.90

	Sodium lactate injection (Ringer's), 500 ml, with giving set	100.0	4	61.42	245.69
	If heavy bleeding				
	Ampicillin, powder for injection, 500 mg, vial	15.0	4	48.86	29.32
	Diazepam, injection, 5 mg/ml, in 2 ml ampoule	15.0	1.0	7.04	1.06
	Gauze pad, 10 x 10 cm, sterile	30.0	4.0	10.33	12.40
	Oxytocin, injection, 10 IU in 1 ml ampoule	30.0	3.0	19.54	17.59
	If heavy bleeding, after placenta removal				
	Oxytocin, injection, 10 IU in 1 ml ampoule	15.0	1.0	19.54	2.93
	If severe pre-eclampsia or eclampsia				
	Hydralazine, powder for injection, 20 mg ampoule	20.0	1.0	144.63	28.93
	Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	20.0	1.0	29.70	5.94
	Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	20.0	1.0	8.26	1.65
	Sodium lactate injection (Ringer's), 500 ml, with giving set	20.0	4.0	61.42	49.14
	Syringe, needle + swab	20.0	1.0	4.30	0.86
	Water for injection, 10 ml ampoule	20.0	2.0	6.67	2.67
	Continued treatment for pre-eclampsia or eclampsia				
	Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	20.0	1.0	8.26	1.65
	Late referral for pre-eclampsia or eclampsia				
	Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	10.0	12.0	29.70	35.64
	Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	10.0	12.0	8.26	9.91
	Water for injection, 10 ml ampoule	20.0	2.0	6.67	2.67
	Antibiotics				

	Ampicillin, powder for injection, 500 mg, vial	100.0	64.0	48.86	3,127.25
	Gentamycin, injection, 40 mg/ml in 2 ml vial	100.0	12.0	15.93	191.11
	Metronidazole, injection, 500 mg in 100 ml vial	100.0	12.0	54.92	659.09
	Syringe, needle + swab	100.0	12.0	4.30	51.65
	Water for injection, 10 ml ampoule	100.0	64.0	6.67	426.99
	Additional drugs needed				
	Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	20.0	1.0	8.26	1.65
	Unit cost (per client)				5,046.23

	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Management of eclampsia	Severe pre-eclampsia				
	Bag, urine, collecting, 2000 ml	100.0	1	26.69	26.69
	Foley catheter	100.0	1	43.90	43.90
	Test strips, urine analysis	100.0	8	2.32	18.59
	High blood pressure (if diastolic BP > 0mmHg)				
	Hydralazine, powder for injection, 20 mg ampoule	100.0	1	144.63	144.63
	IV giving/infusion set, with needle	100.0	1	17.98	17.98
	Sodium lactate injection (Ringer's), 500 ml, with giving set	100.0	1	61.42	61.42
	Misoprostol, tablet, 200 mcg	40.0	2	16.43	13.14
	Oxytocin, injection, 10 IU in 1 ml ampoule	40.0	2	19.54	15.63
	Sodium chloride, injectable solution, 0,9 %, 500 ml	40.0	1	75.76	30.30
	Convulsions				
	Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	10.0	1	8.26	0.83

	Sodium lactate injection (Ringer's), 500 ml, with giving set	10.0	4	61.42	24.57
	Syringe, needle + swab	10.0	1	4.30	0.43
	Water for injection, 10 ml ampoule	10.0	2	6.67	1.33
	If pregnancy < 7 months monitor blood pressure and urine)				
	Test strips, urine analysis	50.0	5	2.32	5.81
	Continued convulsions				
	Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	10.0	1	29.70	2.97
	Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	10.0	1	8.26	0.83
	Delayed labour or late referral				
	Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	5.0	12	29.70	17.82
	Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	5.0	12	8.26	4.95
	Recurring conversions				
	Magnesium sulfate, injection, 500 mg/ml in 10-ml ampoule	10.0	1	8.26	0.83
	Unit cost (per client)				432.65
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Management of obstructed labour	General				
	Gloves, surgeon's, latex, disposable, sterile, pair	100.0	4	18.94	75.76
	Spinal anaesthesia				
	IV giving/infusion set, with needle	90.0	1	17.98	16.18
	Lidocaine HCl (in dextrose 7.5%), ampoule 2 ml	90.0	1	29.70	26.73
	Sodium lactate injection (Ringer's), 500 ml, with giving set	90.0	2	61.42	110.56
	Syringe, needle + swab	90.0	1	4.30	3.87

	Epinephrine, ampoule, 1 mg/ml	45.0	1	46.77	10.52
	And if necessary				
	Syringe, needle + swab	10.0	1	4.30	0.43
	Epinephrine, ampoule, 1 mg/ml	10.0	1	46.77	4.68
	General anaesthesia				
	Atropine sulphate, injection, 1 mg in 1 ml ampoule	10.0	1	10.24	1.02
	IV giving/infusion set, with needle	10.0	1	17.98	1.80
	Sodium lactate injection (Ringer's), 500 ml, with giving set	10.0	2	61.42	12.28
	Syringe, needle + swab	10.0	2	4.30	0.86
	Ketamine, 10 ml vial, 50 mg/ml	10.0	1	94.77	9.48
	Prophylactic antibiotics				
	Ampicillin, powder for injection, 500 mg, vial	-	4	48.86	-
	Cefazolin, ampoule, 500 mg	100.0	2	50.79	101.58
	Other				
	Bag, urine, collecting, 2000 ml	100.0	1	26.69	26.69
	Foley catheter	100.0	1	43.90	43.90
	Procedure				
	Gauze pad, 10 x 10 cm, sterile	100.0	5	10.33	51.65
	Needle, suture, assorted sizes, round body	100.0	3	2.58	7.75
	Povidone iodine, solution, 10 %, 5 ml per injection	100.0	1	2.50	2.50
	Suture, catgut, chromic, 0, 150 cm	100.0	1	58.54	58.54
	Suture, non-absorbable, synthetic, 3/0, curved needle	100.0	1	19.90	19.90
	Blade, surgical, no. 22, sterile, disposable	100.0	1	7.75	7.75
	If signs of infection				
	Ampicillin, powder for injection, 500 mg, vial	25.0	64	48.86	781.81

	Gentamycin, injection, 40 mg/ml in 2 ml vial	25.0	28	15.93	111.48
	IV giving/infusion set, with needle	25.0	1	17.98	4.49
	Metronidazole, injection, 500 mg in 100 ml vial	25.0	12	54.92	164.77
	Sodium chloride, injectable solution, 0,9 %, 500 ml	25.0	8	75.76	151.51
	After delivery				
	IV giving/infusion set, with needle	100.0	1	17.98	17.98
	Oxytocin, injection, 10 IU in 1 ml ampoule	100.0	2	19.54	39.08
	Paracetamol, tablet, 500 mg	100.0	12	0.62	7.50
	Pethidine, 50 mg/ml, 2 ml ampoule	100.0	1	17.51	17.51
	Sodium lactate injection (Ringer's), 500 ml, with giving set	100.0	8	61.42	491.39
	Syringe, needle + swab	100.0	1	4.30	4.30
	Unit cost (per client)				2,386.27

	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Antibiotics for pPRoM	Amoxicillin, caplet, 250 mg	80.0	42.0	1.4	45.7
	Erythromycin, tablet, 250 mg	20.0	28.0	3.7	20.5
	Unit cost (per client)				66.2
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Maternal sepsis case management	Antibiotics				
	Amoxicillin, caplet, 250 mg	100.0	18	1.36	24.48
	Ampicillin, powder for injection, 500 mg, vial	100.0	64	48.86	3,127.25
	Gentamycin, injection, 40 mg/ml in 2 ml vial	100.0	9	15.93	143.34
	Metronidazole, injection, 500 mg in 100 ml vial	100.0	12	54.92	659.09

	Syringe, needle + swab	100.0	64	4.30	275.48
	Water for injection, 5 ml ampoule	100.0	64	6.07	388.43
	Other				
	Bag, urine, collecting, 2000 ml	100.0	1	26.69	26.69
	Foley catheter	100.0	1	43.90	43.90
	Gloves, surgeon's, latex, disposable, sterile, pair	100.0	1	18.94	18.94
	IV giving/infusion set, with needle	100.0	1	17.98	17.98
	Lancet, blood, disposable	100.0	1	0.63	0.63
	Oxygen, 1000 litres, primarily with oxygen cylinders	25.0	2	327.13	122.67
	Paracetamol, tablet, 500 mg	100.0	8	0.62	5.00
	Sodium chloride, injectable solution, 0,9 %, 500 ml	100.0	24	75.76	1,818.17
	Complete blood count	100.0	1	216.94	216.94
	Unit cost (per client)				6,888.98
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
New born sepsis management	Blood culture	30.0	-	-	-
	Cephalotin, 100 ml vial	30.0	4	72.31	86.78
	Chest X-ray	-	1	-	-
	Gentamycin, injection, 40 mg/ml in 2 ml vial	100.0	5	15.93	79.63
	IV giving/infusion set, with needle	20.0	1	17.98	3.60
	Oxygen, 1000 litres, primarily with oxygen cylinders	20.0	-	327.13	-
	Unit cost (per client)				170.00
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Treatment of haemorrhage	After bleeding is controlled				
	Albendazole, tablet, 400 mg	25.0	1	1.70	0.43
	Lancet, blood, disposable	100.0	1	0.63	0.63
	Test, haemoglobin	100.0	1	-	-
	If there are signs of				

	infection				
	Ampicillin, powder for injection, 500 mg, vial	10.0	64	48.86	312.72
	Gentamycin, injection, 40 mg/ml in 2 ml vial	10.0	12	15.93	19.11
	IV giving/infusion set, with needle	10.0	1	17.98	1.80
	Metronidazole, injection, 500 mg in 100 ml vial	10.0	12	54.92	65.91
	Sodium chloride, injectable solution, 0,9 %, 500 ml	10.0	8	75.76	60.61
	Water for injection, 5 ml ampoule	10.0	64	6.07	38.84
	Repair of tears and lacerations				
	Cotton swab	50.0	1	1.39	0.70
	Diazepam, injection, 5 mg/ml, in 2 ml ampoule	50.0	1	7.04	3.52
	Lidocaine, injection, 1 % in 20 ml vial	50.0	1	86.09	43.04
	Needle, suture, assorted sizes, round body	50.0	3	2.58	3.87
	Pethidine, 50 mg/ml, 2 ml ampoule	50.0	1	17.51	8.76
	Povidone iodine, solution, 10 %, 5 ml per injection	50.0	1	2.50	1.25
	Suture, catgut, chromic, 0, 150 cm	50.0	2	58.54	58.54
	Suture, non-absorbable, synthetic, 2/0, needle	50.0	1	19.68	9.84
	If HB < 7g/dL (severe anaemia), first 3 months				
	Ferrous Salt + Folic Acid, tablet, 200 + 0.25 mg	25.0	180	0.12	5.42
	If HB < 7g/dL (severe anaemia), following 6 months				
	Ferrous Salt + Folic Acid, tablet, 200 + 0.25 mg	25.0	180	0.12	5.42
	If HB between 7-11g/dL				
	Ferrous Salt + Folic Acid, tablet, 200 + 0.25 mg	75.0	180	0.12	16.27
	Atonic uterus				
	Oxytocin, injection, 10 IU in 1 ml ampoule	50.0	6	19.54	58.63
	Other				
	Bag, urine, collecting, 2000 ml	100.0	1	26.69	26.69

	Blood, one unit	25.0	2	-	-
	Foley catheter	100.0	1	43.90	43.90
	Gloves, surgeon's, latex, disposable, sterile, pair	100.0	4	18.94	75.76
	IV giving/infusion set, with needle	100.0	1	17.98	17.98
	Oxytocin, injection, 10 IU in 1 ml ampoule	100.0	1	19.54	19.54
	Sodium lactate injection (Ringer's), 500 ml, with giving set	100.0	2	61.42	122.85
	Syringe, needle + swab	100.0	1	4.30	4.30
	Unit cost (per client)				1,026.33

Table A2.3: Child health commodities and supplies

	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Diarrhoea	ORS, sachet	100	3	6.99	20.98
	Total cost				20.98
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Diarrhoea	Children 0-6 months				
	Zinc, tablet, 20 mg	10	7	3.25	2.27
	Children 6-59 months				
	Zinc, tablet, 20 mg	90	14	3.25	40.89
	Total cost				43.17
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Mild pneumonia	Amoxicillin, caplet, 250 mg	100	6	1.36	8.16
	Paracetamol, tablet, 100 mg	100	6	0.20	1.18
	Salbutamol, tablet, 4 mg	5	12	0.21	0.13
	Salbutamol, syrup, 2 mg/5 ml	5	12	4.27	2.56
	Total cost				12.03
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Severe	At Hospital				

pneumonia	Ampicillin, powder for injection, 500 mg, vial	100	20	48.86	977.27
	Gentamicin inj 10 mg/ml 2 ml amp	100	15	10.74	161.03
	Nasogastric tube, CH12, 125 cm, disposable	20	3	35.30	21.18
	Oxygen, 1000 litres, primarily with oxygen concentrators	100	6	-	-
	Prednisolone, tablet, 5 mg	5	6	0.96	0.29
	Salbutamol, syrup, 2 mg/5 ml	50	12	4.27	25.62
	Syringe, needle + swab	100	5	4.30	21.52
	After discharge				
	Amoxicillin, caplet, 250 mg	100	15	1.36	20.40
	Gentamicin inj 10 mg/ml 2 ml amp	100	5	10.74	53.68
	Syringe, needle + swab	100	5	4.30	21.52
	Total cost				1,302.50
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Malaria	Diagnosis				
	Malaria test kit (RDT)	200	1	38.74	77.48
	Slide and stain for microscopy	200	1	12.91	25.83
	Treatment				
	Artemether + Lumefantrine, tablets, 20 + 120 mg, 6 x 1 blister	0	6	12.05	-
	Artesunate + Amodiaquine, tablets, 50 mg + 153 mg, 3 + 3 blister	100	3	26.08	78.25
	Artesunate + SP, tablets, 50 mg + 500 mg + 25 mg, 3 + 1 blister	0	1	47.35	-
	Total cost				181.56
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Severe malaria	Blood, one unit	10	2	-	-
	Glucose inj 5 %, 500 ml with giving set	80	1	82.73	66.18
	IV giving/infusion set, with needle	80	1	17.98	14.38
	Oxygen, 1000 litres, primarily with oxygen	20	1	-	-

	concentrators				
	Quinine, injection, 300 mg/ml, 2 ml ampoule	50	9	23.50	105.76
	Blood glucose level test	100	1	172.18	172.18
	Artusenate, 20 mg/ml, 1 ml ampoule	50	4	172.18	344.35
	Nasal prongs	20	1	18.08	3.62
	Total cost				706.46
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Measles treatment	Vitamin A, caplet, 100,000 IU	10	3	2.15	0.65
	Paracetamol, tablet, 500 mg	100	6	0.62	3.75
	Vitamin A, caplet, 200,000 IU	80	3	3.36	8.06
	Vitamin A, caplet, 50,000 IU	10	3	2.84	0.85
	Total cost				13.31

Table A2.4: Drugs, commodities and supplies for Tuberculosis

	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Microscopy: Diagnostic Test for Passive TB Case Finding	Applicator sticks, if loops are not available, pack of 1000	100	0.01	344.35	3.44
	Microscope slides, lime-soda-glass, pack of 50	100	0.02	258.26	5.17
	Diamond pen	100	0.0002	344.35	0.07
	Sputum containers, pack 100	100	0.01	946.96	9.47
	Immersion oil, 500ml	100	0.0001	3,529.59	0.35
	Lens tissue (paper), 50 pages/block, 10 blocks/pack	100	0.0005	3,185.24	1.59
	Liquid soap for hands, 1 litre	100	0.002	0.86	0.00
	Paper towels, single-use, box. 150 towels/pack, 30 packs/ carton	100	0.0016	5,079.16	8.13
	Disposables gloves, powder free, 100 pieces per box	100	0.005	1,205.23	6.03
	Nitril gloves, powder free, if Auramine O is used for staining	100	0.001	1,549.58	1.55
	Laboratory request forms,	100	0.0011	2,324.36	2.56

	pack of 1000				
	Laboratory report forms, pack of 1000	100	0.0011	2,324.36	2.56
	Laboratory register	100	0.0003	1,205.23	0.36
	Filterpaper (diameter 70 mm), 100 per pack	100	0.0004	430.44	0.17
	Filter paper round, diameter 150, packs of 100	100	0.0004	860.88	0.34
	Desinfectant, phenol, bottle of 5 kg	100	0.0003	8,264.40	2.48
	Stable chlorine desinfectant, pack of 100 tablets	100	0.0002	2,324.36	0.46
	Protective eye glasses	100	0.0002	430.44	0.09
	Methylated ethanol for spirit lamps, bottle of 2.5 L	100	0.0004	258.26	0.10
	Basic fuchsine, 100g (bottle)	100	0.0003	5,423.51	1.63
	Methylene blue, 100g (bottle)	100	0.0001	9,383.54	0.94
	Phenol crystals colourless, 5Kg	100	0.0001	8,264.40	0.83
	Ethanol, 96%, 2.5L (bottle), for stain solutions	100	0.0002	602.61	0.12
	Ethanol, 96%, 2.5L (bottle), for decolourization	100	0.002	602.61	1.21
	Hydrochloric acid, 2.5L (bottle)	100	0.0001	2,324.36	0.23
	Concentrated sulphuric acid, 2.5L (bottle)	100	0.0001	7,059.18	0.71
	Auramine O, 50g (bottle)	100	0.0001	2,840.89	0.28
	Potassium permanganate, 250g (bottle)	100	0.0001	8,264.40	0.83
	Total cost				51.69
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Microscopy: Diagnostic Test for active TB Case Finding	Applicator sticks, if loops are not available, pack of 1000	100	0.01	344.35	3.44
	Microscope slides, lime-soda-glass, pack of 50	100	0.02	258.26	5.17
	Diamond pen	100	0.0002	344.35	0.07
	Sputum containers, pack 100	100	0.01	946.96	9.47
	Immersion oil, 500ml	100	0.0001	3,529.59	0.35
	Lens tissue (paper), 50 pages/block, 10 blocks/pack	100	0.0005	3,185.24	1.59
	Liquid soap for hands, 1 litre	100	0.002	0.86	0.00

	Paper towels, single-use, box. 150 towels/pack, 30 packs/ carton	100	0.0016	5,079.16	8.13
	Disposables gloves, powder free, 100 pieces per box	100	0.005	1,205.23	6.03
	Nitril gloves, powder free, if Auramine O is used for staining	100	0.001	1,549.58	1.55
	Laboratory request forms, pack of 1000	100	0.0011	2,324.36	2.56
	Laboratory report forms, pack of 1000	100	0.0011	2,324.36	2.56
	Laboratory register	100	0.0003	1,205.23	0.36
	Filterpaper (diameter 70 mm), 100 per pack	100	0.0004	430.44	0.17
	Filter paper round, diameter 150, packs of 100	100	0.0004	860.88	0.34
	Desinfectant, phenol, bottle of 5 kg	100	0.0003	8,264.40	2.48
	Stable chlorine desinfectant, pack of 100 tablets	100	0.0002	2,324.36	0.46
	Protective eye glasses	100	0.0002	430.44	0.09
	Methylated ethanol for spirit lamps, bottle of 2.5 L	100	0.0004	258.26	0.10
	Basic fuchsine, 100g (bottle)	100	0.0003	5,423.51	1.63
	Methylene blue, 100g (bottle)	100	0.0001	9,383.54	0.94
	Phenol crystals colourless, 5Kg	100	0.0001	8,264.40	0.83
	Ethanol, 96%, 2.5L (bottle), for stain solutions	100	0.0002	602.61	0.12
	Ethanol, 96%, 2.5L (bottle), for decolourization	100	0.002	602.61	1.21
	Hydrochloric acid, 2.5L (bottle)	100	0.0001	2,324.36	0.23
	Concentrated sulphuric acid, 2.5L (bottle)	100	0.0001	7,059.18	0.71
	Auramine O, 50g (bottle)	100	0.0001	2,840.89	0.28
	Potassium permanganate, 250g (bottle)	100	0.0001	8,264.40	0.83
	Total cost				51.69
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Microscopy: To test monitor treatment for pulmonary TB cases	Applicator sticks, if loops are not available, pack of 1000	100	0.01	344.35	3.44
	Microscope slides, lime-soda-glass, pack of 50	100	0.02	258.26	5.17
	Diamond pen	100	0.0002	344.35	0.07

	Sputum containers, pack 100	100	0.01	946.96	9.47
	Immersion oil, 500ml	100	0.0001	3,529.59	0.35
	Lens tissue (paper), 50 pages/block, 10 blocks/pack	100	0.0005	3,185.24	1.59
	Liquid soap for hands, 1 litre	100	0.002	0.86	0.00
	Paper towels, single-use, box. 150 towels/pack, 30 packs/ carton	100	0.0016	5,079.16	8.13
	Disposables gloves, powder free, 100 pieces per box	100	0.005	1,205.23	6.03
	Nitril gloves, powder free, if Auramine O is used for staining	100	0.001	1,549.58	1.55
	Laboratory request forms, pack of 1000	100	0.0011	2,324.36	2.56
	Laboratory report forms, pack of 1000	100	0.0011	2,324.36	2.56
	Laboratory register	100	0.0003	1,205.23	0.36
	Filterpaper (diameter 70 mm), 100 per pack	100	0.0004	430.44	0.17
	Filter paper round, diameter 150, packs of 100	100	0.0004	860.88	0.34
	Desinfectant, phenol, bottle of 5 kg	100	0.0003	8,264.40	2.48
	Stable chlorine desinfectant, pack of 100 tablets	100	0.0002	2,324.36	0.46
	Protective eye glasses	100	0.0002	430.44	0.09
	Methylated ethanol for spirit lamps, bottle of 2.5 L	100	0.0004	258.26	0.10
	Basic fuchsine, 100g (bottle)	100	0.0003	5,423.51	1.63
	Methylene blue, 100g (bottle)	100	0.0001	9,383.54	0.94
	Phenol crystals colourless, 5Kg	100	0.0001	8,264.40	0.83
	Ethanol, 96%, 2.5L (bottle), for stain solutions	100	0.0002	602.61	0.12
	Ethanol, 96%, 2.5L (bottle), for decolourization	100	0.002	602.61	1.21
	Hydrochloric acid, 2.5L (bottle)	100	0.0001	2,324.36	0.23
	Concentrated sulphuric acid, 2.5L (bottle)	100	0.0001	7,059.18	0.71
	Auramine O, 50g (bottle)	100	0.0001	2,840.89	0.28
	Potassium permanganate, 250g (bottle)	100	0.0001	8,264.40	0.83
	Total cost				51.69

