

KENYA NATIONAL BUREAU OF STATISTICS



Data Quality Assessment Framework (DQAF)

O. Prerequisites

O.1 Legal environment

O.1.1 Responsibility for collecting, processing, and disseminating statistics

KNBS draws its mandate for collecting, compiling, analyzing, abstracting, and disseminating statistical information on Kenya's official statistics from the Statistics Act 2006. Specifically the act identifies KNBS as the principal agency of the government for collecting, analysing and disseminating statistical data in Kenya and permits KNBS to plan, authorise, coordinate and supervise all official statistical programmes undertaken within the national statistical system.

The Statistics Act can be downloaded from

http://www.knbs.or.ke/index.php?option=com_phocadownload&view=category&id=23:policies-manuals&Itemid=599

National accounts

The national accounts are published in accordance with Statistics Act 2006.

O.1.2 Data sharing and coordination among data producing agencies

The Statistics Act gives KNBS the responsibility of coordinating the National Statistical System (NSS). The Act provides for a comprehensive approach to statistical cooperation in Kenya, including access to data for the purposes of official statistics production.

The NSS includes producers and users of statistics under the supervision and coordination of the KNBS and mainly comprises of government Ministries, Departments, and State Agencies (MDAs).

The Statistics Act empowers the Director General of KNBS to share data at the request of any person or agency upon payment of any fee that may be applicable provided the data is shared is not about individual persons or entities.

KNBS collaborates and holds regular meetings with several key data providers such as The National Treasury, Central Bank of Kenya, Kenya Revenue Authority, and Ministry of Agriculture to promote understanding on data requirements. KNBS has Memoranda of Understanding with the key data

providers to facilitate data sharing and ensure access to data in a standardized manner.

0.1.3 Confidentiality of individual reporters' data

The Statistics Act (Section 22) stipulates that the KNBS cannot publish, or otherwise make available to any individual or organization, information that would enable the identification of any individual person or entity.

Individuals engaged in any bureau activity are obliged to sign an oath of secrecy for the confidentiality of the statistics collected.

In addition, national accounts compilation systems are separate from other computer systems within KNBS and necessary IT security measures are put in place. Documentation is always done in a secure manner. Information is only disseminated in an aggregated manner through Statistical releases and/or on the KNBS website.

0.1.4 Ensuring statistical reporting

The Statistics Act specifies how data and information should be collected to ensure adherence to statistical reporting, specifically Sections 16, 19 and 21.

KNBS policies and practices emphasize the requirement for the authorized person (research assistant mandated to conduct the statistical data collection) to clearly explain the purposes of the survey/census to the respondent during the introduction. During the data collection design, the burden placed on respondents is considered and measures are taken to reduce respondents' fatigue.

Every questionnaire indicates contact persons who can provide assistance in responding, as well as information on how to complete the questionnaire and explanations for answering the questions.

Also, every paper and internet questionnaire contains legally required information on the purpose, type, and scope of the survey, obligation to provide information, reporting unit, confidentiality, and other aspects of the survey. In particular, a reference to the Statistics Act is given in surveys and statistical inquiries.

To encourage future participation, the KNBS provides respondents with information on the results of the survey, upon request and in conformity with established statistical confidentiality guidelines.

0.2 Resources

0.2.1 Staff, facilities, computing resources, and financing are commensurate with statistical programs.

The national accounts estimates are compiled in a unit comprising 5 members of staff who have the requisite training in national accounts from in reputable

institutions and experts. They all have the required and sufficient computing. Since that number is limited the various activities are shared amongst the staff. The sharing is done in such a way as to maximize their output while ensuring that every staff familiarizes themselves with all the section's activities. For the purposes of monitoring and evaluation, staff are appraised semi-annually based on prior agreed targets that are derived from the national accounts' work programme. All staff are recruited on the basis of professional qualifications and in open competition.

The national accounts section has sufficient computing resources that are available to all the staff and back-up procedures are utilized to ensure security of data. When necessary, other KNBS staff and facilities are used to support the national accounts activities. Though the KNBS budget is usually tight, work plans are developed in consideration of resource availability and cost-benefit analysis to maximize on outputs and outcomes.

0.2.2 Measures to ensure efficient use of resources are implemented

Annual budgetary process/performance contract

Planning of resources is carried out centrally on an annual basis. Funds are allocated by the National Treasury for ongoing statistical activities, such as the annual and quarterly National Accounts as well as for ad hoc surveys and development projects. Work is carried out and reviewed on the basis of the Performance Contract with the ministry; efficient use of resources is followed up on a quarterly basis.

Work programme

KNBS activities are guided by the Strategic Plan. An annual schedule of activities (work plan) is then drawn from the Strategic Plan. The annual work plan includes itemized budget which guide the timing of the activities as well as optimization of resources.

