Liberia Institute of Statistics & Geo-Information Services (LISGIS)

Description of Sources and Methods Used in Liberian National Accounts

GROSS DOMESTIC PRODUCT

(Base year 2016 and SNA 2008)

JULY 2024

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Acronyms

ANA	Annual National Accounts
BoF	Bureau of Fishing
BoP	Balance of Payments
CBL	Central Bank of Liberia
CIT	Corporate Income tax
CPI	Consumer Price Index
FAD	Forestry Authority Department
FISIM	Financial Intermediation Services Indirectly Measured
GDP	Gross Domestic Product
GDP(E)	Gross Domestic Product by expenditure approach
GDP(P)	Gross Domestic Product by production approach
GST	Goods and Services Tax
GVA	Gross Value Added
HIES	Household Income and Expenditures Survey
ISIC	Industrial Standard Industry Classification
LEC	Liberia Electricity Corporation
LISGIS	Liberia Institute of Statistics and Geo-Information Services
LRA	Liberia Revenue Authority
LWSC	Liberia Water and Sewerage Corporation
NAAS	National Accounts Annual Survey
MFDP	Ministry of Finance and Development Planning
MoA	Ministry of Agriculture
MoL	Ministry of Labour
MoME	Ministry of Mining and Energy
MoU	Memorandum of Understanding
NaFAA	National Fishery and Aquaculture Authority
NOE	Non observed Economy
NPISH	Non-Profit Institutions Serving Households
2008 SNA	System of National Accounts 2008

I. Introduction

National Accounts provides a comprehensive, conceptual, and accounting framework for analyzing and evaluating the performance of an economy. National Accounts is designed to account for all economic transactions and its compilation draws data from several sources, including statistical methods and administrative data sources. Statistical data sources include economic censuses and surveys of enterprises and households on income generation and expenditure. Administrative data sources comprise data collected from ministries, agencies, and commissions (MACs) including public corporations that provide services within the economy.

To effectively collect data required for compiling GDP estimates for Liberia, the Liberia Institute of Statistics and Geo-Information Services (LISGIS) strengthened collaborations amongst key MACs that compile economic data regularly. Those collaborative institutions that are producers of economic data required for national accounts include the following:

- Ministry of Agriculture (MoA)
- Ministry of Finance and Development Planning (MFDP)
- Central Bank of Liberia (CBL)
- Liberia Revenue Authority (LRA)
- Liberia Telecommunication Authority (LTA)
- Ministry of Education (MoE)
- Ministry of Health (MoH)
- Forestry Development Authority (FDA)
- National Fisheries and Aquaculture Authority (NaFAA)
- Liberia Electricity Corporation (LEC)
- Liberia Water and Sewerage Corporation (LWSC)

The purpose of this document is to provide users with a description of sources and methods used for the compilation of the national accounts in Liberia. This document first introduces the overview of the national accounts system in Liberia, the revision policy of GDP estimates compilation, different approaches used for the compilation of GDP in Liberia along with data sources and methods, and future development on GDP compilation.

II. Overview of the System of National Accounts in Liberia

Gross domestic product compilation in Liberia dates back to the year 1950. However, the GDP series (1950-1960) for Liberia was first compiled on behalf of the Government of Liberia by a Northwestern University team in 1962 and was subsequently' adjusted' by the Department of Planning and Economic Affairs. The rate of expansion of the

economy of Liberia during the decade preceding 1961 surpassed that of almost any other country in the world. Gross domestic money income more than quadrupled between 1950 and 1960 (Beleky, 1973).

During the period 1970 to the late 1980s, GDP compilation was based on SNA 1968 with the description of sources and methods used for national accounts estimation found in "Sources and Methods of Estimation of National Product, 1970-1973", along with the 1981-1986 series. An update of the “New Series and Methodology for Estimating Gross Domestic Product, 1973" was published in 1975, 1978, and 1987 respectively. Before the 1989 crisis in Liberia, national accounts estimates were published annually in a “Survey of Liberia" publication.

Since the post-crisis period, major activities were implemented to compile national accounts estimates according to the SNA 1993, which began in 2007 with the conduct of a business census called the National Establishment Census (NEC). The National Accounts Annual Survey (NAAS) was conducted in 2009 with a base period of 2007 using the NEC 2017 as a survey frame. However, estimates produced from the NAAS were unpublished. In 2012, the International Monetary Fund (IMF) provided technical support to implement the NAAS according to SNA 2008 using the 2007 NEC and other administrative data from the Liberia Business Registry with 2010 as the base year. However, the annual GDP estimates compiled were also unpublished.

The most recent GDP estimates compiled with a new base year (2016) were produced using additional source data (economic survey data, tax data, and other administrative data from public corporations, and MACs). The present GDP series of Liberia covers the period 2016 to 2020 with the base year at 2016.

2.1 Institutional framework

The National Accounts Section is a subdivision of the Economic Statistics Division at LISGIS and is responsible for collecting, compiling, and analyzing national accounts estimates for Liberia using revenue and expenditure data that are collected from both primary (survey of businesses) and secondary (administrative data) data sources. The Unit produces macroeconomic aggregates and GDP estimates to inform policy decisions for the Liberian Government and international partners. The National Account Unit is responsible for collaborating with government ministries, agencies, and commissions (MACs) including public corporations for the compilation of administrative data required for GDP estimates compilation.

2.2 Outline of Approaches used for GDP compilation

Although there are three (3) methods for compiling GDP estimates internationally, national accounts estimates in Liberia are compiled using two (2) approaches: production and expenditure methods. Additionally, the supply and use table (SUT) framework was compiled that integrates the three (3) approaches comprising the production, expenditure, and income methods (United Nations, 2009).

2.3 Main classifications

The framework for compiling GDP estimates for the economy is based on the System of National Accounts (SNA 2008) which recommended the use of various classifications for transitioning from SNA 1993 to SNA 2008. In the case of Liberia, the following classification are implored namely: ISIC Rev. 4, CPC 2, COICOP 12, BPM6, COFOG, COPNI, etc.

2.4 Main data sources

There are two (2) major categories of data sources used to compile the current annual GDP estimates (base year 2016). These data sources include the following:

a) **Statistical** (**Primary)** data sources such as census and surveys.

b) **Administrative (Secondary)** data sources, where data holdings contain information which is not primarily collected for statistical purposes but is used by statistical offices.

The Statistical data sources used during the compilation process for GDP series 2016 to 2020 are the following:

- National Establishment Census (NEC 2017)
- National Accounts Annual Survey using 2016 and 2017 income and expenditure of sample businesses (NAAS 2018)
- Household Income and Expenditures Survey 2016 (HIES)
- Agriculture Recall Survey (2016)
- Agriculture Crop-cutting Survey (not exhaustive)
- Consumer Price index

Administrative data sources collected from the MACs regularly include:

- Agriculture, forestry, and fishery data
- Government Finance Statistics data
- Financial (including insurance) sector data

- Tax data
- Balance of payment data
- Foreign trade data
- Electricity and water supply data
- Production values and volumes for mining and manufacturing industries

III. Revision Policy

(This chapter presents the revision policy of GDP compilations and dissemination.)

3.1 Revision policy

The Revision Policy provides users with information on the guidelines about reasons, types, and supporting documentation of the revisions. The revision guide is also designed to provide users with a clear understanding of periods for revision during the time data is released.

The estimation of GDP in Liberia is done in stages depending on available data and progressively termed as provisional, revised, and final. The first publications are the provisional estimates subject to revision.

