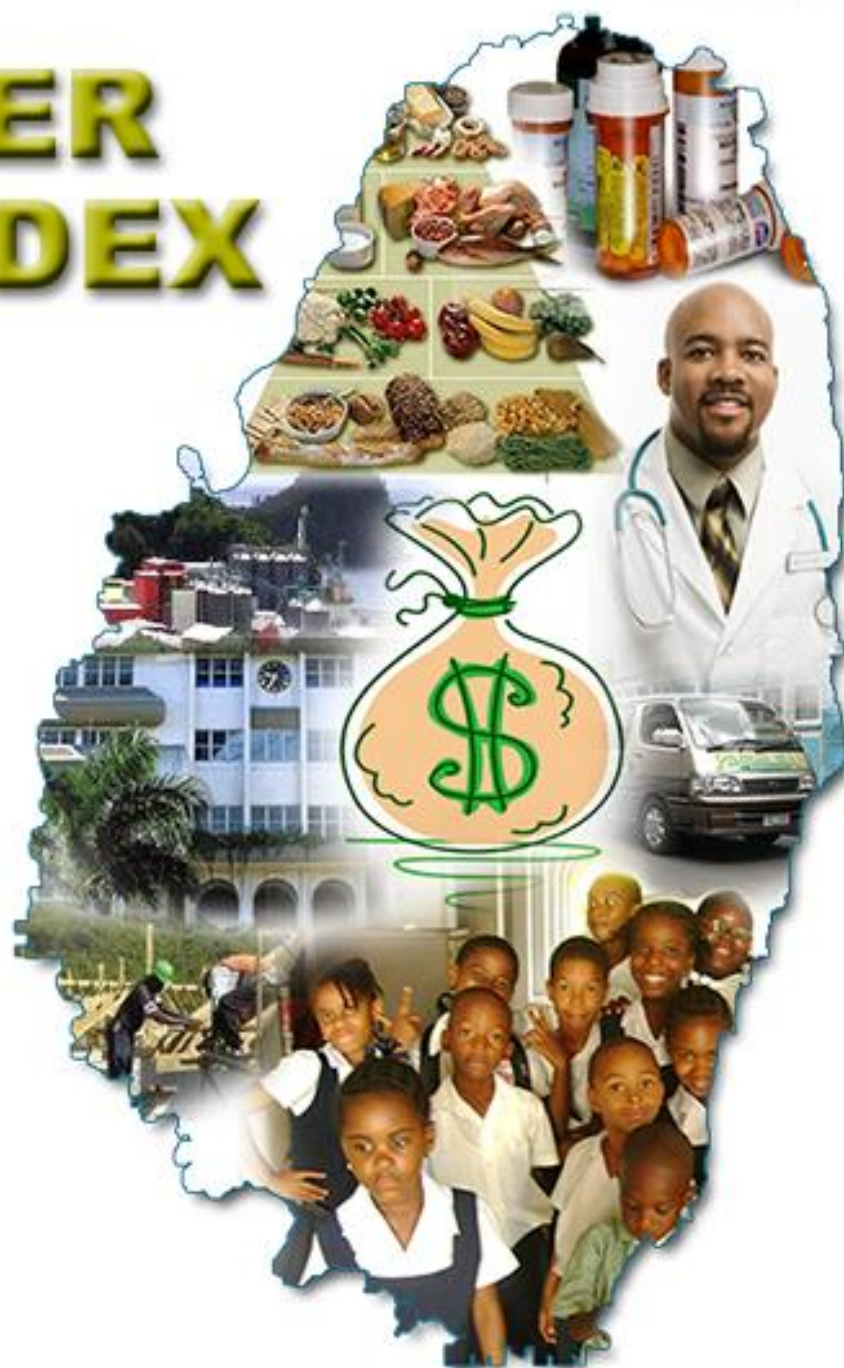# ST VINCENT AND THE GRENADINES

CONSUMER PRICE INDEX 2010

STATISTICAL OFFICE
Central Planning Division
Ministry of Finance and Economic Planning
December, 2010

ST VINCENT AND THE GRENADINES

CONSUMER PRICE INDEX 2010

TABLE OF CONTENTS

TABLES AND CHARTS

FOREWORD

The *"Consumer Price Index 2010"* is the first publication on the sources and methods for compiling the Consumer Price Index, produced by the Staff of the Economic Statistics Unit, Statistical Office, Central Planning Division, Ministry of Finance and Economic Planning (MFEP). The objective of this report is to provide government planners, policymakers, business enterprises, academics and the general public with information on how the Statistical Office measures price movements that are the primary cause of inflation in St Vincent and the Grenadines. The statistics contained in this report are in accordance with the standard methodology adopted by the Eastern Caribbean member countries and is consistent with the recommendations of the 2004 *Consumer Price Index Manual* .

This publication reports on the outcome of the updating and rebasing St Vincent and the Grenadines Consumer Price Index from base year 2001 to base year 2010. The revising of the consumer price index series incorporated new data sources, and adopted new international methodological and classification standards

This report includes sections describing the sources and methods used to derive the Consumer the Consumer Price Index (CPI) and inflation rate which provides a guide to data users on the compilation and estimation process. It presents tables and charts on the CPI that are based on the Classification of Individual Consumption by Purpose (COICOP) and compare the current and revised weights of the CPI basket. It also provides average retail prices for selected items of the CPI basket.

The Statistical Office recognizes and commends the tremendous efforts of the staff of the Economic Statistics Unit and those who collected the prices and their unwavering commitment in bringing this updating exercise to a successful completion.

The tables and charts presented in this report should prove useful in analyzing the performance of economy. Any suggestions for improvement, comments or queries may be directed to the Statistical Office, Central Planning Division, Ministry of Finance and Economic Planning .

Gatlin Roberts
Chief Statistician
The Statistical Office
Central Planning Division
Ministry of Finance and Economic Planning

ACKNOWLEDGEMENTS

The Statistical Office wishes to thank the business community, public corporations, government agencies, and everyone, who has contributed, in one way or another, to facilitate the completion of this report.

The production of Consumer Price Index report depends on a large set of data gathered from selected establishments and specially designed surveys, all of which involve the participation of a myriad of persons and institutions. The Statistical Office looks forward to your continued support.

The Statistical Office would like to acknowledge the significant contribution and the overwhelming support of Dr. Paul Armknecht, Statistics Adviser of the Caribbean Regional and Technical Assistance Centre (CARTAC), whose commitment cannot be over emphasized.