	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Culture: Diagnostic Test for Passive TB Case finding	Tube for liquid cultures, growth detection based on fluorescence signal, per test - 1 tubes per test + 10% repeat + 10% contamination	100	1.2	451.96	542.35
	Growth supplement for liquid cultures, growth detection based on fluorescence signal, per test. BACTEC MGIT 960 Supplement Kit (100 tests, PANTA and OADC combined) + 10% repeat + 10% contamination	100	1.2	129.13	154.96
	Petri-dishes, disposables, sterile; 20 per bag, 15 bags per package	100	0.001	9,383.54	9.38
	Immunochromatographic tests for the rapid identification of Mycobacterium tuberculosis, per test	100	0.092	172.18	15.84
	Droppers, disposable, 1.5 ml, 20 per bag and 25 bags per package	100	0.003	7,059.18	21.18
	Culture tubes, diameter 16 mm, pack of 100	100	0.002	3,529.59	7.06
	PP-tubes for centrifuge, 50 ml; 500 pieces/pack	100	0.005	14,118.35	70.59
	PP-tubes for centrifuge, 15 ml; 500 pieces/pack	100	0	14,118.35	-
	Loop, disposable 10 m, 500 pieces/pack	100	0.003	2,152.19	6.46
	Plastic Pasteur pipettes, 1.5 ml, 500 pieces/pack	100	0.003	4,734.81	14.20
	Deep freeze storage box with lid for 2 ml cryovials , autoclavable PP	100	0.001	946.96	0.95
	Gloves, vinyl or nitrile, powder free, disposable, size S, 100/pack	100	0.005	1,377.40	6.89
	Gloves, vinyl or nitrile, powder free, disposable, size M, 100/pack	100	0.008	1,377.40	11.02
	Gloves, vinyl or nitrile, powder free, disposable, size L, 100/pack	100	0.003	1,377.40	4.13
	Autoclavable bags at	100	0.001	4,734.81	4.73

	134°C, 410 x 620 mm, 100 pieces per pack				
	Filter paper round, diameter 150, packs of 100	100	0.001	860.88	0.86
	Tube brush 280 mm long	100	0.002	258.26	0.52
	Brush for glassware 120 mm long	100	0.001	602.61	0.60
	Laboratory coat, size L	100	0.001	4,132.20	4.13
	Laboratory coat, size M	100	0.002	4,132.20	8.26
	Laboratory coat, size S	100	0.001	4,132.20	4.13
	FFP2 or FFP3 respirators, individually packed, packs of 10	100	0.003	2,582.63	7.75
	Disinfectant for floors, container 10 litres	100	0.001	6,198.30	6.20
	Disinfectant, ethanol-based, container 5 litres	100	0.001	5,509.60	5.51
	Spray hand for bottle with disinfectant of 1 litre	100	0.001	602.61	0.60
	Liquid soap for hands, 1 litre	100	0.001	0.86	0.00
	Disinfectant for hands, alcohol-based, 1 litre bottle	100	0.001	946.96	0.95
	Cotton wool, 1 kg	100	0.001	258.26	0.26
	Tissue pulp, absorbent sheets, approx. 550 x 350 mm	100	0.003	602.61	1.81
	Total cost				911.32
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Culture: Diagnostic test for smear negative or Xpert negative	Tube for liquid cultures, growth detection based on fluorescence signal, per test - 1 tubes per test + 10% repeat + 10% contamination	100	1.2	451.96	542.35
	Growth supplement for liquid cultures, growth detection based on fluorescence signal, per test. BACTEC MGIT 960 Supplement Kit (100 tests, PANTA and OADC combined) + 10% repeat + 10% contamination	100	1.2	129.13	154.96
	Petri-dishes, disposables, sterile; 20 per bag, 15 bags per package	100	0.001	9,383.54	9.38
	Immunochromatographic tests for the rapid identification of	100	0.092	172.18	15.84

	Mycobacterium tuberculosis, per test				
	Droppers, disposable, 1.5 ml, 20 per bag and 25 bags per package	100	0.003	7,059.18	21.18
	Culture tubes, diameter 16 mm, pack of 100	100	0.002	3,529.59	7.06
	PP-tubes for centrifuge, 50 ml; 500 pieces/pack	100	0.005	14,118.35	70.59
	PP-tubes for centrifuge, 15 ml; 500 pieces/pack	100	0	14,118.35	-
	Loop, disposable 10 m, 500 pieces/pack	100	0.003	2,152.19	6.46
	Plastic Pasteur pipettes, 1.5 ml, 500 pieces/pack	100	0.003	4,734.81	14.20
	Cryo-vial, sterile with cap, 2 ml	100	0	17,131.42	-
	Deep freeze storage box with lid for 2 ml cryovials , autoclavable PP	100	0.001	946.96	0.95
	Gloves, vinyl or nitrile, powder free, disposable, size S, 100/pack	100	0.005	1,377.40	6.89
	Gloves, vinyl or nitrile, powder free, disposable, size M, 100/pack	100	0.008	1,377.40	11.02
	Gloves, vinyl or nitrile, powder free, disposable, size L, 100/pack	100	0.003	1,377.40	4.13
	Autoclavable bags at 134°C, 410 x 620 mm, 100 pieces per pack	100	0.001	4,734.81	4.73
	Filter paper round, diameter 150, packs of 100	100	0.001	860.88	0.86
	Tube brush 280 mm long	100	0.002	258.26	0.52
	Brush for glassware 120 mm long	100	0.001	602.61	0.60
	Laboratory coat, size L	100	0.001	4,132.20	4.13
	Laboratory coat, size M	100	0.002	4,132.20	8.26
	Laboratory coat, size S	100	0.001	4,132.20	4.13
	FFP2 or FFP3 respirators, individually packed, packs of 10	100	0.003	2,582.63	7.75
	Disinfectant for floors, container 10 litres	100	0.001	6,198.30	6.20
	Disinfectant, ethanol-based, container 5 litres	100	0.001	5,509.60	5.51
	Spray hand for bottle with disinfectant of 1 litre	100	0.001	602.61	0.60
	Liquid soap for hands, 1 litre	100	0.001	0.86	0.00
	Disinfectant for hands, alcohol-based, 1 litre bottle	100	0.001	946.96	0.95

	Cotton wool, 1 kg	100	0.001	258.26	0.26
	Tissue pulp, absorbent sheets, approx. 550 x 350 mm	100	0.003	602.61	1.81
	Total cost				911.32

	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Culture: Monitoring Treatment for MDR or XDR-TB	Tube for liquid cultures, growth detection based on fluorescence signal, per test - 1 tubes per test + 10% repeat + 10% contamination	100	1.2	451.96	542.35
	Growth supplement for liquid cultures, growth detection based on fluorescence signal, per test. BACTEC MGIT 960 Supplement Kit (100 tests, PANTA and OADC combined) + 10% repeat + 10% contamination	100	1.2	129.13	154.96
	Petri-dishes, disposables, sterile; 20 per bag, 15 bags per package	100	0.001	9,383.54	9.38
	Immunochromatographic tests for the rapid identification of Mycobacterium tuberculosis, per test	100	0.092	172.18	15.84
	Droppers, disposable, 1.5 ml, 20 per bag and 25 bags per package	100	0.003	7,059.18	21.18
	Culture tubes, diameter 16 mm, pack of 100	100	0.002	3,529.59	7.06
	PP-tubes for centrifuge, 50 ml; 500 pieces/pack	100	0.005	14,118.35	70.59
	Loop, disposable 10 m, 500 pieces/pack	100	0.003	2,152.19	6.46
	Plastic Pasteur pipettes, 1.5 ml, 500 pieces/pack	100	0.003	4,734.81	14.20
	Deep freeze storage box with lid for 2 ml cryovials , autoclavable PP	100	0.001	946.96	0.95
	Gloves, vinyl or nitrile, powder free, disposable, size S, 100/pack	100	0.005	1,377.40	6.89
	Gloves, vinyl or nitrile, powder free, disposable, size M, 100/pack	100	0.008	1,377.40	11.02

	Gloves, vinyl or nitrile, powder free, disposable, size L, 100/pack	100	0.003	1,377.40	4.13
	Autoclavable bags at 134°C, 410 x 620 mm, 100 pieces per pack	100	0.001	4,734.81	4.73
	Filter paper round, diameter 150, packs of 100	100	0.001	860.88	0.86
	Tube brush 280 mm long	100	0.002	258.26	0.52
	Brush for glassware 120 mm long	100	0.001	602.61	0.60
	Laboratory coat, size L	100	0.001	4,132.20	4.13
	Laboratory coat, size M	100	0.002	4,132.20	8.26
	Laboratory coat, size S	100	0.001	4,132.20	4.13
	FFP2 or FFP3 respirators, individually packed, packs of 10	100	0.003	2,582.63	7.75
	Disinfectant for floors, container 10 litres	100	0.001	6,198.30	6.20
	Disinfectant, ethanol-based, container 5 litres	100	0.001	5,509.60	5.51
	Spray hand for bottle with disinfectant of 1 litre	100	0.001	602.61	0.60
	Liquid soap for hands, 1 litre	100	0.001	0.86	0.00
	Disinfectant for hands, alcohol-based, 1 litre bottle	100	0.001	946.96	0.95
	Cotton wool, 1 kg	100	0.001	258.26	0.26
	Tissue pulp, absorbent sheets, approx. 550 x 350 mm	100	0.003	602.61	1.81
	Total cost				911.32
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Drugs Susceptibility testing for first-line drugs; new TB cases	BACTEC™ MGIT™ 960 SIRE kit, One kit is sufficient for 40 test + 10% repeat	100	1.1	156.68	172.35
	Tube and growth supplement for liquid cultures, growth detection based on fluorescence signal, per test - 5 tubes per test + 10% repeat	100	5.5	167.87	923.29
	Syringes, single use, 20 ml, 100 pieces per pack	100	0.001	7,661.79	7.66
	Syringe filters, 100 pieces per pack	100	0.001	35,295.88	35.30
	Silica gel for desiccator, 0.5 kg	100	0.001	3,529.59	3.53

	DNAse-/RNAse-free TIPS, for pipettes 0.1 - 10 µl, 10 boxes at 960 per pack	100	0.003	10,760.94	32.28
	Sterile, DNA-/RNAse-free TIPS 100 - 1000 µl	100	0.003	10,760.94	32.28
	Dispenser-tips Universal 10ml sterile	100	0.004	10,760.94	43.04
	Total cost				1,249.73
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Drugs Susceptibility testing for first-line drugs; previously treated TB cases	BACTEC™ MGIT™ 960 SIRE kit, One kit is sufficient for 40 test + 10% repeat	100	1.1	156.68	172.35
	Tube and growth supplement for liquid cultures, growth detection based on fluorescence signal, per test - 5 tubes per test + 10% repeat	100	5.5	167.87	923.29
	Syringes, single use, 20 ml, 100 pieces per pack	100	0.001	7,661.79	7.66
	Syringe filters, 100 pieces per pack	100	0.001	35,295.88	35.30
	Silica gel for desiccator, 0.5 kg	100	0.001	3,529.59	3.53
	DNAse-/RNAse-free TIPS, for pipettes 0.1 - 10 µl, 10 boxes at 960 per pack	100	0.003	10,760.94	32.28
	Sterile, DNA-/RNAse-free TIPS 100 - 1000 µl	100	0.003	10,760.94	32.28
	Dispenser-tips Universal 10ml sterile	100	0.004	10,760.94	43.04
	Total cost				1,249.73
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Xpert Molecular Testing: Presumptive TB cases	Xpert Cartridge, one cartridge	100	1	859.15	859.15
	Total cost				859.15
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Xpert Molecular Testing: Resistance testing for new	Xpert Cartridge, one cartridge	100	1	859.15	859.15
	Total cost				859.15

cases					
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Xpert Molecular Testing: Retreatment cases	Xpert Cartridge, one cartridge	100	1	859.15	859.15
	Total cost				859.15
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Xpert Molecular Testing: Retreatment cases	Xpert Cartridge, one cartridge	100	1	859.15	859.15
	Total cost				859.15
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Xpert Molecular Testing: children	Xpert Cartridge, one cartridge	100	1	859.15	859.15
	Total cost				859.15
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Xpert Molecular Testing: Extra pulmonary	Xpert Cartridge, one cartridge	100	1	859.15	859.15
	Total cost				859.15
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
LPA (Molecular Testing)	Standard reaction tubes with O-ring, 1.5 ml, 1000 per pack	100	0.01	15,290.86	152.91
	Cryo-vial, sterile with cap, 2 ml, with outer winding; pack of 1000	100	0.003	21,171.50	63.51
	Cryo-tags sized to fit for use on cryo-tubes, rolls of 1000	100	0.003	4,939.70	14.82
	PCR tubes, 0.2 ml with attached caps, sterile, DNAse- RNAse-free, 1000 per pack	100	0.002	9,998.20	20.00
	DNAse-/RNAse-free TIPS, for pipettes 0.1 - 10 µl, 10	100	0.004	10,760.94	43.04

	boxes at 960 per pack				
	DNAse-/RNAse-free TIPS, for pipettes 20 - 200 µl, 10 boxes at 960per pack	100	0.006	10,760.94	64.57
	Sterile, DNA-/RNAse-free TIPS 100 - 1000 µl	100	0.012	10,760.94	129.13
	Pasteur-pipettes, plastic, sterile, 1.5ml, 500 per pack	100	0.03	4,704.68	141.14
	Combitips for Multipette 10 ml, 100 pieces/pack	100	0.003	9,409.37	28.23
	Plastic bags, disposable PP, 100 pieces per pack	100	0.005	1,175.96	5.88
	Gloves, vinyl, powder free, disposable, size M, 100 per pack	100	0.09	1,411.84	127.07
	Gloves, vinyl, powder free, disposable, size S, 100 per pack	100	0.06	1,411.84	84.71
	Gloves, vinyl, powder free, disposable, size L, 100 per pack	100	0.03	1,411.84	42.36
	Forceps plastic	100	0.003	1,293.90	3.88
	Bottles, plastic	100	0.003	2,587.79	7.76
	Marker pen, water resistant	100	0.003	587.98	1.76
	Gloves, nitril, powder free, disposable, size 6-7, 100 per pack	100	0.01	1,646.85	16.47
	Gloves, nitril, powder free, disposable, size 7-8, 100 per pack	100	0.005	1,763.93	8.82
	Gloves, nitril, powder free, disposable, size 8-9, 100 per pack	100	0.002	1,881.87	3.76
	Strips for the rapid detection of resistance to isoniazid and rifampicin, per strip	100	1	5,410.60	5,410.60
	Total cost				6,370.42
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Second-Line TB Drugs	6 Km Lfx Eto Cs Z/ 15 Lfx Eto Cs	100	1	160,659.97	160,659.97
	Total cost				160,659.97
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
XDR	12 Cm-Mfx-PASER- Cs-Amox/Clv – Z / 12 Mfx-PASER- CS- Amox/Clv	100	1	654,437.30	654,437.30

	Total cost				654,437.30
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Isoniazid Preventive therapy for adults and children with HIV and on ART without TB	Isoniazid, 300 mg tab	100	270	1.73	467.20
	Total cost				467.20
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Isoniazid Preventive therapy for adults and children with HIV and not ART without TB	Isoniazid, 300 mg tab	100	270	1.73	467.20
	Total cost				467.20

Table A2.5: Prevention of mother to child transmission (PMTCT) drugs and supplies

Testing and Counselling Protocol				Total (KES)
	Units	KES		
Laboratory Tests - Abbott determine	each	95.00	100%	95.00
Laboratory Tests - Unigold	each	285.60	10.0%	28.56
Pregnant women attending ANC tested for HIV				
Laboratory Tests - FBC	each	299.55	100%	299.55
Laboratory Tests - Creatinine	each	299.55	100%	299.55
Laboratory Tests - CD4	each	470.41	100%	470.41
Laboratory Tests - PCR test	each	2,361.11	100%	2,361.11
Laboratory Tests - ALT	each	299.55	100%	299.55
HIV Positive women treated with ARV				
Drugs - NVP- Newborn	dose	28.86	0.60	17.32
Drugs - AZT PMTCT Prophylaxis	dose	3,403.40	0.20	680.68
Drugs - AZT/3TC PMTCT Prophylaxis	dose	10.60	0.20	2.12
Drugs - NVP PMTCT Prophylaxis	dose	3.34	0.20	0.67
Drugs - Cotrimoxazole	dose	310.87	1.00	310.87
Drugs - NVP- Newborn	dose	28.86	1.00	28.86
Drugs - AZT/3TC PMTCT HAART	dose	7,735.57	0.80	6,188.45
Drugs - EFV PMTCT HAART	dose	1,789.11	1.00	1,789.11
Unit cost (KES)				**12,871.82**

Table A2.6: Antiretroviral therapy (ART) drugs and supplies

	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
First line ART (adults)	AZT + 3TC + EFV				
	Efavirenz (EFV), tablet, 600 mg	11.5	365	14.38	603.46
	Lamivudine (3TC), tablet, 150 mg	11.5	730	3.79	317.99
	Zidovudine (AZT), capsule, 300 mg	11.5	730	10.59	888.93
	d4T + 3TC + EFV				
	Efavirenz (EFV), tablet, 600 mg	14.1	365	14.38	739.89
	Lamivudine (3TC), tablet, 150 mg	14.1	730	3.79	389.88
	Stavudine (d4T), capsule, 40 mg	14.1	730	2.84	292.41
	TDF + 3TC + EFV				
	Tenofovir (TDF), tablet, 300 mg	10.7	365	18.68	729.59
	Efavirenz (EFV), tablet, 600 mg	10.7	365	14.38	561.48
	Lamivudine (3TC), tablet, 150 mg	10.7	730	3.79	295.87
	AZT + 3TC + NVP				
	Lamivudine (3TC), tablet, 150 mg	27	730	3.79	746.59
	Nevirapine (NVP), tablet, 200 mg	27	730	0.59	116.74
	Zidovudine (AZT), capsule, 300 mg	27	730	10.59	2,087.05
	d4T + 3TC + NVP				
	Lamivudine (3TC), tablet, 150 mg	27.9	730	3.79	771.47
	Nevirapine (NVP), tablet, 200 mg	27.9	730	0.59	120.63
	Stavudine (d4T), capsule, 40 mg	27.9	730	2.84	578.60
	TDF + 3TC + NVP				
	Tenofovir (TDF), tablet, 300 mg	2.7	365	18.68	184.10
	Lamivudine (3TC), tablet, 150 mg	2.7	730	3.79	74.66
	Nevirapine (NVP), tablet, 200 mg	2.7	730	0.59	11.67
	TDF + FTC + EFV				
	Tenofovir (TDF)/Emtricitabine	3.5	365		

	(FTC), tablet, 300/200 mg			30.13	384.92
	Efavirenz (EFV), tablet, 600 mg	3.5	365	14.38	183.66
	TDF + FTC + NVP				
	Tenofovir (TDF)/Emtricitabine (FTC), tablet, 300/200 mg	2.5	365	30.13	274.94
	Nevirapine (NVP), tablet, 200 mg	2.5	730	0.59	10.81
	Total cost				10,365.34
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Second line ART (adults)	TDF + 3TC + LPV/r				
	Tenofovir (TDF), tablet, 300 mg	29.7	365	18.68	2,025.11
	Lamivudine (3TC), tablet, 150 mg	29.7	730	3.79	821.24
	Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	29.7	1,460.00	23.85	10,340.21
	AZT + ddl + LPV/r				
	Zidovudine (AZT), capsule, 300 mg	27.4	730	10.59	2,117.96
	Didanosine(ddI), capsule, 400 or 250 mg	27.4	365	60.30	6,031.03
	Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	27.4	1,460.00	23.85	9,539.45
	AZT + 3TC + LPV/r				
	Zidovudine (AZT), capsule, 300 mg	13.9	730	10.59	1,074.44
	Lamivudine (3TC), tablet, 150 mg	13.9	730	3.79	384.35
	Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	13.9	1,460.00	23.85	4,839.36
	TDF + FTC + LPV/r				
	Tenofovir (TDF)/Emtricitabine (FTC), tablet, 300/200 mg	11.7	365	30.13	1,286.73
	Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	11.7	1,460.00	23.85	4,073.42
	AZT + 3TC + TDF + LPV/r				
	Zidovudine (AZT), capsule, 300 mg	6	730	10.59	463.79
	Lamivudine (3TC), tablet, 150 mg	6	730	3.79	165.91
	Tenofovir (TDF), tablet, 300 mg	6	365	18.68	409.11
	Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	6	1,460.00	23.85	2,088.93
	ABC + ddl + LPV/r				
	Abacavir (ABC), tablet, 300 mg	5.3	730	50.79	1,965.13
	Didanosine(ddI), capsule, 400 or	5.3	365		

