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Behind the model, beyond the numbers: The 2019 Social Accounting Matrix for Nigeria

Methods for constructing and estimating the Database

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Contents

Abstract

A Social Accounting Matrix (SAM) is a comprehensive and economy-wide database that records data on all transactions taking place in an economy over a specific period, typically one year. The SAM serves two primary objectives. Firstly, it presents the economic structure and interrelationships among economic agents in the region under analyses. Secondly, it provides a database for analysing the economy's performance and simulating the effects of policy interventions through multisectoral linear models and computable general equilibrium (CGE) models. This paper presents the 2019 SAM for Nigeria, offering a suitable database for implementing and evaluating the country's social and economic policies. The study outlines how to pass from a standard structure of the SAM to a detailed scheme by explaining all the accounts included, and covering key aspects of its construction and estimation. Considering the characteristics of the Nigerian economy, this SAM shows a special structure to reflect the Home Production for Home Consumption (HPHC) concept and a high disaggregation of the agricultural sector. Furthermore, this SAM presents a high level of disaggregation by encompassing labour and household characteristics, considering regions and rural and urban areas. The SAM is used as a database to perform a descriptive analysis of the Nigerian economy.

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Preface

The European Commission is committed to cooperating with developing countries to address issues related to inequality, nutrition and food security. This commitment is carried out through the evaluation of relevant policies and by facilitating access to analytical tools for researchers in these countries, enabling them to conduct their own assessments. In this regard, the Joint Research Centre (JRC), the European Commission's in-house science service, is committed to providing support for the following areas: i) improving information systems on agriculture, nutrition and food security, ii) conducting policy and economic analysis to support the policy decision-making process and iii) offering scientific advice on selected topics concerning sustainable agriculture, food and nutrition security.

The JRC is responsible for developing methodologies and tools to conduct economy-wide analysis related to the sustainability of policies in the agri-food sector, sustainable resources, and address the food and nutrition security issues. These analyses and tools aim to assist the EU institutions and partner countries in formulating and evaluating policies while providing demand-driven technical and scientific advice. Among the possible scientific tools, economic simulation models are used to depict the interrelationships between selected economic variables and provide a simplified representation of economic reality. These models are utilised to quantify the impacts of policy changes through ex-ante policy analysis.

The construction of databases to provide evidence-based policy support to partner countries is one of the objectives of the Pan-Africa Network for Economic Analysis of Policies (PANAP). PANAP is a network that brings together academic/research and institutional partners collaborating with the JRC to develop research on agricultural economics and policy issues, with a focus on Africa. PANAP is aligned with the Action Agenda of the Political Declaration of the 3rd AU-EU Agriculture Ministerial Conference held in Rome on June 21, 2019 (EC Decision C(2019) 4277).

PANAP engages key stakeholders, researchers, data analysts, and policy makers from national and multilateral institutions, in productive discussions on the role of science in supporting policy decision-making in Africa, particularly in the farming and food sectors (Morokong & Ferrari, 2020). The objective of PANAP is to enhance the collaboration between researchers/scientists and policymakers in Africa, including relevant multi-lateral African institutions, and to stimulate their cooperation on selected topics linked to policy priorities in Africa. PANAP also contributes to understanding and addressing scientific issues in the fields of agriculture and food security, with the aim of supporting effective policies and achieving sustainability of the agri-food sectors to enhance food and nutrition security. These efforts are in alignment with the Malabo Declaration Commitment 3, which aims to end hunger in Africa by 2025, as well as Sustainable Development Goal (SDG) 1 and SDG 2.

The primary audience for this paper comprises a diverse spectrum of stakeholders with a shared objective: to foster evidence-based policy decision-making in Africa. This inclusive audience encompasses statistical offices, researchers, modellers, key stakeholders, data analysts, and policy makers from both national and multilateral institutions. While policy makers are part of the intended readership, this paper's main focus lies in presenting and interpreting data rather than providing explicit policy recommendations.

By serving as a robust foundation of data and insights, this paper offers a database which empowers modelling for policy tools addressed to the decision-makers to craft policies that are firmly rooted in empirical evidence, ultimately contributing to the region's socio-economic advancement.

1 Introduction

The significant GDP rebase in 2013 from approximately USD 270 billion to USD 510 billion in 2013, has converted Nigeria into the largest economy in Africa and the 26th largest economy globally. This has led to a very different structure of the Nigerian economy. The remarkable 90% surge was primarily attributed to the inclusion of previously unaccounted sectors like telecommunications, movies, and retail, underscoring the need for updated economic statistics to reflect the evolving economic landscape accurately. However, the mere act of GDP rebasing, while essential for statistical accuracy, does not inherently translate to economic prosperity or alter the ground reality.

The country faces various challenges, particularly in the area of food security, which has become a focal point for macroeconomic analysis and policy formulation. With a large portion of the population engaged in agriculture, the agricultural sector plays a crucial role in Nigeria's economy, producing a wide range of crops, including maize, rice, cassava, and various cash crops.

The use of a customized version of a single-country Computable General Equilibrium (CGE) model is instrumental in analysing agricultural and rural policy priorities in Nigeria and trade policy across the African continent. This analysis is vital for addressing income and labour inequalities, as well as enhancing food security. Furthermore, the impact of the African Continental Free Trade Area (AfCFTA) on Nigeria's economy is a pressing concern, underscoring the necessity for policies that can foster economic development and sectoral growth. To facilitate this analysis, the development of a specific database that provides a comprehensive description of the country's regional economies, their interlinkages, and the disaggregation of key sectors is imperative. The calibration of the CGE model necessitates a comprehensive database system, such as a Social Accounting Matrix.

A Social Accounting Matrix (SAM) provides a holistic and economy-wide representation of all economic transactions occurring within a specific period, typically a year. This framework has been widely utilized across various research disciplines, policy analyses, and economic modelling in diverse contexts. In the context of Nigeria, the SAM serves as a vital tool for understanding the country's economic structure and is a cornerstone for linear multisectoral models, enabling the analysis of different policy scenarios and their implications. The construction and estimation of a new SAM for Nigeria represent a significant achievement, offering detailed insights into the economic dynamics of the country and serving as a fundamental database for economic analysis and policy formulation. The 2019 SAM for Nigeria is designed to provide a detailed breakdown of accounts by region, rural and urban areas and skill-specific labour factors, contributing to a more comprehensive and nuanced understanding of the country's economic landscape.

This report is structured as follows: Section 2 presents the background, concept, advantages and limitations, while Section 3 describes the main accounts of the Social Accounting Matrix standard scheme. Section 4 describes the structure of the 2019 Nigeria SAM, detailing the accounts and data used, as well as the disaggregation procedures, final adjustments and SAM balancing. Additionally, this section introduces the Home Production for Home Consumption approach, a key feature of the SAM. In Section 5, a description of the Nigerian economy’s structure is provided using SAM data. Finally, Section 6 includes conclusions, and the Annexes provide additional tables and presents the dedicated online tools available.

2 The Social Accounting Matrix framework

2.1 Background, concepts and limitations

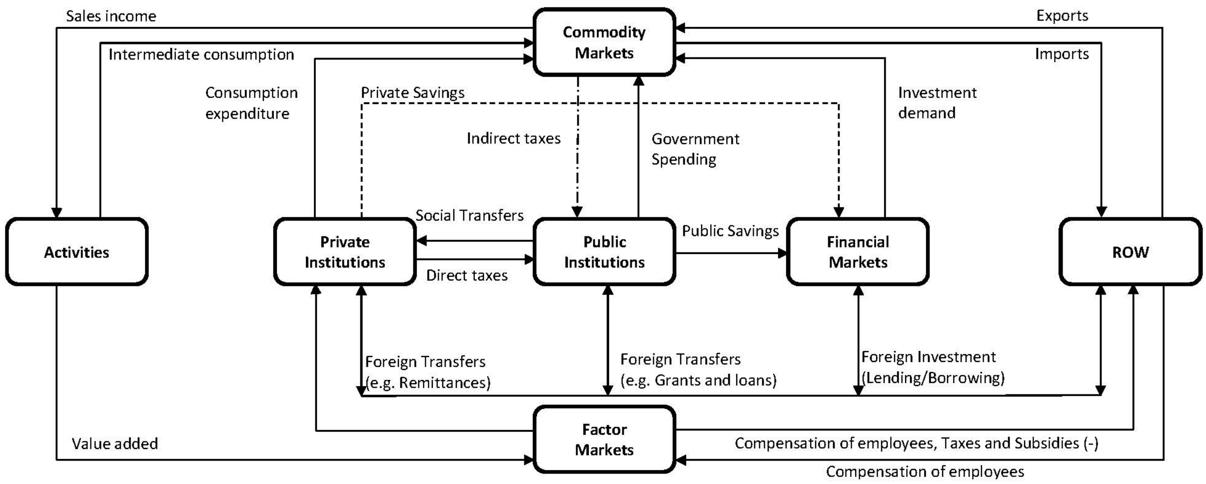
A Social Accounting Matrix is a comprehensive and economy-wide database that provides a detailed overview of an economy, including economic and social information on all transactions among economic agents within a specific country or region over a specific period, typically one year.

