

THE GAMBIA CONSUMER PRICE INDEX (CPI) COMPILATION GUIDE

JANUARY 2020



PRICES AND GOVERNMENT FINANCE STATISTICS UNIT

GAMBIA BUREAU OF STATISTICS

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CHAPTER ONE

INTRODUCTION TO THE GAMBIA'S CONSUMER PRICE INDEX (CPI)

1. Defining the Consumer Price Index

The Consumer Price Index (CPI) is a current social and economic indicator constructed to measure changes over time in the general level of prices of consumer goods and services that households acquire, use, or pay for. The index aims to measure the change in consumer prices over time. This is done by measuring the cost of purchasing a fixed basket of consumer goods and services of constant quality and similar characteristics. The products in the basket are selected as being representative of households' expenditure during a year or other specified period. Such an index is called a fixed-basket price index. The index also aims to measure the effects of price changes on the cost of achieving a constant standard of living (i.e., level of utility or welfare). This concept is called a cost-of-living index (COLI).

2. The Gambia's CPI

2.1 Uses of The Gambia's CPI

The Gambia's CPI has three important Objectives:

1. To measure inflation in the economy so that macroeconomic policy is based on comprehensive and up-to-date price information.
2. To provide a deflator of consumer expenditure in the expenditure national accounts and other economic data.
3. To measure changes in the cost of living of Gambia's households to promote equity in the measures taken to adjust wages, grants, service agreements and contracts.

2.2 Brief history of the Gambia's CPI

The Gambia's CPI initiated in 1974, covering city of Banjul only. Since 1994/1995 there was another unpublished series calculated with weights derived from the 1992 household survey. It covers the city of Banjul and some urban areas such as Bakau, Serrekunda and Latrikunda. In year 2004 consequently, The Gambia Bureau of Statistics (GBoS) decided to increase the CPI coverage and further improve on the base year. As a result, the price survey data collection has been extended and basically focused on a market-based survey approach by selecting 28 representative market centers serving both urban and rural residents. A direct collection methodology, that entailed collecting prices of goods directly by visiting retail outlets, was implemented and conducted on a monthly basis since 2004. Since 2004, the CPI has been compiled using the prices of goods and services from the direct collection methodology in all market centers nationally.

3. Alignment with international best practice in CPI formulation

3.1 Adoption and use of methodology in line with international best practice

The Gambia Bureau of Statistics (GBoS) has committed itself to the adoption and use of methodology that is in line with international best practice and which is relevant and practicable to the Gambia's conditions. The source and method documents of other statistical agencies are also used as reference material.

3.2 International expert groups

The International Labour Organization (ILO) is the authoritative body on the methodology for price statistics and the compilation of CPIs. The International Labour Organization (ILO) is supported by other organizations including the United Nations Statistics Division (UNSD), International Monetary Fund (IMF) and the World Bank. The ILO manual for CPIs is the main

reference material for statistical offices for CPI concepts and definitions. The manual provides the theory and conceptual framework of the CPI and aims to give methodological and practical guidelines for the compilation of CPIs. GBoS largely follows the methodology guidelines in the ILO manual when compiling the Gambia's CPI.

The introduction of new and improved methodology comes as a result of technical and academic discussions of current methodology through a number of expert groups. New methodology may be captured through resolutions taken at official meetings of these groups in consultation with the ILO. The groups provide a forum for specialists to share their experiences and discuss research and methodology on crucial problems of measuring price change, and thereby identify best practice. These groups include:

- ✓ The Ottawa Group, which was formed in 1994. This group is also known as the United Nations International Working Group on Price Indices. The group focuses on applied research in the area of consumer price indices. The group has played a key role in the theoretical and methodological development of price indices.

- ✓ ILO/UNECE joint meeting. The joint meeting is organized by the United Nations Economic Commission for Europe (UNECE) and the ILO. Compilation issues are discussed including collection, processing and dissemination of data, and resource and organizational issues.

3.3 International participation

3.3.1 International Comparisons Programme

The International Comparisons Programme (ICP) is a global statistical initiative established in 1970 to produce internationally comparable price and expenditure data as well as Purchasing Power Parity (PPP) estimates to facilitate cross-country comparisons of price levels, Gross Domestic Product (GDP) and related economic aggregates in real terms and free of price and exchange rate distortions. The ICP uses Purchasing Power Parities (PPPs) to effect conversion. PPPs are spatial price indices. They make it possible to compare the GDPs and component expenditures of countries in real terms by removing the price level differences between them. The programme is globally managed by the World Bank and implemented by regions, namely, Africa, Asia and Pacific Islands, South America, the Commonwealth of Independent States (CIS) and Russia, Western Asia and Europe. GBoS participates in the ICP through collection of prices of goods and services as prescribed by the ICP basket, of which some are already being collected.

3.3.2. Harmonized Consumer Price Index (HCPI)

The Harmonized Consumer Price Index (HCPI) is defined as the Consumer Price Index (CPI) developed from comparable methodologies. That means CPIs which have been developed from concepts, definitions and methods that are comparable. The Member States HCPIs are produced by respective Member States using agreed harmonized methodologies. The ECOWAS HCPI is compiled by the ECOWAS Secretariat by aggregating the National HCPIs of the Member States. HCPI is meant to provide an official measure of inflation in the ECOWAS region, and it makes international comparisons easier since the national HCPIs are produced using harmonized methodologies and as much is practicable using the same statistical classifications, standards and

frameworks. The ECOWAS Secretariat is the advocating or implementing body of the Harmonized Consumer Price Index (HCPI) in the ECOWAS region.

CHAPTER TWO

CLASSIFICATION OF GOODS AND SERVICES

1. Background

The Gambia's CPI uses the Classification of Individual Consumption by Purpose (COICOP) for goods and services. COICOP is the international standard for classifying household expenditure. Goods and services are classified according to their intended use. It is an integral part of the 1993 and 2008 System of National Accounts (SNA). COICOP is used for household budget surveys, consumer price indices and international comparisons of Gross Domestic Product (GDP) and its component expenditures.

2. Classification of Individual Consumption by Purpose (COICOP)

The United Nations Statistical Division (UNSD) is the overseer of COICOP. The high level COICOP categories are given below:

01 - Food and non-alcoholic beverages

02 - Alcoholic beverages and tobacco

03 - Clothing and footwear

04 - Housing, water, electricity, gas and other fuels

05 - Furnishings, household equipment and routine household maintenance

06 - Health

07 - Transport

08 - Communication

09 - Recreation and culture

10 - Education

11 - Restaurants and hotels

12 - Miscellaneous goods and services

13 - Individual consumption expenditure of non-profit institutions serving households (NPISHs)

14 - Individual consumption expenditure of general government

2.1 Individual consumption

Individual consumption expenditures are those that are made for the benefit of individual persons or households. More specifically:

- ✓ All consumption expenditures by households are defined as individual. These are contained in COICOP categories 01 to 12.
- ✓ Only some of the consumption expenditures of general government are defined as individual. Expenditures on general public services, defence, public order and safety, economic affairs, environmental protection and housing and community amenities are considered to be for the benefit of the community as a whole rather than for individual households. They are termed “collective consumption expenditures” (or “actual final consumption of general government” or “actual collective consumption”) and are excluded from COICOP.

The Consumer Price Index focuses on households and thus uses COICOP categories 01 to 12.

Illegal products such as prostitution and narcotics are excluded from the Gambia’s CPI.

2.2 Structure of COICOP classification in the Gambia's CPI

The structure of COICOP is made up of 2-digit, 3-digit, 4-digit, 5-digit, 8-digit and 12-digit classification levels. The 12-digit is the most detailed whilst the 2-digit is the least. The table below shows an example of a decomposition of a 2-digit level down to 8-digit level.

Table 1:EXAMPLE OF COICOP HIERARCHY

TABLE 1: EXAMPLE OF COICOP HIERARCHY			
COICOP	PRODUCT CODE	COICOP DESCRIPTION	INDICATOR PRODUCT
1	Food and Non-alcoholic Beverages		
1.1	Food		
01.1.1	Bread and Cereals		
01.1.1.1	1111001	Rice	Long-Grained Rice (Imported)
01.1.1.1	1111002	Rice	Paddy Rice Long Grain (Local)
01.1.1.1	1111003	Rice	Medium-Grained Rice (Imported)
01.1.1.1	1111004	Rice	Small grained rice (imported)
01.1.1.1	1111005	Rice	Basmati Rice (Imported)
01.1.1.2	1112001	Maize	Maize
01.1.1.3	1113001	Bread	A Loaf of Bread

The numbering system for the different classification levels has been simplified by naming the different levels using names such as categories, classes, and groups. The table below shows the naming convention for the different classification levels.

Table 2: COICOP NAMING CONVENTION

Table 2: COICOP naming convention		
COICOP LEVEL	NAME	EXAMPLE
2-Digit	Category	Food and Non-alcoholic Beverage
3-Digit	Class	Food
4-Digit	Group	Bread and Cereals
5-Digit	Product	Bread
8-Digit	Indicator Product	Loaf of Tapalapa
12-Digit	Sampled Product	Tapalapa 700g Loaf of Bread in Stores in Fajara

2.3 Product types

The COICOP four-digit levels (Groups) are divided into different types of products:

- ✓ Services (S);
- ✓ Non-durables (ND);
- ✓ Semi-durables (SD); and
- ✓ Durables (D).

The following excerpt from the International Labour Organization CPI Compilation Manual gives the standard definitions of the types of products as used in price statistics:

The distinction between non-durable goods and durable goods is based on whether the goods can be used only once or whether they can be used repeatedly or continuously over a period of considerably more than one year. Moreover, durables, such as motor cars, refrigerators, washing machines and televisions, have a relatively high purchasers' value. Semi-durable goods differ from durable goods in that their expected lifetime of use, though more than one year, is often significantly shorter and their purchasers' value is substantially less.

The categories of goods defined as durables in COICOP are listed below:

- ✓ furniture and furnishings;
- ✓ major household appliances whether or not electrical;
- ✓ major tools and equipment;
- ✓ vehicles;
- ✓ telephone and fax equipment;
- ✓ information processing equipment;
- ✓ musical instruments;
- ✓ equipment for the reception, recording and reproduction of sound and pictures; and
- ✓ jewelry, clocks and watches.

The following goods are listed as semi-durables:

- ✓ clothing and footwear;
- ✓ household textiles;
- ✓ small electrical household appliances;
- ✓ glassware, tableware and household utensils;
- ✓ small tools and miscellaneous accessories;
- ✓ spare parts for vehicles;
- ✓ recording media;
- ✓ games, toys, hobbies;
- ✓ equipment for sport, camping, etc.;
- ✓ books; and
- ✓ other personal effects.