0.3 Relevance

0.3.1 Monitoring user requirements

KNBS relies on a number of sources to monitor user requirements. For National Accounts, KNBS refers to the international recommendations as contained in the SNA and various handbooks on national accounts. In addition, KNBS is in frequent consultations with institutions such as universities, KIPPRA, Ministry of Devolution and Planning, Central Bank of Kenya, Ministry of Finance, IMF, World Bank, UNECA, experts on statistics and on economic and social subjects and individual researchers. KNBS monitors data needs from such data users to inform its plans for further developments of the national accounts.

For special subjects, expert committees are constituted mainly from key stakeholder institutions to advise the KNBS management on different statistical domains. Stakeholders' workshops are held in which users and data providers are given a chance to articulate their interests, representatives of the KNBS can

	<p>explain methodology and clarify the feasibility of proposals in discussions with the parties concerned.</p> <p>Views of users of official statistics are also collected through frequent data request by emails, letters, telephone calls and office visits. Ad-hoc and periodic user satisfaction surveys are also conducted. KNBS also organizes for dissemination workshops during which participants are allowed to ask a few questions or make comments regarding official statistics and such feedback is used to enrich KNBS understanding of users needs.</p>
<p><u>0.4 Quality management</u></p>	<p><i>0.4.1 Processes in place to focus on quality</i></p> <p>KNBS has an established Quality Policy that has been in place since 2008 and this policy is published on the KNBS website and made available in all the bureau offices. This can be downloaded from http://www.knbs.or.ke/index.php?option=com_phocadownload&view=category&id=23:policies-manuals&Itemid=599</p> <p>The policy states that KNBS is committed to providing quality statistics and associated services effectively and efficiently. The Bureau should be customer- and results-focused. The top management of KNBS is committed to the Quality Management System (QMS), modeled on the ISO 9001:2015 international standard, and shall provide the necessary resources to achieve all the set objectives and ensure effective communication and implementation of the QMS.</p> <p>To keep it abreast with prevailing circumstances, this Quality Policy shall be reviewed at least once every three years.</p> <p><i>0.4.2 Quality monitoring</i></p> <p>As noted above the quality policy dictates that internal audits are to be carried out on a regular basis and there is an internal auditor in place for this purpose. A dedicated quality team is also in place to support and monitor the implementation of the principles within the quality policy.</p>
<p>1. Integrity</p>	
<p><u>1.1 Professionalism</u></p>	<p><i>1.1.1 Impartiality of statistics</i></p> <p>The Statistics Act 2006 provides for the organization of KNBS as a semi-autonomous government agency. KNBS is headed by a Director General, who is authorized to direct the statistical systems in the institutions of the State, and is required to act on the basis of scientific considerations.</p> <p>The national accounts statistics are produced in adherence to the internationally accepted standards and published according to an advanced</p>

release calendar which is available on KNBS' website in order to avoid any external pressure regarding the timing of the publication.

The KNBS has a reputation of professionalism, scientific approach in the compilation of statistics, and being an impartial organization. Competitive recruitment is used to enhance professionalism and staff participates in regional and international workshops to ensure further knowledge of best statistical practices.

1.1.2 Selection of sources, methodology, and modes of dissemination

The national accounts statistics are produced in adherence to the internationally accepted standards, in particular following the principles outlined in SNA2008.

Though KNBS solicits for user needs and requirements for official statistics, it decides independently what statistics to compile and develop, which sources to use, and what methods to apply. It also decides what to publish as official statistics and when and how this will be done. The decision on dissemination is often based on scientific and technological considerations as well as budget restrictions and user needs.

1.1.3 Commenting on erroneous interpretation and misuse of statistics

The reactions of the media in Kenya to KNBS publications are monitored and evaluated daily through the Communications Office. Response to erroneous interpretations and misinformation are then sent to the media as need arise. Erroneous interpretation or inquiries by other users are responded to on individual basis.

1.2 Transparency

1.2.1 Disclosure of terms and conditions for statistical collection, processing, and dissemination

The Statistics Act 2006 is available to the public on the KNBS website at http://www.knbs.or.ke/index.php?option=com_phocadownload&view=category&id=23:policies-manuals&Itemid=599. Hard copies of the Act are also available from the KNBS library.

During the conducting of surveys and censuses, KNBS informs respondents of the objectives of the relevant survey/census, noting that the information received will be used for statistical purposes only. In addition, KNBS informs the respondents of their rights and obligations in provision of the information sought. Contact details of the relevant experts (mostly 2) are provided for in case of any inquiries on technical and administrative issues.

In all KNBS publications details on the contact persons, addresses, telephone numbers, e-mail addresses, and other relevant information of interest are always provided.

Whenever major revisions on methodologies and data sources are done, journalists receive methodological information on the new statistics at press conferences and other events. The information on the topic of interest is provided through presentations and information notes. The disseminated information is also uploaded on the KNBS website. An advanced release calendar is published on the website, with publication dates for all key statistics

1.2.2 Internal governmental access to statistics prior to release

KNBS releases statistics in formats and at times convenient to broad range of users, and which promote widespread access and informed debate. In this respect, the Bureau does not provide data to any institution or external person before its official releases. Access to national accounts data by government ministries, departments and agencies is normally provided on the same day, after the official release.