SELECTED ACRONYMS

CARTAC   Caribbean Regional Technical Assistance Centre

CDs   Census Divisions

COICOP   Classification of Individual Consumption by Purpose

CPI   Consumer Price Index

CPI Manual   Consumer Price Index Manual: Theory and Practice, 2004

ECCB   Eastern Caribbean Central Bank

ECCU   Eastern Caribbean Currency Union

EDs   Enumeration Districts

HBES   Household Budget and Expenditure Survey

IMF   International Monetary Fund

MFEP   Ministry of Finance and Economic Planning

PIPS   Price Index Processing Software

PSU   Primary Sampling Unit

SO   Statistical Office

UN   United Nations

REVISING ST. VINCENT AND THE GRENADINES CONSUMER PRICE INDEX JANAUARY 2010

The Consumer Price Index, commonly referred to as the CPI is one of the most important statistic produced by the Statistical Office, Central Planning Division, Ministry of Finance and Economic Planning (MFEP). It is designed to provide information on trends in consumer prices and real cost-of-living of the population. It is an important economic indicator and is used to adjust prices in order to measure real economic growth.

I. INTRODUCTION

The Consumer Price Index (CPI) is a measure of the change in average prices of a fixed basket of goods and services purchased by consumers in a specified reference period. The CPI measures the rate of inflation or alternatively changes in the cost of living for households. Generally, the CPI "basket" includes those goods and services frequently purchased by consumers and represents an important part of their expenditure.

The CPI definition emphasizes three important points:

1. Between any two periods, some prices may increase, some decrease and others may be unchanged but the index will change based on the average movement of all prices.

2. The index measures the purchasing power over time as it relates to a fixed basket of goods and services.

3. The index is essentially a consumer price index and therefore measures changes in the price of goods and services purchased by households. It does not include capital goods or the goods and services typically purchased by enterprises and or government for business purpose.

II. WHY A NEW CONSUMER PRICE INDEX?

The Statistical Office took a decision to update the CPI in collaboration with the Eastern Caribbean Central Bank (ECCB). The Caribbean Regional Technical Assistance Centre (CARTAC) provided technical support to the Statistical Office through a sub-regional project. The main aim of this exercise was to introduce updated methods and procedures used for compiling the CPI that are in accordance with international standards and also allow for comparison among the Eastern Caribbean Currency Union (ECCU) member states.

In an effort to update the old CPI, a Household Budget and Expenditure Survey (HBES) was deemed a necessary requirement. As part of the Country Poverty Assessment (CPA) project funded by the European Development Fund, the HBES, which consisted of a detailed questionnaire on expenditure on goods and services and a diary survey of household's daily expenditure, was conducted over the period November 2007- October 2008.

The HBES was based on an inquiry of the population and its expenditure on various goods and services to derive an updated CPI basket that reflected more recent consumer spending patterns. The findings from this latest survey allowed for the addition of new goods and services that have become significant to households, and the removal of those that are no longer relevant.

The old CPI had its base in a HBES conducted in 1996, which represented a pattern of consumer spending that existed more than ten years ago. Since then, consumer spending patterns have changed, and some of the items in the basket of goods and services have become irrelevant and outdated while new items have emerged as important. It is therefore necessary to update the basket of goods and services periodically to ensure that the index continues to be relevant.

III.   MAIN FINDINGS OF THE HBES

From the HBES it was revealed that consumption patterns in St Vincent and the Grenadines have changed significantly. As depicted in Table 3.0, the share of expenditure allocated to Housing, Fuel and Light, experienced the largest increase moving from 12.77 percent in 2001 to 30.06 percent in 2010, reflecting the addition of owner's rent to the basket. In contrast, the share of expenditure allocated to Food has fallen significantly from 53.61 percent in 2001 to 21.91 percent in 2010. The Clothing and Footwear group also experienced a decline from 8.87 percent in 2001 to 3.22 percent in 2010.   Similarly, the expenditure share for Communication rose from 2.45 percent in 2001 to 9.41 percent in 2010, reflecting the importance of cellular phones and mobile communication.

IV.   IMPROVEMENTS TO THE NEW CONSUMER INDEX

Through assistance from CARTAC, a consultant assisted in developing consumption expenditure estimates from the HBES and in deriving the new CPI market basket. Training on the new *CPI Manual (2004), and* technical guidance on the use of the Price Index Processor System (PIPS) were also provided by CARTAC. PIPS is the new CPI software developed by the IMF's Statistics and Technology and General Services Department.

The introduction of the revised Consumer Price Index has enhanced the key features of the Index:

Box 1: Key Features of the Revised Consumer Price Index

Improved and expanded samples of outlets reflecting those normally visited by households. This improves the coverage of the index as outlets not previously covered in the CPI have also been included. The CPI is now more representative of St Vincent and the Grenadines.

Having new item structures that include both updated spending patterns and new products (e.g., adding college tuition, cell phones, and computers. This improves the CPI by reflecting current patterns in consumer purchases.

Using the Classification of Individual Consumption by Purpose (COICOP), the international standard recommended in the *CPI Manual (2004)*. This replaces regional classification structures that were somewhat different with 11 divisions rather than the 12 as provided in COICOP.

Introduction of owner's equivalent rent to make the CPI conceptually consistent with the System of National Accounts and to include owner-occupied housing in the index for the first time.

Box 1Cont'd: Key Features of the Revised Consumer Price Index

Using the Price Index Processor System (PIPS) introduces major improvements to the methods and procedures currently used in the CPI, namely:

Compilation of indices that uses geometric averaging rather than arithmetic averaging to reduce the bias that results from arithmetic average of prices and arithmetic average of price relatives;

Imputation of missing prices that uses the price change of related products vs. carrying forward the last reported price, which has an inherent bias;

Quality adjustments of prices to reflect pure price changes using techniques documented in the *CPI Manual (2004)*; and

Introducing new goods into the product and item structure using the techniques documented in the *CPI Manual (2004)*.

Creating greater comparability across the region in terms of classifications, structure, methods, and procedures used in the CPI.

PURPOSE AND USES OF THE CPI

The CPI is widely used as a general measure of inflation for three reasons. It is easily available on a monthly basis; it is usually not revised and is published frequently. The CPI is monitored by the general public and, therefore, is used for a wide variety of purposes such as the following:

- The CPI is often used by employers and other agencies for the adjustment of wages and salaries and by labour unions in collective bargaining and wage negotiations.

- The CPI is used as a proxy for the general inflation rate, even though it only measures consumer inflation.

- The price data collected for the CPI can be used to compile other indices, such as the price indices used to deflate household consumption expenditures in national accounts estimates, or for measuring differences in the purchasing power of money.