The following goods are listed as non-durables:

- ✓ food and non-alcoholic beverages;
- ✓ alcoholic beverages and tobacco;
- ✓ materials for the maintenance and repair of the dwelling;
- ✓ electricity;
- ✓ non-durable household goods;
- ✓ pharmaceutical products;
- ✓ fuels and lubricants;
- ✓ gardens, plants and flowers;
- ✓ pets and related products;
- ✓ newspaper and periodicals;
- ✓ stationery and drawing materials; and
- ✓ personal care products.
- ✓ The following are listed as services:
- ✓ actual rentals paid by tenants;
- ✓ imputed rentals for owner-occupiers;
- ✓ services for the repair and maintenance of a dwelling (plumbers and electricians);
- ✓ water supply and other services relating to the dwelling n.e.c.;
- ✓ domestic services and household services;
- ✓ medical services;
- ✓ dental services;
- ✓ hospital services;
- ✓ maintenance and repair of personal transport equipment;

- ✓ other services in respect of personal transport equipment;
- ✓ transport services;
- ✓ postal services;
- ✓ telephone and telefax services;
- ✓ recreational and sporting services;
- ✓ cultural services;
- ✓ games of chance;
- ✓ package holiday;
- ✓ education;
- ✓ restaurants and hotels;
- ✓ accommodation services;
- ✓ social protection services;
- ✓ insurance;
- ✓ financial services n.e.c; and
- ✓ other services n.e.c

Some COICOP classes contain both goods and services because it is difficult, for practical reasons, to break them down into goods and services. Such classes are usually designated as a service when the service component is considered predominant; for example, services for the maintenance and repair of the dwelling, which includes the cost of labour and materials.

2.4 Mixed purpose goods and services

There are some products whose intended use changes according to geographical location; hence COICOP may be twisted to suit local conditions. Goods and services with multi-purpose use are allocated to a category that represents the dominant use, e.g., food consumed outside the home is

shown under Restaurants and hotels and not in Food and non-alcoholic beverages. Some services may consist of a bundle of goods and services that serve mixed purposes. A purpose breakdown of each bundle is done in order to produce the most precise fit that is consistent with practical considerations of data availability. An example of mixed-use products is the purchase of in-patient hospital fees, which include payments for medical treatment, accommodation and catering.

CHAPTER THREE

WEIGHTS IN THE CPI

1. Introduction

The weights of the CPI represent the proportions of consumption expenditure by households in a specific period. Each indicator product in the CPI has a weight attached to it which reflects its relative importance in the overall index. The impact that a price change for a good or service has on the overall index is therefore determined by the weight attached to it. The weighted sum of changes in the price of specific products and services in the CPI provides the rate of inflation. Whereas the prices are updated on a monthly, quarterly or annual basis, the weights are normally updated only every four or five years.

There are two types of weighting for the construction of an aggregated price index for a population on the basis of Household Expenditure Survey (HES) otherwise Integrated Household Survey (IHS) results for the case of The Gambia. These are called plutocratic and democratic. Plutocratic weights reflect total expenditures of all reference households and the composition of the estimated aggregate values of the reference population. In this type of weighting, each household contributes to the weights an amount proportional to its expenditure. This is the method used to calculate the CPI weights for the Gambia's CPI.

Democratic weighting gives equal importance to all households by averaging consumption value proportions over the whole population instead of summing consumption values. Democratic weights reflect the expenditure of an average household.

In terms of geographical coverage, all expenditure made by residents outside the boundaries of the country is excluded. However, all expenditure by non-residents within the country are included;

this is referred to as the domestic concept. If all expenditure made by residents outside the boundaries of the country is included, then the national concept would be applied. GBoS has adopted the domestic concept for the scope of the CPI. This includes all expenditure by private households/consumers within the boundaries of The Gambia, irrespective of the place of normal residence of the consumer.

2. Need to update weights

The reference period is the time period to which the estimated weights relate. The chosen period should cover a seasonal cycle, typically a calendar year, and should reflect economic conditions that are reasonably normal or stable. Any irregularities may need to be adjusted.

The accuracy of weights to represent current expenditure patterns decreases as the length of time increases from the weight reference period. However, the frequency of updating weights depends on the availability of the expenditure survey results.

The choice of a weights reference year should ideally avoid periods of high inflation or periods when the influence of special factors is significant.

The International Labour Organization CPI Compilation Manual lists the following sources for weights:

- ✓ **Household expenditure surveys (HES).**

The main requirements of Household Expenditure Survey /Integrated Household Survey (IHS) are that the survey should be representative of all private households in the country, should not exclude any particular group, and should include all types of consumption expenditures by households. HES/IHS include expenditures that are outside the scope of the CPI, but these should be excluded

from the total expenditure used to estimate CPI weights. Examples are interest payments on credit cards or mortgage bonds.

✓ **National accounts.**

The household sector in national accounts consists of all individual households and institutional households. Institutional households are usually excluded from HES/IHS. National accounts expenditure estimates may be used to adjust the weights of products that are known to suffer from significant cases of under- or over-reporting.

✓ **Retail sales data.**

Retail sales statistics can provide detailed data at area and product level. The main difficulty in using the data is that it usually contains data for groups that are outside the CPI reference population, e.g. expenditure by businesses.

✓ **Scanner data.**

Cash register data may be used to derive CPI weights.

✓ **Population censuses.**

Population statistics may be used in the absence of any expenditure statistics as a basis for regional weights.

For most countries, the Household Expenditure Survey/Integrated Household Survey is the main source for deriving CPI weights. The Household Expenditure Survey/Integrated Household Survey usually requires the use of supplementary data sources to supplement in order to deal with known cases of under- or over-reporting. The use of a combination of Household Expenditure

Survey/Integrated Household Survey data and national accounts is a common way of deriving CPI weights.

3. Deriving CPI weights

3.1 Integrated Household Survey

In the years of 2015/2016, GBoS has run an Integrated Household Survey (IHS). The primary objective of IHS is to provide information on households' consumption expenditure patterns. However, the IHS also provides estimates for monitoring poverty levels. Successive IHS gauge changes in household consumption patterns, levels of income and income distribution. In 2015/16 GBoS conducted its latest Integrated Household Survey.

3.1.1 Sampling and Coverage of the Survey

3.1.1.1 Sampling

The sampling frame used for the Integrated Household Survey (IHS2015/2016) was the 2013 Gambia Population and Housing Census. The sampling frame is a complete list of Enumeration Areas (EA) containing a convenient number of households, which serves as a counting unit for the census. The sampling frame contains information about the location, the administrative belongings, the type of residence, and the number of residential households and population of each EA.

For statistical purposes, The Gambia is divided into eight Local Government Areas (LGA), including two urban municipalities (Banjul and Kanifing). Each LGA is sub-divided into districts except for the two municipalities, each district is divided into Wards, and each Ward is divided into Settlements. There was a total of 38 districts excluding the two municipalities, 120 Wards and 4,096 EAs. Depending of the size (number of households) of the settlement, an EA can

comprise of one settlement, a group of small settlements, or a part of a large settlement. Each EA is designated as urban or rural area.

The unit of study for the IHS includes residential households and persons living in those households within all the districts and excluded collective abodes such as hospitals, prisons, orphanage, military barracks, etc. The estimates were to be representative at district level making up a total of 40 strata (38 districts plus Banjul and Kanifing municipalities).

3.1.1.2 Sample selection and implementation

The IHS 2015/16 sample was a stratified sample selected based on a two-stage probability proportional to size (PPS). The stratification concerned sorting each stratum by urban and rural areas (Banjul and Kanifing are entirely urban areas). Samples were selected independently in each stratum by a two-stage selection process.

The first stage dealt with selecting 667 EAs with probability proportionate to the EA size as the primary sampling unit (PSU). The size of EA is the total number of residential households residing in that EA during the 2013 Population and Housing Census. Sample EAs were selected independently in each stratum and constituted the survey clusters. A household listing operation was conducted in all selected EAs and the list of households served as the sampling frame for the selection of households in the second stage.

In the second stage, 20 households were selected per cluster with an equal probability systematic selection from the household listing. A total of 13,340 households were selected for interview and 13,281 households were interviewed. The household response rate was about 99.4 per cent. The level of response rate for IHS 2015/2016 demonstrates a successful data collection implementation

of the survey. The IHS 2015/2016 survey was the first of its kind to allow reliable estimation of key indicators at the national, rural-urban, Local Government Area and districts levels.

CHAPTER FOUR

CPI BASKET OF GOODS AND SERVICES

1. Introduction

The basket is a list of specific goods and services which forms the sample for price collection in the CPI.

2. Basket of goods and services for The Gambia's CPI

In 2018, GBoS has been working on the processes of selecting a new basket based on the recent Integrated Household Survey 2015/2016 results. Each residence area (Urban & Rural) has its own set of weights for the national basket. Every product that appears in at least one residence area (Urban & Rural) is included in the national basket.

3. Selection criteria for the basket of goods and services

Determining the basket composition at a disaggregated residence area (Urban & Rural) level improves the relevance of the CPI to the purchasing patterns at a local level. The baskets reflect the pattern of residence rather than the point at which purchases are made. For publication purposes, GBoS compiles indices at residence area level.

The basket selection is conducted per 'index' area. The objective of the process is to ensure inclusion in the basket of those goods and services that represent the greatest share of expenditure within a group. Products are included in the basket if they contribute at least 0.01% of the total household expenditure.

The 2019 CPI basket contains 265 products, which is more than the 2004 basket, which had 207 products. The residence area (Urban & Rural) baskets and list of goods and services are provided in Table 3.