1.2.3 Attribution of statistical products

All statistics are published on KNBS website. Information about KNBS is included in all publications and the majority of publications include a forward or introduction from the Director General of the bureau.

All data published are identifiable by KNBS logo or name on the publication.

1.2.4 Advance notice of major changes in methodology, source data, and statistical techniques.

Major changes in methodology, source data, and statistical techniques are discussed by stakeholders groups, peer reviewers before released to the users in advance and when changes are introduced. Explanations of new methods and changes in source data and statistical techniques are published on the website and in all relevant print publications. Special publications for preliminary results also make changes transparent. The bureau makes consultations with various stakeholders groups and have the information peer reviewed before publishing. Major changes are also discussed with users well in advance (over a year, at times) in dedicated seminars.

1.3 Ethical standards

1.3.1 Guidelines for staff behavior

All bureau staff are bound by the Code of Conduct for KNBS employees, which states that "An employee in whom a position of public trust and authority is vested in shall exercise the trust and authority in the best interest of the people of Kenya".

All new staff attend an induction programme which includes sensitization on the guidelines and codes of conduct for staff.

2. Methodological soundness

2.1 Concepts and definitions

2.1.1 Concepts and definitions follow international standards

Analytical framework:

The overall structure and compilation of National accounts (annual and quarterly) is in accordance with the System of National Accounts 2008(SNA 2008).The *2008 SNA* was implemented in 2014, and historical series beginning 2006 were revised. Work on back casting to 2001 (previous base year) is on-going.

Definitions:

The Gross Domestic Product (GDP) is the monetary value of all the final goods and services produced within a country in a specific time. In Kenya, annual GDP is calculated from the production and expenditure approaches. The approaches are defines as:

- **GDP by Production:** This is the value of output less the value of goods and services used to produce the output (intermediate consumption) from all the economic activities within the production boundaries of the economy.
- **Expenditure on GDP:** This approach involves computing the sum of Private final consumption expenditures and government final consumption expenditures, Investment by private and Government enterprises, and difference between exports and imports.
 - **Government Final consumption expenditure:** The expenditure incurred by the general government on a wide range of consumption goods and services either on collective services or selected individual goods or services. Government final consumption expenditure is derived as: Value of all types of output of general government less the value of output for own capital formation less the values of any receipts from sales plus value of goods and services purchased for delivery to households free or at economically insignificant prices.
 - **Private final consumption expenditure** refers to the consumption of households and non-profit institution serving the households including expenditure of residents abroad but excludes expenditure of non-residents locally.
 - **Gross fixed capital formation** measures the value of a producer's acquisitions of new and existing fixed assets less disposal of that type of assets during the accounting period more plus specified expenditure that adds value to the non-produced assets. It includes intellectual property and major improvements on existing assets.

	<ul style="list-style-type: none"> ▪ Changes in inventories are the value of entries into the inventories less value of withdrawals and value of any recurrent losses of goods held in inventories during the accounting period.
<p><u>2.2 Scope</u></p>	<p><i>2.2.1 Scope broadly consistent with international standards</i></p> <p>Transaction coverage The production boundary is consistent with the SNA 2008 and includes production of goods whether they are sold or not.</p> <p>Geographic coverage Kenya administrative boundaries and embassies.</p> <p>Exceptions to coverage Activities not currently covered in the compilation of national accounts statistics include illegal activities, expenditure on computer software and databases, and entertainment, literary and artistic originals. Leases and other transferable contacts are also not included.</p> <p>Unrecorded activity Adjustments are made for certain types of under-reporting, such as expenditures consumption of alcohol and tobacco. Estimates for consumption from own agricultural production is also included.</p> <p>Asset boundary The asset boundary for fixed assets consists of goods and services that are used in the production for more than one year. Fixed assets included in Kenyan national accounts compilation consist of; Dwellings, non-residential building with a lifespan of 40 years, Other structures with a life span of 30 years. Other machinery and equipment, Transport equipment, ICT equipment with a lifespan of 10, 8, and 5 years respectively.</p> <p>Gross Capital stock is calculated according to the SNA 2008 guidelines.</p>
<p><u>2.3 Classification/sectorization</u></p>	<p><i>2.3.1 Classification/sectorization broadly in line with international standards</i></p> <p>Classification systems Economic activities are classified according to International Standard Industrial Classification of all economic activities revision 4 (ISIC rev 4) with a few modifications (e.g. processing of tea and coffee are treated as manufacturing activities).</p> <p>Products are classified according to the Classification of Product by Activity (CPA).</p> <p>Household final consumption expenditure is classified according to the COICOP. Final consumption expenditure of non-profit institutions serving households (NPISHs) is classified according to the COPNI.</p>