- The CPI is used by some governments or central banks to set inflation targets for purposes of monetary policy.

- The CPI is used to index other payments, such as rent, interest payment and price of bonds.

- Private researchers, students and the public, use the CPI for social and economic studies of the economy, school projects and general information.

Additionally, the CPI has acquired a unique status as one of the key economic statistics in most countries. There are several factors that help to explain this:

- All households have their own personal inflation experience and often compare it to the CPI. The general public is very conscious of changes in the price of consumer goods and services, and the direct impact those changes have on their living standards. Interest in the CPI is not confined only to policy makers.

- Changes in the CPI tend to receive a lot of attention. In fact, the publication can make headline news' at times, as the CPI is a high-profile statistic.

- The CPI is published frequently, usually each month, so that the rate of consumer inflation can be closely monitored. It is also a timely statistic that is released very soon after the end of the period to which it refers.

- The CPI is a statistic with a long history, and people have been familiar with it over time.

- The CPI a relatively reliable price index compared with the price indices for some other flows. Although price changes for certain kinds of consumer goods are difficult to measure because of quality changes, price changes for other kinds of goods and services, such as capital goods and government services, especially public services, tend to be even more difficult to measure.

- The CPI is published regularly. This makes it attractive for many purposes, especially those with financial consequences such as indexation.

Given the importance of the CPI to a multitude of users, the Statistical Office is making every effort to improve the accuracy and relevance of the Index.

V. CONSUMER PRICE INDEX PROCESSES

THE DEVELOPMENT OF THE CPI

The CPI market basket was developed from detailed expenditure information provided by families and individuals on what they actually bought. The data used to develop the new CPI was collected from the Household Budget Expenditure Survey which was conducted during the period November 2007 to October 2008.

A sample of approximately 1,100 households which represented 4.4 percent of all households in the sampling from the 2001 Housing and Population census was selected for enumeration. The survey consisted of a two-stage stratified systematic random sampling selection process. At the first stage, Enumeration Districts (EDs) were selected based on a sampling frame constructed from Census Divisions (CDs). The size of each ED as described as Primary Sampling Units (PSUs), included in the frame was measured in units of clusters of households to be interviewed in each enumeration district. In the second stage, one cluster of households was randomly selected from the selected PSU with a probability proportional to size. The end result was that each household had the same probability of being selected in the sample.

During the HBES period, a sample of families from around the country provided information about their spending habits for major consumer goods and services in an interview survey. To collect information on frequently purchased items, such as food and personal care products, families also kept diaries, in which they listed purchases made during a 2-week period.

The Statistical Office has classified all expenditure items into more than 200 categories, according to the United Nation's Classification of Individual Consumption by Purpose (COICOP), the international standard. The categories are arranged into 12 Divisions as shown in Table 1.0.

Table 1.0

<u>COICOP DIVISION WITH EXAMPLES OF ITEMS IN EACH CATEGORY</u>

COICOP DIVISION	CATEGORY EXAMPLES
01 FOOD AND NON-ALCOHOLIC BEVERAGES	Breakfast cereal, milk, coffee, chicken
02 ALCOHOLIC BEVERAGES AND TOBACCO	Wine, beer, cigarettes
03 CLOTHING AND FOOTWEAR	Men's shirts and pants, women's dresses and blouses, shoes
04 HOUSING, WATER, ELECTRICITY, GAS, AND OTHER FUELS	Rent of primary residence, owners' equivalent rent, Electricity
05 FURNISHINGS AND HOUSEHOLD SUPPLIES	Bedroom and living room furniture, detergents, cleaning supplies
06 HEALTH	Prescription drugs and medical supplies, physicians' services, eyeglasses and eye care, hospital services
07 TRANSPORT	New vehicles, airline fares, gasoline, motor vehicle insurance
08 COMMUNICATION	Postage, telephone services, cellular phones and service
09 RECREATION AND CULTURE	Televisions, computers, software and accessories toys, pets and pet products, sports equipment, admissions
10 EDUCATION	Primary, secondary, and college tuition and fees
11 RESTAURANTS AND HOTELS	Full service meals at restaurants and cafes, snacks, Lodging
12 MISCELLANEOUS GOODS AND SERVICES	Haircuts and other personal services, cosmetics, watches a jewelry, legal and funeral expenses

Also included within these groupings are various government-charged user fees, such as water charges, auto registration fees, and vehicle inspection. In addition, the CPI includes taxes (such as Value Added Tax, VAT) that are directly associated with the prices of specific goods and services. However, the CPI excludes taxes (such as income and Social Security taxes) not directly associated with the purchase of consumer goods and services.

The CPI does not include investment items, such as stocks, bonds, real estate, and life insurance. (These items relate to savings and investments and not to consumption expenses.)

CPI WEIGHTS

The weights reflect the spending patterns of households during a previous period. Much depends on how appropriate and timely the weights are. The more current the weights, the more reflective they are of current consumer spending patterns. It is therefore, important to update the weights used in the CPI.

The weights obtained from the sample are extrapolated to represent the entire population by the application of an expansion factor.

Establishing the weights for the items and subsequently the subgroups and major groups, all expenditures were expressed on an annual basis. A base of 1000 was used to allocate the weights. The following table shows the major grouping, annual expenditure and weight allocation in terms of percentages:

Table 2.0

SUMMARY OF DIVISIONS BY ANNUAL EXPENDITURE AND WEIGHT

COICOP DIVISIONS	ANNUAL EXPENDITURE (EC$M)	WEIGHT %
FOOD AND NON-ALCOHOLIC BEVERAGES	238.30	21.91
ALCOHOLIC BEVERAGES AND TOBACCO	42.05	3.87
CLOTHING AND FOOTWEAR	38.64	3.22
HOUSING, WATER, ELECTRICITY, GAS, AND FUELS	327.09	3.01
FURNISHINGS AND HOUSEHOLD SUPPLIES	68.79	6.59
HEALTH	19.45	1.79
TRANSPORT	128.86	11.84
COMMUNICATION	102.40	9.41
RECREATION AND CULTURE	41.48	3.81
EDUCATION	14.37	1.32
RESTAURANTS AND HOTELS	20.31	1.87
MISCELLANEOUS GOODS AND SERVICES	46.25	4.31
TOTAL	1,087.98	100.00