Table 3: CPI BASKET OF GOODS AND SERVICES, RURAL, URBAN AND NATIONAL BASKETS INDICATOR PRODUCTS AND EXPENDITURE WEIGHTS

Product Code	Indicator Product	Rural Expenditure Weight	Urban Expenditure Weight	National Expenditure Weight
1.1.1.1	Long-Grained Rice (Imported)	54	448	502
1.1.1.2	Paddy Rice Long Grain (Local)	100	22	122
1.1.1.3	Medium-Grained Rice (Imported)	1,145	2,885	4,031
1.1.1.4	Small grained rice (imported)	1,019	2,822	3,841
1.1.1.5	Basmati Rice (Imported)	-	382	382
1.1.1.6	Maize	21	40	61
1.1.1.7	Millet	49	131	180
1.1.1.8	Bread	674	4,009	4,682
1.1.1.9	Findi	7	26	33
1.1.1.10	Millet Flour	-	31	31
1.1.1.11	Spaghetti	23	73	96
1.1.1.12	Fish Pie	23	132	155
1.1.1.13	Cake (pan, etc.)	39	84	122
1.1.1.14	Gari (Cassava Flour)	-	20	20
1.1.1	Bread and Cereals	3,153	11,105	14,258

1.1.2.1	Beef	341	2,202	2,543
1.1.2.2	Sheep/Goat meat (mutton)	64	120	184
1.1.2.3	Chicken (Imported)	124	1,389	1,514
1.1.2.4	Chicken (Local)	61	478	539
1.1.2.5	Pork	-	62	62
1.1.2.6	Canned meat	10	92	102
1.1.2.7	Goat Meat	113	191	304
1.1.2	Meat	714	4,534	5,248
1.1.3.1	Fresh Bonga	531	1,075	1,606
1.1.3.2	Smoked Bonga	83	425	508
1.1.3.3	Cat Fish	-	1,226	1,226
1.1.3.4	Fresh Grouper/Lady Fish	-	1,777	1,777
1.1.3.5	Fresh Barracuda	-	198	198
1.1.3.6	Dried Couta/Tenny	15	18	33
1.1.3.7	Shrimps	-	143	143
1.1.3.8	Tilapia	42	82	125
1.1.3.9	Sardine (Tin Fish 125ge)	32	34	66
1.1.3.10	Dried fish	41	76	117
1.1.3	Fish	745	5,054	5,799

1.1.4.1	Eggs	51	446	497
1.1.4.2	Fresh Milk	44	177	221
1.1.4.3	Sour Milk	56	220	275
1.1.4.4	Evaporated Milk	96	835	931
1.1.4.5	Powdered Milk	22	239	261
1.1.4.6	Vitalait	65	417	482
1.1.4.7	Yoghurt	-	44	44
1.1.4	Milk, cheese and eggs	333	2,377	2,710
1.1.5.1	Palm Oil	267	992	1,259
1.1.5.2	Butter	-	616	616
1.1.5.3	Vegetable Oil (Sold loose)	521	1,434	1,955
1.1.5.4	Peanut Buter	134	305	439
1.1.5.5	Margarine	14	29	43
1.1.5	Oil and Fats	936	3,377	4,313
1.1.6.1	Groundnuts-Shelled	44	125	170
1.1.6.2	Raw Groundnut Powder	40	80	120
1.1.6.3	Banana	35	332	367
1.1.6.4	Oranges	11	106	117
1.1.6.5	Mangoes	7	102	110

1.1.6.6	Lime	11	171	182
1.1.6.7	Apple	6	100	106
1.1.6.8	Baobab fruit	8	10	18
1.1.6.9	Paw - Paw	2	10	12
1.1.6.10	Water Melon	38	257	295
1.1.6.11	Roasted Groundnut	35	47	82
1.1.6.12	Dates	3	83	86
1.1.6	Fruit and Nuts	241	1,424	1,665
1.1.7.1	Potatoes (Irish)	100	696	796
1.1.7.2	Sweet Potatoes	64	216	280
1.1.7.3	Cassava	41	238	279
1.1.7.4	Dry Beans	85	218	303
1.1.7.5	Small Pepper-Fresh	129	261	390
1.1.7.6	Tomatoes-Fresh	98	466	565
1.1.7.7	Bitter Tomato	125	333	458
1.1.7.8	Garden Eggs	76	235	311
1.1.7.9	Okra	69	450	519
1.1.7.10	Onion	451	1,472	1,923
1.1.7.11	Pumpkin	18	61	79
1.1.7.12	Big Red Pepper	156	700	855
1.1.7.13	Kren-Kren	21	121	142

1.1.7.14	Bisap	75	248	322
1.1.7.15	Cabbage	50	193	243
1.1.7.16	Lettuce (Salad)	8	169	177
1.1.7.17	Tomato Puree (Paste)	189	725	914
1.1.7.18	Carrot	6	193	199
1.1.7.19	Cucumber	4	139	143
1.1.7.20	Cassava Leaves	6	33	39
1.1.7	Vegetables including potatoes and other tuber vegetables	1,772	7,167	8,938
1.1.8.1	Sugar	684	1,802	2,485
1.1.8.2	Black mint (Mint Fresh)	2	12	14
1.1.8.3	Chewing gum (Hollywood)	11	89	100
1.1.8.4	Honey	13	49	61
1.1.8.5	Ice Cream (Bowl)	-	100	100
1.1.8.6	Mint Stick	26	44	70
1.1.8.7	Biscuit (e.g. Bidew)	145	463	609
1.1.8	Sugar, jam, honey, syrups, chocolate and confectionery	880	2,558	3,438
1.1.9.1	Salt	106	469	575
1.1.9.2	Garlic	64	363	427
1.1.9.3	Maggi Cube	176	521	696

1.1.9.4	Small Dry Pepper	24	97	121
1.1.9.5	Locust Beans (Neteetu)	38	122	160
1.1.9.6	Black Pepper (Whole Seed)	110	438	548
1.1.9.7	Vinegar	8	73	81
1.1.9.8	Chilli powder	3	27	30
1.1.9.9	Mayonnaise	44	476	520
1.1.9	Food products n.e.c.	574	2,584	3,159
1.1	FOOD TOTAL	9,348	40,181	49,529
1.2.1.1	Tea Bags	55	342	396
1.2.1.2	Coffee-Nescafe (50gr)	-	287	287
1.2.1.3	Powdered Tea (Ovaltine, 200gr)	57	286	343
1.2.1	Coffee, Tea and Cocoa	112	915	1,027
1.2.2.1	Juices (Wonjo)	27	192	219
1.2.2.2	Chinese Green Tea (20) (Ataya)	397	1,026	1,423
1.2.2.3	Soft Drinks (Coke, Spirit, Fanta)	9	344	353
1.2.2.4	Mineral Water (Malta, Cocktail, Vimto)	1	28	30
1.2.2.5	Cold water (1.5Ltr)	12	31	43

1.2.2	Mineral Waters, Soft Drinks, Fruit and Vegetable Juices	446	1,621	2,067
1.2	NON-ALCOHOLIC BEVERAGES TOTAL	558	2,536	3,094
1	FOOD AND NON-ALCOHOLIC BEVERAGES TOTAL	9,906	42,717	52,623
2.1.1.1	Spirits	-	3	3
2.1.1	Spirits	-	3	3
2.1.2.1	Wines (Red, White, etc.)	-	6	6
2.1.2.2	Palm Wine	0.19	1	1
2.1.2	Wine	0.19	7	7
2.1.3.1	Beer (lager and porter)	-	22	22
2.1.3.2	Stout	-	0	0
2.1.3	Beer	-	22	22
2.1	ALCOHOLIC BEVERAGES TOTAL	0	31	31
2.2.0.1	Piccadilly	116	215	331

2.2.0.2	Marlboro	-	31	31
2.2.0.3	Benson	-	37	37
2.2.0.4	Manise (Tobacco) Wrapped in Paper	8	48	56
2.2.0.5	Bond	146	307	452
2.2.0.6	Snuff	8	12	20
2.2.0.7	Rizzla	4	9	13
2.2.0	Tobacco	282	658	940
2.2	TOBACCO	282	658	940
2.3.0.1	Kola Nuts	58	100	158
2.3.0.2	Bitter Cola Nut	3	31	33
2.3.0	Narcotics	60	131	191
2.3	NARCOTICS	60	131	191
2	ALCOHOLIC BEVERAGES, TOBACCO AND NARCOTICS TOTAL	343	820	1,163
3.1.1.1	Material for trouser	586	1,609	2,195
3.1.1	Material for trouser	586	1,609	2,195

3.1.2.1	Babies' Clothes (Napkin)	39	155	193
3.1.2.2	Boy's Underpants (4-6 Years)	4	18	22
3.1.2.3	Boy's Shirt (12-16 Years)	31	123	154
3.1.2.4	Boy's Trousers (12-16 Years)	49	195	243
3.1.2.5	Ladies Docket	-	63	63
3.1.2.6	Ladies Dress	43	132	175
3.1.2.7	Ladies Underwear	17	68	85
3.1.2.8	Lady's Blouse	-	104	104
3.1.2.9	Men's Shirts	18	71	88
3.1.2.10	Men's Trousers	43	173	217
3.1.2.11	Men's Underwear	15	59	74
3.1.2.12	Singlet	15	43	58
3.1.2.13	Track Suits	1	5	6
3.1.2.14	T-Shirt	20	78	98
3.1.2.15	Girl's Dress (10 Years)	31	124	155
3.1.2.16	Brassiere	11	42	53
3.1.2.17	Men's Sock	7	19	26
3.1.2.18	School Uniform (Grade 1)	24	57	81
3.1.2	Garments	366	1,528	1,894

3.1.4.1	Laundry (Hand Wash, Trousers and Shirt for Men)	-	2,495	2,495
3.1.4	Cleaning, Repair and Hire of Clothing	-	2,495	2,495
3.1	CLOTHING TOTAL	952	5,633	6,585
3.2.1.1	Boy's Rubber Sandals (12-16 Years)	12	43	55
3.2.1.2	Shoes-Plastic (Nyambalastic (12-16 Years)	40	141	181
3.2.1.3	Boy's Slippers (12-16 Years)	11	40	51
3.2.1.4	Sports Shoes (12-16 Years)	27	119	147
3.2.1.5	Gilrs's Slippers (Charack, 12-16 Years)	14	49	62
3.2.1.6	Girl's Rubber Sandals (12-16 Years)	8	21	29
3.2.1.7	Girls' Full Shoes-Synthetic (12-16 Years)	11	38	48
3.2.1.8	Men's Full Shoe	86	306	391
3.2.1.9	Men's Slipper	18	65	83
3.2.1.10	Men's Sports Shoes	25	146	170
3.2.1.11	Women's Full Shoes	19	73	92
3.2.1	Shoes and other footwear	269	1,041	1,310
3.2	FOOTWEAR	269	1,041	1,310

3	CLOTHING AND FOOTWEAR TOTAL	1,222	6,673	7,895
4.1.1.1	One Bedroom Sitter	1.25	3	4.58
4.1.1.2	One Bedroom	1.34	4	4.89
4.1.1.3	Two Bedroom Without Toilet & Kitchen Facility	-	1	1.32
4.1.1.4	Two Bedroom with Toilet & Kitchen Facility	-	3	3.16
4.1.1.5	Three Bedroom Without Facility	-	0	0.20
4.1.1.6	Three Bedroom with Facility	-	1	0.92
4.1.1	Rent	3	12	15
4.3.1.1	Cement	71	225	296
4.3.1.2	Ceramic Tiles (Indian)	-	15	15
4.3.1.3	Joints (Three-Quarter T-Joint)	0	1	2
4.3.1.4	Oil Paints (3.6)	3	9	11
4.3.1.5	Water Paints (18 Ltr.)	3	8	11
4.3.1.6	Electric Pipes (20 mm, White)	1	2	3
4.3.1.7	Plastering of Room (3 by 3 meter room size)	1	3	4
4.3.1.8	Tilling of Room (3 by 3 meter room size)	27	84	111
4.3.1.9	Painting of Room (3 by 3 meter room size)	0	0	0
4.3.1.10	Window Frame (Aluminum, Standard Window)	-	5	5
4.3.1	Materials for the Maintenance and Repair of the Dwelling	105	352	457