The development of SAMs can be traced back to the pioneering works of Stone (1947) and others, and subsequent advancements in their use as an economic analysis model (Defourny & Thorbecke, 1984; Pyatt & Round, 1985). Unlike Input-Output tables, SAMs incorporate a more complex accounting structure that captures all economic transactions, allowing for the representation of the circular flow of income and expenditure and illustrating the interlinkages among production, trade, demand, income generation, and its subsequent distribution among institutional sectors (Pyatt & Round, 1985).

SAMs are valuable tools for understanding the structure of an economy and provide a suitable database for economic modelling. They can be used for multisectoral linear models to calculate multipliers and as a database for more complex Computable General Equilibrium (CGE) models. This allows for the analysis of how the economy operates while considering socio-economic factors such as employment, poverty, growth, and income distribution, as well as for the assessment of the impact of different policy interventions.

The concept of the circular flow of income stays at the foundation of SAM development, as depicted in Figure 1.

Figure 1. The circular flow of income and expenditure.



Source: Own elaboration.

This diagram illustrates the circular flow of income and expenditure in an economy, showcasing how money flows between different economic agents and markets. Transactions go in and out of the boxes indicating inflows and outflows:

Summarizing the content of the diagram: Economic activities purchase intermediate products and, on the other hand, sell final products to commodity markets. Simultaneously, they generate value added that is allocated to Factor Markets. Private institutions, such as households, receive incomes from the factor markets, which they spend in commodity markets and accumulate as private savings. Public institutions, like the government, collect direct and indirect taxes, which they spend in commodity markets, pay social transfers to private institutions, and accumulate as fiscal surplus in financial markets. Private and public institutions, as well as the rest of the world, engage in transfers among themselves in current and capital accounts. After that, the Private and Public savings as well as foreign investments, representing disposable income are reinvested to generate new final demand through investment or spending, which continues the economic cycle anew.

2.2 The sequence of accounts

The information presented in Figure 1 can also be conveyed in a schematic way, as in Table 1.

Table 1. The Integrated Economic Accounts (example without sector details).

Resources	Total	Rest of the world	Total Economy	Transactions and balancing items		Total Economy	Rest of the world	Total	Uses
Account: I Production account or Goods & Services account	443,544	443,544	0	P.7	Imports	0	0	0	Account : I Production account or Goods & Services account
	0	0	0	P.6	Exports	0	456,097	456,097	
	692,763	0	692,763	P.1	Production	0	0	0	
	0	0	0	P.2	Intermediate consumption	357,463	0	357,463	
	0	0	23,239	D.21-D.31	Taxes less subsidies on products	0	0	0	
	335,300	0	0	B.1g	Gross value added	0	0	335,300	Account : II.1.1 Generation of income account
	-12,553	-12,553	0	B.11	External balance of goods and services	0	-12,553	-12,553	
Account: II.1.1 Generation of income account	101,028	676	100,352	D.1	Compensation of employees	100,503	525	101,028	Account : II.1.2 Allocation of primary income account
	24,655	-1,133	25,788	D.2-D.3	Taxes - subsidies on products & imports	24,655	0	0	
	0	0	23,239	D.21-D.31	Taxes less subsidies on products	0	0	0	
	0	0	0	D.29-D.39	Other taxes - subsidies on production	0	0	1,416	
	220,913	0	218,901	B.2g	Operating surplus, Gross	218,901	0	220,913	
Account: II.1.2 Allocation of primary income account	307,158	189,116	118,043	D.4	Property income	198,844	108,314	307,158	
	278,719	0	276,706	B.5g	Primary income balance / Gross National Income	276,706	0	278,719	Account : II.2 Secondary distribution of income account
Account: II.2 Secondary distribution of income account	36,700	74	36,626	D.5	Current taxes / Income and Capital	36,625	75	36,700	
	22,423	0	22,423	D.61	Social contributions	22,423	0	22,423	
	29,704	322	29,382	D.62	Social benefits other than in kind	28,862	843	29,704	
	24,188	8,289	15,899	D.7	Other current transfers	19,924	4,264	24,188	
	275,215	0	273,202	B.6g	Gross disposable income	273,202	0	275,215	Account : II.3 Redistribution of income in kind account
Account: II.3 Redistribution of income in	0	0	0	D.63	Social transfers in kind	0	0	0	
	0	0	0	B.7g	Adjusted disposable income	0	0	0	
Account: II.4 Use of income account	275,215	0	273,202	B.6g	Gross disposable income	273,202	0	275,215	Account : II.4 Use of income account
	0	0	0	P.3	Final consumption expenditure	146,951	0	146,951	
	1,904	0	1,904	D.8	Adjustment for the change in pension entitlements	1,904	0	3,808	
	128,264	0	126,252	B.8g	Gross savings	126,252	0	128,264	Account : III.1 Capital Account
	70,771	70,771	0	B.12	Current external balance	0	70,771	70,771	
Account: III.1 Capital Account	0	0	0	P.51	Gross Fixed Capital Formation and Investment in Valuables	191,068	0	191,068	
	0	0	0	P.52	Change in inventory	3,897	0	3,897	
	0	0	0	P.53	Acquisitions less disposals of valuables	46	0	46	
	0	0	0	K.2	Non-produced non-financial assets	35,316	-35,316	0	
	2,907	20	2,887	D.9(+)	Capital transfers receivable (+)	0	0	0	
	0	0	2,882	D.9(-)	Capital transfers payable (-)	0	0	0	
	0	-5	5	D.9Z	Transitional operations	0	0	0	
	112,172	70,766	39,394	B.10.1	Changes in net worth due to saving and capital transfers	0	0	0	
	4	98,186	-98,182	B.9	Net lending (+)/net borrowing (⊠)	-106,082	106,082		Account : III.2 Financial Account
Account: III.2 Financial account		377,484	554,243	F	Net acquisition of financial assets…	456,061	475,670		
		0	0	F.1	Monetary gold and SDRs	-48	0		
		71,028	59,948	F.2	Currency and deposits	114,791	16,187		
		242,740	71,392	F.3	Debt securities	245,536	68,597		
		-121,946	-105,059	F.4	Loans	-152,886	-74,118		
		235,896	401,217	F.5	Equity and investment fund shares/units	294,812	342,301		
		5,198	25,962	F.6	Insurance, pension and standardized guarantee schemes	9,185	21,976		
		-1,530	-6,751	F.7	Financial derivatives and employee stock options	-2,953	-5,328		
		-53,854	107,534	F.8	Other accounts payable / receivable	-52,376	106,055		

Source: Own elaboration.

The accounts of the System of National Accounts (SNA) record all economic flows and stocks, each relating to a particular aspect of economic behaviour.

It contains flows or stocks and shows the entries for an institutional sector, or the rest of the world. Typically, the entries in the account do not conceptually balance, so a balancing item must be introduced. Balancing items are meaningful measures of economic performance in themselves. When calculated for the whole economy, they constitute significant aggregates.

The integrated economic accounts provide a comprehensive view of the total economy, incorporating balance sheets and enabling the representation of principal economic relations and key aggregates.

In this table, transactions and other flows are displayed in the middle of the table, with columns to the left representing resources and columns to the right representing uses. While only three columns are shown in, in a complete presentation, there would be one column for each institutional sector or subsector of interest, which would disaggregate the value in the Total Economy columns. The table's structure maintains consistency, with totals on the left-hand side and right-hand side of the accounts matching line by line.

The basic accounting framework of the SNA is one of quadruple accounting. This implies that a transaction gives rise to two entries for each party to the transaction. There is vertical consistency within each unit and horizontal consistency between the two units for each type of entry.

In the presented setup, the accounts are grouped into three categories: current accounts, accumulation accounts, and balance sheets.

- Current accounts deal with production, the generation, distribution, and use of income. Each account after the first - starts with the balancing item of the previous one - recorded as resources. The last balancing item is saving which, in the context of the SNA, is that part of income originating in production, domestically or abroad that is not used for final consumption.
- Accumulation accounts cover changes in assets and liabilities and changes in net worth (the difference for any institutional unit or group of units between its assets and liabilities). The accounts concerned are the capital account, financial account, the other changes in the volume of assets account, and the revaluation account. The accumulation accounts show all changes that occur between two balance sheets.
- Balance sheets present stocks of assets and liabilities and net worth. Even when balance sheets are not compiled, a clear understanding of the conceptual relationship between accumulation accounts and balance sheets is necessary if the accumulation accounts themselves are to be correctly elaborated.

While the current presentation contains significant detail, further depth can be added. Additional columns might be introduced for subsectors, and the rest of the world column can be divided according to various geographical zones. The goods and services column can be separated into market goods and services. However, including more detail directly in this scheme simultaneously would result in a very complicated and unmanageable table. For this reason, more detailed analysis is conducted in other frameworks, which are presented in the next section.

2.3 Basic structure of a SAM

The SAM consists of six main basic groups: activities and commodities, factors of production, Private and Public institutions, and combined capital accounts and Rest of the World (ROW). At this stage, it is important to ensure that the row sum and the column sum match. We will then see other conditions that have to be consistent to verify the accuracy of a SAM.