	<p>The classification of government final consumption expenditure is according to COFOG. Gross fixed capital formation is classified by type of assets and type of economic activity. Foreign trade is classified according to the Harmonized System.</p>
<p><u>2.4 Basis for recording</u></p>	<p><i>2.4.1 Principles for valuation</i></p> <p>Valuation:</p> <p>Final consumption expenditure by households is estimated at purchasers' prices while estimates of fixed capital are shown on a gross basis. Estimate of consumption of fixed capital is compiled on basis of PIM. Disposals for fixed assets are estimated according to the SNA 2008. Changes in inventories are calculated as the addition to or withdraw from the stock within a given period, valued at the prevailing market price. Exports are valued at free on board (FOB) while imports are adjusted to FOB from CIF (Cost, Insurance and Freight).</p> <p>Market output and output for own final use are valued at basic prices. Market output and output for own final use by activity are valued at basic prices. Intermediate consumption is estimated at purchaser's prices,</p> <p><i>2.4.2 Recording basis</i></p> <p>Time of recording:</p> <p>Household final consumption expenditure is recorded on accrual basis. Government expenditure is recorded on accrual basis and revenues are recorded on a cash basis. General government transactions that are expenditure on goods and services are generally recorded on an accrual basis as recommended in the 2008 SNA.</p> <p>Government revenues are, however, recorded on a cash basis except for extraordinary receipts (appropriation in aid) which are treated on an accrual basis.</p> <p>Recording of fixed capital expenditure is done on an accrual basis. Recording of change in inventories is done on an accrual basis and work-in-progress is recorded in the period it is produced.</p> <p><i>2.4.3 Grossing/netting procedures</i></p> <p>Gross and net values are computed according to the 2008 SNA.</p>
<p>3. Accuracy and reliability</p>	
<p><u>3.1 Source data</u></p>	<p><i>3.1.1 Source data collection programmes</i></p> <p>Production approach:</p> <ul style="list-style-type: none"> • Benchmark estimates • Census of industrial production (CIP)

- Integrated survey of services (ISS)
 - Kenya Integrated Household Budget survey (KIHBS)
 - Survey of trade and transport margins
 - 2009 Kenya Population and housing census
- Quarterly and monthly data sources
 - General government expenditure and revenue
 - VAT data - Kenya Revenue Authority
 - Monthly trade returns - Kenya Revenue Authority
 - Quarterly statistical bulletin - Central Bank of Kenya
 - Exports of horticultural produce - Horticultural Directorate
 - Agriculture survey
 - Monthly survey of industrial production
 - Monthly survey of hotels and restaurants
 - Monthly generation and Consumption of electricity - Kenya Power and Lighting Company
 - Quarterly survey of business expectations
 - Annual survey of transport and storage
 - Annual survey of mining and quarrying
 - Annual labour enumeration survey
 - Monthly consumer prices survey
 - Monthly wage index public - Directorate of Personnel Management

Expenditure approach are currently being developed on as work in progress

The main data sources for the different components are:

Benchmarks

- Household final consumption expenditure
- Kenya Population and Housing census 2009.
- KIHBS 2005/2006

Quarterly and monthly data sources

- VAT turn over data
- Foreign trade statistics
- BOP statistics

3.1.2 Source data definitions, scope, classification, valuation, and time of recording

	<p>Various economic and social surveys conducted by the KNBS are designed in conformity with the requirements of the 2008 SNA in respect to scope, coverage, valuation and time of recording principle. Where variations exist necessary adjustments are made in line with the SNA. Continuous improvements are done to address data gaps. Data from administrative and surveys relating to financial years, which do not correspond to calendar years, are adjusted to conform to calendar years.</p> <p><i>3.1.3 Source data timeliness</i> Annual administrative data are available within 2 to 3 months while annual surveys data are available between 3 months. Monthly survey and administrative data are available within 2 to 3 months.</p>
<p><u>3.2 Assessment of source data</u></p>	<p><i>3.2.1 Source data assessment</i> The accuracy of survey data are routinely assessed e.g. misclassifications, editing procedures to identify outliers, consistency with other related data Routine assessment of information from administrative data is also done by comparing with other supplementary sources.</p>
<p><u>3.3 Statistical techniques</u></p>	<p><i>3.3.1 Data compilation statistical techniques</i></p> <p>Production approach The compilation of gross value added is largely done through product flow approach. This approach ensures consistency between the supply and demand of products. Values of gross output are mainly compiled from survey and administrative data. Intermediate consumption in some cases is estimated from survey and administrative data while in other cases it is computed as a fixed ratio of the gross output based on base year benchmarks.</p> <p>Each year, quarterly GDP is compiled for all the four quarters while independent estimates of annual GDP are also compiled. Quarterly estimates are then aligned to the annual estimates by benchmarking.</p> <p>Compilation of quarterly estimates is mostly done using the same source and type of data as annual. The quarterly estimates are however based on less comprehensive data and often contain more revisions than the annual ones.</p> <p>GDP at current and constant prices is estimated for all the ISIC divisions and published at 1 digit level. The industries are:</p> <ul style="list-style-type: none"> • Agriculture, forestry and fishing • Mining and quarrying • Manufacturing • Electricity Water supply • Construction • Wholesale and retail trade; repairs • Transport and storage

- Accommodation and food services
- Information and communication
- IT and other information service activities
- Financial and insurance activities
- Real estate
- Professional, scientific and technical activities
- Public administration and defense
- Education
- Human health and social work activities
- Arts, entertainment and recreation
- Other service activities

FISIM is computed but unallocated while VAT is estimated through product flow by applying an adjusted VAT rate (effective rate) and then confronted with what is reported by the revenue authority. Other taxes on products are taken as reported by the KRA.