4.4.1.1	Water Charges (10 cum)	83	749	832
4.4.1	Water Supply	83	749	832
4.4	WATER SUPPLY AND MISCELLANEOUS SERVICES RELATING TO THE DWELLING	83	749	832
4.5.1.1	Electricity (300 kwh)	125	3,137	3,263
4.5.1	Electricity	125	3,137	3,263
4.5.2.1	Gas	1	15	17
4.5.2	Gas	1	15	17
4.5.4.1	Charcoal	96.96	686	783
4.5.4.2	Firewood	179.13	1,756	1,936
4.5.4	Solid Fuels	276	2,442	2,718
4.5	ELECTRICITY, GAS AND OTHER FUELS	403	5,595	5,998

4	HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	594	6,709	7,302
5.1.1.1	Wooden Bed (Box Bed with Decorated Head)	16	148	164
5.1.1.2	Bedstead	10	91	101
5.1.1.3	Sofa Chair (One Set)	-	66	66
5.1.1.4	Mattress (Double Bed 8 Inches)	5	49	54
5.1.1	Furniture and Furnishing	32	354	385
5.1.2.1	Vynil Floor Cover (Thick, 1 Mtr)	3	8	11
5.1.2	Carpets and Other Floor Coverings	3	8	11
5.1	FURNITURE AND FURNISHING, CARPETS AND OTHER FLOOR COVERINGS	35	362	397
5.2.0.1	Ready-made Curtains (1 Packet)	16	92	108
5.2.0.2	Mosquito Net	-	1	1
5.2.0.3	Mat (sleeping/Praying)	28	21	49
5.2.0.4	Bed Sheet (Double Bed)	100	60	160

5.2.0	Household textiles	144	175	319
5.2	HOUSEHOLD TEXTILES	144	175	319
5.3.1.1	Pedestal Fan	1	3	5
5.3.1.2	Freezer (Upright)	-	6	6
5.3.1.3	Generator	-	4	4
5.3.1.4	Iron (charcoal)	0	2	2
5.3.1.5	Solar panel	2	18	20
5.3.1.6	Refrigerator with Freezer (165-190 Ltr)		15	15
5.3.1	Major household appliances whether electric or not	3	48	52
5.3	HOUSEHOLD APPLIANCES	3	48	52
5.4.0.1	Cooking Knife	8	83	91
5.4.0.2	Frying Pan	1	3	3
5.4.0.3	Negro Pot	3	14	17
5.4.0.4	Thermos Flask	8	19	27
5.4.0.5	Bucket (Plastic)	6	24	29
5.4.0.6	Plastic Basin	25	100	126
5.4.0.7	Plastic Pan	37	147	184

5.4.0	Glassware, tableware and household utensils	88	390	478
5.4	GLASSWARE, TABLEWARE AND HOUSEHOLD UTENSILS	88	390	478
5.5.2.1	Batteries	49	197	246
5.5.2.2	Torch Light	27	108	135
5.5.2.3	Wheel Barrow	2	9	11
5.5.2	Small Tools and Miscellaneous Accessories	78	313	392
5.5	TOOLS AND EQUIPMENT FOR HOUSE AND GARDEN	78	313	392
5.6.1.1	Bleach (Ordsavel)	75	367	442
5.6.1.2	Candle	98	393	491
5.6.1.3	Insecticides Sprays	120	756	876
5.6.1.4	Lighters	45	380	425
5.6.1.5	Matches	137	491	628
5.6.1.6	Soda Powder	107	427	534
5.6.1.7	Soda Soap	135	290	426
5.6.1.8	Starch (Dakandeh)	47	187	234
5.6.1.9	Incense (Stick, 1 Packet)	111	412	523
5.6.1.10	Light Bulb	93	340	433
5.6.1	Non-durable Household Goods	968	4,043	5,011

5.6.2.1	Maid servants-Full Time	-	551	551
5.6.2.2	Drivers	-	108	108
5.6.2	Domestic Services and Household Services	-	658	658
5.6	GOODS AND SERVICES FOR ROUTINE HOUSEHOLD MAINTENANCE	968	4,701	5,669
5	FURNISHING, HOUSEHOLD EQUIPMENT AND ROUTINE HOUSEHOLD MAINTENANCE	1,316	5,989	7,306
6.1.1.1	Amoxilliyin	5	63	67
6.1.1.2	Aspirin	1	20	21
6.1.1.3	Coartem	26	53	79
6.1.1.4	Ibrufen	9	36	44
6.1.1.5	Paracetamol	39	158	197
6.1.1	Pharmaceutical Products	80	328	409
6.1	MEDICAL PRODUCTS, APPLIANCES AND EQUIPMENT	80	328	409
6.2.1.1	Out-Patient Fees (Ticket Paid)	5	14	19
6.2.1.2	Doctor's Fee (Public Health Facility)	13	50	63
6.2.1.3	Doctor's Fee (Private Clinic)	-	34	34
6.2.1	Medical Services	17	98	115

6.2.2.1	Dental Costs (Tooth Uproot)	-	8	8
6.2.2	Dental Services	-	8	8
6.2	OUTPATIENT SERVICES	17	106	123
6.3.0.1	Hospital Fees (Hospitalization, Public)	-	42	42
6.3.0	Hospital services	-	42	42
6.3	HOSPITAL SERVICES	-	42	42
6	HEALTH	98	476	574
7.1.1.1	Car (Toyota Yaris)	-	1,761	1,761
7.1.1	Motor Cars	-	1,761	1,761
7.1.2.1	Motorcycle (DT Yamaha 125)	-	1,233	1,233
7.1.2	Motor Cycles	-	1,233	1,233
7.1.3.1	Purchase of Bicycle	-	528	528
7.1.3	Bicycles	-	528	528
7.1	PURCHASE OF VEHICLES	-	3,523	3,523

7.2.1.1	Bicycle Tyre	1	4	5
7.2.1.2	Motor vehicle Tyres Tube	-	42	42
7.2.1.3	Puncture Repair	9	33	42
7.2.1.4	Servicing of Motor Vehicle (Brake Repair, Labour)	-	195	195
7.2.1.5	Bicycle Tyre	27	106	133
7.2.1.6	Car Battery	1	34	35
7.2.1	Spare Parts and Accessories for Personal Transport Equipment	38	414	452
7.2.2.1	Diesel	254	1,333	1,587
7.2.2.2	Motor Oil (4.5 Ltr)	17	44	61
7.2.2.3	Petrol	228	1,002	1,229
7.2.2	Fuels and Lubricants for Personal Transport Equipment	498	2,378	2,877
7.2	OPERATION OF PERSONAL TRANSPORT EQUIPMENT	536	2,793	3,329
7.3.2.1	Bus Fares (Seven Kilometers)	51	204	255
7.3.2.2	Taxi Fares (Shared Taxi, Fixed Route)	452	1,456	1,909
7.3.2.3	School Bus Fare (Single Ticket)	-	25	25
7.3.2	Passenger Transport By Road	503	1,685	2,189
7.3.3.1	International Flights (Return Ticket, Six Hours)	-	506	506
7.3.3	Passenger Transport by Air	-	506	506

7.3.4.1	Ferry Fares (Big Ferry, Single Ticket)	-	98	98
7.3.4	Passenger Transport by Sea and Inland Waterway	-	98	98
7.3	TRANSPORT SERVICES	503	2,289	2,792
7	TRANSPORT	1,040	8,604	9,644
8.1.0.1	Letter Postage (International)	-	39	39
8.1.0.2	Letter Postage (Local)	-	2	2
8.1.0	Postal services	-	41	41
8.1	POSTAL SERVICES	-	41	41
8.2.0.1	Fixed line Telephone Set (one Piece)	-	0	0
8.2.0.2	Mobile phone (Itel)	9	35	44
8.2.0	Telephone and telefax equipment	9	36	45
8.2	TELEPHONE AND TELEFAX EQUIPMENT	9	36	45
8.3.0.1	Internet Costs (1 Hrs, Cyber Café)	-	2,880	2,880
8.3.0.2	E-Credit	876	4,967	5,843
8.3.0	Telephone and telefax services	876	7,847	8,723
8.3	TELEPHONE AND TELEFAX SERVICES	876	7,847	8,723

8	COMMUNICATION	885	7,924	8,809
9.1.4.1	Memory Card Chip (4 GB)	13.870	55.48	69
9.1.4	Recording Media	13.870	55	69
9.1	AUDIO-VISUAL, PHOTOGRAPHIC AND INFORMATION PROCESSING EQUIPMENT	13.870	55	69
9.2.2.1	Television Set (LG, LED, 32, SAMSUNG)	-	-	-
9.2.2.2	Radio (12 MB)	-	-	-
9.2.2.3	Radio Cassette Player (4 Batteries)	-	-	-
9.2.2	Musical Instruments and Major Durables For Indoor Recreation	-	0	
9.2	OTHER MAJOR DURABLES FOR RECREATION AND CULTURE	-	0	0
9.4.2.1	Ticket for Football Game (National League)	-	17	17
9.4.2.2	Videos Club Ticket (Football Match)	8	28	35
9.4.2.3	Weekend Dance Charges (Saturday Night)	8	31	39
	Recreational and Cultural Services	16	75	91
9.4	RECREATIONAL AND CULTURAL SERVICES	16	75	91

9.5.1.1	Text Books	-	53	53
9.5.1	Books	-	53	53
9.5.2.1	Newspapers (Standard Newspaper)	-	192	192
9.5.2.2	Magazines	-	0	0
9.5.2	Newspapers and Periodicals	-	192	192
9.5.4.1	Pens	6	13	19
9.5.4.2	Envelopes	0	4	5
9.5.4	Stationery and Drawing Materials	6	17	23
9.5	NEWSPAPERS, BOOKS AND STATIONERY	6	262	268
9	RECREATION AND CULTURE	36	392	428
10.2.1	School Fees (Private School, Grade 7)	-	19	19
10.2.2	Examination Fees (Private School, Grade 9)	-	1	1
10.2.0	Secondary education	-	20	20
10.2	SECONDARY EDUCATION	-	20	20
10	EDUCATION		20	20

11.1.1.1	Rice with Side Dish (1 plate, Domoda, Yassa, etc.)	50	450	500
11.1.1.2	Tea with Milk (1 Cup of Tea)	25	225	250
11.1.1	Restaurant, Cafés and the Like	75	675	750
11.1	CATERING SERVICES	75	675	750
11.2.1	Hotel (1 Night, Three-Star)	-	4	4
11.2.2	Lodge (1 Night)	-	0	0
11.2.0	Accommodation services	-	4	4
11.2	ACCOMMODATION SERVICES	-	4	4
11	RESTAURANTS AND HOTELS	75	679	754
12.1.1.1	Beautician (Facial Makeup, 1 Service)	3	19	22
12.1.1.2	Barber (Hair Cut, 1 Service)	4	49	53
12.1.1.3	Beauty Salon (Hair Straightening, 1 Service)	5	84	89
12.1.1	Hairdressing Salons and Personal Grooming Establishments	12	152	164
12.1.3.1	Face Powder (Makeup Powder)	29	193	222
12.1.3.2	Nail Polish	1	27	29
12.1.3.3	Razor Blade	15	62	77
12.1.3.4	Shampoo (1000 ml)	28	120	148

12.1.3.5	Skin Light (500 ml)	137	280	416
12.1.3.6	Toilet Soap (200g)	65	362	427
12.1.3.7	Tooth Brush (Adult)	9	56	65
12.1.3.8	Tooth Paste (Colgate)	38	237	276
12.1.3	Other Appliances, Articles and Products for Personal Care	322	1,337	1,659
12.1	PERSONAL CARE	334	1,489	1,823
12.3.1.1	Necklace (Gold Imitation, Simple)	-	1,659	1,659
12.3.1	Jewelry, Clocks and Watches	-	1,659	1,659
12.3	PERSONAL EFFECTS N.E.C.	-	1,659	1,659
12	MISCELLANEOUS GOODS AND SERVICES	334	3,148	3,482
	ALL ITEMS INDEX	15,848	84,152	100,000
	NON-FOOD PRODUCTS AND SERVICES (EXCLUDING EDUCATION)	5,942	41,415	47,357

CHAPTER FIVE

SAMPLING AND CPI OPERATIONS

1. Introduction

This chapter explains the sampling and collection methodology for all indicator products. There are two principal data collection groupings. These are the field and head office collections.