The revisions imply significant changes which may have an impact on the previously published data such as:

- Most revisions reflect the incorporation of a wider range of data. In particular, some data that were not available at the release date are incorporated through revisions into subsequent releases;
- Detection of errors associated with incorrect use of information, data processing, introduction of methodological improvements and procedures;
- Use of new data from censuses, surveys, administrative records and special studies for benchmarking of GDP; and
- Use of revised United Nations System of National Accounts and Classifications.

3.1.1 Ordinary revision

Ordinary revision is a minor revision that includes replacing previous data used for the compilation of statistics when improved quarterly and annual data becomes available. Currently, minor revisions are only conducted on annual estimates given that quarterly national accounts estimates compilation is planned for the first quarter of 2024.

3.1.2 Major revision

Major revision involves changing the base year of the national accounts statistics compilation system to a new base year. It includes the compilation of Supply and Use

Tables (SUTs) used for the compilation of backward and forward GDP series. The revision uses new detailed information collected through censuses, surveys, and administrative data. Sometimes, special studies are conducted to bridge the existing information gaps. In the case of Liberia, a new base year was used, while plans are underway to generate Supply and Use Tables (SUTs) after a new rebasing in 2025.

IV. Production Approach

(This chapter focuses on the description of all the economic activities covered in GDP by production approach, data sources, and methods used for the estimates at current and constant prices.)

4.1 The Reference Framework and GDP by Production Approach

The framework for Gross Domestic Product (GDP) compilation at the Liberia Institute of Statistics and Geo-Information Services (LISGIS) is based on the 2008 SNA recommendations for compiling GDP estimates, and the International Standard of Industrial Classification Revision 4 (ISIC Rev.4) for classifying the country's economic activities (UNSD, 2008).

According to the 2008 SNA, three approaches can be used to calculate GDP. They are the following:

The production approach: This method calculates what each separate producer adds to the value of final output (value added), by deducting intermediate consumption from gross output. Value added is summed for all producers within an economy.

The income approach: This method directly measures the incomes received by the owners of the factors of production. These represent the returns to the labour and capital employed such as wages, salaries, and profits.

The expenditure approach: This method sums the values of all final demands, including final consumption expenditures (of households, government, and non-profit institutions serving households), gross fixed capital formation, changes in inventories, and net exports.

Theoretically, all these approaches must produce the same result. Like all statistical estimates, these will contain errors and omissions that are usually reconciled.

Basically, two GDP approaches are currently being used in Liberia:

- The production-based GDP (GDP-P)
- The expenditure-based GDP (GDP-E)

The Production measure of GDP calculates the total value added by producer enterprises in the economy: i.e. the difference between the value of total outputs produced and the value of goods and services consumed in production (intermediate inputs) adjusted for taxes and subsidies on those products.

4.2 Non-observed economy

LISGIS has compiled the non-observed economy (NOE) to ensure exhaustiveness of the GDP estimates. NOE estimates are based on the handbook of “Measuring the non-observed Economy”.

The main methods used for measuring NOE in Liberia are:

- Labour input method (LIM)
- Supply-based approach
- Demand-based approach

The Labour Input method is based on the following steps:

1. Obtain estimates of the supply of labour input to GDP, for selected economic activity and size of the enterprise, from a household labour force survey and/or other demographic sources;
2. Obtain estimates of output per unit of labour input and value-added per unit of labour input for the same activity and size breakdown from regular or special purpose enterprise survey; and;
3. Multiply the labour input estimates by the per unit ratios to get output and value added for the activity and size categories.

The LIM method was used to derive estimates for most of the economic activities except agriculture, transport, and private health.

There are no estimates of NOE for the electricity, water supply, financial sector, public administration, public education, and health.

Supply based method

1. It relies on data about the supply of inputs that are used in producing goods and services. Inputs may include several primary raw materials, just one major raw material, labour, land, fixed capital stock, etc. If data on the supply of one or several inputs used in a given production activity are available, the total production of the activity that uses these inputs can be estimated.
2. Input/output and input/value-added ratios are needed to calculate output and value-added estimates from the input data. Preferably, these ratios should be

obtained through ad-hoc surveys for the current period because productivity or relative prices of inputs and outputs may be changing

Supply based method is used for measuring passenger transport service activities

Demand-based method:

It aims at determining production by using indicator data on specific uses of goods and services. These indicators can be any use of goods and services that sufficiently describe their production. They could be household final consumption expenditures of a certain commodity.

After a measure of output has been obtained, value-added estimates can be derived using output/value-added ratios, as for supply-based methods.

Demand-based method is used for measuring non-observed economy in education and health services

4.3 Data sources of GDP by production approach

Several data sources were incorporated in the compilation of the benchmark estimates. The main datasets used to compile the 2016 benchmark estimates included: the 2018 National Accounts Annual Survey (NAAS 2018), the Household Income and Expenditure Survey (HIES) 2016, the Agriculture Crop-Cutting Survey Projection (2016-2022), the survey of informal transportation among others.

Routine data available for annual GDP compilation include data from administrative sources, and Value Added Tax (VAT) returns from the LRA. Other administrative sources are the Ministry of Agriculture, Forestry Development Authority, National Fishery and Aquaculture Authority, Liberia Telecommunications Authority (LTA), Ministry of Finance and Development Planning, Ministry of Mines and Energy, Central Bank of Liberia, and Liberia Electricity Corporation among others.

Various statistical and administrative data sources were used to compile annual national accounts as shown in Table 1.1 for both the production and expenditure approaches:

Table 1. Main data sources used in compiling GDP

No.	Name of the data source	GDP-P	GDP-E
1	National Accounts Annual Survey	X	X
2	Household Income and Expenditure Survey	X	X
3	Agriculture Crop-Cutting Surveys	X	X
4	Value Added Tax (VAT)	X	X
5	External Trade extracted from the ASYCUDA	X	X
6	Consumer Price Index	X	X
7	Unit Value Index	X	X
8	Construction index	X	X
9	Export prices Index	X	X
9	Mineral data of Ministry of Mines and Energy	X	X
10	Expenditure data from the Ministry of Education	X	X
11	Expenditure data from the Ministry of Health	X	X
12	Agriculture Statistics from Ministry of Agriculture	X	X
13	Forestry data from the Forestry Development Authority	X	X
14	Fishery data from National Fisheries and Aquaculture Authority	X	X
15	Information and Communications data from Liberia Telecommunications Authority	X	X
16	Expenditure and income of General Government	X	X
17	Revenues and expenditures statements, quantities, prices of Electricity (LEC) and Water supply (LWSC)	X	X
18	Profit and loss account of Central Bank of Liberia	X	X
19	Annual & Quarterly profit and loss account of commercial banks	X	X
20	Annual & Quarterly profit and loss account from non-banking monetary institutions	X	X
21	Balance of Payments		X

4.4 Agriculture, forestry and fishing (A)

4.4.1 Introduction

The Agriculture, Forestry, and Fishing industry mainly includes the production of crops (food and cash crops), animal farming, forestry, and fishing. This comprises the activities of growing crops, breeding of livestock, the harvesting of animals or animal products from a farm, fish products from their natural habitats as well as the harvesting of timber and other plants. In Liberia, the activities of crop & animal production, forestry

and logging, and fishing are monitored by the Ministry of Agriculture, the National Fisheries and Aquaculture Authority, and the Forestry Development Authority.

4.4.2 Data sources and methods

Food and cash crops

The main data source of food crops for the 2016 base year and going forward, is the Ministry of Agriculture's annual crop-cutting survey that collects information on rice and cassava production. Additional data source for food crops for the series was extracted from the Household Income and Expenditure Survey (HIES 2016) (LISGIS, 2017).