Agriculture, forestry, fishing

Growing of crops: Quarterly output and intermediate consumption are estimated from the Work in progress model which makes use of the crop forecasts.

Farming of animals: The estimates are derived from the livestock work in progress which mirrors the annual estimation. **Forestry and logging:** The benchmark (output) is extrapolated using the volume indicators for firewood and charcoal collection. The intermediate consumption is derived from the 2009 SUT structure. Suitable deflators used for deriving the current prices.

Fishing and aquaculture: The benchmark (output) is extrapolated using the volume indicators –fish catches. . The intermediate consumption is derived from the 2009 SUT structure. Suitable deflators used for deriving the current prices.

Mining and quarrying: The benchmark (output) is extrapolated using the volume indicators-quantities for stone, sand, clay, fluor spar and gold. Intermediate consumption derived through fixed IO ration.

Manufacturing: Indicators from the Monthly survey of industrial production is utilized to extrapolate the benchmark output. The intermediate consumption is derived from the 2009 SUT structure. Suitable deflators used for deriving the current prices

Electricity, Water supply: Monthly data of electricity sales volume used as the indicators for extrapolating the benchmark output. Fixed IO ratio for IC, suitable deflators for reflation to CU.

Construction: Quarterly output and intermediate consumption are estimated from the Work in progress model.

Wholesale and retail trade; repairs: The Monthly VAT turnover data used as indicator to extrapolate the benchmark output, Fixed IO ratio for deriving the intermediate consumption.

Transport and storage: 2009 Benchmarks are extrapolated estimates for the output and intermediate consumption (derived through the fixed IO ratio) are derived for the passenger road, freight, Air and Warehousing using indicator such as enrolment numbers, tourist arrivals, cargo volume handled.

Accommodation and food services: Extrapolated estimates for the output derived from the hotel statistics data and the VAT turn over data indicators. Fixed IO ratio for the intermediate consumption. Suitable deflators for the current and constant prices.

Publishing, Information and communication: VAT data for the respective economic activity is utilized as indicators for extrapolating the benchmark estimates. The intermediate consumption is derived from the 2009 SUT structure. Suitable deflators used for deriving the current prices.

IT and other information and communication service activities: VAT data for the respective economic activity is utilized as indicators for extrapolating the benchmark estimates. The intermediate consumption is derived from the 2009 SUT structure. Suitable deflators used for deriving the current prices

Financial and insurance activities: Quarterly estimates utilize indicators from the Quarterly statistical bulletin from the central bank

Real estate: Estimates for the quarterly output is derived for both real estate activities and dwellings using the stock of dwellings. The intermediate consumption is derived from the 2009 SUT structure, suitable deflators used for deriving the current prices

Professional, scientific and technical activities: VAT turn over data utilized as indicators for extrapolation of the benchmark estimates.

Public administration and defense: Sum of cost approach to derive the output, Utilizes the quarterly compensation of employees and IC. Suitable deflators for the constant prices.

Education: Utilizes the enrollment numbers as volume indicators. Fixed IO ratio for the intermediate consumption, suitable deflators for the current prices.

Human health and social work activities: Benchmark output in volume terms extrapolated using the number outpatients from the ministry of health. Fixed

IO ratio for the intermediate consumption. Suitable deflator for reflation to current prices.

Arts, entertainment and recreation: Benchmarks output are extrapolated using various indicators, fixed IO ratio are used for deriving the intermediate consumption.

Other service activities: Comprising of activities of membership organization, repair of computer and other personal goods, other personal services activities. The quarterly output estimates use a wide range of indicators for specific economic activity e.g the enrolment numbers, employment numbers, compensation of employees. Fixed IO ratio to derive the intermediate consumption. Suitable deflators for the deflation/reflation to constant and current prices respectively.

Annual GDP at current and constant prices is estimated for all the economic activity to the extent allowed by data availability.