2. Sampling methodology

The most common procedure used for price collection is a sample survey. There are various methods of sampling, whether determined by probability or not. It is important that The Gambia Bureau of Statistics (GBoS) follows an internationally accepted practice when sampling occurs within the CPI. This section discusses the sampling method used by GBoS.

GBoS has the following restrictions in terms of sampling:

- No sampling frame is available.
- Price collection must take place where there are price collectors.
- A probability sample with respect to the base period is not a proper probability sample with respect to the current period.

Any sampling method applied needs to maximize precision and minimize the cost of carrying out the survey. Given the restrictions mentioned above, outlet selection is purposive and sampled products are selected as follows:

- The item selected should be the most popular item in terms of brand and unit. The volume seller is assumed the most popular item. In general, the volume seller is assumed to be the brand and unit with the most shelf space allocated to it.
- The outlet should expect to continue selling the product.
- The item should be regular merchandise. An item is considered to be regular merchandise if the outlet normally sells the item. Special order items that are one-time, one-of-a-kind purchases are not eligible for the index.
- The item must be in good condition.

3. Field and head office collection

Field-based collection entails the use of field staff (price data collectors) who visit sampled outlets and markets in order to record actual prices on the shop floor. The field collection is mostly used for commodities. The collection is carried out on a monthly basis.

The head office collection entails the use of staff based at GBoS's head office mostly for the collection of prices for services. These collections are carried out by e-mail and telephonic surveys. The history and nature of the frequency of changes in prices for specific types of products informs the decision on whether prices should be collected monthly, quarterly or annually.

4. Auditing

GBoS quality assurance audits are conducted on all data collection. The purpose of quality assurance audits is to ensure that the CPI methodology is correctly applied by the field staff at the outlets and by head office collectors. The audit process allows the auditors to confirm if prices and products collected by the price collectors are correct. Audits are performed parallel to price

collection. For the purpose of general coverage and to ascertain the general level of quality, all 28 markets are audited during a year.

5. Data editing

Edits are performed to detect if there are any errors in the data and, if so, to verify and correct those errors. The main objective of editing is to ensure clean data is prepared for analysis. There are four stages in CPI editing:

- Validation stage: check if the correct codes were allocated during capturing and allocate missing unit codes.
- Phase 1: Logical edits, ensure that the current and previous months' data do not have contradictory values.
- Phase 2: Range edits, identify whether the data item value falls inside a determined acceptable range.
- Phase 3: check the correctness of all the allocated unit status codes.

6. Product maintenance

The aim of product maintenance is to ensure there are enough prices for each product in each residence area (Urban & Rural) basket. This process involves substitution of items that are temporarily unavailable, out of season items, and permanently unavailable items. Products and outlets that are permanently closed or temporarily closed for two consecutive months are substituted.

7. Listing of indicator products and methods

The data collection form or questionnaire provides a summary of all indicator products and relevant collection methodology information. This questionnaire is developed using CSPro application and it is in built into the Personal Digital Assistant (PDA) device.

CHAPTER SIX

SPECIAL CASES

A. Housing

1. Introduction

Essentially there are two types of arrangements that characterize the housing market: a house is occupied by the owner of the property, or rented out by a property owner to a tenant. Estimating the cost of housing should consider these two arrangements.

Defining actual rentals is straightforward. These are the amounts actually paid by tenants to the property owner for the provision of accommodation. Typically, a tenant and property owner enter into a rental agreement valid for a particular period of time, for example 1 month, 3 months, 6 months and 12 months depending on rental agreement. The measurement of actual rentals is expected to track the average changes of all rental agreements.

2. Actual rentals for housing

The sample of indicator products includes houses with the following categories and facilities; One Bedroom, Two Bedroom Without Toilet & Kitchen Facility, Two Bedroom with Toilet & Kitchen Facility, Three Bedroom Without Facility and Three Bedroom with Facility. GBoS conducts its own rental survey of letting agents. In 2018, field staff visit letting agents in order to record rental prices of actual rented properties. The collection was carried out on a one-off basis that helped us in categorization of the housing types and facilities for the CPI.

CHAPTER SEVEN

CPI COMPILATION

1. Elementary indices

Compilers of the CPI have to select representative products within an elementary aggregate and then collect a sample of each of the representative products, usually from a sample of different outlets. The individual products for which prices are actually collected are described as the sampled products. Their prices are collected over a succession of time periods. An elementary price index is therefore typically calculated from two sets of matched price observations.

The price index for an aggregate is calculated as a weighted average of the price indices for the sub-aggregates, the weights and type of average being determined by the index formula. The lowest-level aggregates are called elementary aggregates.

Since the elementary aggregates form the building blocks of a CPI, the choice of an inappropriate formula at this level can have a tremendous impact on the overall index. The definition of an elementary aggregate involves aggregation over four possible dimensions:

- ✓ A time dimension; i.e., the index number could be calculated for all item transactions for a year, a month, a week, or a day;
- ✓ A spatial dimension; i.e., the index number could be calculated for all item transactions in the country, province or state, city, neighbourhood, or individual location;
- ✓ A product dimension; i.e., the index number could be calculated for all item transactions in a broad general category (e.g., food), in a more specific category (e.g., margarine), for a

particular brand (ignoring any particular size) or for a particular narrowly-defined item (e.g., a particular universal product code); and

- ✓ A sectoral (or entity or economic agent) dimension; i.e., the index number could be calculated for a particular class of households or a particular class of outlets.

2. Calculating the Gambia's CPI

The CPI measures price change by comparing the cost of a fixed basket of commodities. This basket is based on expenditures in a particular reference period. The basket contains only commodities of unchanging or equivalent quantity and quality, the index reflects pure price movements.

The calculation of The Gambia's CPI entails calculating price relatives using prices in the current and previous survey periods. The survey periods are equal to a month. In the first stage of calculation, for each of the products (goods or services) for which prices are collected, an elementary index is calculated using the Jevons index number formula. The Jevons index is defined as the unweighted geometric mean of the price ratios (relatives).

$$I_j^{0:t} = \pi \left(\frac{P_i^t}{P_i^0} \right)^{\frac{1}{n}} \dots \dots \dots (1)$$

The chained monthly indices link together the month-to-month changes through successive multiplication. The Jevons formula is transitive as the chained monthly indices are identical to the

corresponding direct indices which compare prices in each successive month directly with those of the reference month.

The second stage of calculating the CPI does not involve individual prices or quantities. Instead, a higher-level index is calculated as a Modified Laspeyres' index in which the elementary price indices are averaged using a set of predetermined weights. The formula can be written as follows:

$$I^{0:t} = \frac{\sum W_i^b I_i^{0:t}}{\sum W_i^b} \dots\dots\dots (2)$$

Where $I^{0:t}$ denotes the overall CPI, or any high-level index, from period 0 to t; W_i^b is the weight attached to each of the elementary price indices; and $I_i^{0:t}$ is the corresponding elementary price index. The elementary indices are identified by the subscript i , whereas the higher-level index carries no subscript. The weights are derived in period b , which in practice has to precede period 0, the price reference period. There are three kinds of reference periods:

- ✓ Weight reference period. The period covered by the expenditure statistics used to calculate the weight. Usually, the weight reference period is a year.

- ✓ Price reference period. The period whose prices are used as denominators in index calculation. All future prices to be collected are then compared to these prices in calculating the index.

- ✓ Index reference period. The period for which the index is set to 100, also referred to as the base period.

2.1 Numerical example

The following example shows the calculations applicable to “Bread and Cereals”.

Table 4: CALCULATING THE PRICE RELATIVE AND CREATING THE INDEX

TABLE 3: CALCULATING THE PRICE RELATIVE AND CREATING THE INDEX									
		Classification of Individual Consumption according to Purpose (COICOP)		Expenditure	Base price	Current price GEOMEAN	Price relative	Price updated expenditure	Index
1	1	1.1.1.1	Long-Grained Rice (Imported)	448	16.16	16.61	102.82	46,033	
2	1	1.1.1.2	Paddy Rice Long Grain (Local)	22	14.21	14.86	104.51	2,303	
3	1	1.1.1.3	Medium-Grained Rice (Imported)	2,885	12.16	13.23	108.75	313,789	
4	1	1.1.1.4	Small grained rice (imported)	2,822	12.12	13.71	113.10	319,146	
5	1	1.1.1.5	Basmati Rice (Imported)	382	71.40	69.31	97.07	37,054	
6	1	1.1.1.6	Maize	40	12.36	13.54	109.51	4,432	
7	1	1.1.1.7	Millet	131	12.87	12.98	100.85	13,229	
8	1	1.1.1.8	Bread	4,009	20.08	21.13	105.19	421,669	
9	1	1.1.1.9	Findi	26	51.57	50.27	97.47	2,557	
10	1	1.1.1.10	Millet Flour	31	26.03	22.63	86.94	2,686	
11	1	1.1.1.11	Spaghetti	73	10.78	9.08	84.30	6,156	
12	1	1.1.1.12	Fish Pie	132	44.82	42.57	94.98	12,555	
13	1	1.1.1.13	Cake (pan, etc.)	84	24.07	33.75	140.25	11,711	
14	1	1.1.1.14	Gari (Cassava Flour)	20	33.62	29.77	88.55	1,796	
	2	1.1.1	Bread And Cereals	11,105				1,195,116	107.6

3. Linking new index series to old index series

From time to time, the weights for the elementary aggregates have to be revised to ensure that they reflect current expenditure patterns and consumer behaviour. When new weights are introduced, the price reference period for the new index can be the last period of the old index, the old, and the new indices being linked together at this point. The old and the new indices constitute a linked index.