The SAM is represented as a square matrix, with column accounts recording spending and row accounts recording income. In this matrix, each cell (*i,j*) shows the transaction between account *i* and *j*, in which account *i* receives income from *j*. It's important to note that for each agent, total expenditure (column account total) must equal total income (row account total).

Table 1 provides an example of the structure of a SAM. It explains the different components when adopting a Supply-Use scheme setup. This allows to describe value added by activity and final demand by commodity as macro aggregates but also to differentiate each content by economic sector. It also highlights the income distribution and the transfers among institutions which differentiate the SAM from a Supply-Use scheme. While the standard structure of a SAM is presented in Table 1; the matrix's layout can vary based on the inclusion of specific accounts within the six fundamental groups and how these accounts are subdivided. Additionally, the geographical scope of the SAM (national, regional, multi-regional, etc.) is influenced by the type of analysis being conducted.

Let's see now in detail the main elements of a SAM, column by column and row by row:

Activities column total describes the costs of production by activity, it accounts for:

- The intermediate consumption as the amount that each activity spends on inputs by commodity.
- Remuneration of factors which represent the total wages, rents, interests, and profits earned by each activity.
- Net taxes on production as the amount of taxes (minus subsidies) levied on the production of each commodity.

Activities row total describes the values of commodities produced by each activity domestically.

- The commodities column total describes the total supply and accounts, rather than the domestic production:
- Taxes less subsidies on each commodity.
- Trade and transport margins which represent the difference between the sales value and the cost of goods sold, which are not displayed in this standard structure.
- Imports of goods and services purchased from abroad.

Table 2. A Social Accounting Matrix standard structure.

	Commodities	**Margins**	**Activities**	**Factors**	**Households**	**Enterprises / Corporations**	**Government**	**Investment-Savings**	**Rest of the World**	***Total***
Commodities		Transaction costs (trade / transport)	Intermediate (inputs) consumption		Household consumption		Government expenditure	Investment and stock changes	Exports	*Demand*
Margins	Transaction costs (trade / transport)									*Margins*
Activities	Domestic production									*Gross output / Production (activity income)*
Factors	Net taxes on products		Remuneration of factors and taxes on production / Factor income						Factor income from RoW	*Factor income*
Households				Factor income distribution to households	*(Inter Household transfers)*	Distribution of enterprise income to households	Government transfers to households		Transfers to Households from RoW	*Household income*
Enterprises / Corporations				Factor income distribution to enterprises			Government transfers to enterprises		Transfers to Enterprises from RoW	*Enterprise income*
Government				Factor income to Government / Factor taxes	Direct Household taxes / Transfers to Government	Direct Enterprise taxes / Transfers to Government			Transfers to Government from RoW	*Government income*
Investment-Savings				*(Depreciation)*	Household saving	Enterprise saving	Government saving	*(Capital accounts transfers)*	Capital transfers from RoW (Balance of Payments)	*Saving*
Rest of the World	Imports			Factor income distribution to RoW	Households transfers to RoW	Enterprise income to Row	Government transfers to RoW			*Payments to RoW*
Total	*Supply*	*Margins*	*Costs of production activities*	*Expenditure on factors*	*Household expenditure*	*Enterprise expenditure*	*Government expenditure*	*Investment*	*Incomes from RoW*	

Source: Own elaboration based on Aragie et al. (2017) and Round (2003a).

2.4 Description of the main aggregates

The commodities row total represents the demand side, accounting for:

- Intermediate consumption as the value of goods and services consumed by each activity.
- Consumption expenditure as the value of commodities consumed by households and government.
- Gross capital formation which accounts for investments, changes in inventories, acquisitions less disposals of valuables.
- And finally, exports of goods and services sold abroad.

The factors column total represents the amount of resources used in the production process (i.e., labour, land, and capital) for each institutional sector, as well as the compensation of employees that goes to the Rest of the world.

The factors row total represents the remuneration of factors by activity, as well as the compensation of employees from the rest of the world, and can also be referred to as Gross National Income (GNI).

Now, we will address the institutional sectors all at once. The column total of this aggregate sums up to the expenditure composed of the consumption of goods and services and savings. Transfers, including those belonging to the secondary distribution of income, are accounted for among the institutional sectors. This amount also includes transfers to the rest of the world as for example remittances.

In the row, incomes received per institutional sector are accounted for. It first describes the allocation of primary income among households, enterprises, and government, and then provides the process of secondary distribution. This amount also includes transfers from the rest of the world, such as remittances. It is important to note that the Government conducts differently as a public institution, being the receiver of direct and indirect taxes.

The investment/savings column total represents the amount of Gross Fixed Capital Formation (GFCF) and changes in stocks. It also presents capital transfers payable.

In the row, savings generated by all domestic institutions including transfers of capital from foreign institutions are presented. This includes the consumption of fixed capital, subtracted from the gross operating surplus. Additionally, this row accounts for the capital transfers receivable and capital transfers from the Rest of the World in the form of net borrowing.

Concluding with the last account, which has already been anticipated, the Rest of the World column total shows income from abroad received within the country (or region) under study, as well as expenditures by the rest of the world. These expenditures are divided into the purchase of goods and services (exports), payments to domestic factors of production used abroad, and transfers recorded from other economies (such as factor payments, foreign loans and aid, remittances, etc.).

Finally, by row, payments to the rest of the world are presented, thus, income received by the rest of the world account, including imports of commodities, transfers abroad from domestic institutions, and the remuneration of factors of production abroad.

3 Economic agents and accounts

In the standard representation of this macroeconomic scheme we can list some recurring economic agents and accounts, among others: Activities and Commodities, Factors of production, Institutional sectors, including the Rest of the World, and the Investment-Savings. In the following sub-sections we delve into the characteristics of the main items, including also some approach adopted by the PANAP team.

3.1 Activities and Commodities

The standard structure of the SAM, as presented in Table 2, distinguishes between Supply and Use schemes. The table depicts Activities involved in the production of one or more Commodities (representing goods and services) and the flows are valued at basic prices. The supply of Commodities at purchaser prices is then calculated by encompassing domestic production by Activities, imports from other countries (rest of the world) or regions, trade and transport margins, and taxes less subsidies on products (both domestic and imported) (Mainar-Causapé et al., 2018).

In the second table, flows are valued at market prices (including indirect taxes on products and margins). This scheme presents the intermediate use of commodities in the production of final goods and services. Commodities can be sold domestically (to activities, households, and government) or exported. Activities that use inputs and the factors of production (such as labour, capital, land, etc.) are illustrated by columns. The sum of the primary factors plus taxes less subsidies on production represents the value added by Activities. The rows describe the Commodity demand, including intermediate consumption (by Activities), final consumption demand by institutional sectors (Household and Government), investment and exports. The sum of the values of commodities produced by each activity gives the gross output value.

For each commodity, the SAM records the associated costs of trade and transport (margins). These transaction costs are linked to the expenses incurred in moving goods among producers, markets, and national borders, whether for domestic consumption, import or export, and are considered part of the supply costs of commodities (Mainar-Causapé et al., 2018).

3.1.1 Home Production for Home Consumption (HPHC) approach

In developing countries, the dual role of households, both as producers and consumers, is a common characteristic, particularly in economies with a large share of subsistence agriculture. Consequently, there is a necessity to define and estimate home production for home consumption (HPHC) within a SAM.

The traditional concept of the Representative Household Group (RHG) includes the household behaviour as consumer of goods and services and as providers of factors of production (and receptor-contributors of transfers). The HPHC concept is introduced in the SAM by assuming that households function as units of production of commodities, consuming part or all of what they produce. This expansion of the SAM structure requires additional sets of column and rows as sub-columns and sub-rows of the commodity and activity accounts.

In the case of the Commodities accounts, this requires additional rows and columns to distinguish between the commodities produced by households for their own consumption (HPHC, whether as input or final product) and other marketed commodities (produced by both conventional productive activities and households). The rows of these commodity accounts show how HPHCs are used as intermediate inputs in the households productive activities and their consumption in the final demand of household (RHG). The column summarizes the contribution of the household activities to each of these goods.

HPHC commodities can only be produced by the RHGs that consume those commodities; therefore, each RHG must simultaneously be a household and an activity. The columns of the household's activities show how they use inputs (both HPHC and marketed), while the rows depict the destination of their production, whether as inputs for own-consumption or for the market. All the incurred tax and trade and transport costs should be allocated exclusively to the marketed component of the commodity (Mainar-Causapé et al., 2018).

The incorporation of HPHC into a SAM requires more comprehensive data from surveys and censuses, along with additional estimations. Obtaining Data for HPHC involves segmenting consumption demand between marketed and HPHC commodities and identifying the costs structures used in production. Typically, this will require reconciling data from different sources, especially household income and expenditure data, labour force and agricultural (production) surveys.

3.2 Factors of production

The factors of production refer to the resources employed in the production process (combined with intermediate inputs to produce goods and services). Traditionally, these factors include capital and labour, and can also encompass other types such as land. The specific types and disaggregation of factors of production depend on the purpose of the analysis. For example, the labour account can be disaggregated based on educational level distinguishing between skilled and unskilled workers.