Chart 1.0

Structure of the new basket January 2010=100
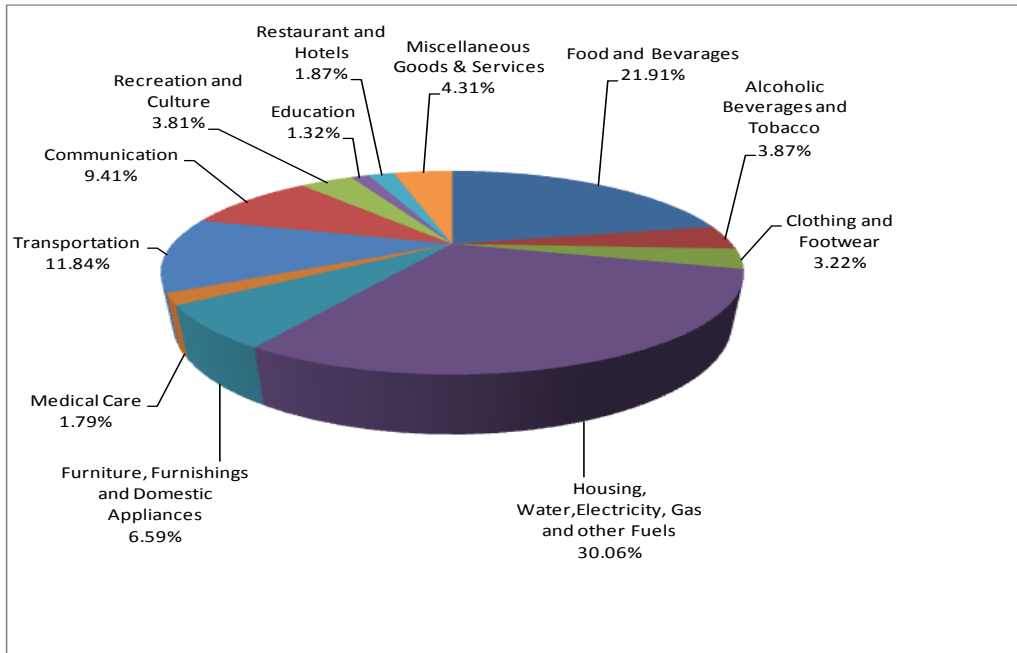
Chart 1.1

Structure of the old basket January 2001=100
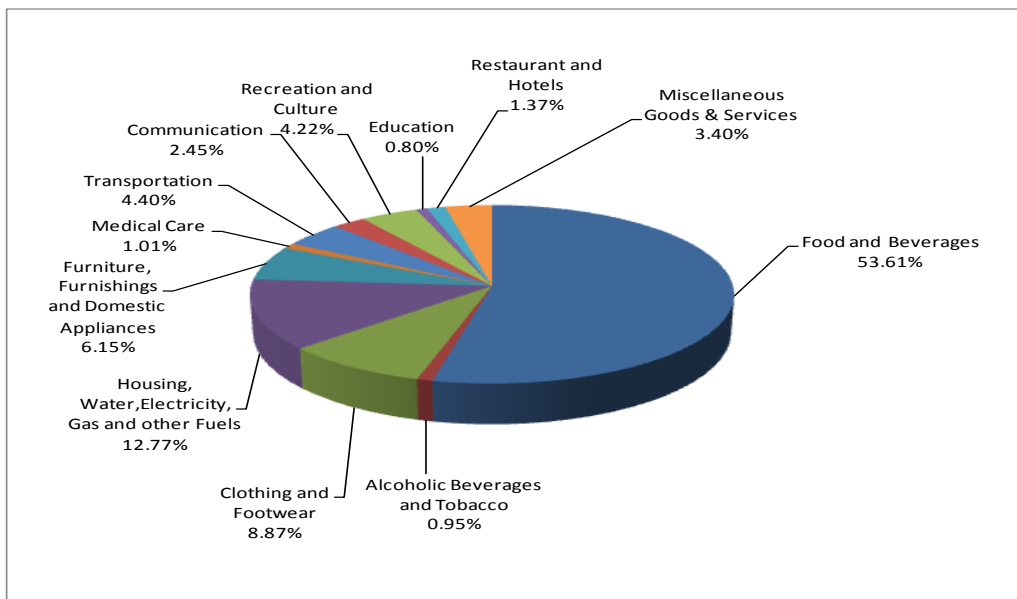
Table 3.0

COMPARISON OF CURRENT AND REVISED WEIGHTS
ON THE COICOP STRUCTURE (EXPENDITURE SHARES)

Item Code	Item	Current Weights	Revised Weights	Change
	All Items—COICOP	100.00	100.00	
01	**FOOD AND NON-ALCOHOLIC BEVERAGES**	53.61	21.91	-31.70
01.1.1	*Bread and Cereals*	13.87	4.41	-9.46
01.1.2	*Meat*	7.06	4.32	-2.74
01.1.3	*Fish*	4.66	1.59	-3.07
01.1.4	*Dairy Products, Cheese and Eggs*	4.85	2.60	-2.25
01.1.5	*Oils and Fats*	4.18	0.88	-3.30
01.1.6	*Fruits*	2.71	0.68	-2.03
01.1.7	*Vegetables*	9.67	3.03	-6.64
01.1.8	*Sugar and Confectioneries*	4.72	1.29	-3.43
01.1.9	*Other Foods*	0.48	1.04	0.56
01.2.2	*Coffee, Tea and Cocoa*	1.19	0.35	-0.84
01.2.1	*Soft Drinks, Fruit & vegetable juice*	0.22	1.72	1.50
02	**ALCOHOLIC BEVERAGES AND TOBACCO**	0.95	3.87	2.92
02.1	*Alcoholic Beverages*	0.72	3.68	2.96
02.2	*Tobacco*	0.23	0.19	-0.04
03	**CLOTHING AND FOOTWEAR**	8.87	3.22	-5.65
03.1.2	*Clothing*	5.44	2.22	-3.22
03.1.1	*Textile Materials*	1.66	0.18	-1.48
03.1.4	*Tailoring and Dressmaking*	0.37	-	-
03.2	*Footwear*	1.45	0.83	-0.62
04	**HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS**	12.77	30.06	17.29
04.1.1	*House Rent*	5.57	19.26	13.69
04.9.1	*House Tax*	2.02	-	-
04.9.2	*House Insurance*	0.73	-	-
04.4.1	*Water Consumption*	0.98	1.31	0.33

