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**COLLECTION AND PROCESSING OF PRICE DATA**

**METHODOLOGY FOR PRICE COLLECTION AT THE FIELD LEVEL**

**Note prepared by the National Institute of Statistics of Cameroon**

**SUMMARY**

The Consumer Price Index makes it possible to monitor price changes on a month-to-month basis, and thereby, to assess inflationary pressures. The quality of this indicator is closely linked to the quality of data collected at the field level.

The choice of observation centres is designed to represent a geographical cross-section of the country and to offer several possible combinations for calculating a national index.

In order to determine the market price, a three-tiered sampling is conducted: the first-tier sampling comprises “goods and services”, the second, “sales outlets” and the third, “dates of data collection”.

Prices are collected at the field level on the basis of a questionnaire. Trained collectors compile data in the observation centres. The collection technique used depends on the type of product variety: homogeneous or heterogeneous. Price surveyors must report the disappearance of a product or sales outlet to the head of the price department, who indicates the course of action to be taken.

## I. INTRODUCTION

1. The Consumer Price Index (CPI) is the instrument used to measure variations in the general level of prices in Cameroon between two given periods. These prices correspond to goods and services available to consumers throughout the country. The National Institute of Statistics monitors posted prices including all taxes. Price collection and the computation of consumer price indices is a practice of fairly long standing in Cameroon, dating back to 1965, when a consumer price index for non-native families was introduced at the instance of French cooperation experts in the city of Yaoundé. In 1994, as part of the process of developing a national consumer price index, these two indices were replaced by one: the household consumer price index. Thus, since January or April 1994, as the case may be, the Directorate of Statistics and National Accounts (DSCN) has been collecting data on household final consumption prices in 12 cities in Cameroon: Yaoundé, Douala, Bafoussam, Garoua, Maroua, Bertoua, Bamenda, Buéa/Limbé, Ngaoundéré, Ebolowa, Bafia and Edéa. The selection of these centres was designed to represent a geographical cross-section of the country and to offer several possible combinations for calculating a national index. Household final consumption price indices are currently calculated and published by DSCN for 5 of the 12 cities (Yaoundé, Douala, Bafoussam, Garoua and Bamenda), together with a national index. We will attempt to demonstrate on a step-by-step basis how data are collected in the field.

## II. SAMPLING

2. The prices observed are those of completed transactions compiled in relation to households. Given the difficulty of setting up a household data-collection methodology, simplifying hypotheses are issued, thereby facilitating the collection and approximation of the prices charged.

### *Simplifying hypotheses*

(a) The universe of transactions carried out by households is replaced by the universe of prices charged by a set of vendors in the area surveyed, whose products are purchased by the households belonging to the reference population;

(b) In order to arrive at a sample of prices, various intermediate samples are established:

(i) A sample of goods and services to be observed;

(ii) A sample of sales outlets from which prices are collected;

(iii) A sample of dates of data collection.

This last hypothesis is justified by the fact that it is impossible to capture the amounts of all transactions or prices charged by vendors over the course of a given period in a given survey area. These three samplings are combined to produce a sample of prices observed for specific goods and services in specific sales outlets and on specific dates. They thus constitute a three-tiered sampling, the first of which comprises “goods and services”, the second, “sales outlets” and the third, “dates of data collection”.