	250 mg			60.30	1,166.59
	Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	5.3	1,460.00	23.85	1,845.22
	ABC + TDF + LPV/r				
	Abacavir (ABC), tablet, 300 mg	2.7	730	50.79	1,001.10
	Tenofovir (TDF), tablet, 300 mg	2.7	365	18.68	184.10
	Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	2.7	1,460.00	23.85	940.02
	d4T + 3TC + LPV/r				
	Stavudine (d4T), capsule, 40 mg	2.1	730	2.84	43.55
	Lamivudine (3TC), tablet, 150 mg	2.1	730	3.79	58.07
	Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	2.1	1,460.00	23.85	731.13
	ABC + 3TC + LPV/r				
	Abacavir (ABC), tablet, 300 mg	1.2	730	50.79	444.93
	Lamivudine (3TC), tablet, 150 mg	1.2	730	3.79	33.18
	Lopinavir/ritonavir (LPV/r), tablet, 200/50 mg	1.2	1,460.00	23.85	417.79
	Total cost				54,491.86
	Drug/Supply	Percent receiving this aspect of the treatment	Units per person	Unit cost (KES)	Cost per average case (KES)
Paediatric ART	**0-11 months**				
	AZT (60 mg) + 3TC (30 mg) + NVP (50 mg)	5	730	6.11	223.10
	AZT 10 mg/ml + 3TC 10 mg/ml + LPV/r (80 + 20 mg/ml)	10	730	27.55	2,011.00
	12-23 months				
	AZT (60 mg) + 3TC (30 mg) + NVP (50 mg)	10	1,460.00	6.11	892.38
	24-59 months				
	AZT (60 mg) + 3TC (30 mg) + NVP (50 mg)	25	1,825.00	6.11	2,788.70
	60 months-7 years, 11 months				
	AZT (60 mg) + 3TC (30 mg) + NVP (50 mg)	17	2,190.00	6.11	2,275.58
	8 years-14 years, 11 months				
	AZT + 3TC + NVP	33	730	86.09	20,738.48
	Total cost				28,929.24

Table A2.7: Drugs and medical supplies for non-communicable diseases

	Coat per case (KES)
Screening for risk of CVD/diabetes	208
Follow-up care for those at low risk of CVD/diabetes (absolute risk: 10-20%)	208
Treatment for those with very high cholesterol but low absolute risk of CVD/diabetes (< 20%)	1,465
Treatment for those with high blood pressure but low absolute risk of CVD/diabetes (< 20%)	1,140
Treatment for those with absolute risk of CVD/diabetes 20-30%	2,852
Treatment for those with high absolute risk of CVD/diabetes (>30%)	2,873
Treatment of new cases of acute myocardial infarction (AMI) with aspirin	4,667
Treatment of cases with established ischaemic heart disease (IHD) and post MI	3,719
Treatment for those with established cerebrovascular disease and post stroke	3,719
Treatment of cases with rheumatic heart disease (with benzathine penicillin)	746
Standard glycemic control	15,943
Intensive glycemic control	20,899
Retinopathy screening and photocoagulation	89
Neuropathy screening and preventive foot care	1,511
Mammography	226
Breast cancer treatment: Stage 1	10,099
Breast cancer treatment: Stage 2	33,287
Breast cancer treatment: Stage 3	38,898
Breast cancer treatment: Stage 4	28,310
Asthma: Inhaled short acting beta agonist for intermittent asthma	1,555
Asthma: Low dose inhaled beclometasone + SABA	4,214
Asthma: High dose inhaled beclometasone + SABA	6,872
Asthma: Theophylline + High dose inhaled beclometasone + SABA	8,694
Asthma: Oral Prednisolone + Theophylline + High dose inhaled beclometasone + SABA	10,731

Appendix 3: Norms and Standards for Road Construction

Table A3.1: General-preliminary and supervisory/support services

Activities	**Unit**	**Quantity**	**Cost (KES)**	**Total cost (KES)**
Engineer's main office	No	1	6,376,408.34	6,376,408
Construction of engineer's laboratory	No	1	4,923,316.37	4,923,316
Laboratory furniture, equipment and associated equipment services:				
Writing desk	No	1	20,741.46	20,741
Furniture and equipment for the engineer's laboratory				
Laboratory furniture				
Writing desk, 2.2m x 0.9m with lockable drawers	No.	1	20,741.46	20,741.46
Swivel chair, adjustable height with arms	No.	1	9,824.90	9,824.90
4 -Drawer lockable steel filing cabinets	No.	2	14,846.52	29,693.03
3m2 wooden book shelves	No.	2	15,283.18	30,566.36
Drawing tables 1.8m x 0.9m with drawers	No.	2	14,191.52	28,383.04
Chairs for drawing tables	No.	2	6,113.27	12,226.54
Typist Table complete with a chair	No.	1	12,444.87	12,444.87
Lockable cupboards	No.	2	7,641.59	15,283.18
Table Lamps	No.	2	3,274.97	6,549.93
Soft Board for wall notices 2.0 x 1.0m	No.	3	9,824.90	29,474.70
Bench for People waiting	No.	1	38,207.94	38,207.94
Refrigerator 75 litre capacity	No.	1	60,041.06	60,041.06
Fire Extinguisher CO2 type 10 litres capacity	No.	2	19,213.14	38,426.28
First Aid Kit for general purposes	No.	1	10,916.56	10,916.56
First Aid Kit for snake bites	No.	1	21,833.11	21,833.11
Set of Laboratory cleaning and washing up	No.	1	10,916.56	10,916.56
Set of curtains for all windows	No.	3	6,549.93	19,649.80
Total				**395,179.32**

Table A3.2: Compaction test (AASHTO T99 & T180)

	Unit	Quantity	Cost (KES)	Total cost (KES)
Compaction moulds complete with base plate and extension collar 101.1.6 internal diameter x 11.6.43mm high	No.	15	1,746.65	26,199.73
2.49Kg compaction hammer, drop regulated to	No.	2	5,239.95	10,479.89
4.536Kg compaction hammer, drop regulated to 457.2mm	No.	2	8,733.24	17,466.49
Electric vibrating Kango hammer fitted with steel tamper (BS 1377) with support frame	No.	1	294,747.00	294,747.00
Staright Edge 300mm long with handles	No.	5	3,929.96	19,649.80
Steel Tamping rod (BS 1377)	No.	4	2,183.31	8,733.24
Compaction moulds 152.4mm dia x 116.43 high complete with base plate and extension collar	No.	2	4,366.62	8,733.24
Galvaniszed metal tray 1m x 0.5m x 75mm	No.	4	2,619.97	10,479.89
75mm brush	No.	2	65.50	131.00
Semi - automatic balance 25kg capacity accurate to 10g including weights	No.	1	8,733.24	8,733.24
20mm BS Sieve, 300mm diameter	No.	1	873.32	873.32
Stop Clock	No.	4	1,309.99	5,239.95
Electric Oven thermostatically controlled between 10 and 150 deg. Celsius 0.2225 cu.m min capacity	No.	2	30,566.36	61,132.71
As item 13/105 but gas	No.	1	50,216.16	50,216.16
Liquid limit divide to BS 1377	No.	2	26,199.73	52,399.47
Cone penetrometer with gauge and automatically controlled test cup	No.	1	152,831.78	152,831.78
Total				**728,046.91**

Table A3.3: Density (sand replacement method BS 1377)

	Unit	Quantity	Cost (KES)	Total cost (KES)
Metal Containers (450mm diameter)	No.	2	2,183.31	4,366.62
Stainless steel tray 305mm diameter	No.	2	873.32	1,746.65
Metal tray 300 x 300mm square 40mm deep with 150mm diameter hole in the centre	No.	2	873.32	1,746.65
Metal tray 500 x 500mm square 50mm deep with 200mm diameter hole in the centre	No.	2	1,309.99	2,619.97
Steel pegs for fixing tray in position	No.	50	65.50	3,274.97
Sand pouring cylinder 150mm diameter	No.	2	2,619.97	5,239.95
Sand pouring cylinder 215mm diameter	No.	2	3,929.96	7,859.92
Cold steel chisel 20mm x 300mm long	No.	3	436.66	1,309.99
Cold steel chisel 10mm x 150mm long	No.	3	327.50	982.49
1.5kg, 3.5kg hammer and 1kg rubber mallet	Set	1	262.00	262.00
Scoop for removing excavated material from hole 250m long handle	No.	4	109.17	436.66
100mm brush soft	No.	3	65.50	196.50
50mm brush soft	No.	3	43.67	131.00
Primus gas stove	No.	1	6,549.93	6,549.93
Calibrating can 150mm diameter x 150mm deep	No.	2	5,676.61	11,353.22
As item 13/105 but 200mm diameter 250mm deep	No.	2	9,824.90	19,649.80
Total				**67,726.32**

Table A3.4: Density (nuclear method AASHTO T238J)

	Unit	Quantity	Cost (KES)	Total cost (KES)
Nuclear denosometer (Troxler 3411B or similar approved) complete with hole forming device and guide)	No.	1	974,741.00	**974,741.00**
4.0 CBR (AASHTO T193)	**Unit**	**Quantity**	**Cost**	**Total cost**
CBR Mould 152.4 dia x 178mm high complete with perforated base plate and extension collar 50.8mm high	No.	25	6,549.93	163,748.33

that can be fitted to either end of the mould				
Perforated swell plate 150mm diameter with an adjustable centre post of rustproof metal provided with a lock - nut	No.	25	3,274.97	81,874.17
2.25kg split surcharge weight	No.	25	218.33	5,458.28
Set of annual surcharge weights	No.	25	436.66	10,916.56
Solid Base plate for CBR Mould	No.	25	436.66	10,916.56
Static Compaction displacer discs 1 No. 61.4mm, 1 No. 50.8mm and 2 No. 38.8 Thick	Set	4	1,091.66	4,366.62
Disk lifting handle	No.	10	654.99	6,549.93
Linear shrinkage mould	No.	10	1,091.66	10,916.56
Static Compaction press 50 tonnes capacity with an adjsutable daylight between platens of 530 to 250mm (hydraulic or mechanical operation and hand operated)	No.	1	196,498.00	196,498.00
Set of guards for above press	No.	1	26,199.73	26,199.73
CBR load frame (electric and hand operated) including proving rings for 10KN and 28KN stabilizing bar, piston and bracket	No.	1	152,831.78	152,831.78
Penetration gauge	No.	4	21,833.11	87,332.44
Swell measurement tripod complete with gauge calibrated in 0.01 divisions	No.	4	6,549.93	26,199.73
Soaking tank for CBR moulds sufficient for at least 50 moulds	No.	1	10,916.56	10,916.56
Total				**794,725.25**

Table A3.5: Relative density of aggregates

	Unit	**Quanti ty**	**Cost (KES)**	**Total cost (KES)**
Wire mesh basket with apertures not greater than 6.5mm large enough to contain 2.5kg of aggregate	Set	2	5,676.61	11,353.22
A stout waterlight container in which the basket can be freely suspended	No.	2	2,183.31	4,366.62
Soft absorbent cloth (Tea towel)	No.	10	218.33	2,183.31
Shallow tray of area not less than 0.065m2	No.	2	1,309.99	2,619.97

An air tight container of similar capacity	No.	2	2,183.31	4,366.62
Pycnometer of I litre capacity	No.	4	2,183.31	8,733.24
Semi automatic 5kg balance accurate to 0.1g to be of size and type to permit the basket containing the sample to be suspended in water (to be supplied with weights)	No.	1	43,666.22	43,666.22
Hot Air Dier (Electrical)	No.	1	10,916.56	10,916.56
Total				**88,205.76**
Flankiness Gauge	No.	1	1,091.66	1,091.66
ACV apparatuers of 150mm internal diameter with plunger and base plate	No.	1	39,299.60	39,299.60
Metal Tamping rod 16mm diameter and 450mm to 600mm length with one end round	Set	2	436.66	873.32
Cylindrical measure to BS 812	No.	2	3,493.30	6,986.60
Total				**48,251.18**
LAA TEST				
LAA Machine as el - 42-530/01 or similar	No.	1	327,496.66	327,496.66
Spare set of Abrasive charges	No.	1	9,824.90	9,824.90
Total				**337,321.56**
8.0 concrete: cube and compression testing	**Unit**	**Quanti ty**	**Cost (KES)**	**Total cost (KES)**
Concrete compression machine	No.	1	523,994.66	**523,994.66**
Concrete: slump and cube manufacture (BS 1881)	**Unit**	**Quanti ty**	**Cost (KES)**	**Total cost (KES)**
Slump cone, tamping rod and base	No.	2	5,676.61	11,353.22
Concrete cube mould 150mm cube	No.	25	1,746.65	43,666.22
Total				**55,019.44**
Concrete: cube and compression testing	**Unit**	**Quanti ty**	**Cost (KES)**	**Total cost (KES)**
Concrete compression machine	No.	1	523994.66	523994.66
Soaking tank for cubes (capacity 50 No.)	No.	1	32,749.67	32,749.67
Cube Tamping Rods	No.	8	7,641.59	61,132.71

Total				**617,877.04**
Aggreges and chippings	**Unit**	**Quanti ty**	**Cost (KES)**	**Total cost (KES)**
Metal Tamping rod 16mm diameter and 450mm to 600mm length with one end round	Set	1	436.66	436.66
Beaker 250ml	No.	2	218.33	436.66
Thermometer 0 to +50 degree C	No.	2	218.33	436.66
Thermometer 0 to +250 degree C	No.	2	218.33	436.66
Reagent grade silica gel 500g container	No.	30	2,619.97	78,599.20
Sub-total				**80,345.84**
bitumen spray test (BS 1707)	**Unit**	**Quanti ty**	**Cost**	**Total cost**
Slump cone, tamping rod and base	Set	1	6,549.93	6,549.93
Steel ray 20mm deep x 01m2 (for measuring bitumen spray quantity) including purpose made detachable handle 1.5m long to enable trays to be picked up.	No.	6	13,099.87	78,599.20
Sub-total				**85,149.13**
Consumables and sundries	**Unit**	**Quanti ty**	**Cost (KES)**	**Total cost (KES)**
Paraffin wax	Kg.	50	21,833.11	1,091,655.55
Gas	Kg.	1200	545.83	654,993.33
Gunny sack	No.	500	436.66	218,331.11
Plastic Bags 900x450mmx1000 gauge	No.	300	436.66	130,998.67
Plastic Bags 450x300mmx1000 gauge	No.	300	327.50	98,249.00
Filter paper 150mm diameter watman No.5 (Boxes of 100)	No.	20	14,191.52	283,830.44
Filter paper 450mm diameter watman No.5 (Boxes of 100)	No.	20	24,016.42	480,328.44
Filter paper 100mm diameter watman No.5 (Boxes of 100)	No.	20	10,916.56	218,331.11
Trichloroethylene 205 litre drum	No.	2	109,165.55	218,331.11
Cotton Waste (or drying cloths)	Kg.	50	2,183.31	109,165.55

Filter paper 270mm diameter 33mm diameter hole in the centre watman No.5 (Boxes of 100)	No.	20	18,283.18	305,663.55
Filter paper 400mm diameter watman No.5 (Boxes of 100)	No.	30	17029.83	510894.8
Gas cylinder compatible with stove supplied under tem 14 105	No.	10	13099.87	130998.67
Plastic bag 900x450mmx1000 gauge	No.	300	43.67	13099.87
Sub-total				**4,464,871.20**
Marshall testastm D1559	**Unit**	**Quanti ty**	**Cost (KES)**	**Total cost (KES)**
Specimen mould assembly	No.	3	10,916.56	32,749.67
Specimen extractor	No.	1	43,666.22	43,666.22
Marshall Compactor complete	No.	1	87,332.44	87,332.44
Marshall testing machine complete inducting flow	No.	1	174,664.89	174,664.89
Electric mixer with isomantle	No.	1	130,998.67	130,998.67
Water Bath	No.	1	87,332.44	87,332.44
200mmx200mmx50mm deep steel baking trays	No.	6	1,091.66	6,549.93
Pols suitable for heating bitumen	No.	6	436.66	2,619.97
Spatulas	No.	3	873.32	2,619.97
Dial thermometer 10 to 210 degree C	No.	3	5,676.61	17,029.83
Gloves for handling hot material	Pair	10	545.83	5,458.28
Rubber gloves to remove specimens from water bath	Pair	1	567.66	567.66
Flat bottom scoop	No.	2	873.32	1,746.65

Landle for placing mixture in moulds	No.	2	6,549.93	13,099.87
Gyratory compactor (laboratory mix design) ELE SERVO PAC or equivalent with 100mm and 150mm diameter moulds	No.	1	3,493,297.75	3,493,297.75
Vibratory hammer complete with shanks, tampers 6 moulds and 7 base plate	No.	1	76,415.89	76,415.89
Sub-total				**4,176,150.13**

Maximum s.g. of bituminious paving mixtures (ASHTM D2041)	**Unit**	**Quantity**	**Cost (KES)**	**Total cost (KES)**
Balance of sufficient capacity and sensitivity to enable maximum specific gravity of samples of un-compacted paving mixture to be calculated to at least four significant figures, it shall be equipped with a suitable suspension apparatus to permit weighing of the samples while suspended centre of the pan	No.	1	39,299.60	39,299.60
Vacuum pump	No.	1	52,399.47	52,399.47
Glass or Metal container at least 1000ml	No.	1	65,499.33	65,499.33
Quantitative extraction of bitumen from bituminious mixtures ASHTM D2172 AND ASHTM D95	**Unit**	**Quantity**	**Cost**	**Total cost**
Water Bath for use with bowl suitable for immersing the bowl and apparatus for suspending the bowl from the centre of the scale pan	No.	1	8,733.24	8,733.24
Over capable of maintaining temp at 100 to 104 degrees C	No.	1	87,332.44	87,332.44
Flat pan 300mm x 200mm x 25mm deep	No.	1	2,183.31	2,183.31
Balance capacity 5000g accurate to 0.2g	No.	1	32,749.67	32,749.67
Balance capacity 15000g accurate to 0.2g	No.	1	26,199.73	26,199.73
Small mouth graduate 1000ml capacity	No.	2	4,366.62	8,733.24
Ignition dish 125mm capacity	No.	2	3,929.96	7,859.92
Dessucatir	No.	1	9,824.90	9,824.90
Analytical balance	No.	2	109,165.55	218,331.11
Centrifuge to ASHTM E2172	No.	2	261,997.33	523,994.66

Filter rings for centrifuge	No.	2	3,929.96	7,859.92
Reflux condenser to ASHTM e95	No.	2	50,216.16	100,432.31
Petroleum naphthalene	No.	2	654.99	1,309.99
Trichloroethylene reagent grade	No.	2	2,619.97	5,239.95
Extractor Fan	No.	2	873.32	1,746.65
Sub-total				**1,042,531.04**
Recovery of bitumen from solution	**Unit**	**Quantity**	**Cost (KES)**	**Total cost (KES)**
Centrifuge to AASHTO T170	No.	2	109,165.55	218,331.11
Centrifuge tubes	No.	2	43,666.22	87,332.44
Distillation assembly to AASHTO T170	No.	1	10,916.56	10,916.56
Water jacketed condenser	No.	1	4,803.28	4,803.28
ASTM low distillation thermometer with range 2 to 300 degrees C	No.	2	26,199.73	52,399.47
Gas flow meter	No.	1	14,846.52	14,846.52
Corks drilled as AASHTO T170	No.	10	24,016.42	240,164.22
Separator funnel 125mk capacity	No.	1	24,016.42	24,016.42
Supply of CO2	Kg.	60	2,619.97	157,198.40
Flexing tube	m	30	2,510.81	75,324.23
Sodium Hexamataphosphate	Kg.	5	1,964.98	9,824.90
Sand for density test	Kg.	500	873.32	436,662.22
Calcium carbide	Kg.	10	9,169.91	91,699.07
Sodium Sulphate (anhydrous salt)	Kg.	10	9,169.91	91,699.07
Sodium hydroxide (reagent grade)	Kg.	2	8,733.24	17,466.49
Potassium dichromate (reagent grade)	Kg.	2	8,733.24	17,466.49
Sulphuric acid (concentrated)	Lt.	2	8,733.24	17,466.49
Sub-total				**1,567,617.38**

Table A3.6: Sieve analysis

	Unit	Quantity	Cost (KES)	Total cost (KES)
BS Sieve 300mm diameter in sizes 75,63,50,37.5,28,20,14,10,6.3,5 and 4mm plus lid and receiver	Set	1	87,332.44	87,332.44
BS Sieve 300mm diameter in sizes 2,1,0.6,0.5,0.425,0.30,0.15 and 0.075 plus lid and receiver	Set	1	87,332.44	87,332.44
Electric Sieve shaker	No.	1	87,332.44	87,332.44
BS Sieve 200mm diameter 0.425 and 0.075mm	No.	1	13,099.87	13,099.87
1m x 1m x 75mm deep galvanized metal tray	No.	5	9,169.91	45,849.53
Riffle box with 50mm slots (BS 1377)	Set	1	43,666.22	43,666.22
Sub-total				**364,612.94**
	Unit	**Quantity**	**Cost (KES)**	**Total cost (KES)**
Sodium hydroxide (reagent grade)	Kg.	2	8,733.24	**17,466.49**
Miscellaneous equipment				
Wheel barrow	No.	3	6,549.93	19,649.80
Dustpan brush	No.	3	873.32	2,619.97
Shovel	No.	3	2,619.97	7,859.92
Pick axe with handle	No.	3	2,838.30	8,514.91
Metal scoop large (150m wide)	No.	3	2,838.30	8,514.91
Metal scoop medium (100m wide)	Set	2	2,619.97	5,239.95
Garden trowel	No.	2	2,183.31	4,366.62
Steel tray 0.3 x 0.3 x 0.01 deep	Set	8	2,619.97	20,959.79
Palette knife 200mm long fade	No.	3	2,183.31	6,549.92
Palette knife 100mm long fade	Set	3	1,746.65	5,239.95
BS Sieve 450 diameter 37.5mm	No.	1	5,239.95	5,239.95
BS Sieve 450 diameter 20mm	Set	2	10,916.56	21,833.11
BS Sieve 450 diameter 5mm	Set	2	13,099.87	26,199.73
BS Sieve 450 diameter 0.6mm	No.	6	15,283.18	91,699.07
BS Sieve 450 diameter 0.425mm	No.	14	15,283.18	213,964.49