Item Code	Item	Current Weights	Revised Weights	Change
04.3	*House Repairs and decoration*	0.49	2.54	2.05
04.5	***FUEL AND LIGHT***	**2.98**	**6.95**	**3.97**
05	**FURNITURE, FURNISHINGS AND DOMESTIC APPLIANCES**	**6.15**	**6.59**	**0.44**
05.1.1a	*Furniture and furnishings*	2.74	1.85	-0.89
05.4	*Glassware, Tableware & Household Utensils*	0.72	.20	-0.52
05.3	*Household Appliances*	1.38	1.19	-0.19
05.6.1a	*Soaps and Detergents*	0.93	1.78	0.85
05.6.1b	*Other Household Supplies*	0.25	0.12	-0.13
05.6.2	*Domestic Servants*	0.13	1.45	1.32
06	**MEDICAL CARE**	**1.01**	**1.79**	**0.78**
07	**TRANSPORTATION**	**4.40**	**11.84**	**7.44**
08	**COMMUNICATION**	**2.45**	**9.41**	**6.96**
09	**RECREATION AND CULTURE—COICOP**	**4.22**	**3.81**	**-0.41**
10	**EDUCATION—COICOP**	**0.80**	**1.32**	**0.52**
11	**RESTAURANTS AND HOTELS**	**1.37**	**1.87**	**0.50**
11.1	*Meals at restaurants, cafes & the like*	1.37	1.83	0.46
12	**MISCELLANEOUS GOODS & SERVICES**	**3.40**	**4.31**	**0.91**

Table 4.0

COMPARISON OF WEIGHT WITH OTHER ECCU COUNTRIES
BY COICOP DIVISIONS
2010=100

CODE	COICOP DIVISION	St. VINCENT	ANGUILLA	ANTIGUA	DOMINICA	GRENADA	MONTSERRAT	NEVIS	St. KITTS	St. LUCIA
01	FOOD AND NON - ALCOHOLIC BEVERAGES	21.91	12.81	17.54	18.33	20.35	NA	13.27	16.04	25.00
02	ALCOHOLIC BEVERAGES AND TOBACCO	3.87	2.34	2.01	0.77	1.83	NA	1.36	2.71	6.50
03	CLOTHING AND FOOTWEAR	3.22	3.25	4.05	5.14	3.66	NA	4.90	4.20	1.70
04	HOUSING, WATER, ELECTRICITY, GAS, AND OTHER FUELS	30.06	25.56	28.15	30.69	29.05	NA	27.93	27.53	17.40
05	HOUSEHOLD FURNITURE & FURNISHINGS	6.59	4.04	6.71	4.98	4.50	NA	7.05	6.09	3.30
06	HEALTH	1.79	2.34	1.37	3.36	1.94	NA	2.54	2.38	4.00
07	TRANSPORT	11.84	15.94	15.09	20.16	18.72	NA	21.71	16.13	16.40
08	COMMUNICATION	9.41	13.43	8.69	5.11	10.03	NA	6.90	8.46	12.50
09	RECREATION AND CULTURE	3.81	3.79	3.22	2.60	2.71	NA	2.89	2.91	1.40
10	EDUCATION (EXPENSES)	1.32	5.91	1.44	1.33	0.83	NA	2.43	2.41	3.70
11	RESTAURANTS AND HOTELS	1.87	4.04	4.14	2.70	1.81	NA	3.16	5.60	1.10
12	MISCELLANEOUS GOODS AND SERVICES	4.31	6.54	7.58	4.83	4.59	NA	5.86	5.53	6.90
	TOTAL	100.00	100.00	100.00	100.00	100.00		100.00	100.00	100.00

PRICE COLLECTION

Price collection begins on the first Friday in each month at which time enumerators make visits to gather price information from selected supermarkets, department stores, service stations, etc. Prices are also collected in local markets during the month. The HBES provided an updated list of goods and services that are in popular demand and are preferred by consumers, as well as the most popular establishments from which consumers made their purchases. The criteria used for the selection of outlets were (1) the most frequently visited outlets as revealed by the survey and (2) the availability of goods and services at the outlet.   Prices are recorded on several selected goods and services. The details on these goods and services are clearly defined, to guide the price enumerator in the selection of the correct items. These prices and other relevant information are recorded on price sheets.

In cases where the selected item is available, the enumerator records its price. If the item is not available for three consecutive months or if there have been changes in the quality of the item since the last collection, the enumerator selects a new item and records the changes that affect quality. By collecting price data on a clearly defined market basket of products that consumers purchase for their day-to-day living, the Statistical Office ensures that the CPI will provide an accurate measure of price changes.

The new CPI basket comprises of 187 products and 1,338 varieties that are unique to the selected outlets.   Prices are collected from 243 outlets throughout St Vincent and the Grenadines. This contrasts with the 275 products, in 83 outlets that previously concentrated in Kingstown. For the entire month, more than three thousand prices are recorded from areas throughout St Vincent and the Grenadines.

Once the enumerators have collected the prices in a given month, they are reviewed and entered in the CPI database. The Price Index Processing Software (PIPS) is the CPI database that was developed by the International Monetary Fund (IMF) to assist countries in compiling

the CPI. One advantage of using PIPS is that it provides statistical routines that can be employed to identify data that are potentially outside the bounds of statistical expectations. The unusual prices are checked for accuracy and consistency. Establishments may be contacted or revisited to provide explanations for the unusual changes. Any necessary corrections or adjustments are then made.

Table 5.0

NEW CONSUMER PRICE INDEX
CLASSIFICATION, WEIGHT, NUMBER OF ITEMS AND NUMBER OF OUTLETS
2010=100

COICOP DIVISON	WEIGHT %	NO. OF PRODUCTS FOR PRICE COLLECTION	NO. OF OUTLETS FOR PRICE COLLECTION	FREQUENCY OF PRICE COLLECTION
01 FOOD AND NON-ALCOHOLIC BEVERAGES	21.97	72	12	Monthly
02 ALCOHOLIC BEVERAGES AND TOBACCO	3.87	7	9	Monthly
03 CLOTHING AND FOOTWEAR	3.22	18	3	Monthly
04 HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUEL	30.06	8	126	Monthly & Quarterly
05 FURNISHINGS AND HOUSEHOLD SUPPLIES	6.59	18	17	Monthly & Quarterly
06 HEALTH	1.79	5	3	Monthly & Quarterly
07 TRANSPORT	11.84	22	14	Monthly & Quarterly
08 COMMUNICATION	9.41	5	3	Monthly & Quarterly
09 RECREATION AND CULTURE	3.81	11	19	Monthly & Quarterly
10 EDUCATION	1.32	2	10	Quarterly
11 RESTAURANTS AND HOTELS	1.87	4	5	Monthly & Quarterly
12 MISCELLANEOUS GOODS AND SERVICES	4.31	15	22	Monthly & Quarterly
TOTAL	**100**	**187**	**243**	