### A. Sample of goods and services

3. The sample of goods and services is **representative** of the consumption of households belonging to the reference population. The sampling of goods and services is carried out in each defined stratum of household consumption.
4. The price index calculated by the National Institute of Statistics (INS) is based on six consumption divisions that are derived from the Classification of Individual Consumption According to Purpose (COICOP) nomenclature (consisting of 12 divisions). The aim of the Consumer Price Index (CPI) overhaul currently being conducted by the National Institute of Statistics is to break down the basket of goods and services into 12 consumption divisions. Each consumption division is subdivided into groups, each group into subgroups, each subgroup into product categories and, lastly, each product category into product varieties.
5. Within a particular consumption division, all consumption groups are represented. Subsequently, within each consumption group, consumption subgroups are sampled; within each subgroup, product categories are sampled; and within each product category, product varieties are sampled.
6. The subgroups, product categories and product varieties included in the CPI basket are not the result of a random sampling but rather of a rational selection.
7. The selection criteria used are as follows:
  - (a) Consumption of the subgroup (and, respectively, of the product category and product variety) by households must account for a sufficient share of the consumption of the group (and, respectively, of the subgroup and the product category) and/or show a particular price movement;
  - (b) The prices of product varieties should be reasonably similar in their movements;
  - (c) Product varieties should not be too difficult to observe in the field; in particular, their characteristics should be easily observable.
8. The fact that the CPI basket obtained is a function of consumption patterns means that it differs from one region to another.
9. A sample of all the goods and services consumed by households has been carefully selected.
10. Since it is not only physically impossible but also unnecessary to track all these goods and services, this sample is subdivided into six consumption divisions:
  - (a) Food, beverages and tobacco;
  - (b) Clothing and footwear;
  - (c) Household expenditure;

- (d) Health and personal care;
- (e) Transport;
- (f) Education, recreation, entertainment and culture.

11. The basket may be updated at the beginning of the year in order to take account of decisions made by the head of the price index department, in cooperation with surveyors, concerning the withdrawal or introduction of product varieties or observation points.

12. The following table shows the number of product varieties monitored by the five main observation centres.

Observation centre	Number of product varieties observed
Yaoundé	263
Douala	266
Bafoussam	188
Bamenda	185
Garoua	233

### B. Sample of sales outlets

13. A sample of sales outlets is established in each survey area for each good and service included in the sample of goods and services. These sales outlets are not selected at random, but on the basis of rational parameters: geographical location and the estimated frequency of consumer visits.

14. Thus, the sales outlets in each area are grouped into homogeneous classes. A *sales outlet* is a place where a good or service can be purchased; examples include a market, a shop, a hair salon, a pharmacy, etc.

15. The principal sales outlets are the following:

Sales outlet code	Sales outlet description
01	Supermarkets
02	Department stores
03	Modern groceries
04	Other modern shops
05	Markets
06	Market and roadside stalls
07	Itinerant merchants
08	Hotels, restaurants, bars, coffee shops/restaurants
09	Individual service providers
10	Public service providers
11	Transport sector
12	Clinics, medical laboratories and schools
13	Households

16. Within a sales outlet, prices are observed at observation points. The main observation points are: shopkeepers and other vendors (no distinction made at sales outlets); households (rents); administrative documents, pricing documents (electricity, water, telephone, fuel, public transport, etc.).

*Observation points*

17. An observation point is a sales outlet from which a price is effectively collected. The distinction between a sales outlet and an observation point is not very well defined, since the two terms are often used interchangeably. Thus, for example, within a market (which is a sales outlet):

- (a) A shop in which product prices are recorded is an observation point;
- (b) A saleswoman from whom products are purchased is also an observation point.

18. Yet a store, such as Score (which is a sales outlet), is also an observation point. The same is true of a hair salon, a hotel, a clinic, an automobile repair shop, etc.

19. In order for an observation point to be included in the survey, the following criteria must be met:

- (a) It must sell goods or services contained in the basket;
- (b) It must be easily accessible;
- (c) It must be considered to have temporal permanence.

20. The surveyor must be familiar with the geographical location of the sales outlets that he or she visits regularly. Inside each sales outlet, the surveyor must be able to recognize the usual placement of the products whose prices he or she is monitoring and must therefore be well acquainted with all departments.

21. Definitions of some observation points:

Supermarkets and department stores have the following in common:

- (a) A large sales area;
- (b) Customers able to move freely between departments;
- (c) Self-service;
- (d) A broad selection of goods for sale.

Supermarkets are distinguished by:

- (a) A predominance of food items and household products;

(b) Specialized departments for fresh meats, prepared meats and frozen products;

(c) A clothing department.

Independent specialty stores include: jewellery shops, pharmacies, shoe stores, automobile dealers and ready-to-wear clothing shops.