BS Sieve 450 diameter 0.3mm	No.	1	17,466.49	17,466.49
BS Sieve 450 diameter 0.075mm	No.	1	19,649.80	19,649.80
Lid and Receiver for item 137 to item 143	No.	1	17,466.49	17,466.49
BS Sieve brush	No.	2	982.49	1,964.98
Measuring cylinder set 25ml, 100ml, 500ml, 1000ml and 200ml	No.	2	2,838.30	5,676.61
Glass jar capacity 5 litres	No.	2	2,838.30	5,676.61
200mmx200mmx20mm cadmium plated or aluminium tin	No.	2	12,008.21	24,016.42
Electronic balance capacity 1000g accurate to 0.01g (manual) including weights	No.	2	174,664.89	349,329.77
Balance 2000g capacity accurate to 0.1g including weights	No.	1	141915.22	141915.22
Balance 50kg capacity accurate to 10g including weights	No.	3	109165.55	327496.66
BS Sieve 450mm diameter 0.075mm	No.	1	19649.8	19649.8
Lid and Receiver for item 137 to item 143	No.	1	17466.49	17466.49
Still for producing distilled water	No.	2	98,249.00	196,498.00
Polythene or glass 20 litres storage vessels with tap at bottom	No.	1	2,619.97	2,619.97
Stiff broom	No.	3	4,366.62	13,099.87
Vernier calipers 150mm	No.	3	10,916.56	32,749.67
Vernier calipers 250mm	No.	3	17,466.49	52,399.47
Pestle and mortar	No.	2	4,366.62	8,733.24
Linear shrinkage mould (BS 1377)	No.	1	24,016.42	24,016.42
Average least dimension gauge	No.	2	10,916.56	21,833.11
Lockable tool box	No.	1	14,191.52	14,191.52
Plastic or metal bucket including lid 10 litres capacity	No.	2	24,016.42	48,032.84
Polythene wash bottle (500ml)	No.	30	982.49	29,474.70
A4 size clip board	No.	2	1,091.66	2,183.31
Thermometer range 50 degrees C to 150 degrees	No.	5	15,283.18	76,415.89

C glass (BS 593)				
Laboratory thermometer range 0 degrees C to 250 degrees C	No.	5	25,108.08	125,540.39
Maximum and minimum thermometer (BS 692)	No.	5	25,108.08	125,540.39
Rain gauge	No.	1	15,283.18	15,283.18
Pocket dial thermometer +500c to 2500c accurate to +3% with 0.75m long	No.	3	15,283.18	45,849.53
5 litres capacity steel storage containers with leak and	No.	5	26,199.73	130,998.67
Hotplate 200m diameter with thermostat heat control unit	No.	2	30566.36	61132.71
450mm diameter x 150mm deep karais	No.	5	2183.31	10916.56
Polythene wash bottle (500ml)	No.	30	982.49	29474.7
A4 size clip board	No.	2	1091.66	2183.31
Thermometer range 50 degrees C to 150 degrees C glass (BS 593)	No.	5	15283.18	76415.89
Laboratory thermometer range 0 degrees C to 250 degrees C	No.	5	25108.08	125540.39
Maximum and minimum thermometer (BS 692)	No.	5	25108.08	125540.39
Sub-total				**2,792,891.55**

Table A3.7: Standard specification

	Unit	**Quantity**	**Cost (KES)**	**Total cost (KES)**
Copies of each of the following standard specification (latest edition)				
BS 812	No.	1	98,249.00	98,249.00
BS 882	No.	1	98,249.00	98,249.00
BS 1377	No.	1	98,249.00	98,249.00
BS 1881	No.	1	98,249.00	98,249.00
BS 1924	No.	1	98,249.00	98,249.00
ASTM 04.03	No.	1	146,281.84	146,281.84
AASHTO - GDPS - 3 V3	No.	1	194,314.69	194,314.69
AASHTO HCM - 25 (PART I & PART II)	No.	1	240,164.22	240,164.22

Sub-total				**20,451,928.25**

Table A3.8: Furniture for engineer's office including survey equipment

	Unit	Quantity	Cost (KES)	Total cost (KES)
Five branded personal laptop computer with the following: Inter Core 2 Duo, 2.8 GHz with 22" SviA colour monitor, 640 Gbhard disc, 8 GB RAM , DVD R/W Rom complete with all accessories and pre loaded with licensed Windows 7 OS, latest MS office and MS project. The PC should Have full Multimedia capabilities.	No.	5	121,828.76	609,144
Provide and maintain Konica Minolta bizhub 220 or similar multifunctional colour / print system	No.	1	523,994.66	523,995
Dot Matrix printer Epson LQ - 1170 or equivalent	No.	1	33,841.32	33,841
As for 13/104 but for branded desktop computer	No.	4	109,165.55	436,662
UPS 600VA	No.	4	15,283.18	61,133
Electronic Scientific Calculator 12 figures (Casio FX	No.	4	2,838.30	11,353
Type writer 450mm Carriage : Xerox 610 electronic or similar	No.	1	32,749.67	32,750
Document binding machine	No.	1	6,331.60	6,332
Reams A3 photocopying paper	No.	30	1,091.66	32,750
Reams A4 photocopying paper	No.	60	654.99	39,299
Inkject plain paper fax machine with 4 MB of memory	No.	10	24,016.42	240,164
Stapling machine Ofrex size 66 or similar with 5000 staples	No.	4	1,091.66	4,367
Stapling machine Ofrex size 50 or similar with 5000 staples	No.	4	1,091.66	4,367
Pencil Sharpener (Desk mounted type)	No.	2	1,091.66	2,183
Heavy duty paper punch	No.	1	4,366.62	4,367
Ordinary Paper punch	No.	4	3,274.97	13,100
Filing Tray	No.	10	1,091.66	10,917
First Aid Kit	No.	2	10,916.56	21,833
Fire Extinguisher	No.	4	18,283.18	73,133

Waste paper basket	No.	10	1,091.66	10,917
Refrigerator min. capacity 0.285m3	No.	1	48,032.84	48,033
Vacuum cleaner of approved make, minimum 1000W power	No.	1	34,932.98	34,933
900 watt 25 litre microwave oven with grill	No.	1	17,466.49	17,466
Air conditioner unit, medium size	No.	2	54,582.78	109,166
Sub-total				**2,382,203**
	Unit	**Quantity**	**Cost (KES)**	**Total cost (KES)**
Cupboard 0.15m3 lockable	No.	6	12,008.21	72,049.26
Cooker 2 plate electrical	No.	1	17,466.49	17,466.49
Desk 2.2 x 0.9 m with lock up drawers	No.	6	20,741.46	124,448.76
Swivel chair with arms	No.	6	6,986.60	41,919.60
Chairs (Standard)	No.	12	6,113.27	73,359.24
Drawing Table with 3 plan drawers under	No.	1	14,191.52	14,191.52
Drawing table stools	No.	1	6,549.93	6,549.93
Typists desk	No.	3	6,331.60	18,994.80
Typists chair	No.	3	6,113.27	18,339.81
Stationary cupboard , 1.2m3 lockable	No.	2	7,641.59	15,283.18
Steel filing cabinet 4 drawers lockable	No.	3	14,846.52	44,539.56
Bookshelf, 3 shelves 1.5m long hold box files	No.	3	15,283.18	45,849.54
Office Table (2x 1.2m) each with 2 chairs	No.	2	32,749.67	65,499.34
Portable table top electric fan	No.	2	10,916.56	21,833.12
Standard electric fan	No.	2	8,733.24	17,466.48
Conference table for 12 persons	No.	1	65,499.33	65,499.33
Chairs for Conference table	No.	12	6,113.27	73,359.24
3m long bench with cushioned seat and back rest	No.	1	38,207.94	38,207.94
Sub-total				**774,857.14**

Table A3.9: Survey equipment and design software

	Unit	Quantity	Cost (KES)	Total cost (KES)
Engineer's automatic level wild NAK - 2 or similar including tripod	No.	2	26,199.73	52,399.46
Set of tripods (wild or similar)	No.	3	4,366.62	13,099.86
Survey Umbrella	No.	3	8,733.24	26,199.72
Levelling staff 5m with levelling bubble (wild iNLE 3 or similar)	No.	4	2,619.97	10,479.88
2.5m ranging rod (metallic)	No.	2	6,549.93	13,099.86
1m stainless steel straight edge	No.	2	1,528.32	3,056.64
3m aluminium straight edge	No.	4	1,964.98	7,859.92
30m steel white face tape	No.	4	3,493.30	13,973.20
100m steel band tape	No.	2	4,803.28	9,606.56
3m tape measure	No.	4	6,549.93	26,199.72
Steel tape repair outfit	No.	1	8,733.24	8,733.24
2kg Hammer	No.	3	1,528.32	4,584.96
Pangas 16" straight	No.	10	1,091.66	10,916.60
Roll of tracing paper 75mm x 20m	No.	10	14,191.52	141,915.20
Drawing office stools	No.	2	14,191.52	28,383.04
Total station complete with a field data collector LEICA Model 2" or similar including all accessories and supporting software	No.	1	4,584,953.29	4,584,953.29
Box (complete set) of highway curves	No.	2	9,388.24	18,776.48
Highway program for geometric design, drawing of cross sections and quantity calculation	No.	1	436,662.22	436,662.22
Provide Licensed AutoCAD Civil 3D 2011 Software	No.	1	218,331.11	218,331.11
Sub-total				**5,629,230.96**
	Unit	**Quantity**	**Cost (KES)**	**Total cost (KES)**
Three 4-wheel drive vehicles, complete with mobile telephone hand free headset, 2-way radio (equivalent to hiring the vehicle)	veh.mth	120	193,797.15	23,255,658.00

Extra over item-fuel, maintenance, lubricants, and servicing	km	72000	19.63	1,413,360.00
Six twin-cab pick-up vehicle, mobile telephone hands free headset, 2 way radio	veh.mth	240	130,117.85	31,228,284.00
E.O. item 1.07 inclusive of fuels, maintenance, lubricants and servicing for mileage over 3,000 km per vehicle month	km	144,000	15.42	2,220,480.00
Two 4-wheel drive single-cab pickup vehicle , with mobile telephone hands free headset, 2-way radio	veh.mth	80	118,136.86	9,450,948.80
E.O item 1.09 inclusive of fuels, maintenance, lubricants, and servicing for mileage over 3000km per vehicle	km	48000	14.01	672,480.00
1 3.0 litre 14 seater minibus, with mobile telephone hands free headset, 2-way radio	veh.mth	36	138,168.66	4,974,071.76
E.O item 1.09 inclusive of fuels, maintenance, lubricants, and servicing for mileage over 3000km per vehicle	km	24000	14.02	336,480.00
Erect and maintain publicity sign	No	6	148,762.83	892,576.98
Protection and relocation of services-lump sum	PC sum	1	100,000,000.00	100,000,000.00
Over head costs: % of 1.14			7,000,000.00	7,000,000.00
Support staff:				-
Office assistant	m.mth	54		-
Chainmen	m.mth	150		-
Laboratory attendant	m.mth	150		-
General attendant	m.mth	90		-
Installation of modern kiosk fabricated according to specifications	No	250	84,906	21,226,440.00
Prime cost sum of 20m for renovation/construction of stalls in e3xisting market along the road	PC sum		20,000,000	20,000,000.00
% of item 1.18 for overhead costs	%	7%	1,400,000	98,000.00
Prime cost sum of 5m to cover employer's obligation to pay DAB	%	7%	350,000	24,500.00
Sub-total				**222,793,279.54**

Table A3.10: Site clearance and topsoil stripping

	Unit	**Quantity**	**Cost (KES)**
Clearing site on road reserve including removal of trees, hedges, bushes etc	Ha	67	51,660
Removal of unsuitable material/top soil to maximum depth of 200mm including excavation, loading and disposal	M3	133,193	112
Cutting of trees of girth above 300mm, cutting of trunks, branches, uprooting and removal of materials/depressions, pits by earth etc.			
4.03.1: Girth 300mm and above	No	50	698
4.03.2: Girth above 600mm to 900mm	No	50	1,943
4.03.03: Girth above 900mm to 1800mm	No	18	3,877
4.03.04: Girth above 1800mm	No	8	7,078
Transplantation of existing trees of girth above 600mm, uprooting and shifting of trees and placing in excavated pits	No	10	5,199
Dismantling of structures on roadway including sorting out the dismantled materials, disposal of un-serveable material free of cost			
4.05.1: Stone masonry	m3	100	515
4.05.2: Plain concrete	m3	1,530	573
4.05.3: Reinforced concrete	m3	1,090	2,782
4.05.4: Bituminous pavement	m3	5,000	789
4.05.5: Granular pavement	m3	15,400	287
4.05.6: Invert block drains	m	4,000	33
4.05.7: CI water mains	m	2,000	326
4.05.8: Bus shelters	No	13	16,496
4.05.9: Existing gabions	m3	275	200
4.05.10: Sewer lines	m	500	632
Items for dismantling 4.05:			
4.06.1: Bollards	No	200	1,159
4.06.2: Fencing	m	3,550	114
Hume pipe culverts (excavation of earth, dismantling of head walls, bedding			

etc			
4.07.1: up to 600mm dia	m	630	521
4.07.2: 600mm to 900mm dia	m	50	1,455

Table A3.11: Earth works

	Unit	**Quantity**	**Rate (KES)**	**Total (KES)**
Activities				
Cut to fill in soft material, including benching of shoulders and embankments to 95% MDD	m3	200,000	365	73,096,000
Cut to fill in hard material, including benching of shoulders and embankments to 95% MDD-require blasting	m3	40,000	1,836	73,429,600
Cut to fill in hard material, including benching of shoulders and embankments to 95% MDD-no blasting	m3	370,000	36	13,275,600
Scarify, water, process and compact 150mm existing ground below embankments or sub grade to 95% MDD	M3	150,000	87	13,036,500
Construction of 300mm sub-grade and earthen shoulders including transport	m3	100,000	448	44,845,000
Cut to spoil soft materials	m3	300,000	123	37,008,000
Fill in soft materials from borrow pits	m3	200,000	322	64,394,000
Fill in hard materials from borrow pits	m3	70,000	529	37,058,700
Excavate and cart to spoil in swamps	m3	15,000	74	1,116,150
Provide rock fill (boulders) material and fill to swampy areas	m3	10,000	176	1,759,300
Provide filter fabric under, over or around rock fill	m2	32,000	200	6,395,200
Sub-total				365,414,050

Table A3.12: Excavation and filling for structures

	Unit	**Quantity**	**Rate (KES)**

Excavate in soft material to any depth for structures e.g. box culverts, abutments, wing walls, open foundations, gabions, retaining earth walls and pier foundations			
depth up to 3m	m3	6,801	178
depth 3m and above	m3	7,000	262
Excavate in soft material to any depth for structures e.g. box culverts, abutments, wing walls, open foundations, gabions, retaining earth walls and pier foundations			`
depth up to 3m	m3	2,915	1,001
depth 3m and above	m3	2,915	1,229
River training including providing and laying boulders apron on river bed for protection against scour with stone boulders weighing not less than 40kg complete	m3	2,923	3,575
River training in hard material excavation complete	m3	1,253	186
Provide, placing selected granular back fill material behind abutment, wing wall retaining wall and retaining earth wall	m3	17,825	778
Provide and place gabion mesh and mattresses	m2	9,960	1,948
Provided and place rock fill below structures and to gabions	m3	6,298	1,079
Provide and place close jointed rip-rap	m3	6,298	1,582
Provide and lay stone pitching as per the drawings	m2	1,200	905
Extras over on item No. 7.09 for grout	m2	1,200	943
Provide filter fabric under and/or behind gabions	m2	1,800	280
Provide and place porous filter material complete as per the drawings and technical specifications	m3	6,298	2,041

Table A3.13: Culverts and drainage works

	Unit	Quantity	Rate (KES)

Excavation in soft material to any depth for pipe culverts and sub-soil drains	m3	21000	154.7
Excavation in hard material to any depth for pipe culverts and sub-soil drains-hard rock	m3	1421	1835.64
Excavation in hard material to any depth for pipe culverts and sub-soil drains, hard rock-no blasting	m3	3000	218.85
Excavation in hard material to any depth for pipe culverts and sub-soil drains, hard rock (jack hammer)	m3	3000	1763.55
Provide, lay and joint 300mm I.D cement concrete pipes for drains inlets	m3	2000	2978.37
Provide, lay and joint 600mm I.D reinforced cement concrete pipes	m3	2000	4855.77
Provide, lay and joint 900mm ID reinforced cement concrete pipes	m3	1500	10484.34
Provide, lay, and joint 1200mm I.D reinforced cement concrete pipes	m3	600	20055.79
Provide, lay 160mm I.D PVC pipes in inlet to drains from sub-base	m3	3500	1271.69
Provide and place PCC/RCC class 25/20 concrete for side walls	Unit	Quantity	Rate
Construction class 15/20 concrete lining to side drains and out fall channels, bed concrete for side drains, kerbs, pipe culverts	m3	15000	11,544.11
Provide and place PCC/RCC class 25/20 concrete for use as bedding and temporary works	m3	2236	1154.41
Provide and place PCC/RCC class 20/20 concrete for in-situ gravity structures, drains, service ducts as locations to be instructed by engineer	m3	867	12973.76
Excavation in soft material, provide and joint precast concrete down chutes on slopes of high fill including bedding and back filling	m3	1080	14299.82
Allow for in-situ lining with concrete class 20/20 on outfall drains through built-up areas and limited access	m3	1620	11,722.93
Provide and place 300mm dia half dish as per drawing and specifications	m3	2000	1952.84
Provide and place and compact rock fill and subsoil drains	m2	2547	1079.41
Provide and place filter fabric to rock fill and subsoil drains	m2	2829	279.85
Provide and construct stone masonry walls for drains and culverts	m2	5400	1834.65

Table A3.14: Passage of traffic

	Unit	Quantity	Rate (KES)

Provide and maintain the signs and barriers for safe passage of traffic	L/S		
Maintain and allow for the passage of traffic through the works	L/S		
Provision, processing and compaction of gravel of sub base quality of existing 7m wide roads for deviation	m3	20000	868.22
Provide, lay and compact 150mm graded crushed stone base on deviations	m3	15000	2884.51
Provision and applying of prime coat, tack coal and laying and compacting of 50mm AC including cleaning of drains	m3	6000	14258.27
Provision and applying of prime coat, tack coal and laying and of AC for patchwork and regulation including cleaning of drains	m3	2000	16926.38

Table A3.15: Natural gravel for base and sub-base

	Unit	Quantity	Rate (KES)
Provide, place and compact natural gravel material in new road, junction accesses and bus bays	m3	90000	836.06
Provide, place and compact natural gravel material in non-motorised traffic facilities	m3	16380	977.03

Table A3.16: Graded crushed stone sub base and base

Unit	Quantity	Rate (KES)	Total (KES)
m3	90000	2941	264690000

Table A3.17: Cement and lime treated material

	Unit	**Quantity**	**Cost per activity (KES)**
Provide, transport to site and spread cement improvement agent for natural material sub-base for new roads, junctions, bus bays and matatu parks	Ton	7,500	21603.81
Mixing natural gravel material	m3	90,000	74.21
Mixing in plant for graded crushed stones	m3	90,000	138.18
Curing and protection of treated base as per guidelines for new roads, bus bays, matatu stands	m2	980,000	18.25

Table A3.18: Bituminous surface treatments and surface dressing

	Unit	Quanti ty	Cost per activity (KES)
Provide, heat and spray MC-70 cutback bitumen prime coat at rate of 1.0 litre/m2 to 1.2 litres/m2 on the surface of the carriage way, shoulders, bus bays, accesses and junctions	LT	600000	124.28
Clean and prepare surfaces, provide and spray K1-60 bitumen emulsion as tack coat to carriage way at a spray rate of 0.3-0.8 litres/m2	LT	800000	121.25
Prepare surfaces, provide, mix, lay and compact, 19mm super pave, asphaltic concrete type as wearing course	m3	21000	18145.49
Provide, lay and compact dance bituminous macadam as base layer (37.5) super pave type) with modified bitumen and 0/40mm aggregates on prepared surface of granular base layer, 125mm thick	m3	40000	14838.04
Provide, place and compact concrete class (15 (20) 100mm thick to foundation of piers, abutments and retaining walls	m3	1222	11544.11
Provide, place and compact concrete class 30(20) to foundation of piers, abutments, retaining walls	m3	29000	7163.2
provide, place and compact concrete class 30(20) to piers caps, wall of abutments, retaining walls and to deck slab	m3	14945	20720.57
Provide, place on the p concrete piers caps, precast concrete girders of class 35 (20)	m3	3154	21487.36
Provide, erect and dismantle formwork to provide class F1 finish to main footings of piers, abutments walls and retaining walls	m2	100000	558.82
Provide, erect and dismantle formwork class F2 finish to soffit of deck	m2	6803	747.42
Provide, erect and dismantle formwork class F3 finish to soffit of deck			
Reinforcements			
High tensile bar reinforcement to BS 4461 of any diameter less than 16mm	Ton	3000	127668.5
High tensile bar reinforcement to BS 4461 of any diameter 16mm to 40mm	Ton	5000	116993.6

Table A3.19: Pre-stressed concrete

	Unit	Quant ity	Cost per activity (KES)
Pre-stressing strands, reinforcing bars			
Length between 18 and 20m	No	200	429,505.52
Materials and grouting of the pre-stressed concrete deck units	No	200	61,378.89

Installation, tension, and grout 30mm diameter galvanised transverse stressing bars of various lengths	No	80	30,587.41
Pre-stressing strands, cable ducts, cable anchorages	No	152	363,387.84
Pre-stressed concrete decking and diaphragm walls	Nm3	2310.4	34,104.21
Design, fabrication drawings, structural steel works	Ton	900	260,869