Annual GDP compilation methodology

Production approach

Growing of crops: output is estimated for marketed production, own final use and seeds. Output for own final use is derived from the KIHBS while market output is the sum of household purchases, intermediate consumption and exports derived from KIHBS, Supply and use table and foreign trade statistics. CPI for the corresponding crops, rural market prices and average price to farmers are used as deflators

Farming of animals: The estimates are derived from the livestock work in progress. The 2009 Kenya Population and Housing census collected data on stock of livestock by type. The model utilizes information from the ministry of Agriculture, ILRI study on animal productivity and IGAD report of “the contribution of livestock to the Kenyan Economy.” Proportion of male and female animals and the time taken between births for exotic and indigenous cattle, sheep and goats was provided by the ILRI study. The IGAD report provided information of average milk production by animal and region and the proportion of animals under zero grazing and free grazing. The report also provided information on farm gate prices for various animal products. Value of export and import is derived from foreign trade statistics. Support services to agriculture: output is estimated as sum of costs. Data on Compensation of employees, intermediate consumption and consumption of fixed capital are derived from government books of accounts and financial statements of Horticultural crop development authority (HCDA) and Kenya plant Health Inspectorate services (KEPHIS). Government salary index and implicit deflator are used to estimate constant prices.

Forestry and logging: Non market output is derived as sum of costs from the government books of accounts and financial statement of Kenya Forest services. Government salary index and implicit price from the supply and use table are used to deflate compensation of employees and intermediate consumption. The numbers of households using firewood was collected by 2009 KPHC and the amount of time spent collecting firewood provided by 2005/06 KIHBS. Output of firewood is estimated based on the time spent and gazetted minimum wage for unskilled labour for agriculture.

Fishing: Marketed outputs at both current and constant prices are based on quantity and value of fish landed obtained from the fisheries department. Intermediate consumption is assumed 15 per cent of output at constant prices. Unreported output is assumed to be 5 per cent of market output informed by household expenditure patterns and employment in KIHBS.

Manufacturing: The benchmark estimates are based on census of industrial production. Quantum indices are used to extrapolate annual estimates to derive output at constant prices. Monthly survey of industrial production (MSIP) and turnover sales from value added tax (VAT) records are used to estimate quarterly estimates. The ratio of intermediate consumption to output is estimated at constant prices based on the Census of industrial production.

Electricity generation and supply: Financial statements for Kenya Power and Kenya electricity generating company are used to obtain output and intermediate consumption. Output comprises sales of electricity to domestic users and exports while intermediate consumption includes fuel cost recoveries and non-fuel costs input. Electricity sales in Kilo Watt Hour (KWH) are used to extrapolate output at constant prices to derive quarterly estimates.

Water supply, sewerage and waste management: National accounts have compiled the accounts for two industries; water supply and sewerage and waste collection and treatment. The market outputs for both water supply and waste management are estimated using the CIP 2009 for benchmark output.

The KIHBS 2005/2006 is used to estimate the output of household enterprises that are water vendors. Water supply and waste management outputs at current prices are deflated using CPI water services and CPI services respectively to estimate the constant prices.

The non-market output is estimated as sum of costs. Data from County government and water services boards are used to estimate output and intermediate consumption at current prices. Public sector wage index and IC deflators are used to deflate compensation of employees and intermediate consumption respectively. Output for own final consumption is based on the number of households collecting water based on the Kenya Population and housing census.

Construction: The estimates for the industry are based on government data and work in progress model. The model uses supply of materials produced locally and imported. Domestic supplies originate from quarrying and certain sub

sectors of manufacturing. Imports classified by broad economic categories include goods used as input in the construction industry. Intermediate consumption is estimated as sum of construction materials and costs associated with construction including fuel, electricity, machinery repairs and other services associated with construction. Compensation of employees is based on data on number of employees and earnings obtained from annual labour enumeration survey. Building construction index for the various construction materials is used as a deflator.

Wholesale and retail trade, repair: Output is sum of trade margins estimated using commodity flow. Trade margins are based on survey of trade margin conducted in 2010 and collected percentage trade mark up. The margins are applied to marketed production to derive output. Intermediate consumption are based on Kenya Integrated Household budget survey (KIHBS) and integrated survey of services (ISS). Turnover data for wholesale and retail trade except repair of motor vehicles is used to derive quarterly estimates. The stock of motor vehicles is used to extrapolate the output of repair of motor vehicle and motorcycles to derive output at constant for both annual and quarterly estimates.

Real estate services activities: The stock of dwellings is based on 2009 KPHC which collected data on type of ownership and tenure of dwelling. The census collected details on roof, floor and wall material used to classify dwelling into different categories. The benchmark for rental values of different categories of dwelling was collected in the 2005/06 KIHBS. Rental values are adjusted using consumer price index increase in rent. Output of each type of dwelling is derived by multiplying the stock of dwellings by the rental value. Intercensal growth rate between 1999 and 2009 KPHC is used to extrapolate output at constant prices. Current prices are derived by reflating using CPI rentals.

Education: The estimates are computed for public and private entities. For public, output is estimated as sum of compensation of employees, intermediate consumption and consumption of fixed capital computed from government's books of accounts. National education account is utilized in calculating output of private institutions. The information collected in the education account includes; enrolment, average fees per student and intermediate consumption. Enrolment numbers are used to derive quarterly and annual estimates.