In the case of cash crops, the data sources are the National Accounts Annual Survey (NAAS, 2018), and monthly production data in volume and value terms from the Central Bank of Liberia.

Livestock

The main data sources of livestock for the 2016 base year and ongoing series were the annual agricultural survey of livestock and the annual count and slaughter of livestock from the Ministry of Agriculture. An additional data source on livestock is the HIES which provided data on household expenditure on animal production.

Forestry

Data source on the forest sector for the 2016 base year and going forward, is the local production of timber and charcoal, exports of logging products, and other forest products that are compiled by the Forestry Development Authority.

Fishing

Data source of the fishery sector for the 2016 base year and going forward, is the local production of Artisanal and industrial fishing of different fish species and other marine products in volume and value terms.

4.4.3 Estimates at current prices

In the compilation of current price estimates for food crops production, and non-timber products (charcoal), the price from the Consumer Price Index was used.

Method of Compilation:

Food and cash Crops

Output at basic prices according to data sources:
Output of rice & cassava= Quantities (year t)*Prices (year t)

Data on the cost of production of rice and cassava are available from HIES. This information was used for estimating IC for the base year 2016.

Forestry

The output of forestry is equal to the value of forestry production.

Intermediate consumption was derived from NAAS and tax data for forestry companies.
GVA=Output-IC

Livestock

The formula for estimating the output of livestock in general is based on the following relationship. Output of live animals + imports = animals slaughtered + exports + change in animal stock. O = animal slaughtered + GFCF + Changes in Inventories & exports-imports. GFCF + Changes in Inventory = changes in the number of animals in the herd GFCF=dairy animals and working animals. Changes in Inventory = animals to be slaughtered.

Fishing

Output is measured as the volume multiplied by price data by type of fishing.
IC is based on the proportion of input/output data for 2016.
GVA=Output - IC

4.4.4 Volume measures

Food and cash Crops

Output at constant prices=Quantities (year t)*Price (base year 2016).
IC at constant prices=share of IC/O of base year*Output at constant prices of Year t
GVA= Output at constant prices – intermediate consumption at constant prices.

Forestry

Volume index (based on quantities) was used to extrapolate the base year output and GVA values
IC at constant price is the difference between Output and GVA at constant prices

Livestock

No producer price index or wholesale prices are available. The CPI price of 2016 was used to re-evaluate the quantities of each year to base year (2016) prices.
Output at constant prices=quantities of current year*2016 CPI price.
IC=Output at constant prices-GVA at constant prices

Fishing

The average price per year was derived by dividing the total values of production with total quantities, to create a price index at 2016 =100. The output at constant prices is equal to the output at current prices (year t) divided by price index of year t. The volume index of output was derived by dividing the constant prices output with the base year output. The GVA of the base year was multiplied with the volume index of output to derive the GVA at constant prices. Intermediate consumption at constant prices=Output at constant prices- GVA at constant prices.

4.5 Mining and quarrying (B)

4.5.1 Introduction

The Mining industry mainly includes the extraction of minerals (gold, diamond, and iron ore), and the quarrying of rocks. This comprises the activities of mining diamond, gold and iron ore, which are monitored by the Ministry of Mines and Energy.

4.5.2 Data sources and methods

The key data sources for the mining sector for the 2016 base year estimate the NAAS data on production and expenditure including the quarrying of rocks and sand from LISGIS. For onward estimates, tax data from the Liberia Revenue Authority (LRA), Volume data from the Ministry of Mines and Energy, (MoME) monthly data on mineral production, and monthly mineral export data in volume and value terms from the Central Bank of Liberia.

4.5.3 Estimates at current prices

Mining products like gold, iron, and diamond are mostly exported, thus an export price was used as a price index to deflate the output.

4.5.4 Volume measures

To apply the volume data, a volume index was used to split the mining sector into a sub-sector that produces each product for which volumes are available. Volume data was used as a volume index for estimating output at constant prices. The same volume index is applied to GVA to derive constant estimates. IC=Output at constant prices-GVA at constant prices.

4.6 Manufacturing (C)

4.6.1 Introduction

According to the ISIC Rev. 4 (2008) definition of Manufacturing, it refers to the physical or chemical transformation of materials, substances, or components into new products, including substantial alteration, renovation, or reconstruction of goods. Although this cannot be used as the single universal criterion for defining manufacturing. Substantial alteration, renovation, or reconstruction of goods is generally considered to be manufacturing (UNSD, 2008).

In Liberia, the manufacturing industry comprises large, medium, and small establishments divided into the following divisions:

- Manufacture of food products
- Manufacture of beverages
- Manufacture of textiles
- Manufacture of wearing apparel
- Manufacture of leather and related products
- Manufacture of wood and products of wood and cork, except furniture; manufacture of articles of straw and plaiting materials
- Printing & reproduction of recorded media
- Manufacture of chemicals and chemical products
- Manufacture of other non-metallic mineral products Manufacture of basic metals
- Manufacture of fabricated metal products, except
- Manufacture of furniture
- Other manufacturing
- Repair and installation of machinery and equipment

4.6.2 Data sources and methods

The key data source for the manufacturing sector at 2016 base year estimates was the NAAS data on production revenue and expenditure from LISGIS. For onward estimates, tax data from the Liberia Revenue Authority (LRA), were implored. Volume and value

monthly data from the Central Bank of Liberia (CBL) on production in the manufacturing industry was also used in compiling annual GDP estimates.

4.6.3 Estimates at current prices

The output of market producers is measured as the sum of sales, changes in inventories of finished goods and work in progress, the value of products which are produced for own final use, and with the value of subsidies on products. Changes in inventories of finished goods, goods for own final consumption, and work in progress are measured according to input costs. Goods for resale are valued at purchasers' prices.

Output at basic price includes the value of goods for own final use, sales of manufactured goods on the domestic market, and exports. However, exhaustive adjustments were applied for the non-observed economy.

Intermediate consumption products are at the purchasers' price. The uses of intermediate goods are usually estimated with purchases in the period plus withdrawals from inventories less increases of inventories.

GVA=Output -Intermediate Consumption

4.6.4 Volume measures

Volume index was used to split the manufacturing sector into sub-sectors that produce each product for which volumes are available. For the remaining manufacturing industries, CPI index was applied in the absence of PPI. Volume data was used as a volume index for estimating output at constant prices. The same volume index is applied to GVA to derive constant estimates. IC=Output at constant prices-GVA at constant prices. For the other sub-sectors. CPI was used to deflate output. GVA at constant prices was derived by multiplying the Output volume index by GVA. IC=output at constant prices-GVA at constant prices.

4.7 Electricity and water supply (D-E)

4.7.1 Introduction

According to ISIC Rev. 4 Section D includes the activity of providing electric power, natural gas, steam, hot water, and the like through a permanent infrastructure (network) of lines, mains, and pipes. Also included is the distribution of electricity, gas, steam, hot water, and the like in industrial parks or residential buildings (United Nations, 2008). This industry therefore includes the operation of electric and gas utilities, which generate, control, and distribute electric power or gas. Also included is the provision of steam and

air-conditioning supply. In Liberia, this industry mainly includes the activity of electric power generation, transmission, and distribution.

Section E which is water supply; sewage, waste management, and remediation activities in the ISIC Rev. 4 includes activities related to the management (including collection, treatment, and disposal) of various forms of waste such as solid or non-solid industrial or household waste as well as contaminated sites. The output of the waste or sewage treatment process can either be disposed of or become an input into other production processes. Activities of water supply are also grouped in this section since they are often carried out in connection with, or by units also engaged in, the treatment of sewage.