Table 6.0

OLD CONSUMER PRICE INDEX
CLASSIFICATION, WEIGHT, NUMBER OF ITEMS AND NUMBER OF OUTLETS
2001=100

COICOP DIVISON	WEIGHT %	NO. OF PRODUCTS FOR PRICE COLLECTION	NO. OF OUTLETS FOR PRICE COLLECTION	FREQUENCY OF PRICE COLLECTION
01 FOOD AND NON-ALCOHOLIC BEVERAGES	53.61	114	8	Monthly
02 ALCOHOLIC BEVERAGES AND TOBACCO	0.95	11	3	Monthly
03 CLOTHING AND FOOTWEAR	8.77	25	5	Monthly
04 HOUSING	9.79	17	13	Monthly
05 FUEL AND LIGHT	2.98	4	2	Monthly
06 HOUSEHOLD FURNITURE AND SUPPLIES	6.15	43	9	Monthly & Quarterly
07 MEDICAL CARE AND EXPENSES	1.01	7	7	Monthly & Quarterly
08 TRANSPORT AND COMMUNICATION	6.85	13	8	Monthly & Quarterly
09 EDUCATION	3.43	12	8	Quarterly
10 PERSONAL SERVICES	3.35	15	7	Monthly
11 MISCELLANEOUS GOODS AND SERVICES	3.01	14	13	Monthly & Quarterly
TOTAL	**100.00**	**275**	**83**	

VI.   SOURCES AND METHODS

COMPUTATION OF THE CPI

The CPI is generally compiled at two levels (i) the elementary level using an equally-weighted geometric mean (Jevons) index and (ii) the weighted higher level using a geometric aggregate (Cobb-Douglas) index.

After the prices are collected, price changes from the previous month are calculated for each price variety. These price relatives are used to calculate each of the item level indexes using a geometric average formula (Jevons) as follows:

Box 2: Geometric Average Formula (Jevons)

$$\text{Item}_j^t = \text{Item}_j^{t-1} \times \prod_{i=1}^{N} \left(\frac{p_i^t}{p_i^{t-1}} \right)^{1/N}$$

Where: p_i^t refers to the price in the current month (t)

p_i^{t-1} refers to the price in the previous month

Item_j^{t-1} refers to the previous month's item index

Once the item indices are calculated the higher level indices for divisions are compiled. The weights used to combine the item indices to derive the total CPI are taken directly from the recent HBES conducted in 2007/2008. The base price reference period when the index is 100 is January 2010 (Jan 2010 = 100). The Cobb-Douglas formula is used for the higher level indices:

Box 3: Geometric Average Formula (Cobb-Douglas)

$$CPI_{Jan\,2010 \to t} = \prod_{j=1}^{M} Item_{j}^{t}{}^{w_{j}^{2008}}$$

Where: $Item_{i}^{t}$ refers to the item indexes in the current month (*t*)

M is the number of items in the basket (187)

w_{j}^{2008} refers to the weight of item *j* in the 2007/08 HBES.

Next, the PIPS calculates weighted indices and percentage changes that show price changes for each category of item. The statistical officers review and analyze the data and prepare a written release that is made available to government agencies, the media, and the public. The entire process of reviewing, analyzing, and publishing the data is finished in about 4 weeks after the last data are collected.

MATCHED PRICE OBSERVATIONS AND IMPUTING MISSING PRICES

A price relative is calculated for each variety comprising the CPI basket. The calculation of price relatives would be simple if a complete set of price quotations were available for the current and previous month. In reality, this does not always happen. Quite often, some of the respondents are unable to provide a price for a particular variety because it is out of stock. Whenever a particular price observation is missing from either the previous month or the current month, the corresponding price observations are eliminated from the other period. This is equivalent to imputing the price of variety (1) in period (t) by the short-term price change of other varieties in the product group. This ensures that the price relatives are calculated on the basis of "matched observations", i.e., a consistent sample of price quotations in each period.

IMPUTING MISSING INDEXES

A missing price index is estimated using its parent index as the proxy, i.e., if a specific product's index in an outlet is missing due to the missing prices, the index of the product or item it belongs to will be taken to be representative. For higher levels, the next available index data in the same group or item for the missing index will be used. Holding missing prices for a variety constant by carrying the last observation forward (i.e., making the short-term price relative for that variety equal to 1.0) during a period of high inflation, would cause short-term distortions in the index. This is because it would understate inflation while the variety was unavailable and then show a large increase in the index when the variety becomes available. Furthermore, the price for the same variety in another outlet is not used to represent the missing price in this outlet. Thus, if the Coca-Cola price is missing in one particular outlet, another outlet's Coca-Cola price will not be used as a proxy. Instead the soft drink index in the same outlet will be taken to represent that of Coca-Cola.

Since parent-group price changes are always calculated as geometric mean changes, imputations are based on geometric means.

If no price is collected for any variety covered by a product (the prices for whole product are missing), its price relatives will be imputed using average price relatives from the item group of the missing price.

DETECTION OF OUTLIERS

An outlier is an observation that is unusually large or small relative to the other values in a price relative data set. Outliers are the observations that appear to be inconsistent with the remainder of the collected data.

There are several possible sources for outliers:

1. The price quotation of a transaction or variety is observed, recorded, or entered into the computer incorrectly.

2. The price quotation comes from a different population, or the quality of that transaction/variety has changed.

3. The price quotation entered is correct, but represents a rare event or novel phenomenon.

Outliers occur when the relative frequency distribution of the data set is extremely skewed. Such distributions have a tendency to include extremely large or small observations.

Two procedures can be applied to identify the possible errors, when outliers are detected. The first one is a non-statistical procedure, which is to find whether a specific price observation falls outside some pre-specified acceptance interval. Generally, a 20 percent threshold is used to identify large and unusual changes when prices are first entered. The second procedure is a statistical measure in which three methods are implemented. In both cases outlier detection will not result in automatic deletion. Often price changes are undertaken after some time and the "pent-up" price changes are unusually large. To delete them would bias the index downwards. The outlier detection is to alert the compiler about a possible error that needs further investigation.