Health and social work: Estimates for general government are based on national and county government expenditure and parastatals. Output is calculated as the sum of intermediate consumption, compensation of employees and consumption of fixed capital. The deflators are government salary index and implicit deflator. Number of patients is used to extrapolate output at constant prices to obtain quarterly estimates. Estimates for market output are based on ISS and KIHBS. Output at constant prices is extrapolated using number of employees.

Arts, entertainment and recreation: The financial statement of Kenya wildlife services are used to estimate output, intermediate consumption and consumption of fixed capital. Turnover from the VAT records is used to derive

output at current prices for the private sector. Output for NPISH is sum of costs.

Annual GDP by expenditure

Expenditure Approach

The expenditure components estimated include; Private consumption expenditure which includes (Household final consumption expenditure and Final consumption expenditure by NPISH), Government final consumption expenditure, Gross fixed capital formation, Imports of goods and services, Export of goods and services, Changes in inventories. National accounts has used the product flow approach to estimate the expenditure components to the 150 products which are then aggregated to come up with the various expenditure components.

- **Private consumption expenditure**

This comprises of the final consumption expenditure by the household and consumption expenditure by NPISH including the consumption by the residents abroad but excluding the non-residents consumption.

- **Household final consumption expenditure.**

The 2006 Benchmark estimate for the Consumption expenditure by the household is based on the KIHBS 2005/2006 data valued at the market prices. Relevant indicators from the product flows are then used to extrapolate the benchmark estimate. Allocation of uses for imports is done by BEC (Broad Economic Category Classification). Imported services allocated to households include life insurance services and the direct purchases by the residents abroad.

- Output for own consumption is estimated for Agricultural and livestock products, fish, owner occupied dwellings, water and charcoal collection. Imputed output for owner occupied dwellings is estimated and recorded as house hold final consumption expenditure. This is obtained from the Kenya Population and Housing Census 2009 by type of dwellings and extrapolated using the 1999-2009 inter-censal growth in the stock of dwellings in volume terms. CPI rentals then used to reflate for the current prices.

- **Final consumption expenditure by NPISH.**

The final consumption expenditure for NPISH is estimated for education, health and social work, arts, entertainment and recreational activities, activities of the membership organization.

The consumption is estimated as output (non-market) minus sales and fees receivables. The output components are deflated using the composite IC deflator for Intermediate Consumption, Salary index for (Compensation of employees).

Government final consumption expenditure

Government final consumption is derived from the non-market output from the government institutions minus the revenues from the incidental fees (that are not economically significant)

This is separately estimated for both the individual services such as health, education, social security and welfare and for collective services such as public administration and defense services.

Government consumption is the government output and is derived through the sum of cost approach. Relevant deflators are then used to deflate these components as recommended by the SNA.

Gross fixed capital formation

Gross fixed capital formation measures the value of new acquisitions and existing fixed assets within the economy less the disposal of the assets. This indicates how much value added fixed assets has been invested in the economy. This also includes the major cost incurred in the improvement of the existing fixed assets. Acquisition of fixed assets with more than one year productive life has been included in the GFCF. Large expenses on land improvement and mineral exploration are included too in GFCF.

The product flow is used to estimate the GFCF in machinery and equipment and the imported capital goods distinguished from the intermediate consumption goods.

The livestock WIP model gives us the estimation for the GFCF through change in livestock numbers as a result of increase in breeding stock, the dairy cattle is considered a GFCF.

Changes in inventories

This is derived from the product flow of few products such as petroleum and Livestock. It is residually derived by taking increase (addition) in stock less the decrease (withdrawals) in the stock of the relevant product being estimated.

Export and import of goods and services

Export and import of goods and services is estimated at a highly disaggregated level for the products. Import price indices and unit value price indices are used for the deflation to constant price.

3.3.2 Other statistical procedures

	<p>Statistical procedures such as coding for mapping trade data to align to NA product code are done as a means of minimizing processing errors. Outliers are not arbitrarily modified; adjusting is done for the missing observation.</p> <p>Other procedures could include compilation of output and IC estimates at a sufficient level of detail; monitoring reliance on fixed IO ratio; and constructions, livestock, growing of crops being treated as work in progress</p> <p>Adjustment for seasonality is done on the quarterly estimates using X-12 Arima model.</p>
<u>3.4 Data validation</u>	<p><i>3.4.1 Validation of intermediate results</i> Quarterly national accounts are revised and validated when the annual estimates are compiled which has more comprehensive information e.g. the annual reports, financial statements of enterprises.</p> <p><i>3.4.2 Assessment of intermediate data</i> The quarterly estimates are only compiled by production approach therefore no statistical discrepancies between the two approaches is indicated</p> <p><i>3.4.3 Assessment of discrepancies and other problems in statistical outputs</i> The annual GDP estimates a statistical discrepancy between the production and the expenditure approaches are relatively small and range between 0.1% to 1.7%, (around 1 percent of GDP at current prices).</p>
<u>3.5 Revision studies</u>	<p><i>3.5.1 Revision studies and analyses</i></p> <p>During the compilation of the quarterly and annual national accounts, KNBS usually examines and validates the data provided. The data examination mainly focuses on the scale, direction and magnitude. If need arises, data providers are consulted to review or to give an explanation. Revisions are discussed in the national accounts' publications. The national accounts' revision cycles are annual and quarterly.</p>
4. Serviceability	
<u>4.1 Periodicity and timeliness</u>	<p><i>4.1.1 Periodicity</i> Quarterly</p> <p><i>4.1.2 Timeliness</i> Three months (90 days) after the end of the reference quarter - on 30th /31st or before - if the end month falls on a weekend</p>
<u>4.2 Consistency</u>	<p><i>4.2.1 Internal consistency</i></p> <p>The annual national accounts data is published in the KNBS annual “Economic Survey” and “Statistical Abstract” publications. The data is compiled by both</p>