In term of presentation, the production factors accounts depict the income received (such as wages, rent, etc.) from the activities and the rest of the world by rows. By columns, these incomes are allocated to the owners of the factors of production (Households, Enterprises and Government), as well as to the rest of the world. In the standard structure, based on the Aragie et al. (2017) and Round (2003a) schemes, factors also include net taxes on production and net taxes on products.

3.3 Households

The household sector provides information on the income and expenditure patterns of individuals within an economy. Typically, Households are organized into Representative Household Groups (RHGs), often categorized based on factors such as income level or geographic location. This information is crucial for studying socioeconomic issues such as income inequality and unemployment, as it allows the modeller to examine how different types of households are affected by an economic shock (Burfisher, 2016).

The Household row account records various sources of income, including income from factors of production (as owners of labour, capital, land, or natural resources), transfers from enterprises (such as distributed profits and direct transfers), direct transfers from the Government, transfers from the Rest of the World (usually for labour services and remittances) and transfers from other households (Mainar-Causapé et al., 2018). By columns, the Household expenditure is detailed, offering a breakdown of how household income is used for purchasing commodities, paying direct taxes to the government, making transfers to other households (both domestic and foreign), as well as household saving (or financing need if negative).

3.4 Enterprises

Enterprises represent the institutional component of the productive sector, typically not consuming inputs like activities. In the enterprise accounts, the rows compile the incomes received from asset ownership (such as capital, land, or natural resources) and income form transfers originating from other institutions. The column illustrates how these revenues are transferred to other institutions, e.g., households in the form of dividends, the payment of direct taxes (enterprise tax) or savings.

Within this group, further disaggregation is possible, such as distinguishing between financial and non-financial corporations, or categorizing companies as public or private.

3.5 Government

The institutional sector of the Government generally differentiates between Local and Central Government. Government income is presented by rows and includes revenue from various sources, encompassing taxes, transfers (both domestic and foreign), and compensation for factors of production (including any assets owned by the government). In contrast, Government expenditure is depicted by columns, and it is categorized into various components, such as consumption demand for goods and services, transfers to other institutions (including subsidies or benefits to households and enterprises), and payments to other countries (such as debt service payments). The investment-saving cell serves to indicate whether the government is running a trade surplus or deficit (if negative) by showing its saving.

3.6 Investment-Savings

The savings generated by all domestic institutions (households, enterprises, and government) as well as the balance of foreign trade on capital account with the rest of the world, are represented by rows in this account. The column displays the capital investment made in goods and services, which includes the Gross Fixed Capital Formation (GFCF) and changes in inventories.

3.7 Rest of the World

The foreign sector is comprised of two trade accounts: imports and exports, which illustrate the economic interaction between the country (or region) under analysis and the rest of the world. Depending on the type of analysis, the rest of the world can be represented as a single account or disaggregated to include other regions or countries (e.g., ECCAS, African Union and rest of the world).

The income received by the rest of the world account, represented by row, includes imports of goods and services (commodities), transfers to foreign institutions (households, businesses, and government), and the compensation of factors of production abroad. On the other hand, the expenditures of the rest of the world are shown by column, which encompass the purchase of goods and services (exports), payments to domestic factors of production used abroad, and transfers from other economies (such as factor payments, foreign loans and aid, remittances, etc.). The investment-saving cell indicates the surplus or deficit with the rest of the world, indicating the capital inflow (in the case of a negative trade balance) or outflow (in the case of a positive trade balance) between the rest of the world and the country under analysis.

4 The 2019 SAM for Nigeria

4.1 Data sources

To construct the 2019 SAM for Nigeria, several statistical sources have been used. The table 2 provides a detailed breakdown of the data sources used for the disaggregation of each section.

As a starting point, the 2010 Input-Output table and statistics for 2019, as well as data on trade and microdata provided by different surveys conducted by the National Bureau of Statistics were used. The integrated economic accounts have been calculated by using UNData statistics and the institutional sectors disaggregation have been estimated according to other countries pattern (Cameroon), considering GDP per capita and geographical characteristics.

Furthermore, data from the Living Standard Measurement Survey General Household Survey Panel (2018/2019), the Living Standard Survey (2018/2019), the Household Income and Expenditure Survey (HIES)- Socio Economic Survey (2019) and the Labour Force Statistics Survey (2017/2018) were considered in the SAM for the labour, employment, agriculture, and household disaggregation.

Table 3. Summary of Data Sources for the Nigeria SAM.

Data item	Data source	Data year
Macroeconomic scheme		
Input-Output Table	National Bureau of Statistics	2010-2019
Integrated Economic Accounts	Estimated	-
National Accounts	National Bureau of Statistics	2019
	UNData	2019
Import taxes	Market Access Map, International Trade Centre	2014
Labour disaggregation		
HIES- Socio-Economic Survey	ILOSTAT	2019
Living Standard Survey	National Bureau of Statistics & World Bank	2018/2019
Labour Force Statistics	National Bureau of Statistics	2017/2018
Other labour force aggregates	Statista and World Bank	2019
Households' disaggregation		
General Household Survey Panel – Living Standards Measurement Study	National Bureau of Statistics & World Bank	2018/2019
Living Standard Survey	National Bureau of Statistics & World Bank	2018/2019
Agriculture disaggregation		
Living Standard Survey	National Bureau of Statistics & World Bank	2018/2019
General Household Survey Panel – Living Standards Measurement Study – Integrated Surveys on Agriculture	National Bureau of Statistics & World Bank	2018/2019
Production and Trade data	FAOSTAT	2019
Employment disaggregation		
HIES- Socio Economic Survey	ILOSTAT	2019
Living Standard Survey	National Bureau of Statistics & World Bank	2018/2019

Source: Own elaboration.

4.2 Structure and estimation of the 2019 Nigeria SAM

Table 4. A Macro-SAM structure of the 2019 Nigeria SAM (in billions Naira).

	HPHC Commodities	Commodities	Margins	Regional activities	Activities	Labour	Capital	Indirect Taxes	Sale Taxes	Households	Enterprises	Government	Investment	World	Total
HPHC Commodities				2,212						7,497					9,709
Commodities			23,624	7,058	105,891					100,681		8,575	37,015	20,711	303,557
Margins		23,624													23,624
Regional activities	9,709	30,625													40,334
Activities		219,038													219,038
Labour				18,785	77,705									80	96,569
Capital				12,293	36,113										48,406
Indirect Taxes				- 13	- 671										- 685
Sale Taxes		1,429													1,429
Households						96,557	15,471				2,184	4,004		4,692	122,908
Enterprises							27,733					307		768	28,809
Government							5,201	- 685	1,429	5,750	6,534			1,994	20,223
Investment										8,713	11,151	6,651		10,500	37,015
World		28,841				12				267	8,940	685			38,746
Total	9,709	303,557	23,624	40,334	219,038	96,569	48,406	- 685	1,429	122,908	28,809	20,223	37,015	38,746	

Source: Own elaboration using the 2019 Nigeria SAM.

The regional breakdown in the SAM corresponds to 6 regions (representing the sub-national macro regions) (see table A3 in the Annex). Each region has a specific agricultural activity producing 22 "subsistence commodities" destined for home consumption, and 23 agricultural marketed commodities. The remaining 44 marketed commodities are produced by specific activities aggregated at a national level.

Furthermore, each Representative Household Group (RHG) is disaggregated into rural and urban and further separated across regions. Finally, 12 different household accounts are detailed in the SAM. Regarding the factor of production, the Nigeria SAM further contains 37 accounts. There are 36 types of labour and one account for capital. Labour is disaggregated across the regions and rural and urban areas, with labour factors are also separated by 3 skill levels (Skilled, Semi-skilled, Unskilled).

In summary, the 2019 Nigeria SAM accounts for:

- 49 activities:
  - 6 regional household agricultural activities
  - 43 activities.
- 89 commodities:
  - 22 home commodities
  - 67 marketed commodities.
- 37 factors of production (36 labour accounts and 1 capital factor);
- Net taxes on products, Net taxes on production, Imports taxes;
- Trade and transport margins;
- 12 households (disaggregated by rural/urban and by income quintiles);
- 2 Other institutional sectors: Corporations/Enterprises and Public Institution as the Government;
- Rest of the world;
- Investment-Saving.

All the accounts considered in the 2019 SAM for Nigeria are detailed in Annex 1.

4.2.1 Activities and Commodities disaggregation

The initial values for the rows and columns representing commodities and activities were obtained initially from the Input-Output table for 2010 and an estimation for the year 2019. From the two schemes were derived the Supply and Use tables for the year 2019. The SAM for Nigeria presents a total of 49 activities and 89 commodities.

As mentioned previously, this SAM includes the disaggregation of agriculture into household agriculture by regions and national agricultural activities separately. Therefore, the activities in the primary sector consist of 6 regional activities. The remaining activities amount to 43, totalling 49 (see Table A1 in the Annex for the full activity list).