4.7.2 Data sources and methods

Electricity, gas, steam, and air conditioning supply

The main data source for electricity in Liberia is the Liberia Electricity Corporation (LEC) which provides monthly data on the volume of electricity generated, volume and values of electricity sold, and consolidated annual accounts.

Water supply; sewerage, waste management, and remediation activities

The main data source for water supply is the Liberia Water and Sewer Corporation (LWSC) which provides monthly data on the volume of water produced, volume and values of water sold, and consolidated annual accounts. Data on sewer services is also supplied by the LWSC. Other data on waste management is directly obtained from the NAAS 2016.

4.7.3 Estimates at current prices

Method for compiling Electricity and Water supply

Volume and values of production on a monthly basis are used for transformation on an annual basis.

Output = Sum of sales, other operating income and production for own consumption.
Intermediate Consumption: Sum of cost of production and administrative expenses less change in inventories of raw materials.
GVA=Output -Intermediate Consumption

4.7.4 Volume measures

Volume data was used as a volume index for estimating output at constant prices. The same volume index is applied to GVA to derive constant estimates. IC=Output at constant prices-GVA at constant prices.

4.8 Construction (F)

4.8.1 Introduction

The construction sector includes general construction activities (such as the construction of complete dwellings, office buildings, farm buildings, etc.) specialized construction (such as demolition, site preparation, electrical, plumbing, etc.) of buildings, and the construction of civil engineering works (such as motorways, bridges, harbors, airfields, irrigation systems, industrial facilities, etc.)

In Liberia, this industry mainly covers the activities of construction of buildings, roads, bridges, sports facilities, and recreational parks. It also covers the activities of electrical, plumbing, and other construction installation activities.

4.8.2 Data sources and methods

The key data sources for construction are obtained from the National Accounts Annual Survey (NAAS) which collects data on construction material costs used. For onward estimates, the tax data from the Liberia Revenue Authority (LRA) and data on cement production in volume and value terms from the Central Bank of Liberia (CBL) were used to compile the annual estimates.

4.8.3 Estimates at current prices

The output of market producers is measured as the sum of sales, changes in inventories of finished goods and work in progress, the value of products produced for their final use, and the value of subsidies on products. Changes in inventories of finished goods, goods for own final consumption, and work in progress are measured according to input costs. Goods for resale are valued at purchasers' prices.

Intermediate consumption products are at the purchasers' price. Uses of intermediate goods are usually estimated with purchases in the period plus withdrawals from inventories less increases of inventories.
GVA=Output -Intermediate Consumption

4.8.4 Volume measures

Volume data on cement was used as a volume index for estimating output at constant prices.
The same volume index is applied to GVA to derive constant estimates. IC=Output at constant prices-GVA at constant prices.

4.9 Wholesale and retail trade (G)

4.9.1 Introduction

The section on **Wholesale and retail trade** is classified under section G of ISIC Rev. 4 and includes the activities of sale (i.e. wholesale and retail) of goods (without transformation) of any type, and the rendering of services incidental to the sale of these goods. The section also includes the repair of motor vehicles and motorcycles (United Nations, 2008). In Liberia, this section includes wholesale and retail trade of goods (except motor vehicles and motorcycles), retail sale and repair of motor vehicles and motorcycles including related spare parts and accessories.

4.9.2 Data sources and methods

The main data source for wholesale and retail trade is obtained from the National Accounts Annual Survey (NAAS) that collects data on wholesale and retail trade; and repair of motor vehicles and motorcycles. For onward estimates, tax data from the Liberia Revenue Authority (LRA) were used to compile the annual estimates.

4.9.3 Estimates at current prices

The Gross Output of market producers is measured as the sum of sales, changes in inventories of finished goods and work in progress, the value of products that are produced for own final use and with the value of subsidies on products. Changes in inventories of finished goods, goods for own final consumption, and work in progress are measured according to input costs. Goods for resale are valued at purchasers' prices.

Gross output at the current price for 2016 is based on trade margins data of the 2018 NAAS that were cross-checked with sales turnover from administrative records to verify the robustness of the estimates and to produce estimates for other years.

Intermediate consumption products are at the purchasers' price. Uses of intermediate goods are estimated with purchases in the period plus withdrawals from inventories less increases of inventories.

4.9.4 Volume measures

CPI was used to deflate the gross output trade margins. The same volume index of output trade margin is applied to GVA to derive constant estimates.

Intermediate Consumption = Output at constant prices - GVA at constant prices

4.10. Transport and storage (H)

4.10.1 Introduction

The Transportation and Storage industry is classified under Section H of the ISIC Rev. 4. According to ISIC Rev. 4, this section covers the provision of passenger or freight

transport by road, water, air, rail, or pipeline and associated activities such as terminal and parking facilities, cargo handling, storage, etc. It also includes postal and courier activities and the renting of transport equipment with a driver or operator (United Nations, 2008). In Liberia, the section includes the activities of land transport, warehousing and storage, support activities for transport, and postal and courier activities.

4.10.2 Data sources and methods

The key data used to estimate transportation and storage were the NAAS (2018), and the Household Income and Expenditure Survey (2016 HIES) for the informal sector. For onward estimates, tax data from the Liberia Revenue Authority (LRA) were used to compile the annual estimates for the formal sector while the volume data from the Ministry of Transport were used to compile the informal.

4.10.3 Estimates at current prices

Gross output was derived using the combination of income from fares charged, number of trips made, average number of passengers transported, daily revenue generated, number of days worked in a week; a breakdown of daily expenses, etc. Onward estimates for gross output were derived by multiplying the volume index of transportation for the informal sector. In the case of the formal sector, turnover data were used.

4.10.4 Volume measures

CPI of transport was used to deflate the output of transport and storage services. The same volume index of output is applied to GVA to derive constant estimates. The IC at the current price was deflated by the CPI for Transport. IC=Output at constant prices-GVA at constant prices.

4.11 Accommodation and food service (I)

4.11.1 Introduction

This section includes the provision of short-stay accommodation for visitors and other travelers and the provision of complete meals and drinks fit for immediate consumption in the ISIC Rev 4. The amount and type of supplementary services provided within this section can vary widely. Some units may provide only accommodation while others provide a combination of accommodation, meals and/or recreational facilities (United Nations, 2008). In Liberia, this section includes the activities of accommodation services and the service activities of food and beverages.

4.11.2 Data sources and methods

For accommodation and food services activities, data sources include the NAAS 2018 data (business financial statements, annual business structure business) on accommodation and food service activities, and goods and service tax (GST) file from the Liberia Revenue Authority. The informal sector estimates were compiled using the HIES data and methods are the same as for other industries.

4.11.3 Estimates at current prices

The output for Accommodation and food service activities is adjusted for changes in inventories of goods. Exhaustiveness adjustments are significant in this branch for small enterprises and for the informal.

Intermediate consumption was derived using similar methods as other industries for 2016 and 2017 while other years were based on the input/output ratio on gross output.

4.11.4 Volume measures

CPI was used to deflate the output of accommodation and food services. The same volume index of output is applied to GVA to derive constant estimates. IC=Output at constant prices-GVA at constant prices.

4.12 Information and communication (J)

4.12.1 Introduction

The Information and Communication industry is categorized under Section J of the ISIC Rev. 4. According to ISIC Rev. 4, this section covers the production and distribution of information and cultural products, the provision of the means to transmit or distribute these products, as well as data or communications, information technology activities and the processing of data and other information service activities (United Nations, 2008). In Liberia, the industry covers telecommunication activities, programming and broadcasting activities, computer consultancy activities, information service activities, publishing activities, and activities related to the production of motion pictures, video and television programs, sound recording, and music publishing activities.