The introduction of new weights is often a complex operation because it provides an opportunity to introduce new items, new samples, new data sources, new compilation practices, new elementary aggregates, new higher-level indices or new classifications. These tasks are often undertaken simultaneously at the time of reweighting to minimize overall disruption to the time series and any resulting inconvenience to users of the indices.

3.1 Features of a linked index

There are several important features of a linked index:

- ✓ The linked index formula allows weights to be updated, and facilitates the introduction of new items and sub-indices and the removal of obsolete ones.
- ✓ In order to be able to link the old and the new series, an overlapping period is needed in which the index has to be calculated using both the old and the new set of weights.
- ✓ A linked index may have two or more links. Between each link period, the index may be calculated as a fixed weight index. The link period may be a month or a year.
- ✓ Linking is intended to ensure that the individual indices on all levels show the correct development through time.

- ✓ Linking leads to non-additivity. When the new series is chained onto the old, the historical higher-level indices cannot be obtained as weighted arithmetic averages of individual indices using the new weights. If, on the other hand, the index reference period is changed and the index series prior to the link period is rescaled to the new index reference period, this series cannot be aggregated to higher-level indices by use of the new weights.

3.2 Method of linking and rebasing

There are many different methods of linking indices. The method followed by GBoS is as follows:

1. We created an overlap period of one year i.e., for the New Index Series the Price Reference Period is January 2019, Index Reference Period is January 2019 =100 also. For the Old Series the Price Reference Period is August 2004, Index Reference Period is also August 2004=100. This means that the Old Series has been running from August 2004 to December 2019, whereas the New Series started running from January 2019 and will continue to run forever till the next re-base exercise. In this case we have created an overlap period of one year i.e., January 2019 to December 2019.
2. We took the New CPI Series i.e., January 2019=100 and we first referenced these to December 2019=100.
3. We used these referenced series i.e., January 2019=100 referenced to December 2019=100 and Spliced/Linked onto the Old Series (August 2004=100) so as to have a continuum of similar historical indexes pattern. In this we have linked the two series together.
4. We Rescaled the Spliced/Linked series to January 2020=100 as our new Index Reference Period. Going backward and forward we rescaled all the index series from August 2004 up to the current period.

FOR ILLUSTRATION OF THE LINKING PROCESS SEE TABLES 5, 6, 7 AND 8

Table 6: RESCALED SERIES OF JANUARY 2019=100 TO DECEMBER 2019=100

RESCALED SERIES OF JANUARY 2019=100 TO DECEMBER 2019=100													
ALL ITEMS(NEW SERIES; 2019=100)	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20
OVERALL INDEX	96.9	97.2	97.8	98.0	98.1	98.4	98.5	99.0	99.5	99.7	99.9	100.0	100.1
FOOD AND NON-ALCOHOLIC BEVERAGES	97.1	97.4	97.6	97.8	97.9	98.1	98.4	99.0	99.5	99.7	99.9	100.0	100.7
FOOD	97.0	97.3	97.5	97.7	97.9	98.1	98.3	99.0	99.5	99.7	99.9	100.0	100.8
(i) Bread and Cereals	98.0	98.3	98.3	98.6	98.8	99.0	99.1	99.4	99.7	99.8	99.9	100.0	104.7
(ii) Meat	96.2	96.4	96.8	96.9	97.0	97.1	97.3	97.5	99.0	99.2	99.6	100.0	102.6
(iii) Fish	95.8	96.2	96.8	96.9	97.0	97.2	98.0	98.4	99.3	99.6	99.9	100.0	100.2
(iv) Milk, Cheese and Eggs	96.9	97.1	97.3	97.4	97.7	97.9	98.0	99.1	99.3	99.4	99.9	100.0	99.2
(v) Oils and fats	97.9	98.0	98.2	98.4	98.5	98.7	98.9	99.1	99.5	99.8	99.9	100.0	104.3
(vi) Fruits & nuts	97.4	97.5	97.7	97.9	98.3	98.5	98.8	98.9	99.6	99.7	99.9	100.0	89.7
(vii) Vegetables, root crops & tubers	97.8	98.3	98.4	98.5	98.4	98.9	99.2	99.3	99.6	99.9	99.9	100.0	98.9
(viii) Sugar, jam, honey & sweets	92.6	93.3	93.7	93.7	93.9	94.0	94.2	99.2	99.7	99.8	99.9	100.0	95.9
Other food products (N.E.C)	97.7	98.0	98.2	98.3	98.4	98.6	98.9	99.1	99.3	99.8	99.9	100.0	95.1
Non-alcoholic beverages	97.9	98.0	98.3	98.6	99.0	99.1	99.2	99.3	99.6	99.7	99.9	100.0	98.5
NON-FOOD PRODUCTS AND SERVICES	96.7	96.9	98.1	98.2	98.3	98.6	98.7	98.9	99.5	99.7	99.9	100.0	99.5
ALCOHOLIC BEVERAGES, TOBACCO AND NARCOTICS	97.4	97.6	97.9	98.1	98.2	98.3	98.4	98.4	99.6	99.9	99.9	100.0	93.2
Alcoholic beverages	97.6	97.7	97.8	97.9	98.4	98.5	98.6	98.6	99.9	99.9	100.0	100.0	102.7
Tobacco	98.0	98.0	98.2	98.2	98.3	98.3	98.3	98.4	99.8	99.9	100.0	100.0	91.4
Narcotics	95.0	95.6	96.8	97.3	97.8	97.9	98.5	98.5	98.8	99.5	99.7	100.0	100.5
CLOTHING & FOOTWEAR	96.2	96.6	97.0	97.3	97.6	97.9	98.2	98.6	99.2	99.5	99.8	100.0	100.3
CLOTHING	95.8	96.3	96.7	97.1	97.4	97.8	98.1	98.6	99.2	99.4	99.7	100.0	100.5
Material for trouser	95.9	96.4	96.9	97.2	97.6	97.8	98.1	98.9	99.2	99.5	99.8	100.0	101.7
Garments	98.1	98.4	98.5	98.6	98.7	98.8	98.9	99.2	99.6	99.8	99.9	100.0	100.8
Cleaning, Repair and Hire of Clothing	94.1	94.8	95.3	95.8	96.2	97.0	97.4	97.9	98.8	99.2	99.6	100.0	99.1
Footwear	98.0	98.0	98.1	98.5	98.6	98.6	98.8	98.9	99.5	99.8	99.9	100.0	99.4
HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	98.0	98.3	98.4	98.5	98.6	98.8	98.9	99.0	99.4	99.8	99.9	100.0	100.6
Actual rentals for housing	97.3	97.6	97.6	98.2	99.0	99.0	99.2	99.2	99.3	99.6	99.8	100.0	100.1
Maintenance and Repair of the Dwelling	98.7	99.1	99.1	99.2	99.2	99.3	99.4	99.6	99.8	99.9	100.0	100.0	100.0
Water Supply and Miscellaneous Services Relating to the Dwelling	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Electricity, gas and other fuels	97.7	98.0	98.2	98.2	98.4	98.6	98.7	98.8	99.3	99.7	99.8	100.0	100.8
Furnishing, Household Equipment and Routine Household Maintenance	97.0	97.3	97.4	97.6	97.7	97.8	97.9	98.2	99.7	99.8	99.9	100.0	102.5
Furniture and Furnishing, Carpets and Other Floor Coverings	97.0	97.1	97.6	97.6	97.8	98.0	98.5	98.8	99.2	99.7	99.8	100.0	98.2
Household textiles	95.9	96.3	96.9	97.6	97.9	98.0	98.2	98.5	99.3	99.5	99.8	100.0	100.1
Household appliances	97.5	97.6	97.9	98.0	98.2	98.3	98.7	98.8	99.5	99.6	99.9	100.0	102.4
Glassware, Tableware and Household Utensils	95.5	96.1	96.3	96.6	96.7	97.0	97.1	98.2	99.5	99.8	99.9	100.0	94.8
Tool and Equipment for House and Garden	96.7	96.8	96.9	97.2	97.3	97.5	97.6	98.0	99.3	99.7	99.9	100.0	96.1
Goods and services for routine household maintenance	97.3	97.5	97.6	97.7	97.8	97.9	98.0	98.1	99.8	99.8	99.9	100.0	104.0
HEALTH	98.9	98.9	99.0	99.2	99.3	99.3	99.5	99.5	99.7	99.8	99.9	100.0	96.6
TRANSPORT	99.5	99.6	99.6	99.6	99.7	99.7	99.8	99.8	99.8	99.9	100.0	100.0	100.1
COMMUNICATIONS	92.5	92.5	97.8	97.9	97.9	98.5	98.7	98.9	99.5	99.6	99.8	100.0	95.2
RECREATION AND CULTURE	97.1	97.5	97.9	98.2	98.3	98.4	98.7	98.8	99.3	99.6	99.8	100.0	96.3
Audio-Visual, Photographic and Information Processing Equipment	94.5	94.5	95.2	95.6	95.9	96.2	96.8	97.3	98.7	98.9	99.6	100.0	89.9
Other Major Durables for Recreation and Culture													
Recreational and Cultural Services	92.2	94.2	95.5	96.0	96.2	96.3	97.0	97.3	98.3	98.8	99.5	100.0	104.4
Newspapers, books and stationery	99.5	99.5	99.6	99.7	99.7	99.7	99.8	99.8	99.8	100.0	100.0	100.0	95.1
Education	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0	100.0
Restaurant and Hotels	95.6	96.2	96.5	96.7	96.9	97.1	97.7	98.1	98.8	99.5	99.8	100.0	100.7
MISCELLANEOUS GOODS AND SERVICES	98.0	98.1	98.2	98.4	98.4	98.8	98.8	98.9	99.3	99.6	99.9	100.0	100.9
Personal care	96.9	97.1	97.3	97.3	97.4	97.7	97.8	98.0	98.6	99.2	99.9	100.0	100.1
ALL ITEM INDEX	96.9	97.2	97.8	98.0	98.1	98.4	98.5	99.0	99.5	99.7	99.9	100.0	100.1