Individual service provider outlets include: hair salons, shoe repair shops, dry cleaners, theatres, service stations and clinics.

Public service provider outlets include: AES SONEL; Société Nationale des Eaux du Cameroun (SNEC); Cameroon Telecommunications (CAMTEL); the mayor's office; MTN; Orange Cameroun S.A.; hospitals; and primary, middle and secondary schools.

Grocers' shops include: small, family-managed general food stores, convenience stores and kiosks.

The transport sector includes: passenger transport agencies or enterprises (Cameroon Airlines (CAMAIR), CAMRAIL, Garantie Express, Binam Voyages, bus, etc.), taxis, buses and motor coaches.

22. The list of sales outlets is updated regularly. When surveyors go out into the field to collect data, they should note all new major sales outlets that have appeared (especially new department stores) and report these to provincial managers. One sales outlet may include one or more observation points.

### **C. Sample of dates of data collection**

23. The price index reflects the average monthly price change. This implies that product prices collected at sales outlets must be recorded at regular intervals. The question is: how long should the intervals be?

24. Over the course of a month, the prices of all products and services are collected in the first and second halves of the month. The average of the first- and second-half prices of each good or service constitutes the price of the latter for the month in question.

### **III. OBSERVATION PERIOD**

25. Prices are observed for each month of the year. For a given month, a distinction is drawn between:

(a) Goods and services whose prices are set by the competent authorities, which are referred to as "controlled" or "fixed-rate" goods and services (such as fuel, a kilowatt of electricity, a cubic metre of water from SNEC, etc.). The prices of these goods or services remain stable so long as they are not adjusted by a relevant text. In this regard, it is important to record the date of the adjustment so that it can be taken into account when computing the average price for the month in which the adjustment was made;

(b) Goods and services whose prices change very slowly (such as rents). For this type of goods, a single measurement is taken for each three-month period and each sample observation point;

(c) Products whose prices change rapidly. These are mainly foodstuffs, which are usually purchased and then weighed. *Three vendors are selected in each market observed for each of these products, and two visits are carried out each month.* After a product is weighed, it is not necessary to convert the observed weight into kilograms. Its weight may simply be recorded exactly as it appears on the scale. *For example, if a bunch of macabo weighs 2,538 grams, then this is the figure to be recorded, and not 2.538 kilograms.*

26. To sum up, the following observation technique is employed:

	Homogenous product varieties (non-manufactured products sold in markets)			Heterogeneous product varieties		
	Products sold in standard units	Products not sold in standard units		Products sold in markets	Products not sold in markets	Products sold both in markets and elsewhere
		Identical sales units in the same market	Different sales units in the same market			
Code	O1	O2	O3	E1	E2	E3
Observation method	Price collection	Price collection	Price collection	Price collection	Price collection	Price collection
Primary centre	3 collections x 2 visits x 3 markets = 18 collections per month	(purchasing and weighing of all products) 3 collections x 2 visits x 3 markets = 18 collections per month	(purchasing and weighing of all products) 3 collections x 2 visits x 3 markets = 18 collections per month	3 collections x 2 visits x 3 markets = 18 collections per month	3 collections x 2 visits = 6 collections per month	3 collections x 2 visits x 3 markets = 18 collections per month + 3 collections x 2 visits = 6 collections per month
Secondary centre	3 collections x 2 visits x 2 markets = 12 collections per month	(purchasing and weighing of all products) 3 collections x 2 visits x 2 markets = 12 collections per month	(purchasing and weighing of all products) 3 collections x 2 visits x 2 markets = 12 collections per month	3 collections x 2 visits x 2 markets = 12 collections per month	3 collections x 2 visits = 6 collections per month	3 collections x 2 visits x 2 markets = 12 collections per month + 3 collections x 2 visits = 6 collections per month

*1 questionnaire per product variety*

#### IV. PRICE DATA COLLECTION TOOL

27. The collection tool used is the questionnaire. The number of markets and observation points depends on the survey area and type of product variety (homogeneous or heterogeneous).<sup>1</sup> The observation technique employed for a product variety depends on its type.