4.12.2 Data sources and methods

Data sources on Information and Communication derived from the NAAS 2018 for the formal sector, and the Household Income and Expenditure Survey (2016 HIES) for the informal sector. For onward estimates, GST taxable sales data of establishment from the Liberia Revenue Authority (LRA) were used to compile the annual estimates.

4.12.3 Estimates at current prices

The output of market producers for 2016 was measured as the sum of income for telecommunication companies, radio and TV broadcasting corporations, publishing houses, and internet service providers among other information technology-related activities. The output of mobile money was compiled as a secondary output of telecommunication activity as per the recommendation of SNA. Exhaustive adjustment was made for the non-observed economy. Onward estimates were compiled using the value index of income received from services.

Intermediate consumption was computed using similar methods as other industries for 2016 while other years were based on the input/output ratio on gross output.

4.12.4 Volume measures

IC at current prices was derived by reflating constant prices IC with weighted CPI for services, communication maintenance, and repairs.

CPI of Communication was used to deflate the output of this industry. Volumes of mobile data, calls, and telecommunication traffic could be another indicator used for volume estimates. Intermediate consumption (IC) at constant prices was compiled as a product of a fixed input-output ratio and constant prices gross output.

GVA at constant prices=Output at constant prices-IC

4.13 Financial and insurance activities (K)

4.13.1 Introduction

The Financial and Insurance sector is categorized under Section K of the ISIC Rev. 4 and includes financial service activities (including insurance reinsurance and pension funding activities) and activities to support financial services, activities of holding companies, and activities of trusts, funds, and similar financial entities. (United Nations, 2008).

In Liberia, this industry mainly covers financial service activities, insurance and activities auxiliary to financial service and insurance activities. Moreover, the activities of the central bank are included and treated as non-market producers.

4.13.2 Data sources and methods

The major data sources on the financial and insurance sector were derived from the administrative data from the Central Bank of Liberia which usually collects monthly data from establishments operating in the financial and insurance sector. The below data were received from the Central Bank of Liberia that include:

- Annual financial statement of CBL, Commercial banks and Insurance enterprises

- Interest rates of loans and deposits
- Stock of loans and deposits and Loans by economic activities

4.13.3 Estimates at current prices

The output of the firms involved in financial and insurance activities was based on the following:

- Output of the CBL is estimated as the sum of costs incurred by that institution.
- Output of commercial banks is estimated as the sum of FISIM and direct charges.

FISIM is the financial intermediary service indirectly measured using stocks and interest rates of loans and deposits and is allocated to the users as intermediate consumption and final consumption. FISIM was computed as seen below.

- FISIM = FISIM on deposits + FISIM on loans
- FISIM consumed by a depositor = Stock of Deposits x [interest reference rate – interest rate paid on deposits]
- FISIM consumed by a borrower = Stock of Loan x [interest rate charged on loan – interest reference rate]

Output of Insurance activities is estimated separately for life insurance and non-life insurance.

GO of life insurance = Actual premiums earned plus Premium supplements less Benefits due less Increases (plus decreases) in life insurance technical reserves.

GO of non-life insurance = Actual premiums earned plus Premium supplements less Adjusted claims incurred.

IC of life and non-life insurance**:** Administrative and operating expenses of life and non-life insurance activities.

Output of financial auxiliaries for the 2016 base year (NAAS 2018). For ongoing estimates, annual, GO was extrapolated using the value index of income on services.

4.13.4 Volume measures

The FISIM estimates at current and constant prices were allocated by user sector and by industry (as intermediate consumption by industry, and as final consumption for households and government). The base year interest margin applied to the deflated stock of loans and deposits for the current year is used for the compilation of FISIM at constant prices. The overall CPI index is used as a deflator for other components of the financial sector in absence of more appropriate price and volume indices.

4.14 Real Estate Activities (L)

4.14.1 Introduction

The Real Estate sector is categorized under Section L of the ISIC Rev. 4 and includes a range of services related to the provision of property, i.e. buying, selling, and renting of commercial and residential properties or land. Also included are the activities of agents intermediating in buying, selling, letting, or managing real estate. The activities may be carried out on a fee or contract basis and real estate activities with owned or leased property (United Nations, 2008). Compilation on real estate in Liberia was done for two products of real estate activities, i.e. dwelling services and other real estate service activities.

4.14.2 Data sources and methods

The key data sources for the real estate sector were the 2018 NAAS and tax data for the formal sector whilst the HIES was used to estimate imputed rent and actual rent in the informal economy for the reference year. Other data utilized to derive estimates for real estate were the CPI and population of Liberia.

4.14.3 Estimates at current prices

Real estate activity is composed of two activities, the actual rent of residence in rented buildings of real estate owners and service of owner-occupied dwellings (imputed rent) were used to derive the output of real estate. Intermediate consumption is expenditure on repair and maintenance of rented buildings by tenants and real estate owners, and repair by owned occupied dwellers. The gross value added is the difference between gross output and intermediate consumption.

4.14.4 Volume measures

The consumer price index of actual rental for housing was used to deflate the output of this industry. Volumes data on construction of residential building volumes and population can be used for imputed rent. IC=Output at constant prices-GVA at constant prices.

4.15 Professional, scientific, and technical activities (M)

4.15.1 Introduction

This industry is categorized under Section M of the ISIC Rev. 4 and includes specialized professional, scientific, and technical services. Such activities require a high degree of training and make specialized knowledge and skills available to users (United Nations, 2008). In Liberia, the section includes legal and accounting activities, architectural and

engineering activities, technical testing and analysis, scientific research and development activities, advertising and market research activities, consultancy activities, photographic activities, and specialized design activities.

4.15.2 Data sources and methods

The key data sources for Professional, scientific, and technical activities were the 2018 NAAS. For onward estimates, GST taxable sales data of establishment from the Liberia Revenue Authority (LRA) were used to compile the annual estimates.

4.15.3 Estimates at current prices

The output of market producers for the 2016 estimate was measured as the sum of income for the services provided by the companies. Onward estimates were compiled using the value index of income received from services.

Intermediate consumption was computed using similar methods as other industries for 2016 while other years were based on the input/output ratio on gross output.

4.15.4 Volume measures

Overall CPI was used to deflate the output of this industry. The same volume index of output is applied to GVA to derive constant estimates. IC=Output at constant prices-GVA at constant prices

4.16 Administrative and support service activities (N)

4.16.1 Introduction

This industry is categorized under Section N of the ISIC Rev. 4, includes a variety of activities that support general business operations. (United Nations, 2008). In Liberia, the section includes rental and leasing activities; employment activities; travel agency, tour operator, reservation service, and related activities; security and investigation activities; services to buildings and landscape activities; and office administrative, office support, and other business support activities.

4.16.2 Data sources and methods

The key data sources for Administrative and support service activities were the 2018 NAAS which collected data for the formal economy while the 2016 Household Income and Expenditure Survey covered the informal economy (LISGIS). For onward estimates, GST taxable sales data of establishment from the Liberia Revenue Authority (LRA) were used to compile the annual estimates.

4.16.3 Estimates at current prices

The current price of output of market producers for 2016 was measured as the sum of income for the services provided by the companies. Onward estimates were compiled using the value index of income received from services.

Intermediate consumption was computed using similar methods as other industries for 2016 while other years were based on the input/output ratio on gross output.