Table 7: THE NATIONAL CONSUMER PRICE INDEX PRICE REFERENCE PERIOD: AUGUST 2004=100

THE GAMBIA		THE NATIONAL CONSUMER PRICE INDEX ((BASE(Price reference period: AUGUST 2004 = 100))												
Gambia Bureau of Statistics (GBoS)		BY DIVISION AND SELECTED CATEGORIES											Aug 2004=100	Jan 2019=100
COICOP	ALL ITEMS(August 2004=100)	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20
0	All-items CPI (OVERALL INDEX)	211.75	212.94	213.94	216.70	218.75	219.72	220.78	222.36	223.57	224.56	225.69	227.12	227.33
01	FOOD AND NON-ALCOHOLIC BEVERAGES	240.11	241.59	242.68	244.00	246.42	247.64	249.02	251.06	252.72	254.09	255.59	257.40	259.13
01.1	FOOD	242.83	244.34	245.47	246.86	249.25	250.49	251.91	254.00	255.69	257.09	258.61	260.44	262.55
01.1.1	Bread Cereals	240.15	241.74	243.19	245.37	247.03	249.14	249.94	252.37	254.34	255.90	257.38	259.04	271.25
01.1.2	Meat	276.57	278.87	279.20	281.64	283.87	284.34	286.10	288.64	290.17	291.21	292.48	294.45	302.11
01.1.3	Fish	212.34	214.78	216.88	219.68	221.66	222.99	224.86	227.09	228.99	230.65	232.16	233.87	234.36
01.1.4	Milk, Cheese and Eggs	182.41	183.01	184.08	185.62	187.24	187.88	188.91	189.77	190.63	191.68	192.87	194.15	192.58
01.1.5	Oils and fats	272.41	274.18	276.19	277.68	279.58	280.08	281.37	282.90	284.61	285.80	287.45	289.26	301.56
01.1.6	Fruits & nuts	235.12	235.67	236.59	239.33	241.43	243.39	245.49	247.75	250.00	252.14	254.31	256.71	230.26
01.1.7	Vegetables, root crops & tubers	222.84	223.65	224.77	225.86	227.65	229.59	231.78	234.03	236.11	237.95	240.02	242.31	239.58
01.1.8	Sugar, jam, honey & sweets	266.70	266.90	267.36	269.77	270.81	271.06	271.38	271.95	272.48	273.63	274.95	276.49	265.05
01.1.9	Other food products n.e.c	183.21	183.74	184.81	185.59	186.59	187.75	188.79	190.09	191.28	192.50	193.76	195.13	185.50
01.2	Non-alcoholic beverages	142.56	142.93	142.94	143.83	144.78	145.49	145.63	145.92	146.25	146.67	147.52	148.46	146.17
	NON-FOOD PRODUCTS AND SERVICES	175.16	175.99	176.86	182.34	183.07	183.69	184.34	185.33	185.97	186.47	187.11	188.04	187.02
02	ALCOHOLIC BEVERAGES, TOBACCO AND NARCOTICS	124.73	125.23	125.28	125.94	126.59	126.98	127.44	127.89	128.02	128.29	128.65	129.05	120.33
02.1	Alcoholic beverages	127.93	128.12	128.41	129.41	130.51	130.70	131.49	131.81	132.04	132.42	132.87	133.43	137.03
02.2	Tobacco	124.17	124.72	124.73	125.33	125.91	126.34	126.74	127.20	127.33	127.57	127.92	128.29	117.25
03	CLOTHING & FOOTWEAR	171.53	172.73	174.18	175.61	176.83	177.10	177.79	179.31	179.89	180.35	181.00	182.04	182.55
03.1	GARMENTS	166.48	167.60	169.09	170.57	171.82	172.05	172.77	174.24	174.82	175.25	175.89	176.88	177.68
03.1.1	Clothing materials	155.68	156.94	158.14	159.31	159.94	160.03	160.57	161.86	162.56	162.94	163.67	164.51	167.27
03.1.2	Garments	131.52	131.98	132.11	133.17	133.90	133.93	134.56	135.83	136.24	136.59	137.12	137.84	138.96
03.1.4	Repair and hire of clothing	219.40	221.29	224.74	226.97	229.33	229.94	230.90	232.76	233.49	234.05	234.77	236.20	234.15
3.2	Footwear	190.13	191.60	192.91	194.15	195.26	195.68	196.27	197.97	198.54	199.09	199.77	201.03	199.79
04	HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	205.44	205.83	206.45	207.84	208.23	209.55	209.92	211.82	212.69	213.76	214.73	216.06	217.44
04.1	Actual rentals for housing	147.57	147.57	147.97	148.61	148.75	148.95	149.44	155.31	155.70	156.09	156.58	157.56	157.72
04.4.1	Water supply	161.00	161.00	161.00	161.85	162.23	162.32	162.32	162.37	162.55	162.76	162.76	162.91	162.91
04.5	Electricity, gas and other fuels	230.58	231.15	231.91	233.63	234.11	235.96	236.33	237.05	238.16	239.57	240.82	242.40	244.27
05	FURNISHINGS, HOUSEHOLD EQUIPMENT, ETC	154.58	155.38	156.07	157.22	157.87	158.34	158.56	159.00	159.27	159.59	160.00	160.58	164.53
05.1	Furniture, decorations, floor coverings and repairs	148.35	151.30	152.63	153.65	154.01	154.02	154.30	154.66	154.84	155.51	156.34	157.33	154.56
05.2	Household textiles	136.01	136.01	136.16	137.05	137.46	137.50	137.79	138.40	138.71	138.88	139.07	139.70	139.89
05.3	Household appliances	122.61	122.92	123.25	123.92	124.54	124.55	124.59	124.86	125.06	125.29	125.58	126.22	129.20
05.6	Goods and services for routine household maintenance	170.90	171.21	171.89	173.29	174.12	174.99	175.23	175.72	176.04	176.28	176.61	177.00	184.07
06	HEALTH	140.92	141.16	141.19	141.37	141.49	141.80	141.87	141.99	142.38	142.53	142.73	142.98	138.06
07	TRANSPORT	241.76	242.62	242.93	243.57	243.91	243.87	243.93	244.28	244.63	244.76	244.91	245.17	245.50
08	COMMUNICATIONS	105.27	105.27	105.27	168.55	168.68	168.93	168.96	169.01	169.05	169.17	169.31	169.46	169.46
09	RECREATION AND CULTURE	145.55	146.54	146.61	147.90	148.22	148.60	148.85	148.92	149.01	149.16	149.43	149.93	149.93
	Audio-visual, photographic equipment, cultural activities	134.42	134.42	134.82	135.34	136.47	137.24	138.48	138.79	139.19	139.61	140.58	141.51	127.17
09.5	Newspapers, books and stationery	147.99	149.19	149.19	150.64	150.79	151.09	151.12	151.14	151.17	151.26	151.37	151.77	144.35
10	Education	110.66	110.66	110.66	110.88	110.93	111.00	111.07	111.40	111.65	111.76	111.77	111.80	111.80
11	HOTELS, CAFES AND RESTAURANTS	227.42	228.68	230.45	232.18	233.33	234.95	237.02	238.60	240.02	241.59	243.11	244.83	246.42
12	MISCELLANEOUS GOODS AND SERVICES	268.23	269.13	271.39	272.60	274.02	275.77	278.16	280.44	282.77	284.12	285.94	288.35	290.90
12.1	Personal care	268.23	269.13	271.39	272.60	274.02	275.77	278.16	280.44	282.77	284.12	285.94	288.35	288.76
	ALL ITEM INDEX	211.75	212.94	213.94	216.70	218.75	219.72	220.78	222.36	223.57	224.6	225.7	227.12	227.33
	12-MONTH MOVING AVERAGE	206.23	207.26	208.29	209.46	210.72	211.98	213.23	214.50	215.81	217.1	218.5	219.8	
	Month on month inflation rate (1 month rate)	5.9	5.9	5.9	5.9	6.0	6.1	6.1	6.2	6.3	6.3	6.5	6.6	
	Year on Year inflation (12 month rate)	6.1	6.2	6.1	6.9	7.5	7.3	7.3	7.4	7.6	7.5	7.7	7.7	