The General Household Survey Panel (GHS-P) - Living Standard Measurement Survey (2018/19) and the Living Standard Survey (2018/19) played a pivotal role in disaggregating households, with a particular emphasis on the primary sector. The 2019 Living Standard Measurement Survey - Integrated Surveys on Agriculture (ISA), Wave 4 main objective was to provide baseline data on Agricultural Statistics. This data serves a valuable role in national agricultural planning, execution, and policy intervention.

The GHS-P is a long term project with the goal of collecting household-level characteristics, welfare, and agricultural activity along with information on human capital, access to services and resources and other economic activities of the Nigerian household.

The households' participation in the agricultural activities is collected twice: during the Post-Planting and then in the Post-Harvesting season. The data obtained from the survey provides important factors such as labour, food consumption and expenditure which helps in disaggregating the gross production value by products.

Regarding the commodity disaggregation, FAOSTAT represents another valuable data warehouse were to collect data on both value of agricultural production and trade value both in monetary values and in quantity.

Leveraging these datasets and surveys has allowed for the detailed breakdown of the primary sector by region, enabling the identification of household production and self-consumption. The use of these data has allowed for a detailed breakdown of the primary sector by region, which has made it possible to identify household production and self-consumption.

Therefore, the disaggregation of the SAM shows that each region has a specific agricultural activity producing 22 "subsistence commodities" destined for home consumption, and 23 marketed commodities. The remaining 44 marketed commodities are produced by specific activities aggregated at a national level, as shown in Table A2 in the Annex.

4.2.2 Household groups

The 2019 Nigeria SAM incorporates a distinction between rural and urban households and further disaggregates them by region.

As mentioned earlier, the GHS-P was used to identify household consumption derived from their own agricultural production. The Nigeria Living Standard Survey (knows as NLSS, 2018/19), was conducted by the National Bureau of Statistics in collaboration with the World Bank with the main objective to provide critical information for production of a wide range of socio-economic and demographic indicators, including for benchmarking and monitoring of Sustainable Development Goals (SDGs); to monitor progress in population's welfare; to provide statistical evidence and measure the impact on households of current and anticipated government policies. Therefore, it contains a wide range of socio-economic and demographic data pertaining to the basic needs and conditions under which households live on a day to day basis.

To this end, the NLSS 2018/19 provides valuable data on various aspects, including the demographic indicators, education, health, labour, expenditures on food and non-food goods, non-farm enterprises, household assets and durables, access to safety nets, housing conditions, economic shocks, exposure to crime and farm production indicators.

The initial NLSS sample of 22,200 households from the 36 states and FCT, was set to be interviewed over a 12-month period, such that each month, approximately 50 households were to be interviewed. The response rate of households was high, above 93 percent in every state and about 98 percent overall. The final sample comprised of 22,110 households, with much of the difference from initial sample due to security challenges in the state of Borno and subsequent under coverage of the sample in that state.

As a result, the 2019 Nigeria SAM includes 6 regional representative household groups (RHG) (see table A3), which are additionally divided into rural and urban areas, within the labour factors and the income groups. This classification will allow for a more in-depth analysis of redistributive factors and the differential impacts of various policies on different types of households.

4.2.3 Labour segmentation

Depending on the specific objectives of the analysis, the categorization of production factors is crucial. In the 2019 Nigeria SAM, the factors of production are divided into two main groups: labour and capital.

Under the labour factors, in order to account for regional disparities, a differentiation was made among the 6 regions, along with a distinction between urban and rural areas due to the variations in average consumption, employment, and income levels which generally characterizes these two areas. Additionally, to facilitate skill-focused analyses the employment accounts were disaggregated accordingly. This disaggregation is based on data obtained from the NLSS, specifically from section 4 regarding the compensation of employees and the own account workers income, section 9 on non-farm enterprises and section 13 on other sources of income.

While the NLSS offers key employment-related information, a more comprehensive understanding of labour force data was also obtained by considering the Labour Force Statistics (2017/18) and the HIES- Socioeconomic Survey (2019). The primary objective of these surveys was to collect labour market information and other socio-economic data necessary for policy formulation and decision-making in planning processes. Therefore, they encompass extensive data on labour market participation, job characteristics, the informal sector, unemployment, income, child labour. The first survey was organised by the National Bureau of Statistics (NBS) in Nigeria and provided a detailed view of the working age population, labour force and non-labour force, employment and unemployment. The second was conducted by the International Labour Organisation (ILO) and covered information on labour market indicator and a disaggregation of the labour force by economic activity.

Data from UNData were used to account for the total corresponding to the Gross Operating Surplus and Compensation of Employees. Additionally, data from Statista, based on the World Bank, were considered to compare different estimations in the total number of workers for the year 2019.

As a result, the labour accounts for the 2019 national SAM for Nigeria are disaggregated into 36 distinct accounts.

4.2.4 Other accounts

The Nigeria SAM includes three distinct types of taxes: taxes less subsidies on production (indtax), taxes less subsidies on products (saltax) and imports taxes (imptax). Taxes on production are imposed on production activities based on their output, while taxes on products and import taxes are levied on domestic firms for their purchases of intermediate input, as well as on consumers and investors for their acquisitions of final goods and services.

The import tariff rates have been derived from the MAcMap (Market Access Map) database for the year 2014 (International Trade Centre, www.macmap.org, retrieved on 20 April 2020). The MAcMap database is constructed to consistently represent bilateral import tariff protection at the six-digit level of the Harmonised System (HS) classification of the World Customs Organization, see Guimbard (2012) for the methodology. The 2014 data covers the trade of 196 countries categorised into 5205 product lines. The tariff rates included are effectively applied tariffs and assume that importers always adopt the most beneficial preferential tariff available to them. For integration into the SAM, the import tariff rates are aggregated up to the product groups represented in the SAM using trade value weighting. The trade values utilised are averages over the years 2013 to 2015 to reduce volatility. The resulting tariff rates are then applied to the associated SAM accounts' imports to yield import tax values for integration into the SAM.

The margins include the cost related to trade and transport. Trade margins are defined as the actual revenue realised on goods purchased for resale, minus cost of purchased products for trade (Eurostat, 2008). The transport margins consist of those transport charges paid separately by the purchaser in taking delivery of the goods at the required time and location (UNSC, 2009).

The Investment-Saving block represents by row, the domestic private savings of enterprises and households, as well as the fiscal surplus (or deficit) of the government; and by column, includes the gross fixed capital formation (representing investment in commodities such as machinery and equipment, vehicles, etc.) and the change in inventories. Detailed household savings data by region was obtained from the survey National Panel Survey (2019/2020).

Detailed description and codes for all accounts are provided in Annex, tables A.1 and A.2.

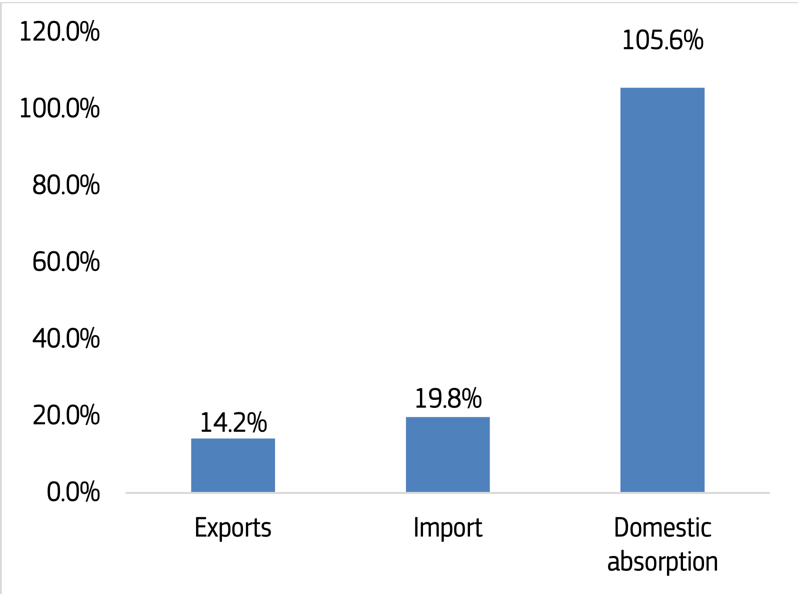
4.2.5 SAM final adjustment and balancing

The microdata provided by these surveys played crucial role in the disaggregation of the sub-accounts specified in this SAM. Given that multiple data sources were used in constructing the SAM, the cross entropy method were applied to reconcile and balance the data (Bacharach, 1970; Mcdougall, 1999; Robinson et al., 2001). In this specific case, we adopted the tool SAMEST (Robinson and McDonald, 2023) to estimate and reconcile different accounts by utilizing macroeconomic targets or targets specific to certain accounts, cells or sub-matrices, when insufficient information is available.

5 Economic overview and income distribution

In this section, we present a descriptive analysis of Nigeria's economy by exploring the main aggregates provided by the SAM. The overview of this section introduces insights into Nigeria's economic structure, household consumption patterns, and income distribution. It highlights regional disparities and sectoral differences within the economy, which can inform policy decisions and help in developing strategies. For example, policies that promote domestic manufacturing and reduce reliance on imported goods could help to address the country's trade deficit and promote more sustainable economic growth. Similarly, policies that target rural areas and address issues such as poverty and inequality could help to promote more equitable income distribution and reduce regional disparities.