4.16.4 Volume measures

Overall CPI was used to deflate the output of this industry. The same volume index of output is applied to GVA to derive constant estimates. IC=Output at constant prices-GVA at constant prices

4.17 Public administration and defense; compulsory social security (O)

4.17.1 Introduction

This industry (Public administration and defense; compulsory social security), is categorized under Section O of the ISIC Rev. 4 and includes activities of a governmental nature, normally carried out by the public administration. This includes enactment and judicial interpretation of laws and their regulation, as well as the administration of programs based on them, legislative activities, taxation, national defense, public order and safety, immigration services, foreign affairs, and the administration of government programs. The section also includes compulsory social security activities (United Nations, 2008).

In Liberia, this section covers governmental expenditure normally carried out by the public administration on government programs including judicial activities, legislative activities, taxation, national defense, public order and safety, immigration services, foreign affairs and the administration of government programs, and compulsory social security activities.

4.17.2 Data sources and methods

The key data source for Public administration and defense; compulsory social security is public sector data obtained from the consolidated fiscal table from the Ministry of Finance and Development Planning (MFDP)

4.17.3 Estimates at current prices

Production of government services is mostly non-market output but may produce some output for its own final use and some market output. Output was valued at the sum of costs for the current price.

Public Administration Output = Intermediate consumption + compensation of employees + consumption of fixed capital + taxes on production

Public Admin Value Added= compensation of employees + consumption of fixed capital + taxes on production

Data was received on a fiscal year basis and has been transformed into a calendar year basis

4.17.4 Volume measures

CPI was used as a deflator for producing volume measurement estimates.

4.18 Education (P)

4.18.1 Introduction

This sector is categorized under Section P of the ISIC Rev 4. The sector includes education at any level or for any profession, oral or written as well as by radio and television or other means of communication. It includes education by the different institutions in the regular school system at its different levels as well as adult education, literacy programs, etc. Also included are military schools and academies, prison schools, etc. at their respective levels. The section includes public as well as private education.

In Liberia, this section includes private and public education of early learning, primary, secondary, vocational and tertiary school systems.

4.18.2 Data sources and methods

The key data sources for Education were the 2018 NAAS data for private education while the consolidated fiscal table from the Ministry of Education covered public education. Additional data source was the National School Census' school enrollment from the Ministry of Education.

4.18.3 Estimates at current prices

The Output of private education was obtained from the 2018 NAAS for 2016 current estimates while onward estimates were extrapolated using the value index of income received from services plus the output for public education using the labor cost and administrative expenses.

Intermediate consumption for private education was extrapolated using the value index of administrative and operating expenses. The intermediate consumption for public education was obtained using the expenses on goods and services in public education.

4.18.4 Volume measures

CPI of education services was used to deflate the output of this industry. The same volume index of output was applied to GVA to derive constant estimates. IC=Output at constant prices-GVA at constant prices

4.19 Health and Social Work (Q)

4.19.1 Introduction

This sector is categorized under Section Q of the ISIC Rev 4. This section includes the provision of health and social work activities. Activities include a wide range of activities, starting from health care provided by trained medical professionals in hospitals and other facilities, over residential care activities that still involve a degree of health care activities to social work activities without any involvement of health care professionals.

In Liberia, this section includes private and public health facilities that provide health services in the economy.

4.19.2 Data sources and methods

The key data sources for Health were the 2018 NAAS data for private health while the consolidated fiscal table from the Ministry of Health covered public health.

4.19.3 Estimates at current prices

The Output of private health was obtained from the 2018 NAAS for 2016 estimates while onward estimates were extrapolated using the value index of income received from services. For public health, output was derived using the labor cost and administrative expenses.

Intermediate consumption for private health was extrapolated using the value index of administrative and operating expenses. The intermediate consumption for public health was obtained using the expenses on goods and services in public health.

4.19.4 Volume measures

Overall CPI was used to deflate the output for the health sector. The same volume index of output is applied to GVA to derive constant estimates.

IC=Output at constant prices-GVA at constant prices.

4.20 Art, entertainment, and recreation (R)

4.20.1 Introduction

This sector is categorized under Section R of the ISIC Rev 4. This section includes a wide range of activities to meet varied cultural, entertainment and recreational interests of the general public, including live performances, operation of museum sites, gambling, sports, and recreation activities. In Liberia, the section includes creative activities, arts & entertainment activities, activities of libraries & museums, gambling & betting activities, and sports activities, amusement & recreation activities.

4.20.2 Data sources and methods

The key data sources for Art, entertainment, and recreation activities were the 2018 NAAS which collected data for the formal economy while the 2016 Household Income and Expenditure Survey covered the informal economy (LISGIS). For onward estimates, GST taxable sales data of establishment from the Liberia Revenue Authority (LRA) were used to compile the annual estimates.

4.20.3 Estimates at current prices

The current price of market producers' output for 2016 was measured as the sum of income for the services provided by the companies. Onward estimates were compiled using the value index of income received from services.

Intermediate consumption was computed using similar methods as other industries for 2016 while other years were based on the input/output ratio on gross output.

4.20.4 Volume measures

Overall CPI was used to deflate the output of this industry. The same volume index of output was applied to GVA to derive constant estimates. IC=Output at constant prices-GVA at constant prices.

4.21 Other services activities

4.21.1 Introduction

This sector is categorized under Section S of the ISIC Rev 4. This section (as a residual category) includes the activities of membership organizations, the repair of computers and personal and household goods, and a variety of personal service activities not covered elsewhere in the classification. In Liberia, establishments in this industry are mainly engaged in the activities of repair of computers, personal and household goods, hairdressing and other beauty treatment activities, and activities of washing and dry-cleaning of textiles.

4.21.2 Data sources and methods

The key data sources for Art, entertainment, and recreation activities were the 2018 NAAS which collected data for the formal economy while the 2016 Household Income and Expenditure Survey covered the informal economy (LISGIS). For onward estimates, GST taxable sales data of establishment from the Liberia Revenue Authority (LRA) were used to compile the annual estimates.

4.21.3 Estimates at current prices

The current price of output of market producers for 2016 was measured as the sum of income for the services provided by the companies. Onward estimates were compiled using the value index of income received from services.

Intermediate consumption was computed using similar methods as other industries for 2016 while the years were based on the input/output ratio on gross output.

4.21.4 Volume measures

Overall CPI was used to deflate the output of this industry. The same volume index of output is applied to GVA to derive constant estimates. IC=Output at constant prices-GVA at constant prices

4.22 Taxes on products

4.22.1 Introduction

Taxes on products are taxes payable per unit of goods or services produced {Citation}. They include Value Added Tax (VAT), excise duty on airtime, taxes on beverages and tobacco, and taxes on petroleum products.

In Liberia, Taxes on products comprise value-added tax, taxes and duties on imports and exports, and other taxes on products (e.g. excise duties, stamp taxes on the sale of specific products, such as alcoholic beverages or tobacco, car registration taxes, taxes on lotteries, taxes on insurance premiums).

4.22.2 Data sources and methods

Monthly tax data on all types of taxes were obtained from the Liberia Revenue Authority (LRA) to compile taxes on products.

4.22.3 Estimates at current prices

Taxes on products at current prices were compiled by summing the below taxes:

1. Value-added type taxes (VAT) (D.211);
2. Taxes and duties on imports (excise tax) excluding VAT (D.212);
3. Import duties (D.2121),
4. Taxes on imports excluding VAT and duties (D.2122);
5. Other taxes on products, except VAT and import taxes (D.214);

4.22.4 Volume measures

Estimates of taxes at constant prices for domestic taxes used the household final consumption expenditure volume index to extrapolate taxes. Meanwhile, for taxes on imports, the volume of imports was used.