Three approaches for identifying outliers in the current period's prices are outlined below:

- Using Z-scores
- Box Plot Method

- Log-normal Method

METHOD OF USING Z-SCORES

In a Z-score test, the mean and standard deviation of the entire data set are used to obtain a Z-score for each data point, according to following formula:

$$Z_i = \frac{(x_i - \bar{x})}{s}$$

Where $\bar{x}$ is the arithmetic mean and s the standard deviation, i.e.

$$s = \sqrt{\frac{\sum_{i=1}^{n} (x_i - \bar{x})^2}{n-1}}$$

If the observations have a bell shaped distribution (normal distribution), the interval from $\bar{x} - s$ to $\bar{x} + s$ will contain approximately 68% of the measurements; the interval from $\bar{x} - 2s$ to $\bar{x} + 2s$ will contain approximately 95% of the measurements, and the interval from $\bar{x} - 3s$ to $\bar{x} + 3s$ will contain approximately all of the measurements.

The Z-score method may be biased if both the mean and standard deviation are affected by the outliers.

BOX PLOTS METHODS

Another procedure for detecting outliers is to construct box plots of the price relatives data. They make no distributional assumptions and, since they rely on the median and quartiles as parameters, the method of detection is not influenced by the outliers themselves. Below are the steps implemented in constructing the box plots for the software.

- The median M, lower and upper quartiles, Q_L and Q_U, and the inter-quartile range, IQR= Q_U - Q_L are calculated for the data set.

- Two sets of limits on the box plot are constructed: inner fences are located a distance below Q_L and above Q_U; outer fences are located a distance of below Q_L and above Q_U.

Observations that fall between the inner and outer fences are called "suspect" outliers.

LOG-NORMAL METHOD

Another method used to identify the possible errors and outliers is to use 2 standard deviations from the log-normal distribution, excluding price relatives of 100 (no change of prices from previous to current period). It takes the natural logarithms of price relatives data, which is assumed log-normally distributed. The standard deviation and mean of the log of all price relatives in the sample are calculated. Those price relatives that fall outside of 2 standard deviations (with 95% confidence level) are considered as possible outliers.

VII.   APPLICATION OF THE CONSUMER PRICE INDEX

The Consumer Price Index is used by many employers and agencies for the adjustment of wages and salaries, by labour unions in collective bargaining, by economist as a gauge for assessing the current performance of the economy and by government in formulating and evaluating many economic policies. In addition, extensive use is made of the CPI series by researchers, students and institutions.

One of the major uses of the CPI is to measure inflation. Inflation is expressed as a percentage and is calculated as the change in the current index over the same period index of the last year. For example, the rate of inflation for the period February 2006 compared to February 2005 was 2.60 percent. This was computed by taking the index of "All Items" for February 2006 (82.83) and dividing it by the All Items index for February 2005 (80.73) and multiplying by 100.

To determine the effect of inflation on a nominal value, it is necessary to deflate the value by the index prevailing at the time. The following table is an example of the application of the CPI showing the effects of inflation on EC$ 100.00.

Table 7.0

PURCHASING POWER OF EC$ 100.00
2005 -2009

YEARS	NOMINAL VALUE (EC$)	CONSUMER PRICE INDEX 2005=100	REAL VALUE EC$
2005	100.00	100.00	100.00
2006	100.00	105.08	95.17
2007	100.00	109.15	91.62
2008	100.00	117.90	84.82
2009	100.00	117.55	85.07

As shown in table 7.0, in 2005 a one hundred dollar, which had the purchasing power of buying a fixed amount of goods and service, will no longer have that purchasing power in 2009, the real value of that EC$ 100.00 is EC$ 85.07, which means that the consumer will have to adjust the goods and services consumed, or find an additional amount of money.

COMPUTATION OF AVERAGE PRICES

The average price method used in the new CPI price computation is based on the geometric average and not the arithmetic average which was previously used in computing the average price in the old CPI. The geometric average is preferred since it is not as affected by extreme values (that is items with large price variance).

Table 8.0

Computation of average prices using arithmetic and geometric mean

ITEM	OUTLET PRICE			Arithmetic Average	Geometric Average
	A	**B**	**C**		
Milk (powdered) (Lb)	5.99	5.65	7.00	*6.21*	*6.19*
English Potatoes (Lb)	2.15	2.00	2.65	*2.27*	*2.25*
Corned beef (12 oz tin)	5.09	5.00	5.65	*5.25*	*5.24*
Chicken (leg quarters) (Lb)	2.08	2.45	3.75	*2.76*	*2.67*

Table 9.0

CHANGES IN THE CONSUMER PRICE INDEX OVER THE PAST THREE YEARS

CODES	GROUPS	WEIGHT	FEB 2010	FEB 2009	FEB 2008	JAN 2010	PERCENTAGES CHANGE FEB 2010 FEB 2009	FEB 2009 FEB 2008	FEB 2010 JAN 2010
	ALL ITEMS	100.00	100.05	100.84	95.75	100.00	-0.79	5.09	0.05
01	FOOD AND NON-ALCOHOLIC BEVERAGES	21.91	99.76	102.77	93.17	100.00	-2.88	9.60	-0.11
02	ALCOHOLIC BEVERAGES AND TOBACCO	3.87	99.92	97.16	92.86	100.00	2.23	4.30	-0.61
03	CLOTHING AND FOOTWEAR	3.22	98.43	99.93	98.50	100.00	-1.50	1.43	-1.57
04	HOUSING, WATER, ELECTRICITY, GAS AND OTHER FUELS	30.06	100.31	97.91	102.89	100.00	2.40	-4.98	0.31
05	HOUSEHOLD FURNITURE AND FURNISHINGS	6.59	100.08	100.11	96.20	100.00	-0.02	3.91	0.09
06	HEALTH	1.79	100.00	91.95	85.41	100.00	8.05	6.54	0.00
07	TRANSPORT	11.84	100.74	91.15	101.78	100.00	9.59	-10.63	0.74
08	COMMUNICATION	9.41	100.00	100.0	100.00	100.00	0.00	0.00	0.00
09	RECREATION AND CULTURE	3.81	99.22	99.99	100.88	100.00	-0.76	-0.89	-0.77
10	EDUCATION (EXPENSES)	1.32	100.00	96.99	93.98	100.00	3.01	3.01	0.00
11	RESTAURANT AND HOTELS	1.87	100.00	100.00	100.00	100.00	0.00	0.00	0.00
12	MISCELLANEOUS GOODS AND SERVICES	4.31	99.85	99.26	96.40	100.00	0.50	2.86	-0.24