Table A3.20: Road furniture

Activities	Unit	Quantity	Cost per activity
i) For lane marking (broken line) with the white paint 100mm wide (including the existing carı	m2	3000	860.4
ii) For edge lines (continous line) with the white paint 100mm wide (including the existing ca	m2	11000	860.4
iii) For edge lines (continous line) with the yellow paint 100mm wide (including the existing c	m2	1000	860.4
Provide and applying two coats of synthetic enamel paint including primer to Kerb as per Te(	m	22636	360.67
Provide and laying hot applied thermoplastic road marking compound in approved colour and	m2	1543	946.44
PERMANENT ROAD SIGNS			
Supplying and fixing cautionary/warning road sign boards made up with high intensity grade	No.	73	14301.51
Supplying and fixing regulatory/mandatory sign boards made up with high intensity grade ret	No.	26	15544.52
Supplying and fixing cinformatory road sign boards made up with high intensity grade retro-reflective type sheeting complete as per drawing and technical specifications			
i) Area less than 1.0m2	No.	20	19961.24
ii) Area more than 1.0m2 but less than 2.0m2	No.	12	24913.09
iii) Area more than 2.0m2 but less than 5.0m2		10	45125.27
Supplying and fixing in position road overhead retro-reflective informatory sign boards including fixing on overhead gantry /any other overhead structure and other supports including cost of back frame and complete as per drawing and technical specifications			
i) For 12.0m span	No.	4	212264.12
ii) For 22.5m span	No.	9	295915.03
Supplying andd fixing in position road cantilever overhang retro-reflective informatory sign boa	No.	10	78188.03
Provide and fix precast road reserve boundary posts of cement concrete class 20/20 and pai	No.	41	3986.51
Provide and fix concrete edge marker posts on the outer edge of shoulder as per drawing sp	No.	50	838.89
Provide and fix kilometer marker posts on the outer edge of shoulder as per drawing specifi(	No.	20	1909.82
Provide and erect single sided single head flexibeam guardrails complete with steel posts, s	m	40000	4355.44
Providing and laying cement concrete kerbs/divider for central reserve, footpaths and traffic islands in concrete class 25/20 grade concrete as per drawing and as directed by the engineer			
i) Barrier type	m	54332	1067.03
ii)Mountable type	m	36792	2197.93
Erect standard bumps using asphalt concrete where directed	m	100	4955.76
Provide and place 20/20 bollard size 1.2m x 0.1m x 0.1m embedded to a depth 0.2m where	No.	500	1465.28
Providing and fixing in the footpath interlocking concrete pavers unishape (monolithic single l	m2	50000	1247.58
Providing and fixing aluminium casted reflective delienators (Cat's eyes) of size 10com x 10(	No.	5000	927.14
Provide moveable concrete barriers using class 25/20 (cost including reinforcement and form	m3	2500	13806.78
Providing and fixing in the service roads/ foot path cobblestones (monolithic single layer prec	m2	40000	981.64

Table A3.21: Miscellaneous bridge works

Description	Unit	Quantity	Rate (KES)
Strip steel type of expansion joint with structural steel and anchorage assembly complete as per drawing & specifications including acceptance testing as specified, to be installed under the supervision of a specialist manufacturer	m	1,412	15,198.63
Reinforced cement concrete crash barrier including cost of reinforcement, steel planets and pipes complete as per drawing specifications	m	4,000	10,316.52
Providing and fixing in position 20mm thick compressible fibre board filler in expansion joint complete as per drawing and technical specifications	m	778	989.89
Providing and filling joint sealing compound as per drawing and Technical specification. Coarse Sand with bitumen (6% by wt)	m	776	643.13
Drainage spouts complete as per drawing and MoR specification	No.	266	4,211.61
Providing weep holes in plain concrete reinforcement concrete abutment, wing wall/ return wall complete as per drawing specification	No.	5,000	681.37
Allow for mobilization of the pile drilling rig to any site within the project road	L/S		
Allow for pile boring in any strata using an approved rig to any site within the project road	m	2,400	10,584.20
Provide reinforcement concrete in M35/20 for bored piles	m3	2,000	21,043.25
Reinforcement Cement concrete pile caps in class 35/20, excluding cost of reinforcement as per drawing and MOR specification	m3	670	21,953.19
Reinforcement cement concrete approach slabs (300 thick) including reinforcement and formwork complete as per drawing specifications	m3	76	22,684.96
Pitching on slopes complete as per drawing and section 2504 technical specification	m3	240	1,942.16
Filter material underneath (150m thick) pitching in slopes complete as per drawing and section 2504 technical specification	m3	683	2,040.84
Construction Reinforced earth structures, together with the construction of earthwork in layers assembly and erection of reinforcing element and placement of facia panel & geotechnical layers (as approved by the engineer) and all other associated components in complete nature as indicated in the drawings. The work shall also carry a warranty certification for maintaining structural / aesthetical integrity of the whole RE wall system for at least 20 years after the construction completion time. The rates excludes Earth filling to be paid elsewhere but includes geo-synthetics panels			
i) Facia panels including reinforcement	m2	23,600	8,641.27

ii) Class 30/20 friction slab	m	848	5,882.65
Pipe Handrail to bridges as per standards	m	3,000	3,385.97
Drilling confirmatory bore holes of 150mm dia in the subsoil strata to conform the properties of subsoil as found during design, including laboratory and field tests on soil and rock. The minimum depth for drilling shall be 15m - 25m subject to 7m insertion in soft rocks and 3m insertion in hard rock as directed by the engineer	m	600	18,352.55
Supply and fixing of POT PTFE bearings complete as per drawings and as per BS:5400 part 9.2, BS3784:1973 and as directed by the engineer			
Sliding bearing			
i) Capacity 270T	No.	100	174,463.53
ii) Capacity 490T	No.	20	340,786.31

Table A3.22: Day works (see standard specification)

Description	**Unit**	**Quantity**	**Rate (KES)**
PLANT			
Crawler Dozer and hydraulic Ripper			
a) 100 - 135Kw rated flywheel power	Hr	30	4,000.00
b) 136 - 185Kw rated flywheel power	Hr	30	7,000.00
c) 186 - 250Kw rated flywheel power	Hr	30	7,500.00
Motorized rubber tyred single engine scrapers			
a) up to 16m3 heaped capacity	Hr	30	3,000.00
b) 17 -26m3 heaped capacity	Hr	30	3,600.00
Motorized rubber tyred twin engine scrapers			
a) up to 16m3 heaped capacity	Hr	30	4,500.00
b) 17 -26m3 heaped capacity	Hr	30	5,400.00
Motor Graders			
a) 80-110 Kw rated flywheel power	Hr	30	3,000.00
b) 111 - 120 Kw rated flywheel power	Hr	30	6,000.00
c) 121 - 160 Kw rated flywheel power	Hr	30	6,500.00

Rollers Towed vibratory including tractor			
a) 6.5 - 8.8t un-ballasted wt	Hr	30	2,500.00
b) 8.6 - 11.7t un-ballasted wt	Hr	30	5,000.00
Road Roller deadweight (Steel Three wheel)			
a) 6.5 - 8.8t un-ballasted wt	Hr	30	2,100.00
b) 8.6 - 11.7t un-ballasted wt	Hr	30	2,550.00
Roller rubber tyred self-propelled			
a) Up to 1t per wheel	Hr	30	1,200.00
b) 1.1t - 2.0t per wheel	Hr	30	1,500.00
Roller vibratory single roll rubber tyred			
8.3 -10.5 un-ballasted weight	Hr	30	1,800.00
Vibrating plate compactor 114-200kg operating	Hr	30	600.00
Compressor rated by normal delivery of free air per minute complete with all tools			
a) 6.0-7.4m3/min	Hr	30	1,200.00
b)7.5-9.7m3/min	Hr	30	1,500.00
c)9.8-25.5m3/min	Hr	30	1,800.00
Mobile rubber tyred rough terrain crane 23-40t max working load	Hr	30	2,800.00
Tracked excavator cranes			
a) 20-28t max working load	Hr	30	3,000.00
b)28.1-36.1t max working load	Hr	30	4,000.00
c)36.1t-56t max working load	Hr	30	6,000.00
Small dumpers 751kg -1.2t max rated payload	Hr	30	1,200.00
Excavators hydraulic wheeled dual purpose			
a)0.6-0.8m3 rated bucket capacity	Hr	30	3,000.00
b) 0.81-1.0m3 rated bucket capacity	Hr	30	3,500.00
Pumps (inclusive of all hoses)			
a)50-76mm delivery	Hr	30	300.00
b)77-101mm delivery	Hr	30	400.00

Rubber tyred tractors including trailer 50-70kw rated flywheel power	Hr	30	1,200.00
Wheel loaders 4x4 articulated			
a) 1.5 - 2.0m3 SAE rated capacity	Hr	30	1,900.00
b)2.01 -3m3 SAE rated capacity	Hr	30	2,400.00
c) 3 - 5m3 SAE rated capacity	Hr	30	6,000.00
Crawler Loaders			
a) 0.8 - 1.3m3 SAE rated capacity	Hr	30	2,600.00
b)1.31 - 1.99m3 SAE rated capacity	Hr	30	3,200.00
c) 2 - 2.5m3 SAE rated capacity	Hr	30	3,800.00
Concrete mixer (Wet capacity)			
a) Up to 100 litres	Hr	30	800.00
b) 101 - 200 litres	Hr	30	1,000.00
c) 201 - 300 litres	Hr	30	1,200.00
Concrete mixer (Wet capacity)			
a) Up to 100 litres	Hr	30	800.00
b) 101 - 200 litres	Hr	30	1,000.00
c) 201 - 300 litres	Hr	30	1,200.00
Concrete Poker vibrator	Hr	30	600.00
Lorries Flat bed			
a) up to 7.5t gross weight vehicle	Hr	30	5,000.00
b)7.6 - 12t gross vehicle weight	Hr	30	6,000.00
Lorries Tippers			
a) up to 11t gross vehicle weight	Hr	30	2,200.00
b)11 - 17t gross vehicle weight	Hr	30	4,000.00
c) 17.1 - 25t gross weight vehicle	Hr	30	6,000.00
Van, Pickup or similar utility vehicle			
a) up to 1t carrying capacity	Hr	30	2,800.00
b)1.1-2.6y carrying capacity	Hr	30	3,200.00
Self-propelled water or Fuel tanker			

a)3500 - 4550 litre capacity	Hr	30	3,000.00
b)4551 - 9000 litre capacity	Hr	30	4,000.00
c) 7001 - 12000 litre capacity	Hr	30	6,000.00
Pressure Bitumen distributor			
a)3500 - 4550 litre capacity	Hr	30	2,200.00
b)4551 - 9000 litre capacity	Hr	30	3,000.00
Mechanical Broom	Hr	30	800.00
Labour			
a) Unskilled Labour	Hr	1,800	80.00
b)Plant Operator	Hr	1,800	150.00
c)Driver	Hr	1,800	137.50
d) Foreman	Hr	1,000	120.00
Materials			
Aggregates for concrete			
a) Fine	m3	1,000	2,400.00
b) Coarse	m3	1,000	2,600.00
Shuttering Timber			
a) F1 finish	m2	1,000	800.00
b) F2 finish	m2	1,000	800.00
c) F3 finish	m2	1,000	1,000.00
Gabion mesh size 1.0m x 1.0m x 1.0m	m2	150	750.00
Stones for Gabions	m3	300	1,800.00
Dynamite stick explosives	kg	30	400.00
Explosive Fuse	m	30	70.00
Detonators	No.	30	120.00

Table A3.23: Street lighting and installation

Description	Unit	Quantity	Rate (KES)
Supply, deliver, install and set up the following			
15m steel galvanised street lighting column made from class "B" steel galvanised pipe complete with bracket for mounting LED floodlights as item 3 below 4 No.	No.	195	91,922.67
15m steel galvanised street lighting column made from class "B" steel galvanised pipe complete with bracket for mounting LED floodlights as item 3 below 2 No.	No.	20	91,922.67
15m steel galvanised street lighting column made from class "B" steel galvanised pipe complete with bracket for mounting LED floodlights as item 3 below 1 No.	No.	125	91,922.67
25 AMP single phase cut out complete with a 5A HRC fuse. State make	No.	215	2,702.87
180W ultra high power LED floor lights which should be engraved to Ministry of roads and Public works standard codes to be provided state make cat No.	No.	945	33,120.98
1.5mm2 twin earth PVC insulated copper cable	No.	13,995	171.21
Metal control pillar as per Drg. F41B, with lockable facility for single phase service line	No.	27	25,377.40
4 way surface mounted consumer unit with a 100 Amps DP integral isolator, state make ……	No.	24	28,739.90
6 way surface mounted consumer unit with a 100 Amps DP integral isolator, state make ……	No.	3	29,885.36
20 Amp single phase MBC's for item No.6 above	No.	57	6,257.44
Blanking plates for item No.6 above	No.	48	386.74
40 Amp current operated earth leakages circuit breaker with rated leakages circuits breaker with rated leakage current of 0.5A state make	No.	27	18,681.94
40 Amp double pole contactor. State make	No.	27	25,377.40
Photo cell kit, photo cell socket and bracket. State make	No.	27	52,153.16
4.6m steel column for mounting item no.11 above as per drawing No.	No.	27	30,817.90
2 core 10.0mm2 PVC/SWA/PVC Cu Cable underground cable	m	19,478	493.64
Earth compromising of a 6mm2 earth lead and 1800mmlong by 15mm diameter copper earth electrode with driving tip and clamp in a 300mm by 300mm by 300mm concrete manhole	No.	294	7,770.52

Providing for 2 feet trenching, shifting, cable laying, tilting and backfilling complete with Hatari tiles on top of the underground cables	m	230	1,407.92
Cable grands for terminating underground cables item 13 and 17	No.	230	1,458.33
1.5mm2 3 core PVC/SWA/PVC Cu Cable for terminating photo cell	m	100	291.14
63Amp MCB with enclosure type Crabtree or equivalent	No.	27	13,067.62
UPVC ducts for carrying service lines and cables across the road, to have concrete surround of 150mm for road crossing	m	260	1,965.01
20 metre street lighting mast installation			
20m steel galvanised street lighting column made from class "B" steel galvanised pipe complete with bracket for mounting LED floodlights as item 3 below- 2 No.	No.	15	115,660.97
Three phase 25Amp cut - out complete with a 10A HRC fuse. State make	No.	15	226,420.28
180 W ultra-high power LED floor lights which should be engraved to Ministry of roads standard codes to be provided state make and cat No.	No.	60	33,120.98
15mm2 twin with earth PVC insulated copper cable from the cut-out unit of the lighting fittings	m	1,750	171.21
Metal control pillar as per Drg . F41B, with lockable facility for the three phase service line	No.	6	25,377.40
4 way surface mounted distribution board with a 100 Amps TP integral isolator, state make ……	No.	6	28,739.90
A 15 Amps 3 phase MCB's for item no. 6 above state make	No.	6	2,063.22
Blanking plates for item No.6 above	No.	21	386.74
40 Amps TPN current operated earth leakages circuit breaker with rated leakages current of 0.5A	No.	6	18,681.94
40 Amps TPN contractor. State make …….	No.	6	19,763.08
Phone cell kit, photo cell socket and bracket. State make	No.	6	52,153.16
4.6m steel column for mounting item no.11 above as per drawing No.	No.	6	30,817.90
a) 10.0mm2 4 core PVC/SWA/PVC Cu cable	m	480	798.69
b) 10.0mm2 2 core PVC/SWA/PVC Cu cable	m	36	493.64
Earth compromising of a 6mm2 earth lead and 1800mmlong by 15mm diameter copper earth electrode with driving tip and clamp in a 300mm by 300mm by 300mm concrete manhole with removable cover	No.	6	7,770.52
Trenching, shifting, cable laying, tilting and backfilling	m	480	1,407.92

Cable grands for terminating underground cables item 13	No.	40	1,458.33
1.5mm2 3 core PVC/SWA/PVC Cu Cable for terminating photo cell	m	60	291.14
63Amp MCB with enclosure type Crabtree or equivalent	No.	6	23,131.67
Cable glands terminating underground cables 2C 1.5mm PVC/SWA/PVC Cable in item 17 above	No.	200	1,458.33
Others	No.		
Allow for prime cost sum of Kenya 200,000 for allowances for engineer's staff	PC Sum		
E.O for item 24.45 for contactors overheads	%		7%
Provide with a driver and maintain one (1) minimum 2.8 litre 4-wheel drive, twin-cab pick-up vehicle or similar approved, mobile telephone hands free headset and two way radio for the exclusive use of the engineer inclusive of the first 3,000 km per vehicle month to revert to the contractor at the end of the project. The vehicle are subject to approval by the engineer	Veh. Month	12	130,117.85
E.O for item 24.47 inclusive of fuels, maintenance, lubricants and servicing for mileage over 3,000km per vehicle month	Km	24,000	15.42
Provide a prime cost sum of KES 2,000,000 for Kenya power Co. ltd Liaisons & attendance charges	L/S		
Provide a prime cost sum of KES 2,000,000 for Kenya power Co. ltd for service line charges	L/S		
Extra over item 24.49 and 24.50 for contractor's profits and overheads	%		7%

Table A3.24: Landscaping and environmental mitigation measures

Description	**Unit**	**Quantity**	**Rate (KES)**
Landscaping and environmental mitigation			
Supplying , stacking and spreading of good earth and manure at site including royalty and carriage up to 15m	m3	10,800	509.29
Supplying , stacking and planting flowering/avenue trees of at least 1m height above the ground level in excavated pits of size 1.2m x 1.2m x1.2m and earth to desired location, filling the pit with soil for large and small trees	No.	4,000	2,482.12
Providing, planting and developing the plants, shrubs and flowerbed on embankment slopes inside the embankment and as shown on the drawing in the excavated pits of size 0.6 x 0.6 x 0.6 after planting, removal and stacking of excavated pits/bed with appropriate material			

a) Medium Shrubs	No.	1,500	872.57
b) Small Shrubs	No.	1,500	636.17
Grassing			
a) Planting of springs of approved indigenous type of grass	m2	64,800	89.52
b) Hydro Seedling			
i) Providing an approved seed mixture for hydro seeding	Kg	600	3,368.59
ii) Hydro Seeding	Ha	20	290,184.47
Providing, planting and developing the lawn in approved variety grass including excavating the existing soil to maximum depth 30mm removing and stacking of excavated earth to directed location, dressing the soil in proper slope, mound, fitting the excavation.	m2	1,800	553.61
Providing and laying crazy stones as per direction of Engineer	m2	600	710.91
Transplanting of existing trees of girth above 600mm girth as directed by engineer, including uprooting and shifting of trees and placing in excavated pits of suitable size and after transplanting, removal and stacking excavated earth to desired	No.	100	23,887.78
Maintenance of transplanted tree including watering, labour, all tools and equipment and maintaining up to defect liability period. As per directed by Engineer up to defect liability period.	No.	100	350.24
Compensatory Road side plantation approved species including MS tree guard, watering, manure maintenance during construction period	No.	1,200	3,202.59

Table A2.25: HIV/AIDS

Description	**Unit**	**Quantity**	**Rate (KES)**
Allow for social amenities to be provided on the road: wellness clinic consisting of two containers of forty feet long as per attached drawings. Rate to include water supply, sewer, power connections, security and utility bills for maintenance of up to 36months	No.	3	2,620,856.36
Implement HIV/AIDS awareness campaign amongst the workers for the duration of the contract	Months	36	35,460.29
Allow availability of Condoms for staff and workers for the duration of the contract	Months	36	28,368.23
Allow a provisional sum of KES 10,000,000 for personnel, purchase of kits and equipments for testing in awareness centres	KES		10,000,000
Extra over item 26.04 for contractor's profits and overheads	%		7.0%

Table A3.26: Road safety education

Description	Unit	Quantity	Rate (KES)
Construct and maintain. children's park along the road corridor as per the drawings and specifications as instructed by the Engineer	No.	1	9,307,079.67
Allow a prime cost sum of KES 2,000,000 for road safety training to the school children along the road	PC Sum	1	
Extra over item 27.02 for contractor's profits and overheads	%		7.0%

Appendix 4: Norms and Standards for Routine Maintenance of Roads

Table A4.1: Routine maintenance of urban roads

Description	Units	Quantity	Rate(KES)	Amount (KES)
Provide, fuel and maintain with a comprehensive insurance cover and driver, 1 No. saloon car (adometer:0 - 60000) of engine capacity 1800 - 2000 c.c. for exclusive use by the Engineer inclusive of the first 4,000km per vehicle month in accordance with clause 138 of special specification.	Months	2	150,000.00	300,000.00
Sub-total				**300,000.00**
Light bush clearance	M^2	613	12.00	7,356.00
Excavate, remove and dispose concrete structures	M^3	15	1,550.00	23,250.00
Cut to spoil in Soft material	M^3	124	442.50	54,870.00
Cut to spoil in hard material	M^3	12	1,000.00	12,000.00
Excavate for vertical drain in soft material	M^3	36	464.00	16,704.00
Excavate for vertical drain in hard material	M^3	18	1,193.50	21,483.00
Ditch/mitre drain/catch water drain excavation	M^3	24	335.15	8,043.60
Open lined drain cleaning	M	50	500.00	25,000.00
Gulley pot construction	NO	4	4,925.00	19,700.00
Gulley pot cleaning	NO	40	300.00	12,000.00

Provide and fix Composite Gulley pot cover of 450 x 450 mm	NO	5	5245	26,225.00
Provide and fix Composite Gulley pot frame of 450 x 450 mm internal dimension	NO	3	10000	30,000.00
Provide and lay 600 x 225 x 75 mm side slab. This includes 75mm gravel bedding	M^2	10	1,500.00	15,000.00
Manhole Construction	NO	2	50,000.00	100,000.00
Manhole Cleaning	NO	2	1,000.00	2,000.00
Manhole Repairs	NO	2	5,000.00	10,000.00
Manhole covers construction/replacement	NO	2	12,000.00	24,000.00
Culvert cleaning - 450mm diameter fully blocked	M	6	512.00	3,072.00
Culvert cleaning - 600mm diameter fully blocked	M	6	600.00	3,600.00
Excavate in soft material for pipe culverts, headwalls, wing walls, aprons, toe walls, drop inlets, minor drainage structures and compact excavated surface as specified by the Engineer	M^3	8	430.00	3,440.00
Provide , lay, join and backfill with suitable material 450mm inner diameter precast concrete pipes	M	6	5,500.00	33,000.00
Provide , lay, join and backfill with suitable material 600mm inner diameter precast concrete pipes	M	6	6,500.00	39,000.00
Provide and place A142 fabric mesh reinforcement	M^2	5	475.80	2,379.00
Provide and place 150mm thick stone pitching including grouting of ratio 1:4 cement to sand mortar as specified	M^2	5	1,500.00	7,500.00
Provide and place class 15/20 concrete to bedding and surround	M^3	5	12,325.00	61,625.00
Provide and place class 25/20 concrete to headwalls, wing walls, aprons, surrounds to walls, inlets and outlets to pipe culverts including formwork	M^3	5	15,954.65	79,773.25
Excavate for, provide and install Invert Block Drain of inner diameter 300mm including single course side slab on both sides. This includes 75mm gravel bedding	M	20	2,500.00	50,000.00
Shoulder grading	M^2	800	15.00	12,000.00
Provide, place, spread and compact natural gravel to shoulders	M^3	27	1,890.00	51,030.00
Provide, lay and compact hand packed stone material including filling of voids with stone dust and watering as directed by the Engineer.	M^3	10	3,050.00	30,500.00
Provide and spray MC-30 as prime coat at a rate of 0.8-1.0 L/sq metre as directed by the Engineer	L	50	107.30	5,365.00