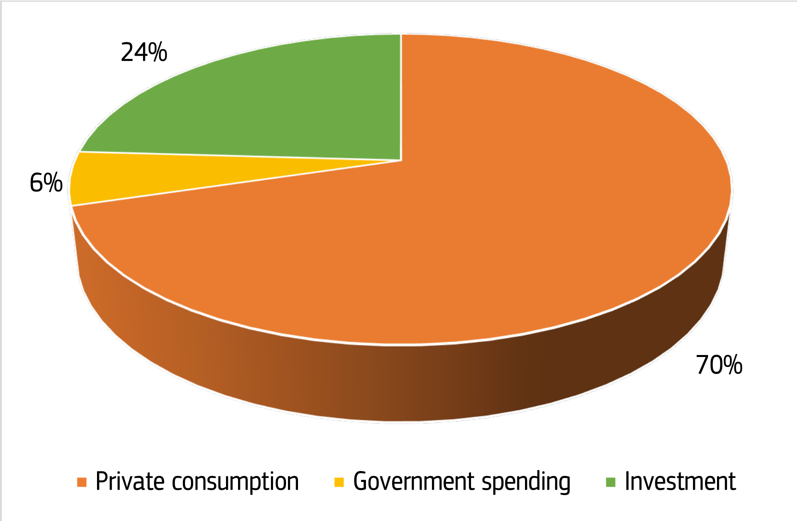
Figure 2. Domestic absorption, imports, and exports as % of the GDP. Nigeria 2019.



Source: Own elaboration using the 2019 Nigeria SAM.

In 2019, Nigeria's economic structure was characterized by a domestic absorption of 105.6% of the GDP (Figure 2). Exports contributed 14.2%, while imports made up 19.8%, indicating a trade deficit. Domestic absorption (or Gross national expenditure) is the sum of the private (Households) and public (Government) consumption expenditure and the gross capital formation. In this case, the domestic absorption over the GDP suggests that Nigeria's economy is driven by a combination of domestic production and net imports. The fact that domestic absorption exceeds 100% of the value of the GDP indicates that Nigeria is an importer of goods and services, with a significant portion of its domestic demand being met by imports. Figure 3 illustrates the breakdown of domestic absorption into its components — consumption, investment, and government spending. This composition is crucial for understanding how public and private sectors contribute to overall demand. The composition of domestic absorption reveals that private consumption accounted for 70% of the total, indicating a consumer-focused economy. This means that a significant portion of Nigeria's domestic demand is driven by household spending, with consumers playing a key role in driving economic activity. Investment made up 24% of domestic absorption, reflecting efforts toward capital formation and economic growth. Government spending contributed 6% of domestic absorption, highlighting limited public sector expenditure in relation to domestic.

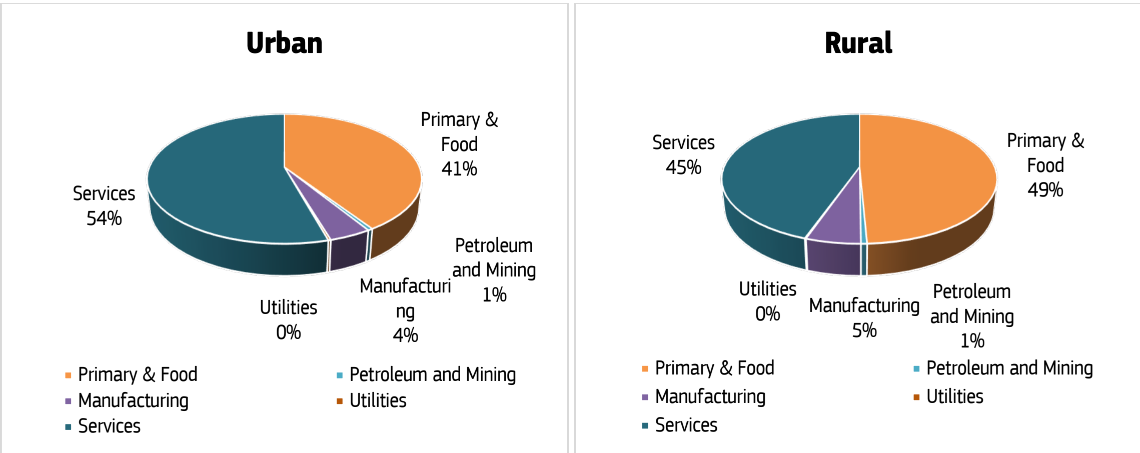
Figure 3. Domestic absorption composition. Nigeria 2019.



Source: Own elaboration using the 2019 Nigeria SAM.

Figure 4 reveals differences in household consumption patterns between Urban and Rural areas in Nigeria. Rural households tend to allocate a larger share of their expenditure to food, at 49.3%, while urban households allocate a larger share to non-food items, at 59.3%. This suggests that urban households have a higher demand for non-food products and other services, which may be driven by their higher incomes and greater access to the services market. In contrast, rural households may have lower incomes and limited access to markets, leading them to allocate a larger share of their expenditure to agriculture and food items.

Figure 4. Household consumption pattern in Urban and Rural areas. Nigeria 2019.



Source: Own elaboration using the 2019 Nigeria SAM.

Table 5 illustrates the share of household consumption expenditure for subsistence and marketed agricultural commodities in Nigeria in 2019, categorized by region, urban and rural areas, and commodity groups. HPHC Agriculture refers to subsistence consumption, which represents the share of home-produced goods consumed directly by households, while Marketed Agriculture refers to marketed consumption, indicating the share of goods purchased in markets.

In urban areas, subsistence consumption (HPHC Agriculture) is relatively low, indicating a greater reliance on marketed agricultural commodities. In the North, subsistence shares range from 21% in the Central region to 33% in the West, while in the South, these shares are lower, ranging between 12% and 13% across all regions. Conversely, marketed consumption (Marketed Agriculture) dominates urban areas, with the South East and South West recording the highest shares of marketed consumption at 88% and 87%, respectively, while the North West has the lowest at 67%. This demonstrates the significant dependence on markets for food consumption in urban settings.

In rural areas, subsistence consumption (HPHC Agriculture) is more pronounced, reflecting a stronger reliance on home-produced food. In the North, subsistence shares range from 20% in the Central region to 32% in the West. In the South, subsistence consumption remains consistent at 13% across all regions. However, marketed consumption (Marketed Agriculture) is still substantial in rural areas, with shares above 70% in all regions. Notably, the North West has the highest share of subsistence consumption (HPHC agriculture) at 28.2%, while the South Central follows with 23%, highlighting regional disparities in reliance on self-produced food.

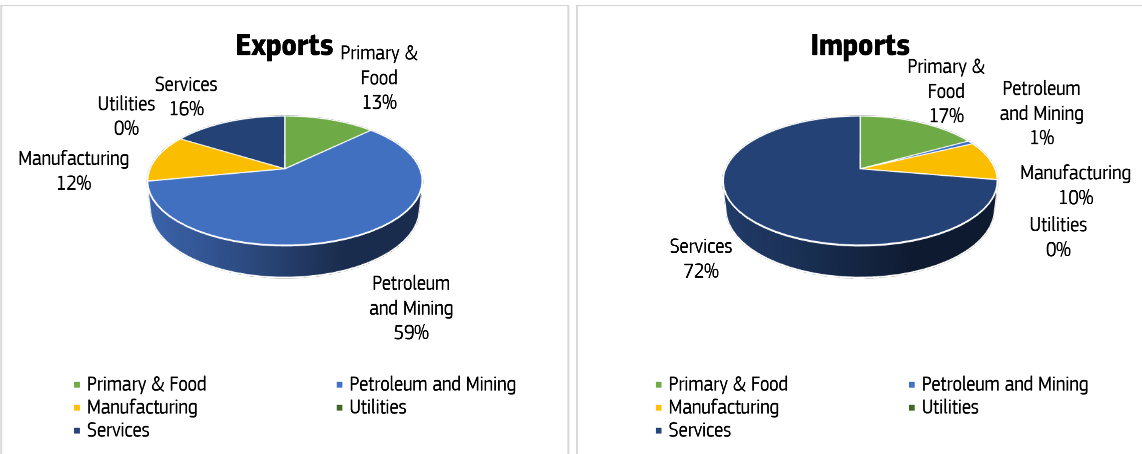
Table 5. Subsistence vs Marketed agricultural consumption across regions and areas. Nigeria 2019.

Commodity group	Urban						Rural					
	North			*South*			*North*			*South*		
	Central	**East**	**West**	**East**	**South**	**West**	**Central**	**East**	**West**	**East**	**South**	**West**
HPHC Agriculture	21%	25%	33%	12%	13%	12%	20%	26%	32%	13%	13%	13%
Marketed Agriculture	79%	75%	67%	88%	87%	88%	80%	74%	68%	87%	87%	87%
HPHC Agriculture	28.1%			12.6%			28.2%			12.9%		
Marketed Agriculture	71.9%			87.4%			71.8%			87.1%		
HPHC Agriculture	19.5%						22.6%					
Marketed Agriculture	80.5%						77.4%					

Source: Own elaboration using the 2019 Nigeria SAM.