Table 8:SPLICED/LINKED SERIES RESCALED TO JANUARY 2020=100

RESCALED SPLICED/LINKED SERIES TO JANUARY 2020=100														
COICOP	ALL ITEMS(August 2004=100)	Jan-19	Feb-19	Mar-19	Apr-19	May-19	Jun-19	Jul-19	Aug-19	Sep-19	Oct-19	Nov-19	Dec-19	Jan-20
0	All-items CPI (OVERALL INDEX)	93.14	93.67	94.11	95.32	96.23	96.65	97.12	97.81	98.35	98.78	99.28	99.91	100.00
01	FOOD AND NON-ALCOHOLIC BEVERAGES	92.66	93.23	93.65	94.16	95.09	95.56	96.10	96.89	97.53	98.05	98.63	99.33	100.00
01.1	FOOD	92.49	93.07	93.49	94.03	94.94	95.41	95.95	96.74	97.39	97.92	98.50	99.20	100.00
01.1.1	Bread & Cereals	88.53	89.12	89.66	90.46	91.07	91.85	92.14	93.04	93.77	94.34	94.89	95.50	100.00
01.1.2	Meat	91.55	92.30	92.41	93.22	93.96	94.12	94.70	95.54	96.05	96.39	96.81	97.46	100.00
01.1.3	Fish	90.61	91.65	92.54	93.74	94.58	95.15	95.95	96.90	97.71	98.42	99.06	99.79	100.00
01.1.4	Milk, Cheese and Eggs	94.72	95.03	95.58	96.38	97.23	97.56	98.09	98.54	98.99	99.53	100.15	100.81	100.00
01.1.5	Oils and fats	90.33	90.92	91.59	92.08	92.71	92.87	93.30	93.81	94.38	94.77	95.32	95.92	100.00
01.1.6	Fruits & nuts	102.11	102.35	102.75	103.94	104.85	105.70	106.61	107.60	108.57	109.50	110.44	111.49	100.00
01.1.7	Vegetables, root crops & tubers	93.01	93.35	93.82	94.27	95.02	95.83	96.74	97.68	98.55	99.32	100.18	101.14	100.00
01.1.8	Sugar, jam, honey & sweets	100.62	100.70	100.87	101.78	102.17	102.26	102.39	102.60	102.80	103.24	103.73	104.32	100.00
01.1.9	Other food products n.e.c	98.77	99.05	99.63	100.05	100.59	101.22	101.78	102.48	103.12	103.78	104.46	105.19	100.00
01.2	Non-alcoholic beverages	97.53	97.78	97.79	98.40	99.05	99.53	99.63	99.83	100.05	100.35	100.93	101.57	100.00
	NON-FOOD PRODUCTS AND SERVICES	93.66	94.10	94.57	97.50	97.89	98.22	98.57	99.10	99.44	99.71	100.05	100.55	100.00
02	ALCOHOLIC BEVERAGES, TOBACCO AND NARCOTICS	103.66	104.07	104.11	104.66	105.21	105.53	105.91	106.28	106.40	106.62	106.92	107.25	100.00
02.1	Alcoholic beverages	93.36	93.50	93.71	94.44	95.24	95.38	95.96	96.20	96.36	96.64	96.97	97.37	100.00
02.2	Tobacco	105.90	106.37	106.38	106.89	107.39	107.75	108.09	108.49	108.59	108.80	109.10	109.42	100.00
03	CLOTHING & FOOTWEAR	93.97	94.62	95.42	96.20	96.87	97.02	97.39	98.23	98.55	98.80	99.15	99.72	100.00
03.1	GARMENTS	93.70	94.33	95.17	96.00	96.70	96.83	97.24	98.07	98.39	98.63	98.99	99.55	100.00
03.1.1	Clothing materials	93.07	93.83	94.55	95.24	95.62	95.68	96.00	96.77	97.19	97.42	97.85	98.35	100.00
03.1.2	Garments	94.65	94.98	95.07	95.83	96.36	96.38	96.83	97.75	98.04	98.29	98.67	99.19	100.00
03.1.4	Repair and hire of clothing	93.70	94.50	95.98	96.93	97.94	98.20	98.61	99.40	99.72	99.95	100.26	100.87	100.00
3.2	Footwear	95.16	95.90	96.56	97.18	97.73	97.94	98.24	99.09	99.38	99.65	99.99	100.62	100.00
04	HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	94.48	94.66	94.94	95.59	95.77	96.37	96.54	97.41	97.81	98.31	98.75	99.37	100.00
04.1	Actual rentals for housing	93.57	93.57	93.82	94.23	94.31	94.44	94.75	98.47	98.72	98.97	99.28	99.90	100.00
04.4.1	Water supply	98.82	98.82	98.82	99.35	99.58	99.63	99.63	99.67	99.78	99.90	99.90	100.00	100.00
04.5	Electricity, gas and other fuels	94.40	94.63	94.94	95.64	95.84	96.60	96.75	97.04	97.50	98.08	98.59	99.23	100.00
05	FURNISHINGS, HOUSEHOLD EQUIPMENT, ETC	93.95	94.44	94.86	95.56	95.95	96.24	96.37	96.64	96.80	97.00	97.24	97.60	100.00
05.1	Furniture, decorations, floor coverings and repairs	95.98	97.89	98.75	99.41	99.65	99.65	99.83	100.07	100.18	100.61	101.15	101.79	100.00
05.2	Household textiles	97.23	97.23	97.34	97.98	98.27	98.29	98.50	98.94	99.16	99.28	99.42	99.87	100.00
05.3	Household appliances	94.90	95.14	95.39	95.91	96.39	96.40	96.43	96.63	96.79	96.97	97.19	97.69	100.00
05.6	Goods and services for routine household maintenance	92.84	93.01	93.38	94.14	94.59	95.07	95.20	95.47	95.63	95.77	95.95	96.16	100.00
06	HEALTH	102.07	102.24	102.27	102.40	102.48	102.70	102.76	102.85	103.13	103.23	103.38	103.56	100.00
07	TRANSPORT	98.48	98.83	98.95	99.21	99.35	99.34	99.36	99.50	99.65	99.70	99.76	99.87	100.00
08	COMMUNICATIONS	62.12	62.12	62.12	99.46	99.54	99.69	99.70	99.73	99.76	99.83	99.91	100.00	100.00
09	RECREATION AND CULTURE	97.08	97.74	97.79	98.65	98.86	99.12	99.28	99.33	99.39	99.49	99.67	100.00	100.00
	Audio-visual, photographic and information processing equipment	105.70	105.70	106.01	106.42	107.32	107.91	108.89	109.13	109.45	109.78	110.54	111.28	100.00
09.5	Newspapers, books and stationery	102.52	103.35	103.35	104.35	104.46	104.67	104.69	104.70	104.72	104.78	104.86	105.14	100.00
10	Education	98.98	98.98	98.98	99.17	99.22	99.28	99.34	99.64	99.87	99.96	99.97	100.00	100.00
11	HOTELS, CAFES AND RESTAURANTS	92.29	92.80	93.52	94.22	94.69	95.35	96.19	96.83	97.40	98.04	98.66	99.35	100.00
12	MISCELLANEOUS GOODS AND SERVICES	92.21	92.52	93.29	93.71	94.20	94.80	95.62	96.41	97.20	97.67	98.30	99.12	100.00
12.1	Personal care	92.89	93.20	93.98	94.40	94.89	95.50	96.33	97.12	97.92	98.39	99.02	99.86	100.00
	ALL ITEM INDEX	93.14	93.67	94.11	95.32	96.23	96.65	97.12	97.81	98.35	98.78	99.28	99.91	100.00
	12-MONTH MOVING AVERAGE	5.56	5.63	5.55	6.45	6.88	6.79	6.60	6.99	7.07	7.19	7.0	7.3	6.8
	Year on Year inflation (12 month rate)	6.08	6.16	6.13	6.91	7.46	7.35	7.31	7.36	7.58	7.55	7.73	7.68	7.36

This method satisfies the following criteria:

- ✓ The historical, published rates of change in the CPI are retained (although historical additivity is lost);

- ✓ The base period of the CPI is January 2020 = 100;

- ✓ All monthly changes in the CPI between August 2004 and December 2019 and onwards are a true reflection of the underlying price movements; and

- ✓ All indices are calculated in the normal fashion and additivity through all aggregation levels is ensured.

CHAPTER EIGHT

IMPUTATIONS IN THE CPI

1. Introduction

Although the CPI is published monthly, certain price data are sometimes not available. This may be due to the seasonal nature of the product, the fact that prices change only periodically (such as administrative prices, tariffs and fees), or the absence of the product from outlets for various reasons (e.g., items temporarily unavailable). In all of these cases an imputation method should be used, whether at an aggregated level or a more disaggregated level. The failure to impute for missing prices may lead to a bias in the index.

2. Methods of imputations

2.1 Matched sample

Omitting an observation from the calculation of an elementary index is equivalent to assuming that the price would have moved in the same way as the average of the prices of the items that remain included in the index. Omitting an observation changes the implicit weights attached to the other prices in the elementary aggregate.

2.3 Average price change

Imputation of the missing price by the average change of the other available prices within an elementary aggregate may be applied where the prices can be expected to move in the same direction. The imputation can be made using all of the remaining prices in the elementary aggregate. As already noted, this is numerically equivalent to omitting the item for the immediate period, but it is useful to make the imputation so that if the price becomes available again in a later

period, the sample size is not reduced in the current period. In some cases, depending on the homogeneity of the elementary aggregate, it may be preferable to use only a subset of items from the elementary aggregate to estimate the missing price. In some instances, this may even be a single comparable item from a similar type of outlet whose price change can be expected to be similar to that of the missing one.

2.3 Carry forward

Carrying forward the last observed price should be avoided whenever possible and is acceptable only for a very limited number of periods. Special care needs to be taken in periods of high inflation or when markets are changing rapidly as a result of a high rate of innovation and product turnover. While simple to apply, carrying forward the last observed price biases the resulting index towards zero change. In addition, when the price of the missing item is recorded again, there is likely to be a compensating step-change in the index to return it to its proper value. The adverse effect on the index will be increasingly severe if the item remains unpriced for some length of time. In general, carrying forward is the least preferred procedure or solution to the problem.

3. Methods applied by GBoS

GBoS uses average price change method of imputation in the calculation of the CPI. The choice of method is determined by the level of aggregation of a particular index and the frequency of price collection for a particular product.

Imputation by average price change is only considered once there are no data available to calculate an average percentage change for an elementary index. The lack of data could be attributed to various causes, for example seasonal behaviour or shortages in the market. If data are missing for

an elementary aggregate, the missing elementary index is imputed from the national average percentage change (average of all price changes for the same products in other publication areas).

Let's illustrate for the class of “**spare parts and accessories for personal transport equipment**”.

Assuming that the current month price for Bicycle Tyre (Inner Tube) is missing, so we will impute using the average change price movement of this class. Hence the imputed current month price for Bicycle Tyre (Inner Tube) is 77.03

ILLUSTRATION:

Table 9:IMPUTATION METHOD BY AVERAGE PRICE CHANGE

IMPUTATION METHOD BY AVERAGE PRICE CHANGE				
	Previous Month Price	Current Month Price	Price Relatives	Imputed/Collected Price
Bicycle Tyre (Inner Tube)	75		m	77.03
Motor Vehicle Tyre Tube	700	700	1	700
Puncture Repair	50	50	1	50
Servicing of Motor Vehicle (Brake Repair, Labour)	250	250	1	250
Bicycle Tyre (Outer)	175	200	1.14	200
Car Battery	2500	2500	1	2500
			1.027	
Spare Parts and Accessories for Personal Transport Equipment				

CHAPTER NINE

QUALITY AND QUANTITY ADJUSTMENTS IN THE CPI

1. Quality adjustments in the CPI

The objective of the CPI is to measure pure price change over time, so ideally identical goods and services should be priced from one period to the next. This is called pricing to constant quality. However, in practice, new products appear on the market and replace older products. These new products have different attributes (or quality). For price index purposes, it is necessary to measure these changes in quality, and to remove any change in price attributable purely to the change in quality, from the inflationary movement in the price.

The Gambia's CPI applies quality adjustment in the cases where changes are made to the characteristics or size of a product. This ensures that only price changes for identical products (matching sample approach) are incorporated into the CPI. This method is internationally accredited, but has the disadvantage of ignoring implicit price changes caused by changing characteristics.

Quality adjustments are the process of estimating what the market price of a replacement product would be if it had the characteristics of the product it replaces and with whose price its price is to be compared. The process requires estimating the market value of any differences in the price determining characteristics of the two products and adjusting by addition, subtraction or multiplication by a coefficient – the observed price of the replacement product. The methods that are commonly used for quality adjustments are:

- ✓ Overall mean imputation – the use of price movements of a similar item or items to estimate an overlap price for the old item.

- ✓ Class mean imputation – impute price changes based on price changes of comparable items.

- ✓ Production cost method – adjusts prices on the foundation that the difference between the qualities of old and new products corresponds to the difference in costs to make products. Quality changes can therefore be removed from replacement products if the cost of these quality changes can be determined or is available.

- ✓ Hedonic regression – different variables affecting a product’s price are regressed against the price of the product in order to determine the value of the product should the variables change.

The products where quality adjustments are conducted are: motor vehicles, cellphones, decoders, DVD players and TVs.

The aim of quality adjustments is mainly to estimate the market price for a substitute product if the characteristics are held constant between the old and substitute varieties. In line with international best practice, GBoS would use Hedonic regressions to quality adjust for the products listed above in case the need arises. This would be done by identifying the (price determining) characteristics of a product and using these in a regression analysis.

Parameter estimates would be obtained from the hedonic model to adjust the price change used in index calculations in instances where the new item and old item differ in quality. The new price is then adjusted using these results. This allows the price series to be extended using the substitute product.

2. Quantity adjustments in the CPI

A quantity adjustment is a form of quality adjustment where a change in the quantity of a product results in the adjustment of a price. In other words, the quantity change may take the form of a change in the physical characteristics of the product that can easily be quantified, such as change in weight, dimensions, purity, or chemical composition of a product. Quantity adjustments are applied to products with permanent quantity structure changes.

Quantity adjustment is one of the most straightforward explicit adjustments to undertake. It is applicable when the size of the replacement item differs from that of the available item. This is accomplished by scaling the price of the old or new product by the ratio of quantities.

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