##### A. Price observation only

28. The first group of goods and services (that is, those for which only the price is recorded) comprises:

- (a) Pre-packaged manufactured products;
- (b) Products sold on the basis of standardized units of measurement, such as metres, kilograms, litres, etc.;
- (c) Services.

29. Hence, these include products found in stores and services:

- (a) If the price is displayed, this price is simply recorded;
- (b) If the price is not displayed, then the price to be recorded is obtained from the vendor or the service provider.

30. The price to be recorded for these goods and services is the price paid by consumers who do not enjoy any special conditions of sale. It is the retail price including all taxes.

31. The price to be recorded is that corresponding to the product variety listed in the product variety description. For example:

- (a) If it reads: *Motor oil HD40-50 2-litre can*, then it is the price of the 2-litre can that must be recorded each time. Surveyors should not record the price of the 2-litre can one month and the price of the 4-litre can the following month;
- (b) If it reads: *SAFCA brand 192-page ordinary format notebook*, then it is the price of this notebook only that must be recorded, and not the price of all 192-page notebooks.

32. This is very important for monitoring prices. If the price recorded does not correspond to the unit specified in the product variety description, then the unit being monitored must be expressly indicated.

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<sup>1</sup> A product variety is considered to be homogeneous when the goods and services included in its definition differ very little from each other. A product variety is considered to be heterogeneous when the goods and services covered in its definition differ notably from each other.



33. For manufactured products, it will generally be a matter of recording the price displayed. However, the amount of deposits on reusable containers, and discounts, rebates or refunds offered to any buyers must be deducted from these prices.

34. The prices of defective or seasonal items (holiday, fair, manufacturing defect, etc.) should not be recorded.

35. However, the prices of leftover sales items may be recorded. Likewise, the prices of promotional items may be recorded if the length of such offers is more than one month. If these special prices are recorded, they must be indicated as such.

### **B. Price observation following purchase**

36. The standard or non-standard unit price of certain products can be determined only after purchase followed by weighing (at the office). This primarily concerns foodstuffs sold on the basis of non-standard units of measurement. Such units are of two types:

(a) Non-standard units which are identical for all vendors in a market (such as boxes, glasses or cups, for example);

(b) Non-standard units which vary depending on the vendor in a market (piles, balls, packets or baskets, for example).

37. Three vendors are observed in each market, and two visits are conducted each month.

38. In such cases, it is important to change sample vendors at each visit. To the extent possible, purchases should be made from a variety of vendors. Purchases should not be made regularly from the same vendors, so as to avoid developing a degree of familiarity that could influence the results sought.

### **V. CHECKS**

39. It is important to carry out a certain number of checks on the work completed before submitting the recorded data sheets to the central administration. All price fluctuations must be reported by surveyors, who must provide an explanation for such variations. Checks must be performed before and after price observation.

40. There are two types of checks: completeness checks and coherence checks.

41. Completeness checks are aimed at ensuring that all data sheets have been filled in (prices and weights) and that the sheets have been filled in properly, that is, that the prices of all product varieties have been recorded. Preparing the sheets before conducting a field visit allows for the possibility of catching certain omissions immediately. Given that the product varieties of the CPI basket are listed and numbered, it is useful to number the sheets and put them in order. The number of sheets completed should correspond to the number of product varieties in the basket. Omissions are to be corrected immediately given that some are due to a temporary shortage of a product at a particular observation point, to a permanent shortage or to unavailability at the time of the collection. The head of the department will determine the appropriate corrective measure to be taken in each case.

42. Coherence checks are aimed at identifying incorrect data resulting from collection errors or inaccurate completion of data sheets (during weighing, for example) and at taking the appropriate corrective measures. Even though certain errors sometimes come to light after processing, manual or visual checks should always be performed beforehand. For example, surveyors might find that they have recorded 5,000 grams for the weight of a quantity of pepper rather than 5 grams. Likewise, a 4% variation in the price of a kilowatt of electricity might escape verification. A check should always be made as to whether prices have changed significantly from one month to the next and, if so, a note explaining the reasons for the price change should be submitted.