Next figures (Figure 5) displays the composition of Nigeria's exports and imports in 2019. The figure shows that a significant percentage of exports (around 59%) is comprised of petroleum and mining products, which are typically characterized by volatile prices and limited value-added.

Figure 5. Exports and Imports composition. Nigeria 2019.



Source: Own elaboration using the 2019 Nigeria SAM.

This suggests that Nigeria's export sector is heavily reliant on a few primary commodities, which could make it vulnerable to external shocks.

On the other hand, imports are primarily composed of Services (around 72%), which suggests that Nigeria's economy is heavily reliant on Financial and Telecommunication services (not shown) to meet its domestic demand. This highlights the need for policies that promote domestic services and reduce reliance on imported goods.

The sectoral contribution to the value of production is presented in Table 6, which shows the distribution of labour and capital across different sectors of the Nigerian economy. The table categorizes activities into primary sector (agriculture and fishing), food industry, petroleum and mining, manufactured, utilities, construction, and services. The table highlights the importance of the services sector in the Nigerian economy, particularly in the urban areas, which accounts for a significant proportion of labour and capital. The primary sector and food industry also play substantial roles, particularly in terms of labour. The petroleum and mining sector is capital-intensive, but employs relatively few workers. A clear urban-rural divide exists, with urban areas contributing more with skilled labour to services and manufacturing, while rural areas remain focused on the primary sector contributing with more unskilled labour to crop and livestock production and fisheries.

Table 6. Distribution of factors by aggregate activities. Nigeria 2019.

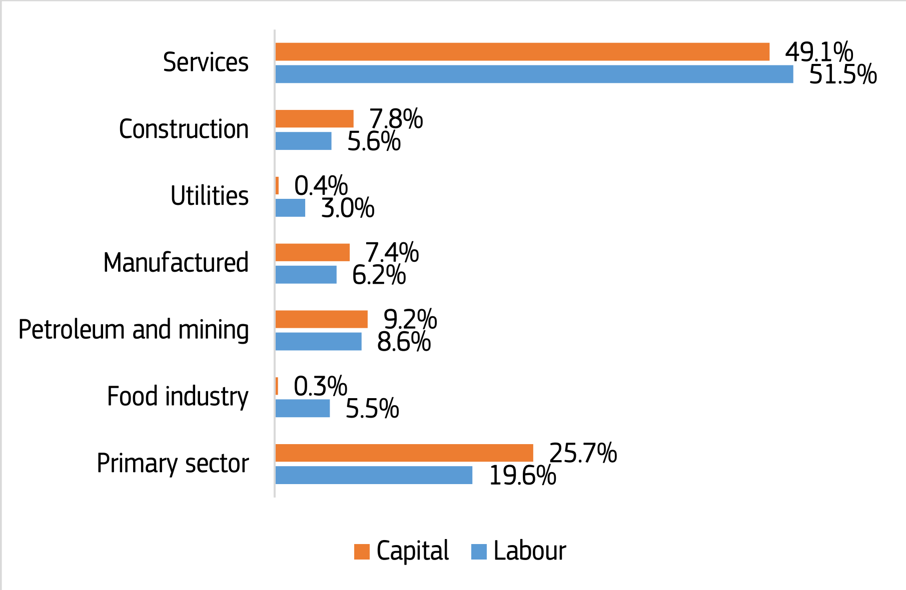
Activity group	Labour						Capital
	Rural			Urban			
	Skilled	Semi-Skilled	Unskilled	Skilled	Semi-Skilled	Unskilled	
Primary sector	0.9%	4.8%	11.8%	0.3%	0.9%	1.0%	25.7%
Food industry	0.4%	0.9%	0.5%	1.2%	2.0%	0.5%	0.3%
Petroleum and mining	0.5%	2.3%	1.2%	1.9%	2.6%	0.1%	9.2%
Manufactured	0.9%	0.5%	0.3%	1.1%	1.0%	2.3%	7.4%
Utilities	0.2%	0.3%	0.1%	1.7%	0.5%	0.2%	0.4%
Construction	0.6%	1.3%	0.6%	0.9%	1.4%	0.8%	7.8%
Services	4.4%	3.9%	10.7%	19.5%	8.1%	4.7%	49.1%
Total	7.8%	13.9%	25.3%	26.7%	16.5%	9.7%	100.0%
% of the Value added	***66.6%***						***33.4%***

Source: Own elaboration using the 2019 Nigeria SAM.

However, the table also shows that the primary sector has a relatively low percentage of skilled labour (0.9%) in the rural areas which turns to be even lower in the urban areas (0.3%), which suggests that Nigeria's economy a room for increasing the productiveness in sectors such as crop and livestock production. The food manufacturing sector, in urban areas, also has a relatively low percentage of labour (1.2%) and capital (0.3%), which suggests that Nigeria's economy may not be taking full advantage of its potential in this sector.

Figure 6 provides a visual representation of the distribution of labour and capital across different sectors in Nigeria. The figure shows that the services sector has the largest share of labour and capital, followed by the primary sector. This is consistent with the data presented in Table 6. However, the figure also highlights the fact that the manufacturing sector has a relatively small share of labour and capital, which suggests that Nigeria's economy may not be prioritizing this sector enough.

Figure 6. Distribution of factors by macro-activity group. Nigeria 2019.



Source: Own elaboration using the 2019 Nigeria SAM.

Table 7 presents the income distribution across different household groups in Nigeria. The table shows that labour income accounts for the largest percentage of income (78.6%) at the national level, followed by capital income (12.6%). This is consistent with the fact that labour is typically the largest source of income for most households.

Table 7. Income distribution by household group. Nigeria 2019.

	INCOME		TRANSFERS		
	Labour	Capital	Enterprise	Government	Rest of the World
Nigeria	**78.6%**	**12.6%**	**1.8%**	**3.3%**	**3.8%**
Urban - North-Central	75.7%	18.1%	1.2%	2.3%	2.7%
Urban - North-East	75.6%	23.8%	0.1%	0.2%	0.3%
Urban - North-West	85.9%	11.2%	0.6%	1.1%	1.3%
Urban - South-East	74.1%	15.0%	2.2%	4.0%	4.7%
Urban - South	75.4%	9.8%	3.3%	5.4%	6.1%
Urban - South-West	74.4%	10.5%	3.0%	5.6%	6.6%
Rural - North-Central	86.9%	12.0%	0.2%	0.4%	0.5%
Rural - North-East	84.6%	15.2%	0.0%	0.1%	0.1%
Rural - North-West	79.7%	19.4%	0.2%	0.3%	0.4%
Rural - South-East	70.7%	12.2%	3.2%	6.3%	7.5%
Rural - South	83.3%	8.8%	1.6%	2.9%	3.4%
Rural - South-West	82.9%	11.0%	1.2%	2.3%	2.7%
Rural	**81.0%**	**13.3%**	**1.1%**	**2.1%**	**2.5%**
Urban	**76.5%**	**12.0%**	**2.3%**	**4.2%**	**4.9%**

Source: Own elaboration using the 2019 Nigeria SAM.

However, the table also shows that there are significant regional disparities in income distribution, with urban households in the North-West region having the highest percentage of labour income (85.9%). This highlights the need for policies that address regional disparities and promote more equitable income distribution.

Other disparities can be observed, for instance, in the urban households in the North-East region which derive 23.8% of their income from capital (more than twice the average among urban areas, around 12%). Rural households in the South-East show a low reliance on labour income (70.7%) compensated by other sources of income, in this case mainly remittances from the rest of the world and transfers from the government. Such disparities reflect structural inequalities in income sources, probably due to underemployment or the informal sector dominance in the rural areas, and highlight the need for policies fostering equitable wealth distribution.

6 Conclusions

This report outlines the construction of the 2019 Social Accounting Matrix for Nigeria, incorporating a satellite account focused on employment. The primary goal is to establish a comprehensive database that facilitates the execution and assessment of the nation's social, economic, and environmental policies and initiatives. The central aim of this undertaking is to furnish a robust database supporting the implementation and evaluation of Nigeria's developmental policies across social, economic, and environmental domains.

The resulting SAM will serve as a foundational resource for employing advanced economic modelling techniques like linear or general equilibrium modelling. This database proves especially valuable in modelling the repercussions of significant initiatives such as the African Continental Free Trade Area (AfCFTA), aiding in simulating various policy scenarios tied to trade liberalisation across Africa.

Furthermore, the SAM-based modelling approach aids in policy coordination across sectors by elucidating linkages and spillover effects within the economy. This helps policymakers discern potential trade-offs and synergies among various policy objectives, such as economic growth, environmental sustainability, and social welfare. This evidence-based decision-making process assists in crafting policies that promote sustainable development, inclusive growth, and address socio-economic challenges.