Provide, lay and compact Asphalt Concrete Type II for Pothole Patching - hot mix	M^3	12	27,000.00	324,000.00
Provide, lay and compact Asphalt Concrete Type II for Surfacing - hot mix	M^3	24	27,000.00	648,000.00
Provide and spray K-160 as tack coat at a rate of 0.8-1.0 L/sq metre as directed by the Engineer	L	720	107.25	77,220.00
Clearing and cutting of potholes and failed areas	M^3	22	775.00	17,050.00
Provide and place steel bollard of 150mm diameter by 1500mm height and 3mm thickness, embedded to a depth 0.7 m. This should be inclusive of all-weather resistant reflective sticker, and class 15/20 concrete bed and fill.	No.	10	6,000.00	60,000.00
Provide and erect warning type sign 750mm size	No.	3	15,000.00	45,000.00
Provide and erect non-standard informatory type sign less than 1 m^2	No.	3	15,000.00	45,000.00
Paint 0.1m wide thermoplastic yellow centreline on the road	M^2	10	2500	25,000.00
Paint 0.1m wide thermoplastic white line on the road	M^2	10	2500	25,000.00
Excavate for, provide and place 250x125mm class 25/20 precast concrete straight raised kerbs haunched in 100mm thick class 15/20 concrete base bedding and mortar joined in support to carriage ways, bus bays and junctions as directed by the Engineer	M	75	1209.25	90,693.75
Provide, lay and compact 80mm thick concrete paving blocks with 49 N/mm2 cube crushing strength conforming to BS 6717 Part 1 of 1986 or Kenya Bureau of Standard equivalent including 30 mm thick compacted sand bed	M^2	50	2100	105,000.00
Provide and lay 600 x 600 x 50mm thick concrete paving slabs including 30 mm thick compacted sand bed	M^2	50	1500	75,000.00
Sub-total				**2,326,879.60**
Other inputs				
Pick -Up 1 - 1.5 tonnes	KM	6	575	3,450.00
Truck, Tipper 12 tonnes	KM	6	1915	11,490.00
Water tanker self-propelled: 6000 - 8000 lt. capacity	HR	6	1881.5	11,289.00
Fine Aggregates (Sand)	M^3	6	1350	8,100.00
Cement (Ordinary Portland)	TON	1	16599	16,599.00
High yield steel reinforcement equal to 16mm diameter or less	TON	0.2	122000	24,400.00
Machine cut natural coral stone block of 8`` x	M^2	30	1500	

8`` x 12``				45,000.00
Sub-total				**120,328.00**
Unit cost of materials				2,447,207.60
Support services				300,000.00
Labour				274,884.76
Total unit cost				**3,022,092.36**

Table A4.2: Routine maintenance of mixed surface road

Activity description	Unit	Quantity	Rate (KES)
Publicity Sign Boards	KS	1.00	15,000.00
Culvert Installation 600 mm with surround	METERS	21.00	14,655.17
Provide, place and compact class 20/25 concrete	M^3	23.00	12,931.03
Heavy grading with watering and compaction instructed by the Engineer	M^3	9,499.00	15.52
Provide gravel wearing course-excavation, free haul, spread, water and compact gravel to specifications	M^3	722.30	1,551.72
Kerbs	MT	406.00	2,155.17
Concrete blocks pavement	M^2	1,200.00	1,724.14

Table A4.3: Routine maintenance of earth surface road

Activity description	Unit	Quantity	Rate (KES)
Publicity Sign Boards	KS	1.00	15,000.00
Heavy grading with watering and compaction instructed by the Engineer	M^3	17,996.00	15.52
Provide gravel wearing course-excavation, free haul, spread, water and compact gravel to specifications	M^3	298.14	1,551.72
Kerbs	MT	506.00	2,155.17
Concrete blocks pavement	M^2	1,500.00	1,724.14

Table A4.3: Routine maintenance of gravel surface road

Activity description	Unit	Quantity	Rate (KES)
Heavy grading with watering and compaction	M^3	800.00	145.00
Carriageway grading -Light grading	M^2	4,000.00	16.24
Provide gravel wearing course-excavation, free haul, spread and compact gravel-equipment	M^3	120.00	2,220.24
Ditch/Mitre drain /catch water drain excavation	M^3	48.00	388.77
Stone Pitching	M^2	400.00	1,160.00
Heavy grading with watering and compaction	M^3	800.00	145.00

Provide gravel wearing course-excavation, free haul, spread and compact gravel-equipment	M^3	120.00	2,220.24
Publicity Sign Boards	KS	1.00	15,000.00
Heavy Bush Clearing	M^2	2,000.00	4.31
Heavy grading with watering and compaction	M^3	7,200.00	15.52
Provide gravel wearing course-excavation, free haul, spread, water and compact gravel to specifications	M^3	740.00	1,551.72

Table A4.4: Periodic maintenance of roads (paved AC surface)

Activity	**Unit**	**Quantity**	**Rate (KES)**
Cut to spoil in Soft	M^3	120.00	513.33
Gulley pot construction	NO	14.00	5,713.00
Gulley pot cleaning	NO	24.00	348.00
Manhole Construction	NO	7.00	58,000.00
Provide , lay and join 600mm inner diameter concrete pipes	M	400.00	9,280.00
Provide, place, spread and compact natural gravel for sub base	M^3	270.00	2,900.00
Base Repair - Hand Packed Stone	M^3	60.00	3,538.00
Pothole Patching - hot mix	M^3	48.00	27,840.00
Asphaltic concrete (AC) for surfacing	M^3	385.00	30,160.00
Kerbs	M	1,200.00	1,402.73
Concrete blocks pavement	M^2	1,440.00	2,436.00

Table A4.5: Periodic maintenance (mixed surface)

Activity	**Unit**	**Quantity**	**Rate (KES)**
Ditch/Mitre drain /catch water drain excavation	M^3	12.00	388.77
Culvert Installation 600 mm with surround	M	12.00	9,280.00
Excavate in soft material for culverts	M^3	12.00	498.80
Stone Pitching	M^2	360.00	1,160.00
Excavate for inlet, out fall, catch water drains, mire and cut-off drains in hard material	M^3	24.00	1,130.98
Provide, place, spread and compact natural gravel for sub base	M^3	24.00	2,900.00
Base Repair - Hand Packed Stone	M^3	198.00	3,538.00
Scarify the existing pavement layer and compact as specified and directed by the engineer	M^3	352.00	1,216.41
Kerbs	M	440.00	1,402.73
Concrete blocks pavement	M^2	1,320.00	2,436.00

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Table A4.6: Standards specification for periodic maintenance of roads (earth surface)

	Unit	Quantity	Rate (KES)
Headwall construction-Concrete	M^3	2.00	13,920.00
Culvert Installation 600 mm with surround	M	12.00	9,280.00
Heavy grading with watering and compaction	M^3	1,120.00	145.00
Base Repair - Hand Packed Stone	M^3	180.00	3,538.00
Kerbs	M	420.00	1,402.73
Concrete blocks pavement	M^2	1,200.00	2,436.00

Table A4.7: Periodic maintenance of roads (gravel surface)

	Unit	Quantity	Rate (KES)
Culvert Cleaning- Fully Blocked - 600mm	M	24.00	593.92
Carriageway grading -Light grading	M^2	4,000.00	16.24
Heavy grading with watering and compaction	M^3	1,440.00	145.00
Provide gravel wearing course-excavation, free haul, spread and compact gravel-equipment	M^3	450.00	2,220.24

Table A4.8: Periodic maintenance of urban roads

Description	Units	Quantity	Rate(KES)	Amount (KES)
Preliminary & General services				
Survey Works	Item	KSHS		50,000.00
Publicity Sign Board frame, erect on site and introduce sticker on the side of steel sheet	No	1	110000	110,000.00
Engineer's Office furniture and laboratory equipment	Item	KSHS		75,000.00
Material testing as directed by the Engineer	Item	KSHS		100,000.00
Provide, fuel and maintain with a comprehensive insurance cover and driver, 1 No. saloon car (adometer:0 - 60000) of engine capacity 1800 - 2000 c.c. for exclusive use by the Engineer inclusive of the first 4,000km per vehicle month	V Months	3	150000	450,000.00
supervisory staff including overtime	Item	KSHS		150,000.00
Sub-total 1				**935,000.00**
Site Clearance				
Excavate, remove and disposal of concrete structures	M^3	24	1550	37,200.00
Clear site on road reserve including removal of trees, hedges, bushes and other vegetation	Ha	0.4	100000	40,000.00
Sub-total 2				**77,200.00**
Earthworks				
Excavate and spread in Soft material and compact to 100% MDD (AASHTO T99)	M^3	735	300	220,500.00
Cut to spoil in Soft material	M^3	560	442.5	247,800.00
Sub-total 3				**468,300.00**

Culvert and Drainage Works				
Provision and laying 600 x 225 x 75 mm side slab. This includes 75mm gravel bedding	M^2	540	1,500.00	810,000.00
Excavate in soft material for pipe culverts, headwalls, wing walls, aprons, toe walls, drop inlets, minor drainage structures and compact excavated surface	M^3	160	430.00	68,800.00
Excavate in hard material for pipe culverts, headwalls, wing walls, aprons, toe walls, drop inlets, minor drainage structures and compact excavated surface	M^3	160	900.00	144,000.00
Provision laying, joining and backfilling with suitable material 450mm inner diameter precast concrete pipes	M	140	5,500.00	770,000.00
Provide, lay, joint and backfill with suitable material 600mm internal diameter concrete pipes culvert	M	180	8,500.00	1,530,000.00
Provide and place A142 fabric mesh reinforcement	M^2	256	475.00	121,600.00
Provide and place 150mm thick stone pitching including grouting of ratio 1:4 cement to sand mortar as specified	M^2	60	1,500.00	90,000.00
Provide and place class 15/20 concrete as surround and bedding to precast concrete pipe drain	M^3	178	12,941.25	2,303,542.50
Provide and place class 25/20 concrete to headwalls, wing walls, aprons, surrounds to walls, inlets and outlets to pipe and box culverts, including formwork	M^3	12	16,752.38	201,028.59
Excavate for, provide and install Invert Block Drain of inner diameter 300mm including single course side slab on both sides. This includes 75mm gravel bedding	M	1200	2,625.00	3,150,000.00
Sub-total 3				**9,188,971.09**
Natural Material Base and Sub-Base				
Provide, spread, water and compact natural gravel to specified thickness at 95% MDD	M^3	825	1890	1,559,250.00
Provide, lay and compact hand packed stone material including filling of voids with stone dust and watering as directed by the Engineer.	M^3	270	3050	823,500.00
Sub-total 5				**2,382,750.00**
Bituminous Mixes				
Provide, lay and compact Asphalt Concrete Type I (0/14) for Pothole Patching - hot mix	M^3	12	27000	324,000.00
Provide and spray K-160 as tack coat at a rate of 0.8 - 1.0 L/sq metre as directed by the Engineer	L	240	107.25	25,740.00
Clearing and cutting of potholes and failed areas	M^3	12	775	9,300.00
Sub-total				**359,040.00**
Road Furniture				
Excavate for, provide and place 250mm x 125 mm precast concrete straight kerb in support to carriageway	M	2800	1,200.00	3,360,000.00

Excavate for, provide and place 125mm x 100 mm precast concrete straight channels in support to carriageway	M	96	800.00	76,800.00
Sub-total				**3,436,800.00**
Concrete Paving Block Works				
Provide, lay and compact 60mm thick concrete paving blocks with 35 N/mm2 cube crushing strength conforming to BS 6717 Part 1 of 1986 or Kenya Bureau of Standard equivalent including 30 mm thick compacted sand bed	M^2	3400	1,750.00	5,950,000.00
Provide, lay and compact 80mm thick concrete paving blocks with 49 N/mm2 cube crushing strength conforming to BS 6717 Part 1 of 1986 or Kenya Bureau of Standard equivalent including 40 mm thick compacted sand bed	M^2	1800	2,100.00	3,780,000.00
Sub-total 8				**9,730,000.00**
Total				**26,578,061.09**

Appendix 5: Operating and Human Resources Costs for Agriculture, Livestock and Fisheries

Table A5.1: Operating costs of units in the State Department of Agriculture

S.No	Unit	Operating Costs (KES)
1	Agriculture, Boards and Committees	17,843,479.00
2	Agricultural Attaches Office	54,737,691.00
3	Agricultural Information Resource Centre	53,401,053.00
4	Agricultural, Business, Market Development and Agricultural Information	4,190,991,505.00
5	Agriculture Development Headquarters Technical Services	9,887,842.00
6	Agriculture Engineering Services	90,356,776.00
7	Agriculture Technology Development and Testing Stations	33,760,957.00
8	AIDS Control Unit	3,649,811.00
9	Bukura Agricultural College	101,944,000.00
10	Coconut Development Authority	152,000,000.00
11	Coffee Board of Kenya	20,920,000.00
12	Communication Unit	94,251,613.00
13	Development Planning Services	55,840,223.00
14	Embu Agricultural College	18,392,512.00
15	Farmers Training Stations	165,156,626.00
16	Finance and Accounts	31,510,222.00
17	Finance and Procurement Services	14,589,188.00
18	Food Security and Management Programme	236,963,048.00
19	Headquarters Administrative and Technical Services	86,954,002.00
20	Headquarters Extension Research Liaison and Technical Building Services	149,452,469.00
21	Horticulture Crop Development Authority	256,180,000.00
22	ICT Unit	

		2,250,052.00
23	Kenya Agricultural Productivity and Agribusiness Project	2,473,249,787.00
24	Kenya Plant Health Inspectorate Service	402,272,000.00
25	Land and Crop Development Service	466,380,445.00
26	Land Development and Machinery Services	227,546,662.00
27	Personnel Administration Services	2,572,920.00
28	Pesticide Control Products Board	104,658,879.00
29	Plant Genetic Resource	76,674,987.00
30	Policy and Agricultural Development Coordination Services	121,737,212.00
31	Private Sector Development Assistance	4,538,682.00
32	Pyrethrum Board of Kenya	299,707,346.00
33	Sericulture Stations	4,060,213.00
34	Small Holder Horticulture Marketing Programme	1,026,663,944.00
35	Small Scale Horticulture Development Project	134,855,107.00
36	State Corporations Unit	14,574,549.00
37	Tea Board of Kenya	20,160,000.00

Table A5.2: Operating costs of units in the State department of Livestock

S.No	Unit	TOTAL
1	AHITI Kabete	121,743,747.00
2	AHITI Ndomba	16,008,250.00
3	AHITI Nyahururu	10,484,152.00
4	Animal Production Farms	7,268,147.00
5	Animal Production Services	45,861,029.00
6	Apicultural and Emerging Livestock Services	5,150,390.00
7	Artificial Insemination Services	25,703,318.00
8	ASAL Based Livestock and Rural Livelihoods Support Project	14,681,209.00
9	Central Artificial Insemination Station	

		52,616,688.00
10	Central Veterinary Laboratory Services Kabete	108,883,501.00
11	Dairy Training School	4,605,522.00
12	Disease and Pest Control Services	169,958,274.00
13	Foot and Mouth Disease Control	54,557,391.00
14	Griftu Pastoral Training Centre	12,275,905.00
15	Integrated ASAL Programmes	274,013,901.00
16	Leather and leather products	45,903,378.00
17	Lenana National Bee Keeping Station	15,750,261.00
18	Livestock Breeding and Laboratory Services	31,470,013.00
19	Livestock Education and Extension Services	24,119,549.00
20	Livestock Information Services	45,054,336.00
21	Livestock Training Support Services	9,166,088.00
22	Livestock Vaccination and Branding Services	23,006,870.00
23	Management and Mitigation of Rift Valley Fever	1,341,777.00
24	Meat Inspectorate	35,558,707.00
25	Meat Training School Athi River	9,353,251.00
26	Mobile Pastoral Training Unit	1,676,050.00
27	Pastoral Areas Veterinary Services	4,416,707.00
28	Pastoral Areas Training Centre	1,956,735.00
29	Project Development Monitoring and Evaluation	3,660,014.00
30	Rabies Control	20,515,395.00
31	Range Management and Improvement	19,152,461.00
32	Sheep and Goats Improvement stations	18,578,909.00
33	Smallholders Dairy Commercialization Programme	58,019,239.00
34	Tick Control Programme	5,333,605.00
35	Veterinary Clinical Services	975,579.00

36	Veterinary Epidemiological Economics Disaster Preparedness and Management Unit	25,661,095.00
37	Veterinary Farms Development	35,581,983.00
38	Veterinary Headquarters	140,029,283.00
39	Veterinary Investigation Laboratory Services	164,230,950.00
40	Zoology Services and Pest Control	51,485,051.00

Source: Ministry of Agriculture, Livestock and Fisheries

Table A5.3: State Department of Agriculture - normative wage bill

State Department of Agriculture					
DIRECTORATE/ DIVISION/ DESIGNATION	**J/G**	**STANDARD No.**	**BASIC (KES)**	**HOUSE (KES)**	**TOTAL ANNUAL PAY (KES)**
IRRIGATION AND DRAINAGE					
Deputy Director - Agriculture	R	1	1,681,956	651,360	2,333,316
Senior Assistant Director - Agriculture	Q	1	1,391,010	651,360	2,042,370
Assistant Director - Agriculture	P	5	5,839,127	2,524,020	8,363,147
Chief Superintending Engineer Water	P	1	1,144,390	651,360	1,795,750
Chief Superintending Engineer-Agriculture	P	2	2,403,225	977,040	3,380,265
Principal Agricultural Officer	N	8	6,184,575	2,068,068	8,252,643
Senior Superintending Engineer - Irrigation	N	5	3,572,765	1,400,424	4,973,189
Senior Superintending Engineer-Agriculture	N	3	2,034,363	602,508	2,636,871
Chief Agricultural Officer	M	10	6,503,598	2,328,612	8,832,210
Superintending Engineer - Irrigation & Drainage	M	1	585,219	195,408	780,627
Engineer Agriculture	L	2	1,087,374	358,248	1,445,622
Senior Agricultural Officer	L	17	9,338,857	3,370,788	12,709,645
Senior Assistant Agricultural Officer	L	20	10,127,489	3,891,876	14,019,365
Senior Superintendent - Irrigation	L	26	13,792,669	4,934,052	18,726,721
Senior Superintendent Agriculture	L	14	7,480,461	2,931,120	10,411,581
Assistant Agricultural Officer	K	7	3,229,697	765,348	3,995,045
Chief Agricultural Assistant	K	3	1,287,507	260,544	1,548,051
Land Survey Assistant	K	1	457,950	81,420	539,370

Superintendent - Irrigation	K	4	1,996,109	358,248	2,354,357
Assistant Agricultural Officer	J	2	709,671	130,272	839,943
Office Administrative Assistant	J	1	314,469	97,704	412,173
Agricultural Assistant	H	2	299,495	48,852	348,347
Sub total		**136**	**81,461,976**	**29,278,632**	**110,740,608**
DIRECTORATE/ DIVISION/ DESIGNATION	**J/G**	**STANDARD No.**	**BASIC (KES)**	**HOUSE (KES)**	**TOTAL ANNUAL PAY (KES)**
AGRICULTURAL ENGINEERING					-
Senior Principal Superintending Engineer-Ag	R	1	1,681,956	651,360	2,333,316
Principal Superintending Engineer-Agricultural	Q	2	2,921,118	1,302,720	4,223,838
Assistant Director - Agriculture	P	3	3,340,159	1,954,080	5,294,239
Chief Superintending Engineer-Agriculture	P	3	3,785,066	1,954,080	5,739,146
Principal Agricultural Officer	N	4	3,016,691	1,563,264	4,579,955
Principal Assistant Office Administrator	N	1	752,807	390,816	1,143,623
Senior Superintending Engineer-Agriculture	N	3	2,338,570	1,172,448	3,511,018
Chief Agricultural Officer	M	1	585,219	325,680	910,899
Senior Assistant Office Administrator	L	1	530,207	325,680	855,887
Supply Chain Management Assistant[2]	J	1	299,495	81,420	380,915
Chief Driver	H	1	299,495	81,420	380,915
Driver	E	1	151,921	56,994	208,915
Support Staff Supervisor	E	1	159,572	56,994	216,566
Support Staff	B	1	120,954	48,852	169,806
Sub		24	19,983,231	9,965,808	29,949,039
STATE COOPORATION					
Assistant Director - Agriculture	P	2	2,179,799	1,302,720	3,482,519
Under Secretary	P	1	1,201,612	651,360	1,852,972
Principal Agricultural Officer	N	2	1,545,688	781,632	2,327,320
Senior Agricultural Officer	L	1	530,207	325,680	855,887
Assistant Office Administrator	K	1	395,652	162,840	558,492