4.23 Subsidies on products

4.23.1 Introduction

A subsidy on a product is a subsidy payable per unit of a good or service. The subsidy may be a specific amount of unit per quantity of a good or service, or it may be calculated ad valorem as a specified percentage of the price per unit. As revenue, these are amounts receivable, mainly by public corporations. In rare cases, general government units and non-profit institutions serving households can receive subsidies when the transferred receivable depends on the general regulations of the subsidy scheme, applicable to all producers - that is, market and nonmarket producers.

4.23.2 Data sources and methods

Data on subsidies were obtained from the Government expenditure data from the Ministry of Finance and Development Planning.

4.23.3 Estimates at current prices

A subsidy may be calculated as the difference between a specified target price and the market price paid by a buyer.

4.23.4 Volume measures

Estimates of subsidies at constant prices used the amounts receivable, mainly by public corporations and non-profit institutions serving households. Volume index to extrapolate subsidies.

V. Expenditures approach

(*This chapter focuses on the description of all the components of the GDP by expenditures approach, data sources, and methods used for the estimates at current and constant prices.)*

5.1 GDP by Expenditure Approach

According to the System of National Accounts (SNA) 2008, the compilation of GDP by type of expenditure is compiled as a sum of final consumption expenditure by Household, Government, Non-Profit Institutions Serving Households (NPISHs), Gross Fixed Capital Formation, Changes in inventories, Valuable, and net Export. For the GDP series under the expenditure approach, all components were largely compiled independently for the time series at current and constant prices from 2016 and onward except changes in inventories which are included and are part of the statistical discrepancy.

The rebasing of GDP by the expenditure approach was based on a mix of direct information on statistical and administrative data sources and indirect information including national accounts estimates on the production side. Micro and macro approaches were used to derive the series components while the CPI was for deriving volume estimates. In addition, unit value indices from imports and production data in volume and value terms were used for deflators in some cases.

5.2 The reference framework

The national accounts of Liberia compile the estimation of GDP by expenditure method in current and constant year prices in regular intervals. The framework used to compile the expenditure components considered an elaborate product flow approach for all the products that were aggregated to derive the totals on the expenditure side. The compilation is based on the general identity model;

GDP by Expenditure = C+ G +I +(X-M)

Where;

C = Household final consumption expenditure; G = Government final consumption expenditure;

I = Investment (sum of gross fixed capital formation and changes in inventories);

X = Export;

M =Imports.

5.3 Household Final Consumption Expenditures

5.3.1 Introduction

The household final consumption expenditure (HFCE) consists of the expenditure whose value must be estimated indirectly, incurred by resident households on individual consumption goods and services, including those sold at prices that are not economically significant and including consumption goods and services acquired abroad (SNA 2008). It excludes the final consumption expenditure of non-residents in the economic territory as well as the expenditure on fixed assets in the form of dwellings or valuables.

5.3.2 Data sources and methods

The Final Consumption Expenditure of Households is estimated based on different data sources such as the Household Income and Expenditure Survey (HIES), administrative sources, output estimations compiled from the Production Approach, and extrapolations. Administrative sources include data on Electricity and Water supply and Sewerage data, Transport vehicles, Payments for licenses and permits made by households, and Financial Intermediation Services Indirectly Measured (FISIM) compiled from the commercial banks and insurance companies data.

The key information used to compile HFCE is the following:

1. purchases of consumer goods and services
2. estimated value of barter transactions
3. goods and services received in kind
4. goods and services produced and consumed by the same household

5.3.3 Estimates at current prices

The HFCE was estimated using the first 12 categories of Classification of Individual Consumption According to Purpose (COICOP) and these sum to the total individual consumption expenditure of households. The 12 categories used are as follows:

1. Food and non-alcoholic beverages;
2. Alcoholic beverages, tobacco, and narcotics;
3. Clothing and footwear;
4. Housing, water, electricity, gas and other fuels;
5. Furnishings, household equipment, and routine household maintenance;
6. Health;
7. Transport;
8. Communication;
9. Recreation and culture;
10. Education;
11. Restaurants and hotels;
12. Miscellaneous goods and services

In addition, various volume indicators from production, imports, CBL, electricity, and tax data (service sector) were analyzed and used to produce HFCE estimates for years other than the 2016 base year.

5.3.4 Volume measures

Constant prices were compiled on an annual basis at the available COICOP level. CPI was used as a deflator for producing volume measurement estimates of HFCE.

5.4 NPISH final consumption expenditures

5.4.1 Introduction

The Non-profit institutions serving households (NPISHs) consist of non-profit institutions (NPIs) that are engaged in the production of non-market services for households or the community at large and whose main resources are voluntary contributions. They are not controlled by the government. The NPIs are legal or social entities created for the purpose of producing goods and services but whose status does not permit them to be a source of income, profit, or other financial gain for the units that establish, control, or finance them. The final consumption expenditure of NPISHs consists of the expenditure, including expenditure whose value must be estimated indirectly, incurred by resident NPISHs on individual consumption goods and services and possibly on collective consumption services (SNA 2008).

5.4.2 Data sources and methods

Data for 2016 was obtained from the National Accounts Annual Survey (NAAS) 2018.

5.4.3 Estimates at current prices

NPISH usually provides goods and services to activities of Education, Health, Housing, Arts and Entertainment & Recreation. For the 2016 NPISHs expenditure value, it was mainly derived from the cost method of these activities. From 2017 and onwards, the extrapolation method was used to estimate NPISHs at the current price. The GVA of the selected sectors from GDP-P was used as an indicator to produce the onward estimates of NPISHs FCE at current prices following the benchmark year 2016

5.4.4 Volume measures

The constant price estimate was derived using composite deflators of NPISH activities. The GVA of the selected sectors from GDP-P was used as an indicator to produce the onward estimates of NPISH FCE at current prices following the benchmark year 2016, while the implied GVA deflator was used for the estimates at constant prices.

5.5 General Government Final Consumption Expenditures

5.5.1 Introduction

General government final consumption expenditure (GGFCE) consists of expenditure whose value must be estimated indirectly, incurred by the general government on both individual consumption goods and services and collective consumption services (SNA 2008).

5.5.2 Data sources and methods

The main data source for the estimates of GGFCE was obtained from the fiscal statement of the Government provided by the Ministry of Finance and Development Planning.

5.5.3 Estimates at current prices

Final consumption expenditure by the General Government was computed by summing compensation of employees and intermediate consumption less sales of goods and services. The non-market output for the Government was obtained in public administration, education, the health sector, research and development, recreational and culture, and other services.

5.5.4 Volume measures

CPI was used as a deflator on the current price estimates to produce volume measurement estimates of GGFCE.

5.6 Gross capital formation

5.6.1 Introduction

According to the SNA 2008, gross capital formation (GCF) is measured by the total value of the gross fixed capital formation, changes in inventories and acquisitions less disposals of valuables.

5.6.1.1 Gross Fixed Capital Formation

Gross fixed capital formation (GFCF) is measured by the total value of a producer's acquisitions, less disposals, of fixed assets during the accounting period plus certain specified expenditures on services that add to the value of non-produced assets (SNA 2008). In other words, it is the acquisitions less disposals of fixed assets plus certain additions to the value of non-produced assets, e.g. major improvements.