Table 10.0

AVERAGE RETAIL PRICE OF SELECTED ITEMS

2002 – 2009

Item	Unit	AVERAGE RETAIL PRICES							
		2002	2003	2004	2005	2006	2007	2008	2009
Sandwich Loaf (white)	each	2.25	2.26	2.25	2.33	2.57	2.66	3.10	3.37
Cream of Wheat	397g box	7.16	6.66	7.11	6.61	6.23	6.70	7.15	7.96
Beef -fresh		10.00	10.00	10.00	11.33	12.00	13.34	14.13	14.18
Pork-Fresh	lb	5.00	5.00	5.00	5.75	6.13	7.21	8.62	8.47
Chicken -wings	lb	2.27	2.28	2.67	2.87	2.92	3.47	4.11	3.83
Chicken - legs	lb	3.04	2.68	3.31	3.68	3.73	3.65	3.72	3.87
Chicken - backs	lb	0.85	0.84	0.91	1.06	1.11	1.10	1.30	1.41
Fish - fresh (Jacks)	lb	2.88	2.88	3.00	3.00	3.96	3.75	4.00	4.00
Fish - fresh (Robin)	lb	3.00	2.71	3.08	3.88	4.00	4.50	5.33	4.50
Codfish	lb	7.00	7.22	7.41	8.18	9.29	10.18	11.06	10.60
Sardines - canned	106g tin	1.84	1.89	1.93	1.97	2.20	2.48	2.66	2.69
Corned Beef - canned	12 oz tin	3.33	3.15	3.42	3.59	4.20	4.23	4.16	4.92
Cooking Margarine	Tub	3.90	4.09	4.35	4.48	4.65	4.75	5.48	6.74
Cheese	lb	6.48	5.76	7.08	8.88	9.35	10.94	13.66	10.53
Eggs	Doz	4.96	5.40	5.99	5.50	6.03	6.96	8.09	7.64
Milk -powdered (full cream)	lb	3.25	3.40	4.02	4.57	4.60	6.48	7.94	5.55
Milk - evaporated	410g tin	1.94	1.94	1.96	2.10	2.20	2.28	2.50	2.59
Milk - condensed	397g tin	2.38	2.40	2.43	2.47	2.55	2.56	2.85	3.04
Cooking Oil	Litre	5.86	5.91	6.03	6.30	6.22	6.70	7.36	8.89
Tomato Ketchup	750ml	5.09	5.11	5.11	5.21	5.42	4.75	4.86	5.11
Salt (fine - loose)	lb	0.45	0.45	0.45	0.50	0.58	0.60	0.55	0.61
Grapefruit Juice	19 oz Tin	3.58	3.58	3.67	3.94	4.58	5.27	5.31	5.75
Orange Juice	19 oz Tin	3.59	3.59	3.69	3.96	4.63	5.45	5.83	5.96
Brown sugar	lb	0.82	0.82	0.82	0.82	0.82	0.86	0.91	0.99
Flour -loose	lb	0.75	0.76	0.76	0.76	0.74	0.77	1.09	1.22
Rice	lb	0.96	0.96	0.97	0.96	0.97	1.00	1.36	1.75
Yeast	1/4 lb Pkg	3.07	3.05	3.14	3.15	3.12	3.39	3.25	3.21

Table 10.0 Cont'd

AVERAGE RETAIL PRICE OF SELECTED ITEMS
2002 – 2009

Item	Unit	AVERAGE RETAIL PRICES							
		2002	2003	2004	2005	2006	2007	2008	2009
Bananas - ripe	Each	0.38	0.39	0.52	0.50	0.47	0.50	0.46	0.26
Carrots	lb	2.95	3.28	3.44	3.95	4.01	3.93	4.19	4.08
Eddoes	lb	1.26	1.49	1.43	1.52	1.50	1.78	2.06	1.77
Dasheens	lb	1.49	1.38	1.50	1.44	1.62	1.57	1.94	1.83
Sweet Potatoes	lb	1.24	1.60	1.38	1.71	1.52	1.61	1.79	1.79
Oranges	Each	0.53	0.54	0.44	0.57	0.58	0.57	0.78	0.67
Onions	lb	1.42	1.45	1.63	1.67	1.83	2.44	2.13	1.97
Tomatoes	lb	4.01	3.99	4.77	5.23	4.85	4.52	4.62	4.52
Rum - local (white)	750 ml Bot	15.30	15.30	15.30	17.76	17.98	19.39	21.65	25.80
Beer - local	280 ml Bot	2.50	2.50	2.50	2.60	2.60	3.30	3.51	3.59
Malta	310 ml bot	3.00	3.00	3.00	3.10	3.10	4.01	4.62	4.75
Men's long sleeve shirt	Each	48.87	46.95	46.78	49.95	49.95	54.95	54.95	54.95
Underwear (ladies)	Each	8.70	7.78	6.95	6.95	6.95	5.00	5.00	5.00
Dress material -linen	Yard	16.95	16.95	14.95	13.95	13.95	14.00	14.70	15.28
Galvanise Sheet	Foot	3.45	3.73	3.73	4.20	4.77	4.90	5.35	6.47
Oil Paint	Gal	84.41	83.97	82.21	83.18	83.85	87.18	86.69	87.42
Lumber (dressed pine)	Bd Ft	2.91	2.93	2.97	2.91	2.83	3.12	3.28	3.27
Cement	94 lb bag	13.50	13.50	13.58	13.99	16.68	19.06	20.35	21.46
Kerosene	Gal	6.00	6.00	6.00	9.00	11.00	12.00	13.27	8.82
LPG (cooking Gas)	20lb Cyl	30.00	30.00	30.00	30.00	33.75	35.00	35.00	35.00
Electricity	120KWH	75.77	79.43	83.08	94.38	101.31	102.56	123.74	93.52
Frying Pan	Each	39.95	39.95	39.95	39.95	39.95	45.95	45.95	45.95
Light bulb	Each	2.91	2.42	2.45	2.41	2.34	2.39	3.14	3.46
Toilet Soap	Each	1.76	1.84	1.59	1.32	1.51	1.51	2.05	2.33
Toilet Paper	Each	0.97	0.96	0.93	0.98	1.01	1.08	1.08	1.11
Toothpaste	Tube	5.51	5.50	5.72	6.51	6.77	7.35	7.36	7.45

VIII. CONCLUSION

The new basket of goods and services became necessary because of significant changes that took place in the buying habits and the spending pattern of consumers. The obvious shifts in the distribution of the population as well as changes in the demographic composition also contributed to the need for the revision of the basket of goods and services. The CPI numbers are published in the monthly CPI Bulletin that is prepared by the Statistical Office. Detailed technical information about the CPI is also available on request.

The CPI basket poses two main challenges for the maintenance of the basket, namely:

1. Collection of prices from the public vegetable market where the items are not sold by weight but rather by heaps.

2. The maintenance of a homogenous basket of goods and services in cases where brands and specification changes frequently.