	<p>the expenditure and the production methods according to SNA2008. Annual national accounts are usually published for a 5 year series.</p> <p><i>4.2.2 Temporal consistency</i></p> <p>Quarterly national accounts are published online in the KNBS website. At the moment only estimates by production approach are published while estimates by expenditure approach are compiled but not published. The KNBS's website (http://www.knbs.or.ke/) disseminates all published time series data (quarterly and annual data in current and constant prices).</p> <p><i>4.2.3 Intersectoral and cross-domain consistency</i></p> <p>The government finance statistics and the external trade and BOP statistics are compiled within the same directorate in KNBS. The Government Finance Statistics are largely in line with GFSM 2014. External trade statistics are based on IMTS 2010 while BPM 6 is used for the compilation of Balance of Payments. The national accounts data are consistent with government finance statistics, external trade statistics and BOP.</p>
<p><u>4.3 Revision</u></p>	<p><i>4.3.1 Revision schedule</i></p> <p>Quarterly data for most recent quarters are preliminary and are subject to revisions, the estimates are reconciled with the annual estimates which are then published in economic survey publications of every year.</p> <p><i>4.3.2 Identification of preliminary and/or revised data</i></p> <p>The press release and the publications indicate that the data for the most recent quarter are provisional, and that data for other quarters in the most recent year are revised where applicable.</p> <p><i>4.3.3 Dissemination of revision studies and analyses</i></p> <p>The quarterly statistical release indicates that the data for the most recent quarters are preliminary and subject to revision.</p>
<p>5. Accessibility</p>	
<p><u>5.1 Data accessibility</u></p>	<p><i>5.1.1 Statistical presentation</i></p> <p>The National accounts quarterly releases has an overview provided with the general trends and sectoral analyses. Data are presented in diagrams, tables and explained in text. Data are published in Kenya shillings millions showing a breakdown of GDP in both current and constant 2009 prices. The quarterly GDP compiled is by the production approach. The data is published in both original and seasonally adjusted forms.</p> <p><i>5.1.2 Dissemination media and format</i></p>

	<p>New releases and the quarterly bulletin, as well as other publications, are available in both hard copy and electronically. All publications are available via the KNBS website. Data are currently published in pdf format.</p> <p>Electronic time series data, see:</p> <p>For published time series data, see:</p> <p>Quarterly national accounts: http://www.knbs.or.ke/index.php?option=com_phocadownload&view=category&id=128:gdp-2015&Itemid=599</p> <p>Quarterly national accounts: http://www.knbs.or.ke/index.php?option=com_phocadownload&view=category&id=107:economic-survey-publications&Itemid=1181</p> <p><i>5.1.3 Data published according to a preannounced schedule</i></p> <p>The advance release calendar for the full year is available on KNBS website, http://www.knbs.or.ke/index.php?option=com_phocadownload&view=file&id=774&Itemid=1211</p> <p><i>5.1.4 Simultaneous release</i></p> <p>The data are released simultaneously to all interested parties by issuing the press release "<i>Quarterly GDP and Balance of Payments for xx Quarter of xxxx</i>". This release is also available on the KNBS website.</p> <p><i>5.1.5 Further statistics provided on request</i></p> <p>Non-published data (but non-confidential) are made available on request for free, in accordance with the commitment to the government (Service Charter), with a response within five days.</p>
<p><u>5.2 Metadata accessibility</u></p>	<p><i>5.2.1 Dissemination of documentation on concepts, scope, classifications, basis of recording, data sources, and statistical techniques</i></p> <p>For National Accounts, metadata is provided alongside the published statistics, in the form of the National Accounts Methods and Sources publication. Information is also provided on the rebasing (Q and A) and highlights. All this documentation is available via the KNBS website.</p>
<p><u>5.3 Assistance to users</u></p>	<p><i>5.3.1 Dissemination of information on contact points</i></p> <p>Contacts are given in all publications, as well as on the KNBS website.</p> <p><i>5.3.2 Availability of documents and service catalogues</i></p> <p>All documents are available via KNBS website in pdf format, as well as hard copies in the KNBS library.</p>