- Transactions included in intermediate consumption (purchases of small tools for production purposes, ordinary maintenance and repair, and acquisition of fixed assets to be used under an operational leasing contract);
- Transactions recorded as changes in inventories (animals raised for slaughter and trees grown for timber);
- Machinery and equipment acquired by households for purposes of final consumption;
- Holding gains and losses (revaluation) and catastrophic losses.

The compilation of gross fixed capital formation in Liberia consists of four categories: 1. Construction (dwellings, other buildings, and structure); 2. Livestock (poultry, cattle, goat, sheep, and pigs); 3. Machinery and equipment; and 4. Research & Development (Mineral exploration).

Construction

The GFCF on construction is estimated from the supply side, starting from the output of construction activity, the inclusion of structures used by the military, and improvements to existing fixed assets (buildings) beyond ordinary maintenance and repairs.

Construction includes general construction and specialized construction activities for buildings and civil engineering works. It includes new work, repair, additions and alterations, the erection of prefabricated buildings or structures on the site and also construction of a temporary nature. Some general construction includes entire dwellings, office buildings, stores and other public and utility buildings, farm buildings, etc., or the construction of civil engineering works such as motorways, streets, bridges, tunnels, etc. It also includes new work, repair, additions and alterations, the erection of prefabricated buildings or structures on the site, and construction of a temporary nature.

Livestock

Livestock production includes deliveries of live animals for slaughter or export and change in livestock net of imported animals for breeding. The change in livestock is broken down into gross fixed capital formation and change in inventories. Gross fixed capital formation in livestock that are cultivated for the products they yield year after year (dairy cattle, draught animals, etc.) is measured by the value of acquisitions less disposals, taking account of the treatment just described of immature livestock reared on own account.

It is therefore equal to the total value of all mature animals and immature animals produced on their own account acquired by users of the livestock less the value of their disposals. Disposals consist of animals sold or otherwise disposed of, including those

sold for slaughter, plus those animals slaughtered by their owners. Transactions recorded as changes in inventories (animals raised for slaughter, trees grown for timber) were excluded from GFCF calculation.

Machinery and equipment

Machinery and equipment cover transport equipment, machinery for information, communication and telecommunications (ICT) equipment, and other machinery and equipment. In the case of Liberia, the below categories were used to compile GFCF on machinery and equipment:

1. **Transport assets and equipment**: This refers to new and used cars, trailers, trucks, ships, motorcycles, and other vehicles.
2. **General and special machinery:** These include engines, turbines, agriculture and forestry machines and tools, machines for metallurgy, mining, and machines for food, beverages, tobacco processing, etc.
3. **Computers and peripherals: These** include PCs, laptops, servers, printers, monitors, projectors, etc.
4. **Radio, TV, and other ICT equipment:** This includes radio, TV, phones, faxes, switchboards, TV cameras, fire and other alarm equipment.
5. **Other uses in business:** This includes furniture, office equipment, medical and optical equipment, musical instruments, fuel elements for nuclear reactors, and other fabricated products.

5.6.2 Data sources and methods

Construction

Data on the Economic survey and ASYCUDA are used to derive the estimates on construction activity and gross fixed capital formation.

Livestock

Data for the estimation of Livestock cultivated assets is obtained from the monthly data on several livestock from the Ministry of Agriculture, Agricultural Survey projection, and the 2016 Agriculture Recall Survey.

Machinery and equipment

Machinery and equipment data are taken from the ASYCUDA database (Foreign Trade statistics) in CIF value.

5.6.3 Estimates at current prices

In the absence of data for the industries not covered by the NAAS, alternative sources and methods were used to complete the GFCF estimates for the total economy. The output (formal and informal) of construction activities was used to complete the GFCE estimates for dwellings and the building of other structures.

Gross Fixed Capital Formation estimates for 2016 and 2017 from the NAAS 2018 were estimated as the Value of a producer's acquisitions, less disposals, of fixed assets during the accounting period.

The estimation of the number of livestock is based on changes in stocks (final stocks minus initial stocks), production, and utilization (slaughtering, sales, and losses) for cattle, sheep, and goats. For the ongoing estimates of GFCF data on production and imports of capital goods were used for Livestock.

5.6.4 Volume measures

Volume index of cement production and UVI for imported capital goods are used for volume measurement of GFCE for construction.

To derive the constant price values of Machinery and equipment, current price values were deflated for each category using the Paasche type of UVI. Net Weights for each type of asset were also available and used to compile detailed Unit Value Indices based on 2016 to derive onward estimates.

The constant price estimates were compiled by applying the 2013 base year prices for each livestock type.

5.7 Export and Imports of goods and services

5.7.1 Introduction

Exports and imports of goods and services consist of transactions in goods and services (sales, barters, gifts, or grants) from residents to non-residents. Imports of goods and services consist of transactions in goods and services (purchases, barters, gifts, or grants) from non-residents to residents. The scope of exports and imports of goods and services are except FISIM. Exports and imports of goods, according to SNA 2008, occur when economic ownership of goods changes between residents and non-residents. Changes in economic ownership in exports/imports of goods and services are referred to as Transactions. Data on exports was disaggregated at the product level for individual years.

5.7.2 Data sources and methods

The major source of data for the estimation of exports and imports of goods and services is the Balance of Payment (BoP) data compiled by the Central Bank of Liberia (CBL) based on the Balance of Payment Manual, Sixth Edition (BPM 6). The data source for the estimation of UVI indices from the external trade statistics extracted from the ASYCUDA at the 8-digit level, provided by the External Trade unit of LISGIS (IMF, 2009).

5.7.3 Estimates at current prices

Data based on the Balance of Payment Manual sixth edition (BPM 6) was used for the compilation of net exports for the series 2016–2020. The constant price estimates of net exports of goods were compiled by using unit values indexes of imports and exports of goods. The exports and imports of services at constant prices were estimated by applying the deflators of GVA for the services sectors covered by the BoP data such as Transport and storage; Information and Communication; Financial services; and Other Services.

Current price estimates are compiled using direct BoP data on exports and imports of goods and services.

5.7.4 Volume measures

The exports and imports of goods and services at constant prices were estimated by applying the deflators of GVA for the services sectors covered by the BoP data such as: Transport and storage; Information and Communication; Financial services; and Other Services.

Volume index of export goods and UVI for import of goods are used to derive volume measurement of Net export of goods. Price data are used for estimating the net export of services at constant prices.

VI. Future development

(This chapter will focus on the plans for further improvement of the national accounts estimates, data sources, plans for the next GDP rebasing, production of SUT or QNA, and increasing the number of indicators in national accounts.)

6.2 Future plans for improvement and rebasing

From the recent GDP rebasing activities, major improvements were carried out using new data sources including administrative and economic surveys. Moreover, recommended methodologies from the 2008 SNA on FISIM were implemented. Also, estimates on the

insurance sector were compiled for life and non-life. Another round of economic census was conducted using a digital platform (Survey Solutions) in 2023 for GDP rebasing in 2025.

Given that major improvements were implemented for the GDP series using the 2016 base year, there are plans to further improve GDP estimates in 2024 and 2025 by ensuring the below activities are conducted.

- Conduct Agriculture census and survey in 2024
- Increase 2016 series back to 2010
- Begin the compilation of QNA by the third quarter of 2024
- Regular compilation of GDP on an annual basis
- Conduct HIES and Labour Force Survey in 2024
- Further improvement of methodology and data sources
- Work with the Revenue Authority on ISIC Rev 4 coding revision of firms
- Work with the Industrial Statistics unit on PPIs with technical assistance from the AFRITAC West 2/IMF.
- Rebase GDP using the 2024 base year from the 2025 economic survey
- Generate Supply and Use tables using the new 2024 GDP estimates

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