Cleaning Supervisor	G	1	234,659	81,420	316,079
Driver	D	1	138,077	53,737	191,814
Sub total		**9**	**6,225,694**	**3,359,389**	**9,585,084**
ADIMINISTRATIVE SERVICE					-
Cabinet Secretary	4	1	12,824,064	2,400,000	15,224,064
DIRECTORATE/ DIVISION/ DESIGNATION	**J/G**	**STANDARD No.**	**BASIC (KES)**	**HOUSE (KES)**	**TOTAL ANNUAL PAY (KES)**
Principal Secretary	U	1	8,519,392	1,800,000	10,319,392
Director - DIT	S	1	1,760,006	977,040	2,737,046
Deputy Director - MCS	R	1	1,760,006	651,360	2,411,366
Deputy Director - Supply Chain Management S	R	1	1,532,233	651,360	2,183,593
Senior Assistant Director - Agriculture	Q	3	3,974,330	1,954,080	5,928,410
Senior Assistant Director - HRD	Q	1	1,261,689	651,360	1,913,049
Assistant Director - HRD	P	1	1,201,612	651,360	1,852,972
Assistant Director - ICT	P	1	1,201,612	651,360	1,852,972
Assistant Director - Supply Chain Management	P	1	1,144,390	651,360	1,795,750
Personal Assistant[1] (Presidency)	P	1	988,570	651,360	1,639,930
Principal State Counsel	P	2	1,882,976	1,302,720	3,185,696
Principal Agricultural Officer	N	3	2,298,495	1,172,448	3,470,943
Principal HRM Officer	N	1	792,882	390,816	1,183,698
Principal Information Officer	N	1	714,553	390,816	1,105,369
Principal Public Communications Officer	N	1	792,882	390,816	1,183,698
Principal Supply Chain Management Officer	N	1	714,553	390,816	1,105,369
Senior Assistant Secretary	N	1	792,882	390,816	1,183,698
Senior State Counsel	N	1	585,219	390,816	976,035
Chief Assistant Office Administrator	M	1	645,332	325,680	971,012
Chief Records Management Officer	M	1	614,365	325,680	940,045
Chief Supply Chain Management Officer	M	1	530,207	325,680	855,887
Senior Assistant Agricultural Officer	L	1	505,069	325,680	830,749

Senior Assistant Office Administrator	L	4	2,021,247	1,302,720	3,323,967
Senior HRM Assistant	L	2	938,853	651,360	1,590,213
Senior HRM Officer	L	3	1,491,040	977,040	2,468,080
Senior ICT Officer	L	1	505,069	325,680	830,749
Senior Records Management Officer	L	1	480,902	325,680	806,582
DIRECTORATE/ DIVISION/ DESIGNATION	**J/G**	**STANDARD No.**	**BASIC (KES)**	**HOUSE (KES)**	**TOTAL ANNUAL PAY (KES)**
Senior Supply Chain Management Officer	L	1	530,207	325,680	855,887
Assistant Office Administrator	K	5	1,959,313	814,200	2,773,513
HRM Assistant	K	2	791,303	325,680	1,116,983
HRM Officer	K	5	2,056,951	814,200	2,871,151
ICT Officer	K	4	1,744,364	651,360	2,395,724
Records Management Officer	K	1	395,652	162,840	558,492
Supply Chain Management Assistant	K	1	395,652	162,840	558,492
Supply Chain Management Officer	K	2	791,303	325,680	1,116,983
Telephone Supervisor	K	2	834,657	325,680	1,160,337
Chief Clerical Officer - General Office Service	J	1	314,469	97,704	412,173
Office Administrative Assistant	J	3	992,262	293,112	1,285,374
Records Management Officer	J	2	644,543	195,408	839,951
Senior Charge hand Building	J	1	346,347	97,704	444,051
Telephone Supervisor	J	2	662,820	195,408	858,228
Assistant Office Administrator	H	1	299,495	81,420	380,915
Assistant Security Officer	H	3	856,395	244,260	1,100,655
Charge hand Building	H	1	285,250	81,420	366,670
Chief Driver	H	8	2,367,473	651,360	3,018,833
HRM Assistant	H	1	299,495	81,420	380,915
Office Administrative Assistant	H	4	1,142,289	325,680	1,467,969
Senior Clerical Officer - General Office	H	4	1,169,491	325,680	1,495,171
Senior Clerical Officer - HRM	H	2	531,640	162,840	694,480

Senior Telephone Operator	H	4	1,010,818	325,680	1,336,498
Supply Chain Management Assistant	H	2	598,991	162,840	761,831
Artisan Grade - Building	G	1	258,716	81,420	340,136
Cleaning Supervisor	G	4	952,077	325,680	1,277,757
Clerical Officer- Accounts	G	1	258,716	81,420	340,136
DIRECTORATE/ DIVISION/ DESIGNATION	**J/G**	**STANDARD No.**	**BASIC (KES)**	**HOUSE (KES)**	**TOTAL ANNUAL PAY (KES)**
Clerical Officer - General Office Service	G	9	2,212,115	732,780	2,944,895
Office Administrative Assistant	G	1	258,716	81,420	340,136
Senior Driver	G	2	471,564	162,840	634,404
Supply Chain Management Assistant	G	1	123,195	81,420	204,615
Cleaning Supervisor	F	1	185,439	56,994	242,433
Clerical Officer - General Office Service	F	2	362,863	113,988	476,851
Driver	F	7	1,235,045	398,958	1,634,003
Artisan Grade - Building	E	1	159,572	56,994	216,566
Driver	E	9	1,413,197	512,946	1,926,143
Security Warden	E	1	159,572	56,994	216,566
Support Staff Supervisor	E	4	638,289	227,976	866,265
Driver	D	4	552,309	214,949	767,258
Support Staff	B	9	1,084,945	439,668	1,524,613
Sub		159	84,185,262	32,350,151	116,535,413
AGICULTURAL ATTACHEE'					-
Deputy Director - Agriculture	R	2	3,212,064	1,302,720	4,514,784
Sub total		**2**	**3,212,064**	**1,302,720**	**4,514,784**
DEVELOPMRNT PLANNING					-
Chief Economist	R	1	1,606,032	651,360	2,257,392
Principal Economist	P	1	1,144,390	651,360	1,795,750
Principal Agricultural Officer	N	2	1,545,688	781,632	2,327,320
Senior Economist	N	1	614,365	390,816	1,005,181

Economist	L	2	961,805	651,360	1,613,165
Senior Assistant Office Administrator	L	1	480,902	325,680	806,582
Assistant Office Administrator	K	1	395,652	162,840	558,492
Junior Agricultural Assistant	F	1	195,276	56,994	252,270
Support Staff Supervisor	E	1	159,572	56,994	216,566
DIRECTORATE/ DIVISION/ DESIGNATION	J/G	STANDARD No.	**BASIC (KES)**	**HOUSE (KES)**	**TOTAL ANNUAL PAY (KES)**
Sub total		**11**	**7,103,681**	**3,729,036**	**10,832,717**
POLICY & AGRIC. DEVELOPMENT COORPARATION.					-
Deputy Director - Agriculture	R	3	4,972,069	1,954,080	6,926,149
Senior Assistant Director - Agriculture	Q	3	4,110,113	1,954,080	6,064,193
Assistant Director - Agriculture	P	8	9,578,143	5,210,880	14,789,023
Principal Agricultural Officer	N	5	3,844,183	1,954,080	5,798,263
Assistant Office Administrator	K	1	436,091	162,840	598,931
Office Administrative Assistant	G	1	258,716	81,420	340,136
Cleaning Supervisor	F	1	176,331	56,994	233,325
Driver	F	1	185,439	56,994	242,433
Support Staff Supervisor	E	2	319,144	113,988	433,132
Driver	D	1	138,077	53,737	191,814
Sub total		**26**	**24,018,306**	**11,599,093**	**35,617,399**
AGRICULTURAL SECRETARY					-
Director - Agriculture	S	1	2,193,935	977,040	3,170,975
Principal Agricultural Officer	N	2	1,545,688	781,632	2,327,320
Senior Assistant Office Administrator	L	2	961,805	651,360	1,613,165
Senior Clerical Officer - General Office Se	H	1	285,250	81,420	366,670
Driver	E	1	159,572	56,994	216,566
Support Staff Supervisor	E	1	151,921	56,994	208,915
Sub total		**8**	**5,298,172**	**2,605,440**	**7,903,612**
FINANCE & ACCOUNTS					-
Chief Finance Officer	R	1	1,760,006	651,360	2,411,366

Senior Assistant Accountant-General	Q	1	1,201,612	651,360	1,852,972
Assistant Accountant-General	P	1	544,950	651,360	1,196,310
DIRECTORATE/ DIVISION/ DESIGNATION	J/G	STANDARD No.	**BASIC (KES)**	**HOUSE (KES)**	**TOTAL ANNUAL PAY (KES)**
Principal Accountant	N	1	714,553	390,816	1,105,369
Chief Accountant	M	2	1,171,532	651,360	1,822,892
Senior Finance Officer	M	1	614,365	325,680	940,045
Senior Accountant	L	3	1,540,345	977,040	2,517,385
Accountant	K	3	1,491,040	488,520	1,979,560
Finance Officer	K	1	395,652	162,840	558,492
Accountant	J	9	3,269,918	879,336	4,149,254
Finance Officer	J	1	363,324	97,704	461,028
Office Administrative Assistant	J	1	363,324	97,704	461,028
Senior Clerical Officer - General Office Se	H	1	285,250	81,420	366,670
Clerical Officer - General Office Service	G	1	234,659	81,420	316,079
Office Administrative Assistant	G	1	258,716	81,420	340,136
Clerical Officer - General Office Service	F	1	195,276	56,994	252,270
Support Staff Supervisor	E	2	319,144	113,988	433,132
Support Staff	B	2	241,908	97,704	339,612
Sub total		**33**	**14,965,573**	**6,538,026**	**21,503,599**
ATDC's					-
Senior Superintending Engineer-Agriculture	N	1	792,882	276,828	1,069,710
Superintending Engineer-Agriculture	M	3	1,941,461	553,656	2,495,117
Engineer Agriculture	L	11	5,916,800	2,002,932	7,919,732
Senior Agricultural Officer	L	3	1,540,345	602,508	2,142,853
Senior Assistant Agricultural Officer	L	4	2,021,247	716,496	2,737,743
Senior Superintendent Agriculture	L	8	4,166,242	1,644,684	5,810,926
Assistant Agricultural Officer[1]	K	1	480,902	130,272	611,174
Chief Agricultural Assistant	K	7	3,300,739	602,508	3,903,247

Engineer Agriculture	K	1	505,069	97,704	602,773
DIRECTORATE/ DIVISION/ DESIGNATION	**J/G**	**STANDARD No.**	**BASIC (KES)**	**HOUSE (KES)**	**TOTAL ANNUAL PAY (KES)**
Assistant Agricultural Officer	J	3	898,486	162,840	1,061,326
Assistant Agricultural Officer	H	2	570,501	86,305	656,806
Chief Driver	H	1	299,495	56,994	356,489
Office Administrative Assistant	H	1	271,649	56,994	328,643
Senior Clerical Officer - General Office Service	H	1	285,250	37,453	322,704
Cleaning Supervisor	G	3	661,945	162,840	824,785
Clerical Officer - General Office Service	G	4	883,306	184,009	1,067,315
Senior Driver	G	1	234,659	37,453	272,112
Cleaning Supervisor	F	3	575,990	122,130	698,120
Clerical Officer - General Office Service	F	1	195,276	34,196	229,472
Driver	E	6	949,782	218,206	1,167,988
Support Staff Supervisor	E	5	797,861	187,266	985,127
Senior Support Staff	D	1	138,077	35,825	173,902
Sub total		**71**	**27,427,965**	**8,010,100**	**35,438,064**
LAND & CROP DEVELOPMENT					-
Director - Agriculture	S	1	2,193,935	977,040	3,170,975
Deputy Director - Agriculture	R	3	4,972,069	1,954,080	6,926,149
Senior Assistant Director - Agriculture	Q	7	9,409,220	4,559,520	13,968,740
Assistant Director - Agriculture	P	20	23,401,172	12,115,296	35,516,468
Principal Agricultural Officer	N	23	17,638,796	8,809,644	26,448,440
Senior Superintending Engineer-Agriculture	N	1	792,882	390,816	1,183,698
Chief Agricultural Officer	M	2	1,170,439	488,520	1,658,959
Superintending Engineer-Agriculture	M	1	678,121	325,680	1,003,801
Senior Agricultural Officer	L	2	1,035,276	325,680	1,360,956
Senior Assistant Office Administrator	L	5	2,605,374	1,628,400	4,233,774
Senior Superintendent Agriculture	L	2	1,010,138	488,520	1,498,658

DIRECTORATE/ DIVISION/ DESIGNATION	J/G	STANDARD No.	**BASIC (KES)**	**HOUSE (KES)**	**TOTAL ANNUAL PAY (KES)**
Senior Supply Chain Management Officer	L	1	530,207	325,680	855,887
Assistant Office Administrator	K	2	810,976	325,680	1,136,656
Accountant	J	2	726,648	195,408	922,056
Assistant Office Administrator	J	1	363,324	97,704	461,028
ICT Officer	J	1	363,324	97,704	461,028
Office Administrative Assistant	J	1	314,469	97,704	412,173
Chief Driver	H	1	271,649	81,420	353,069
Supply Chain Management Assistant	H	1	285,250	81,420	366,670
Cleaning Supervisor	G	1	202,708	81,420	284,128
Clerical Officer - General Office Service	G	3	670,458	200,293	870,751
Cleaning Supervisor	F	1	176,331	56,994	233,325
Driver	F	1	176,331	56,994	233,325
Security Warden	F	1	176,331	56,994	233,325
Driver	E	7	1,109,354	376,160	1,485,515
Support Staff Supervisor	E	7	1,109,354	398,958	1,508,312
Driver	D	1	138,077	53,737	191,814
Support Staff	B	1	120,954	48,852	169,806
Sub total		100	72,453,168	34,696,319	107,149,487
AGRIBUSINESS & MARKET DEVELOPMENT					-
Deputy Director - Agriculture	R	3	4,972,069	1,954,080	6,926,149
Senior Assistant Director - Agriculture	Q	4	5,501,123	2,605,440	8,106,563
Assistant Director - Agriculture	P	3	3,441,488	1,954,080	5,395,568
Principal Agricultural Officer	N	6	4,677,140	2,344,896	7,022,036
Senior Assistant Agricultural Officer	L	1	505,069	325,680	830,749
Senior Assistant Office Administrator	L	1	480,902	325,680	806,582
Assistant Agricultural Officer	K	1	457,950	162,840	620,790
DIRECTORATE/ DIVISION/ DESIGNATION	J/G	STANDARD No.	**BASIC (KES)**	**HOUSE (KES)**	**TOTAL ANNUAL PAY (KES)**

Chief Agricultural Assistant	K	2	961,805	325,680	1,287,485
Office Administrative Assistant	J	1	330,074	97,704	427,778
Cleaning Supervisor	G	1	223,486	81,420	304,906
Cleaning Supervisor	F	1	176,331	56,994	233,325
Driver	E	1	159,572	56,994	216,566
Driver	D	1	138,077	53,737	191,814
Sub total		26	22,025,087	10,345,225	32,370,312
AGRICULTURAL EXTENSION SERVICES					-
Deputy Director - Agriculture	R	3	4,972,069	1,954,080	6,926,149
Senior Assistant Director - Agriculture	Q	16	21,875,339	8,825,928	30,701,267
Assistant Director - Agriculture	P	26	29,714,540	12,636,384	42,350,924
Principal Agricultural Officer	N	101	76,148,223	28,024,764	104,172,987
Senior Superintending Engineer - Irrigation	N	1	714,553	276,828	991,381
Senior Superintending Engineer-Agriculture	N	4	3,091,377	1,139,880	4,231,257
Chief Accountant	M	2	1,171,532	651,360	1,822,892
Chief Agricultural Officer	M	51	29,744,906	10,291,488	40,036,394
Chief Supply Chain Management Officer	M	1	614,365	325,680	940,045
Senior Lecturer	M	1	585,219	325,680	910,899
Superintending Engineer-Agriculture	M	6	4,068,726	1,546,980	5,615,706
Engineer Agriculture	L	2	1,114,333	439,668	1,554,001
Senior Agricultural Officer	L	19	9,875,622	3,598,764	13,474,386
Senior Assistant Agricultural Officer	L	7	3,612,719	1,612,116	5,224,835
Senior Assistant Office Administrator	L	10	5,057,369	2,589,156	7,646,525
Senior HRM Assistant	L	1	505,069	325,680	830,749
Senior Superintendent - Irrigation	L	1	530,207	162,840	693,047
Senior Superintendent Agriculture	L	2	1,087,374	390,816	1,478,190
DIRECTORATE/ DIVISION/ DESIGNATION	**J/G**	**STANDARD No.**	**BASIC (KES)**	**HOUSE (KES)**	**TOTAL ANNUAL PAY (KES)**

Senior Supply Chain Management Officer	L	1	480,902	244,260	725,162
Accountant	K	1	505,069	162,840	667,909
Agricultural Officer	K	5	2,293,030	488,520	2,781,550
Assistant Agricultural Officer	K	4	1,924,824	488,520	2,413,344
Assistant Office Administrator	K	3	1,208,449	358,248	1,566,697
Chief Agricultural Assistant	K	1	480,902	81,420	562,322
Engineer Agriculture	K	1	505,069	162,840	667,909
ICT Officer	K	2	872,182	244,260	1,116,442
Supply Chain Management Assistant	K	1	457,950	162,840	620,790
Accountant	J	1	363,324	97,704	461,028
Assistant Agricultural Officer	J	1	363,324	56,994	420,318
Assistant Office Administrator	J	10	3,358,277	773,490	4,131,767
ICT Officer	J	1	363,324	97,704	461,028
Office Administrative Assistant	J	13	4,480,869	903,762	5,384,631
Principal Driver	J	1	363,324	97,704	461,028
Records Management Officer	J	1	299,495	56,994	356,489
Assistant Office Administrator	H	1	299,495	48,852	348,347
Charge hand Building	H	1	271,649	81,420	353,069
Chief Driver	H	7	2,082,222	392,444	2,474,667
Office Administrative Assistant	H	9	2,474,668	434,783	2,909,451
Senior Clerical Officer - Accounts	H	1	285,250	37,453	322,704
Senior Clerical Officer - General Office Se	H	7	2,082,222	346,849	2,429,072
Supply Chain Management Assistant	H	1	299,495	48,852	348,347
Cleaning Supervisor	G	8	1,901,848	460,837	2,362,685
Clerical Officer - General Office Service	G	11	2,727,858	540,629	3,268,487
Clerical Officer	G	1	202,708	81,420	284,128
Office Administrative Assistant	G	3	776,147	131,900	908,048
DIRECTORATE/ DIVISION/ DESIGNATION	**J/G**	**STANDARD No.**	**BASIC (KES)**	**HOUSE (KES)**	**TOTAL ANNUAL PAY (KES)**

Senior Driver	G	2	405,415	130,272	535,687
Cleaning Supervisor	F	12	2,192,478	504,804	2,697,282
Clerical Officer - General Office Service	F	3	585,827	105,846	691,673
Driver	F	15	2,720,377	688,813	3,409,191
Junior Agricultural Assistant	F	1	195,276	56,994	252,270
Driver	E	28	4,414,465	1,178,962	5,593,427
Support Staff Supervisor	E	17	2,697,425	682,300	3,379,725
Driver	D	6	828,464	218,206	1,046,669
Senior Support Staff	D	3	414,232	97,704	511,936
Support Staff	B	3	362,863	122,130	484,993
Support Staff	A	2	228,793	70,021	298,814
		443	241,253,038	86,057,683	327,310,721
AIRC					-
Deputy Director - Agriculture	R	1	1,606,032	651,360	2,257,392
Senior Assistant Director - Agriculture	Q	1	1,324,777	651,360	1,976,137
Assistant Director - Agriculture	P	2	2,351,588	1,302,720	3,654,308
Principal Librarian	N	1	752,807	390,816	1,143,623
Principal Agricultural Officer	N	5	3,844,183	1,954,080	5,798,263
Chief Accountant	M	1	557,167	325,680	882,847
Chief Agricultural Officer	M	3	1,671,500	977,040	2,648,540
Senior Agricultural Officer	L	1	505,069	325,680	830,749
Senior Librarian	L	1	557,167	325,680	882,847
Chief Library Assistant	L	2	1,062,236	651,360	1,713,596
Senior Assistant Agricultural Officer	L	3	1,592,443	977,040	2,569,483
Senior Library Assistant	K	1	415,325	162,840	578,165
Assistant Office Administrator	K	2	772,358	325,680	1,098,038
Accountant	J	1	363,324	97,704	461,028
DIRECTORATE/ DIVISION/ DESIGNATION	**J/G**	**STANDARD No.**	**BASIC (KES)**	**HOUSE (KES)**	**TOTAL ANNUAL PAY (KES)**

Head Housekeeper/Cateress	J	1	346,347	97,704	444,051
Senior Clerical Officer - General Office Se	H	1	299,495	81,420	380,915
Agricultural Assistant	G	1	258,716	81,420	340,136
Clerical Officer - General Office Service	G	1	258,716	81,420	340,136
Cleaning Supervisor	G	2	459,238	162,840	622,078
Clerical Officer - General Office Service	F	1	195,276	56,994	252,270
Driver	F	1	176,331	56,994	233,325
Driver	E	1	159,572	56,994	216,566
Support Staff Supervisor	E	1	159,572	56,994	216,566
Cook	E	2	319,144	113,988	433,132
Driver	D	1	138,077	53,737	191,814
Support Staff	B	5	604,771	244,260	849,031
Sub		43	20,751,230	10,263,805	31,015,035
KENYA SCHOOL OF AGRICULTURE					-
Assistant Director - Agriculture	P	1	1,089,900	325,680	1,415,580
Principal Agricultural Officer	N	1	792,882	276,828	1,069,710
Chief Agricultural Officer	M	1	585,219	244,260	829,479
Senior Lecturer	M	4	2,340,877	977,040	3,317,917
Lecturer	L	1	505,069	244,260	749,329
Senior Assistant Agricultural Officer	L	1	505,069	244,260	749,329
Senior Youth Polytechnic Instructor	L	3	1,515,207	732,780	2,247,987
Office Administrative Assistant	J	1	363,324	73,278	436,602
Cleaning Supervisor	G	2	492,779	113,988	606,767
Clerical Officer - General Office Service	G	2	446,972	113,988	560,960
Senior Driver	G	1	202,708	56,994	259,702
Clerical Officer - General Office Service	F	1	195,276	47,224	242,499
DIRECTORATE/ DIVISION/ DESIGNATION	**J/G**	**STANDARD No.**	**BASIC (KES)**	**HOUSE (KES)**	**TOTAL ANNUAL PAY (KES)**
Cook	E	1	159,572	47,224	206,796