In summary, the newly presented Nigeria SAM for 2019 encompasses 195 accounts, including activities, commodities, labour detailed by region, rural and urban areas and by skill level, and households disaggregated by region and rural and urban areas. The report also highlights the SAM's availability for download from the DataM portal. Moreover, the framework underpins the "Jobs calculator" tool in the DataM portal, widely utilised for estimating job creation in both the EU and African countries.

Lastly, this is one of two report studies, with the second focusing on the development of the DEMETRA model and the implementation of policy scenarios related to AfCFTA (Omoju et al., 2024).

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List of abbreviations and definitions

AfCFTA	African Continental Free Trade Area
CGE	Computable General Equilibrium
DataM	JRC data portal of agro-economic modelling
EAC	East African Community
ECCAS	Economic Community of Central African States
GDP	Gross Domestic Product
GFCF	Gross Fixed Capital Formation
GHS-P	General Household Survey Panel
HIES	Household Income and Expenditure Survey
HPHC	Home Production for Home Consumption
ISA	Integrated Surveys on Agriculture
indtax	Indirect Taxes
imptax	Import Taxes
JRC	Joint Research Centre
LFS	Labour Force Statistics
LSMS	Living Standards Measurement Study
MAcMap	Market Access Map
NLSS	Nigeria Living Standard Survey
PANAP	Pan-Africa Network for Economic Analysis of Policies
RoW	Rest of the World account
RHG	Representative Household Group
saltax	Sale taxes
SDG	Sustainable Development Goal
SNA	System of National Accounts
UNSC	United Nations Statistical Commission

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Annexes

Annex 1. Accounts of the 2019 Nigeria Social Accounting Matrix

Table A1. Activities disaggregated in the 2019 Nigeria SAM.

Representative Households Groups as activities		
North-Central, North-East, North-West, South-East, South, South-West		
National Activities		
Primary sector	Forestry and logging	
Extraction	Mining of coal and lignite Extraction of crude petroleum and natural gas	Mining of metal ores Other mining and quarrying
Industry	Manufacture of coke and refined petroleum products Manufacture of cement Manufacture of food, beverages and tobacco products Manufacture of textiles, wearing apparel and footwear Manufacture of wood and of products of wood and cork Manufacture of paper and paper products Manufacture of chemicals and pharmaceutical products	Manufacture of other non-metallic mineral products Manufacture of rubber and plastics products Manufacture of electronic and electrical equipment Manufacture of basic metals, iron and steel Manufacture of motor vehicles and assembly Other manufacturing
Facilities	Electricity, gas, steam and air conditioning	Water treatment and supply services and Sewerage waste collection, treatment services; and disposal services
Construction	Construction	
Services	Wholesale and retail trade, repair services of motor vehicles and motorcycles Accommodation services and Food and beverage serving services Land transport Rail transport and transport via pipelines Water transport Air transport Warehousing and support activities for transportation Telecommunications Motion picture, video and television programme production, and others Publishing services Postal and courier activities	Programming and broadcasting services Arts, entertainment and recreation services Financial services, except insurance and pension funding Insurance, reinsurance and pension funding services Real estate services and imputed rents of owner-occupied dwellings Professional, scientific, technical and veterinary services Other administrative and support services Education services Human health services Other services Public administration, defence services and social security services

Source: Own elaboration using the 2019 Nigeria SAM.

Table A2. Commodities disaggregated in the 2019 Nigeria SAM.

HPHC Commodities		
	Maize (HPHC commodities)	Cashew nuts (HPHC commodities)
	Sorghum (HPHC commodities)	Ginger (HPHC commodities)
	Other cereals (HPHC commodities)	Cocoa beans (HPHC commodities)
	Groundnuts (HPHC commodities)	Other crops (HPHC commodities)
	Sesame seed (HPHC commodities)	Palm fruit and kernel (HPHC commodities)
	Rice (HPHC commodities)	Bovine cattle (HPHC commodities)
	Vegetables (HPHC commodities)	Other ruminants (HPHC commodities)
	Cassava (HPHC commodities)	Poultry (HPHC commodities)
	Yams (HPHC commodities)	Other livestock and livestock products (HPHC commodities)
	Other roots and tubers (HPHC commodities)	Raw milk (HPHC commodities)
	Fruits (HPHC commodities)	Fishery (HPHC commodities)
Marketed Commodities		
Primary sector	Maize Sorghum Other cereals Groundnuts Sesame seed Rice Vegetables Cassava Yams Other roots and tubers Cotton Fruits Cashew nuts	Ginger Cocoa beans Natural rubber Other crops Palm fruit and kernel Bovine cattle Other ruminants Poultry Other livestock and livestock products Raw milk Fishery Forestry
Extraction	Coal and lignite Crude petroleum and natural gas	Metal ores Other mining and quarrying products
Industry	Oil refining Cement Food, Beverage and Tobacco Textile, Apparel and Footwear Wood and Wood Products Pulp, Paper and Paper Products Chemical, Chemical Products and Pharmaceutical Products	Non-metallic Products Plastic and Rubber Products Electrical and Electronics Basic metal, Iron and Steel Motor vehicles & assembly Other Manufacturing
Facilities	Electricity, gas, steam and air conditioning	Water treatment and supply services and Sewerage waste collection, treatment services; and disposal services
Construction	Construction	
Services	Wholesale and retail trade, repair services of motor vehicles and motorcycles Accommodation services and Food and beverage serving services Land transport Rail transport and transport via pipelines Water transport Air transport Warehousing and support activities for transportation Telecommunications Motion picture, video and television programme production, and others Publishing services Postal and courier activities	Programming and broadcasting services Arts, entertainment and recreation services Financial services, except insurance and pension funding Insurance, reinsurance and pension funding services Real estate services and imputed rents of owner-occupied dwellings Professional, scientific, technical and veterinary services Other administrative and support services Education services Human health services Other services Public administration, defence services and social security services

Source: Own elaboration using the 2019 Nigeria SAM.

Table A3. Regional description in the 2019 Nigeria SAM.

Region name	***Region code***
North-Central	NCE
North-East	NEA
North-West	NWE
South-East	SEA
South	SOU
South-West	SWE

Source: Own elaboration using the 2019 Nigeria SAM.

Annex 2. On-line resources.

The Social Accounting Matrix of Nigeria (2019) is available on the public website "EC Data-Modelling platform of resource economics DataM". Links can be also accessed with the QR codes listed in this annex.

Figure A2. QR code – DataM URL:

https://datam.jrc.ec.europa.eu

Source: JRC, 2025.

Bulk download

Using DataM, users can make a bulk download of SAM in a ZIP file containing a CSV file. The hyperlinks for the direct bulk download is in Figure A2 and Figure A3.

Figure A3. QR Code – direct bulk data download in English:

https://datam.jrc.ec.europa.eu/datam/perm/dataset/34e1091b-4ca9-4b3f-b07d-f8c98028d557/download/Dataset_JRC_-_Social_accounting_matrix_-_Nigeria_-_2019.zip

Source: JRC, 2025.

In the bulk download, the SAM is presented in a standard flat format as CSV file with header row. Conceptually, it contains a column for the spending agent, a column for the receiving agent and a column for the value.

Interactive download

DataM includes also a function for interactive download, which allows filtering the only part of interest of the datasets. Find the direct link for the SAM in the figure A3.

Figure A3. QR Code – direct link to the data warehouse page of the dataset in English:

https://datam.jrc.ec.europa.eu/datam/perm/dataset/34e1091b-4ca9-4b3f-b07d-f8c98028d557

Source: JRC, 2025.

Interactive dashboard

Users may explore and analyse the data through an interactive dashboard placed in the "PANAP network" section of the website.

Figure A4. QR Code – direct link to the interactive dashboard:

https://datam.jrc.ec.europa.eu/datam/mashup/SAM_NG

Source: JRC, 2025.

The interactive dashboard allows users to undertake their own analysis of the dataset.

It consists of a number of sheets that allow analysing data from different perspectives.

Jobs calculator

The jobs calculator is a tool included in DataM where the user can simulate changes of exports for products or services while dynamic charts will show you real-time the impact on employment in the different fields of the economics. It includes Nigeria among other African countries.

Figure A5. QR Code – direct link to the interactive dashboard:

https://datam.jrc.ec.europa.eu/datam/mashup/JOBS_CALCULATOR/?SAM=NG

Source: JRC, 2025.

Open data portals

In the period subsequent to the publication of this report, following pages will be gradually activated[1] on relevant open data portals, enabling to easily find this dataset on the web:

1. On the JRC Data Catalogue: https://data.jrc.ec.europa.eu/dataset/f41ecc0c-ede6-4ca5-92a4-8cd95d828a96
2. On the EU Open Data Portal: https://data.europa.eu/euodp/data/dataset/f41ecc0c-ede6-4ca5-92a4-8cd95d828a96

List of abbreviations and definitions

CSV	Comma separated value
DataM	JRC data-modelling platform of resource economics
QR code	Quick response code
SAM	Social Accounting Matrix
XLSX	Microsoft Excel file format

[1] The time necessary for the activations of these services is beyond the control of the authors.

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