43. It is also advisable to establish beforehand the amounts to be taken into account for each purchase. For instance, one should always purchase a 200 CFAF pile of macabo or a 200 CFAF hand of plantain. In this way, only the weight of the product will vary from one vendor to the next.

44. For lightweight products, such as shrimp or pepper, for example, very sensitive scales (spring balances) should be used.

## **VI. PROCESSING OF PRODUCT SHORTAGES**

45. A product shortage is considered to exist at a given sales outlet if the product is out of stock or has been permanently withdrawn from sale.

46. Since the number of data collections should be maintained strictly constant over time for the purposes of computing price indices, surveyors should inform the head of department of any product disappearance. The head of department alone will decide on the best method of replacement.

### **A. Temporary disappearance**

47. If the disappearance from the sales outlet under observation is temporary, no price is recorded during the visit in question (and therefore no price is recorded on the data sheet). If this product is observed to be lacking for two consecutive months, a suitable replacement for the product must be found as of the third month.

### **B. Permanent disappearance**

48. After three months of observation, if a product is still not found at its usual observation point, it is considered to have permanently disappeared from that sales outlet. Such products may be replaced by:

- (a) An equivalent product at the same sales outlet;
- (b) Failing this, the same product or an equivalent product at another sales outlet of the same type;
- (c) Failing this, the same product or an equivalent product at another sales outlet of a different type;

- (d) Failing this, a different product at the same sales outlet;
- (e) Failing this, a different product at another sales outlet;
- (f) Or, failing this, an equivalent product at a sales outlet of a different type;
- (g) Or, failing this, another product deemed to be sufficiently similar at the same sales outlet;
- (h) Or, failing this, another product deemed to be sufficiently similar at a sales outlet of a different type.

49. Only the head of department is authorized to make such replacements. All replacement products should be expressly indicated so that they may be properly taken into account in calculating the index.

### **C. Disappearance of sales outlets**

50. The disappearance of a sales outlet may be due to:
- (a) A change of location;
  - (b) A temporary or permanent shutdown of operations;
  - (c) A change of business activity.
51. Surveyors should immediately inform the head of department, who will decide what course of action to take.
52. See the questionnaire - the main collection tool employed - which is attached as an annex to the present document.

## **VI. CONCLUSION**

53. The Consumer Price Index (CPI) may be used to track month-to-month price changes and hence to assess inflationary pressures. This tool is intended to assist Cameroonian decision-makers and economists, international organizations, enterprises and professional associations.
54. The Consumer Price Index (CPI) plays a triple role:
- (a) Economic: It makes it possible to monitor inflation on a month-to-month basis. The CPI is also used as a deflator of numerous economic aggregates (consumption, income, etc.) in order to calculate changes in volume or in real terms;
  - (b) Socio-economic: The CPI, published by means of monthly, quarterly and annual news releases, may be used to index numerous private contracts and to determine wage increases;

(c) Monetary and financial: For the purposes of international comparison, efforts have been made to harmonize price indices between national statistical services under the coordination of the Economic and Statistical Observatory of Sub-Saharan Africa (AFRISTAT). The Harmonized Indices of Consumer Prices (HICP) thus obtained do not replace national consumer price indices. As part of efforts by the Bank of Central African States to achieve price stability, the HICP is the main indicator used to conduct monetary policy in the Economic and Monetary Community of Central Africa (CEMAC). In the case of Cameroon, the CPI and the HICP follow relatively similar trajectories, which is a reflection of their methodological similarity.

55. A system to update the CPI is currently being developed to ensure that its performance and quality keep pace with changes over time. The update will take into account a more extensive basket of goods and services, a larger number of sales outlets and observation points (implying a greater number of prices to be collected), a new household consumption structure based on 12 consumption divisions and modelled on the COICOP nomenclature (using the results of the third Cameroonian household survey (ECAM3)).

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