Driver	E	1	151,921	47,224	199,145
Support Staff Supervisor	E	1	159,572	47,224	206,796
Sub total		22	9,506,347	3,592,250	13,098,598
FOOD SECURITY (NMK)					-
Deputy Director - Agriculture	R	1	1,606,032	651,360	2,257,392
Assistant Director - Agriculture	P	2	2,351,588	1,302,720	3,654,308
Principal Agricultural Officer	N	3	2,338,570	1,172,448	3,511,018
Senior Assistant Office Administrator	L	1	480,902	325,680	806,582
Office Administrative Assistant	J	1	330,074	97,704	427,778
Principal Driver	J	1	363,324	97,704	461,028
Cleaning Supervisor	F	1	176,331	56,994	233,325
Driver	E	1	159,572	56,994	216,566
Support Staff Supervisor	E	1	159,572	56,994	216,566
Sub total		12	7,965,966	3,818,598	11,784,564
SERICULTURE STATIONS THIKA					-
Assistant Director - Agriculture	P	1	1,089,900	195,408	1,285,308
Chief Agricultural Officer	M	2	1,142,386	325,680	1,468,066
Senior Assistant Agricultural Officer	L	2	1,010,138	325,680	1,335,818
Assistant Agricultural Officer	K	1	480,902	81,420	562,322
Chief Agricultural Assistant	K	2	961,805	162,840	1,124,645
Office Administrative Assistant	J	1	299,495	48,852	348,347
Records Management Officer	J	1	363,324	48,852	412,176
Senior Charge hand Building	J	1	314,469	48,852	363,321
Agricultural Assistant	G	1	258,716	37,453	296,169
Clerical Officer - General Office Service	G	1	258,716	37,453	296,169
DIRECTORATE/ DIVISION/ DESIGNATION	**J/G**	**STANDARD No.**	**BASIC (KES)**	**HOUSE (KES)**	**TOTAL ANNUAL PAY (KES)**
Senior Driver	G	1	223,486	37,453	260,939
Support Staff Supervisor	E	1	159,572	34,196	193,769
Sub		15	6,562,909	1,384,140	7,947,049

GRAND TOTAL		**1140**	**654,399,672**	**258,896,416**	**913,296,088**

Source: State Department of Agriculture

Table A5.4: State Department of Livestock current (actual) wage bill

Grade*	Staff In Post	Cost per Staff (KES)	Total Cost (by Grade) (KES)
A	75	149,407	11,205,531
B	63	169,806	10,697,793
C	13	180,810	2,350,535
D	213	191,814	40,856,484
E	420	216,566	90,957,787
F	229	242,433	55,517,130
G	547	316,079	172,894,946
H	399	380,915	151,985,216
I	-	420,972	-
J	435	461,028	200,547,264
K	1,228	539,370	662,346,655
L	901	855,887	771,154,223
M	399	780,627	311,470,317
N	575	1,143,623	657,582,972
O	-	1,214,465	-
P	351	1,285,308	451,143,007
Q	209	2,042,370	426,855,370
R	144	2,411,366	347,236,651
S	8	3,170,975	25,367,800
U	1	10,319,392	10,319,392
		TOTAL	4,400,489,072

***Only provided Subvcode**
Source: State Department of Livestock

Table A5.5: Human resources cost for fisheries function at national level

Job group	Designation	Authorised	2015/2016	2015/2016			
	Headquarters and administration	2015/16	Basic (KES)	House Allowance (KES)	Commuting allowance (KES)	Leave allowance (KES)	Total gross pay (KES)
T	PROVINCIAL COMMISSIONER	1	3,344,899	501,600	288,000	50,000	4,184,499
Q	Deputy Secretary	1	1,327,781	501,600	240,000	10,000	2,520,981
Q	Deputy Chief Economist	1	1,327,781	501,600	240,000	10,000	2,520,981
Q	Senior Assistant Director-HRM	1	1,327,781	501,600	240,000	10,000	2,520,981
P	Under Secretary	1	1,040,354	501,600	144,000	10,000	2,137,554
N	Principal State Counsel	1	720,802	420,000	96,000	6,000	1,507,762
N	Principal Public Communication	1	720,802	420,000	96,000	6,000	1,507,762

	Officer						
N	Senior Statistician (1)	1	720,802	420,000	96,000	6,000	1,507,762
M	Chief HRM Officer	1	616,474	336,000	96,000	6,000	1,275,274
L	Senior Personal Secretary	6	3,039,091	2,016,000	432,000	36,000	6,847,891
L	Senior ICT Officer	2	964,013	672,000	144,000	12,000	2,233,613
L	Economist 1	1	437,184	336,000	72,000	6,000	1,071,984
L	Senior HRM Officer	2	874,368	672,000	144,000	12,000	2,143,968
K	Personal Secretary	4	1,510,272	792,000	240,000	24,000	3,007,872
K	Records Management Officer(1)	3	1,132,704	594,000	180,000	18,000	2,255,904
K	HRM Officer 1	1	377,568	198,000	60,000	6,000	751,968
K	ICT Officer	1	377,568	198,000	60,000	6,000	751,968
K	Assistant Secretary 3	1	377,568	198,000	60,000	6,000	751,968
J	Records Management Officer(2)	1	314,861	120,000	48,000	4,000	553,101
J	Assistant Secretary Cadet	1	314,861	120,000	48,000	4,000	553,101
H	Senior Clerical Officer-General Office Services	7	1,905,879	567,000	336,000	28,000	3,223,279
H	Secretarial Assistant(1)	2	544,537	162,000	96,000	8,000	920,937
	Finance Accounts & Procurement						
U	Permanent Secretary	1	7,240,860	1,800,000	288,000	50,000	10,526,060
R	Chief Finance Officer	1	1,600,005	600,000	192,000	10,000	2,843,605
M	Chief Supply Chain Management Officer	1	616,474	336,000	96,000	6,000	1,275,274
M	Senior Finance Officer	1	616,474	336,000	96,000	6,000	1,275,274
L	Senior Accountant	4	2,026,061	1,344,000	288,000	24,000	4,565,261
K	Accountant(1)	3	1,079,050	594,000	180,000	18,000	2,202,250
K	Supply Chain Management Assistant(1)	3	1,132,704	594,000	180,000	18,000	2,255,904
K	Finance Officer (2)_	2	755,136	396,000	120,000	12,000	1,503,936
J	Senior Secretarial Assistant	1	272,268	81,000	48,000	4,000	460,468

J	Accountant(2)	7	2,204,026	840,000	336,000	28,000	3,871,706
G	Supply Chain Management Assistant(4)	2	470,392	162,000	96,000	8,000	846,792
	Marine and Coastal						
Q	Senior Assistant Director-Fisheries	3	3,983,342	1,620,000	720,000	30,000	7,678,142
P	Assistant Director-Fisheries	2	2,293,980	1,080,000	288,000	20,000	4,123,580
N	Principal Fisheries Officer	5	3,604,008	2,100,000	480,000	30,000	7,538,808
H	Records Management Officer(3)	1	272,268	81,000	48,000	4,000	460,468
	Inland and Riverine						-
Q	Senior Assistant Director-Fisheries	2	2,655,562	1,080,000	576,000	100,000	5,294,762
P	Assistant Director-Fisheries	2	2,293,980	1,080,000	288,000	20,000	4,123,580
N	Senior Executive Secretary	1	720,802	420,000	96,000	6,000	1,507,762
J	Personal Secretary 11	2	629,722	240,000	96,000	4,000	1,102,202
H	Charge hand Mechanical	1	246,954	81,000	48,000	4,000	435,154
G	Fisheries Assistant (2)	4	940,785	324,000	192,000	16,000	1,523,569
	Directorate of Aquaculture						
Q	Senior Assistant Director-Fisheries	5	6,638,904	2,700,000	1,440,000	250,000	13,236,904
P	Assistant Director-Fisheries	2	2,293,980	1,080,000	288,000	20,000	4,123,580
N	Principal Fisheries Officer	5	3,604,008	2,100,000	480,000	30,000	6,346,488
K	Chief Fisheries Assistant	2	755,136	396,000	120,000	12,000	1,503,936
H	Fisheries Assistant (2)	4	940,785	324,000	192,000	4,000	1,562,353
A	Support Staff (3)	5	519,984	225,000	240,000	20,000	1,170,584
	Directorate of Quality Assurance						
S	Director Fisheries	1	2,167,920	720,000	288,000	50,000	3,888,320
Q	Senior Assistant Director-Fisheries	2	2,886,480	1,080,000	576,000	100,000	5,525,680
P	Assistant	2	2,293,980			20,000	

	Director-Fisheries			1,080,000	288,000		4,123,580
N	Principal Fisheries Officer	5	3,917,400	2,100,000	480,000	30,000	7,852,200
J	Lab Technologist 2	2	684,480	240,000	96,000	4,000	1,156,960
G	Cleaning Supervisor(1)	3	766,944	243,000	144,000	4,000	1,323,544
F	Driver (1)	3	578,880	162,000	144,000	12,000	1,012,800
	DIRECTORATE OF FISHERIES						
	designation						
T	Fisheries secretary	1	3,635,760	960,000	288,000	50,000	5,893,760
P	Assistant director of fisheries	1	2,493,456	1,080,000	144,000	10,000	4,207,456
L	senior Assistant Fisheries Officer	5	2,376,000	1,680,000	360,000	30,000	4,566,000
M	Senior Telephone Operator	1	295,944	336,000	96,000	6,000	793,944
H	Supply Chain Management Assistant(3)	1	295,944	81,000	48,000	4,000	488,944
E	Driver 2	10	1,576,800	540,000	480,000	40,000	3,056,800
C	Support Staff(1)	2	249,120	90,000	96,000	8,000	491,120
	FISHERIES AND HATCHARY						
N	Principal Fisheries Officer	5	3,604,008	2,100,000	480,000	30,000	7,538,808
M	Chief gender & social development officer	2	1,232,947	672,000	192,000	12,000	2,550,547
G	Clerical Officer[1] - General Office Service	16	3,763,139	1,296,000	768,000	64,000	6,774,339
	Fisheries Regional centres						
M	Chief Fisheries Assistant[2]	2	1,134,311	672,000	192,000	12,000	2,451,911
L	Senior Fisheries Officer	7	3,040,702	2,352,000	504,000	42,000	7,484,302
J	Senior Secretarial Assistant	5	1,564,228	600,000	240,000	20,000	2,755,428
J	Senior Charge hand Mechanical	1	312,846	120,000	48,000	4,000	551,086
H	Chief Driver	3	811,578	243,000	144,000	12,000	1,376,178
H	Charge hand Building	2	541,052	162,000	96,000	8,000	917,452

G	Senior Driver	2	423,921	162,000	96,000	8,000	740,705
G	Lab Technician[2]	1	211,961	81,000	48,000	4,000	370,353
F	Cleaning Supervisor[2a]	2	335,004	108,000	96,000	8,000	611,036
F	Clerical Officer[2] - General Office Service	3	477,825	162,000	144,000	12,000	911,745
	Deep Sea						
F	Artisan Grade[1	3	639,978	162,000	144,000	12,000	1,034,154
D	Senior Support Staff	4	502,099	198,000	192,000	16,000	1,053,827
D	Driver[3]	2	251,050	99,000	96,000	8,000	526,914
A	Support Staff(3)	5	519,984	225,000	240,000	20,000	1,170,584
			117,311,341	52,569,000	18,216,000	1,698,000	221,309,989

Table A5.6: Activities, inputs and costs for agriculture and livestock at county level

FIELD DEMONSTRATIONS FOR AGRICULTURE AND LIVESTOCK (AGRICULTURE AND LIVESTOCK EXTENSION SERVICES)			
Preparatory activities	**Quantity of input used to provide a unit**	**Unit Cost (KES)**	**Total cost (KES)**
Transport /motorbike(litres of fuel)	5	90.00	450.00
Motorbike cost	1	739.73	739.73
subsistence allowance(officers)	2	1,500.00	3,000.00
Airtime	1	1000	1,000.00
Publicity			-
Public address system hire	1	10,000	10,000.00
Actual field day			-
transport /motor vehicle	30	90.00	2,700.00
subsistence allowance(5 officers)	5	1500	7,500.00
Materials			-
flip charts	1	550	550.00
manila papers	10	30	300.00
felt pen	1	600	600.00
masking tapes	1	120	120.00
Farm inputs			-
Fertilizer			-
DAP	1	2000	2,000.00
CAN	1	1600	1,600.00
Seeds			-
De-wormers (1 litre)	1	1000	1,000.00
Akaricide(1 litre)	1	1000	1,000.00
Feeds(50 kg)bag	2	1400	2,800.00
Mineral leaks (KG)	2	200	400.00
Milking jelly	3	200	600.00
Disinfectant(litres)	1	600	600.00
syringe tubes(poly tubes)	2	800	1,600.00
molasses(10 litres)	1	400	400.00
hay bout	1	3000	3,000.00
FARMER FIELD DAYS			-
Preparatory activities			-
Transport /motorbike(litres of fuel)	5	90.00	450.00
subsistence allowance	1	1,000.00	1,000.00
Publicity			-
Public address system hire	1	10,000	10,000.00
Actual field day			-
transport /multivehicle	30	90.00	2,700.00
subsistence allowance(5 officers)	5	1000	5,000.00
Materials			-

flip charts	1	550	550.00
manila papers	10	30	300.00
felt pen	1	600	600.00
masking tapes	1	120	120.00
Tent(hire)	1	20,000	20,000.00
Farm inputs			-
Fertilizer			-
DAP	1	2000	2,000.00
CAN	1	1600	1,600.00
Seeds			-
(1 litre)	1	1000	1,000.00
Akaricide(1 litre)	1	1000	1,000.00
Feeds(50 kg)bag	2	1400	2,800.00
Mineral leaks (KG)	2	200	400.00
Milking jelly	3	200	600.00
Disinfectant(litres)	1	600	600.00
syringe tubes(poly tubes)	2	800	1,600.00
molasses(10 litres)	1	400	400.00
Human resources cost	5	13500	67,500.00
hay bout	1	3000	3,000.00
		Total cost	**165,179.73**
FARMER FIELD SCHOOL (AGRICULTURE AND LIVESTOCK EXTENSION SERVICES)		**Unit price of each Input (KES)**	**Total cost (KES)**
Identifying the farm(days)	2	4500	9,000.00
Transport(litres)	10	90	900.00
subsistence allowance	1	1000	1,000.00
Sensitization(3 days)			-
Transport(litres)	30	90	2,700.00
subsistence allowance	5	1000	5,000.00
land preparation			-
primary cultivation	1	3000	3,000.00
secondary cultivation	1	3000	3,000.00
Harrowing	1	3000	3,000.00
seeding	1	3000	3,000.00
Planting(labour)	1	3000	3,000.00
Weeding	1	5000	5,000.00
subsistence allowance	2	1500	3,000.00
Transport(litres)	10	90	900.00
Equipment			-
spraying pump	1	16.43835616	16.44
Construction of a crash			-
timber(foot)	12	30	360.00
Nails(Kg)	5	150	750.00
Posts	8	200	1,600.00
Labour			-
Input for feed formulation			-
Maize(90kg bag)	1	3000	3,000.00
wheat bran(50kg bag)	1	2500	2,500.00
Premixes(10kg)	1	600	600.00
Assorted minerals	1	2000	2,000.00
Fish meal(50kg bag)	1	3000	3,000.00

other equipments			-
Milking Can(10ltr)	1	1000	1,000.00
Aluminium milking pale	1	1500	1,500.00
Strip cup	1	500	500.00
Sieve	1	100	100.00
Dehorning wire(meter)	1	250	250.00
Stationery			-
Notebooks	50	40	2,000.00
Pens	50	20	1,000.00
Manila papers	20	30	600.00
Flip charts	1	550	550.00
Felt pens(packet)	1	600	600.00
Certificates			-
printing Certificates(number of farmers)	30	200	6,000.00
Human resources cost	3	13500	40,500.00
		Unit cost	**110,926.44**
RESIDENTIAL TRAININGS			-
Boarding(farmers)	40	4000	160,000.00
Fare refund	40	300	12,000.00
Stationery			-
Notebooks	50	40	2,000.00
Pens	50	20	1,000.00
Manila papers	20	30	600.00
Flip charts	1	550	550.00
Felt pens(packet)	1	600	600.00
Trainer allowance	2	2000	4,000.00
INDIVIDUAL FARM VISIT			-
Transport(litres) per visit	5	90	450.00
subsistence allowance	1	1500	1,500.00
		Total cost	**293,626.44**
DIPPING AND SPRAYING OPERATIONS			
INPUT DESCRIPTION	**Quantity of input used to provide a unit**	**Unit price of each Input (KES)**	**Total cost (KES)**
Initial purchase of acaricides	126 dips	35,000	35,000
Water		6,000	6,000
Dip Infrastructure		470,000	64
To engage dip attendant on casual basis	126 dips	9,000	450
Ward vet. Officers	25	59590	71,508
		unit cost	**113,022**
VACCINATION CAMPAIGNE (PER COUNTY)			
INPUT DESCRPTION	**Quantity of input used to provide a unit**	**Unit price of each Input (KES)**	**Total cost (KES)**
Purchase of Foot & Month Vaccines	250,000 doses	105	26,250,000
Awareness campaigns and mobilization of farmers	125 barasas	10,000	1,250,000
Purchase of Anthrax and Black quarter Vaccines	250,000	18	4,500,000
Awareness campaigns and mobilization of	125	10,000	1,250,000

farmers			
Purchase of Lumpy skin disease vaccines	250,000	6	1,500,000
Awareness campaigns and mobilization of farmers	125	10,000	1,250,000
Purchase Newcastle disease	1,000,000	2	2,000,000
Human resources cost	20	22500	450,000
Purchase of antirabies vaccines	20,000 doses	45	900,000
Purchase of strynine	3kg	135,000	405,000
Awareness campaigns and mobilization of farmers	125	10,000	1,250,000
Total		**Total cost**	**41,005,000**
VETERINARY PUBLIC HEALTH			
INPUT DESCRPTION	**Quantity of input used to provide a unit**	**Unit price of each Input (KES)**	**Total cost (KES)**
Establishment and renovations of slaughter houses.	5	1,757,551	8787755
Purchase and detergents and disinfectants.	125	50,000	6250000
Purchase of protective attires for meat inspectors.	50	5000	250000
Human resources cost	5	22500	112500
Water supply and exhaustion of the soak pits , blood tanks and condemnation pits	125	10,000	1250000
Total		**Total cost**	**16,650,255**
EXTENSION SERVICES ON HERD HEALTH MANAGEMENT AND ANIMAL WELFARE ISSUES			
INPUT DESCRPTION	**Quantity of input used to provide a unit**	**Unit price of each Input (KES)**	**Total cost (KSH)**
Identification of the training needs. Quick assessment to establish areas farmers need to trained is done through administration of questionnaires	50 enumerators	15,000	750,000
Purchase of training materials	25 sets	5000	125,000
Public awareness and mobilization campaigns	50	5000	250,000
Human resources cost	50	4500	225,000
Training of the farmers	50	10,000	500,000
Total		**Total cost**	**1,850,000**
A.I. SERVICES			
INPUT DESCRPTION	**Quantity of input used to provide a unit**	**Unit price of each Input (KES)**	**Total cost (KES)**
Engagement of A.I inseminators	25	25,000	625,000
Tagging & Registration @ KES. 100 per cow	9000	100	900,000
Consumables -plastic soaks and hand gloves 2 KES. 30 per insemination.	750	3333.3	2,499,975
Semen & liquid Nitrogen for 750 inseminations per month	750	6666.6	4,999,950

Desktop computer	25	50,000	1,250,000
Software for cow registration	25	100,000	2,500,000
Total		**Total cost**	**12,774,925**
MARKETING OF AGRICULTURAL PRODUCTS			
Marketing infrastructure			
Cold rooms	Nairobi store , Kisumu Store, Narok store, Machakos	Nairobi @5 m	
		Kisumu @3m	
		Narok @ 3m	
		Machakos @2m	13,000,000
Food stores/depots	Nairobi store @ 10m , Kisumu Store @5m, Narok store @5m Machackos @3m,	Office Rents, Renovation & refurbishing for 4 stores	23,000,000
Refrigerated truck	one truck	1 truck @6m	6,000,000
10 ton lorry	One lorry	one lorry @6m	6,000,000
Pick up	One pick up for local deliveries	one pick up @3m	3,000,000
Double cabin	One double cabin for staff and produce promotions	one double cabin @3m	3,000,000
Marketing Activations	Road shows, exhibitions, trade fairs, advertisement through print, media and advertising agencies.	Quarterly	10,000,000
Research and development	Market intelligence and continuous market research, survey and pricing	Continuous	6,000,000
Marketing strategy paper	Contract a marketing	once	2,000,000

	consultant		
		Total cost	**72,000,000**
COOPERATIVE DEVELOPMENT AND MICROFINANCE			
Trainings to multipurpose cooperatives management team	1	-	-
Development of business/ strategic plans for cooperatives	1	1,000,000	1,000,000
Computers and software development for cooperatives	1	-	-
Audits, Inspections and AGMs/SGMs	1	-	-
Financing Multipurpose Cooperative Societies with revolving funds, LPO/LSO financing and advance against proceeds	1	-	-
		Total cost	**1,000,000**
POLICY FORMULATION			
Problem statement	1	1000000	1,000,000
Refer to existing laws i.e. constitution of Kenya, vision 2030.international treaties and conventions which are ratified by the government of Kenya(research work)	1	2000000	2,000,000
Draft policy	1	2000000	2,000,000
Forward the draft policy to legal department	1	500000	500,000
Draft forwarded to the county executive	1	2000000	2,000,000
Public participation in the whole county	1	3000000	3,000,000
In cooperating public views into the draft policy and send the draft to the attorney office	1	500000	500,000
Send the draft to the executive	1	500000	500,000
Then forward the policy draft to the County Assembly		**Total cost**	**11,500,000**

Source: Costing of Government Functions Survey Data
****Consult Ms Excel Files Provided**