

Producer Price Index – Agriculture (PPI-A)

Methodology for the computation of PPI-A

1. Introduction

The analysis of price data involves a comparison between current and past prices. Comparison over time is required to study the price movement in order to understand the past trends and to indicate future outlook. While price relatives of single commodities can be studied in isolation, a general conclusion can only be derived from averages, covering a given set or class of commodities. The indicators of average price changes are the price indices.

2. Scope

The PPI-A covers agricultural products that are classified according to the latest Central Product Classification (CPC) Ver.2.1. There are two divisions: Division 01 - Crop Products and Division 02 - Animals & Animal Products. "Crop Products" is further divided into 7 Commodity Groups namely:

Group 012: Fresh vegetables

Group 013: Fruit and nuts

Group 014: Oilseeds and oleaginous fruits

Group 015: Edible roots and tubers

Group 016: Stimulant and spices

Group 018: Sugar cane

Group 019: Flowers, ornamental plants

3. Commodity Coverage

The bulk of the products in agriculture, with the exception of forestry, fishing and agricultural services, is taken into account in the producer price index. Thus, about 75% of the gross output of the agricultural sector has been considered.

4. Observation Units

There are essentially three types of observation units for collecting producer prices: (i) producers (ii) purchasers and (iii) markets. However, in the context of Mauritius, different types of observation units are used for different commodities as shown below:

(a) For main commercial crops (sugar cane and tea leaf etc.), the respective marketing agency is the source of the price data.

(b) For vegetables and some fruits, price data are obtained at the National Wholesale Market at Wooton.

(c) For fruits, prices are recorded from different sources such as planters and first middlemen.

(d) For animals and animal products, price data are available at sources varying from marketing agencies to producers.

5. Definition of prices

A price is a pure price when the same amount of money refers to what the buyer pays and what the seller receives. Since the price series form the basis for calculation, the index of the output prices must be representative of what the farmer actually receives.

The prices must be recorded at a point in the marketing of the product which is as close as possible to the farmer. This means that the selling prices should be recorded at the farm gate or (if this is not possible) at the next stage of the commodity flow.

6. Purpose of the agricultural price indices

The purpose of the price indices is to provide information on trends in producer prices of agricultural products and purchase prices of the means of agricultural production.

The selling prices of agricultural products and the purchase of the means of production have a decisive influence on farmers' income. It would, therefore, be useful to have indicators showing how agricultural revenue and expenditure are influenced by their price component.

The agricultural price indicators are of two types: -

- (i) Prices received by farmers represent the producer prices of agricultural products (output prices)
- (ii) Prices paid by farmers are the purchase prices of agricultural requisites (input prices)

The two classes of prices mentioned above are considered important in the context of economic analysis and agricultural policy decisions. Index numbers based on them show the average changes in these prices.

It is to be noted that only the output price index for different groups of commodities is compiled.

7. Price received by agricultural producers

As mentioned earlier, the prices for the index should be farm-gate prices, but this is not possible in many cases. Hence, in place of the farm-gate price, the wholesale price of the product is collected at the National Wholesale Market at Wooton. However, adjustments in terms of transport margins are made to the wholesale prices in order to cater for the true definition of "producer" prices.

With regards to sugarcane, there is no actual market price for the product. The final price for a crop is only available after the crop year to which it refers. Provisional estimates of the price of sugar is provided by Mauritius Sugar Syndicate. This is however revised as soon as the final price is available. The same procedure is applied to 'tea' whereby prices are obtained from National Agricultural Products Regulatory Office (NAPRO).

8. Frequency of Price Collection

The frequency of price collection varies from weekly for some commodities to only once a year in others. Broadly speaking, the frequency of price collection is as follows: -

- (i) For vegetables, price data are collected every second and fourth week of a month at the earlier mentioned auction market.
- (ii) For commodities for which prices are fairly stable, data suppliers are contacted on a quarterly basis, but prices are collected for each month of the quarter. For example, crop products – potato, onion etc.
- (iii) For the main commercial crops like sugar cane and tea, the reported prices are normally fixed for the crop year by the respective marketing agency.
- (iv) For the remaining type of items not mentioned above, the price data are collected on a monthly basis.

9. Weights

9.1 *Weighting scheme and choice of the base period*

As price data are associated with a commercial transaction, it is logical to relate prices to sales rather than total production. However, since the value of production for the market (sales) is not available here, the value of the total production is considered as a proxy in the calculation of weights. Furthermore, since meteorological conditions and market forces may generate high fluctuations, the weighted base is taken as the average of the total production for three years.

It may be noted that in the manuals provided by IMF, ‘Food and Agriculture Organisation’ and ‘Eurostat’, it is recommended that if the quantity weight base is the average of 3 years, then the reference base for prices should be the middle year. In the new set of indices, the weights have been derived by multiplying the average of production during the years 2022, 2023 and 2024 by the average of unit prices for 2023, implying that the **weight reference period is January to December 2023**. The weight is assigned to each commodity group on the basis of total production (as a proxy for sales) pertaining to the particular group. At the commodity level, the weights are apportioned within the commodity group on the basis of the production of each product. Additionally, in order to avoid overlapping in indices, the **index reference period is January to December 2025**, that is, the monthly price for this same period have been used to compute the indices,

Quarterly and annual indices have been computed using a weighting system based on the production value for the weight reference period.

9.2 Evolution of weights from 2018 to 2023

Table A.1: Comparison of weights by commodity group - previous v/s current base periods

Commodity Group	Previous Weight	New weight
	Base period: 2018	Weight reference period: 2023
<u>Crop Products</u>	558.9	587.5
Sugar Cane	212.1	183.8
Other crops products	346.7	403.7
Fresh Vegetables	209.7	275.2
Beans	7.8	4.4
Brinjal	7.7	10.6
Broccoli	---	2.8
Cabbage	11.9	8.2
Cauliflower	3.0	3.9
Carrot	13.6	13.7
Onion	10.9	6.8
Tomato	63.3	31.9
Creepers	60.8	51.1
Other fresh vegetables	30.7	141.8
Fruits and nuts	67.6	86.3
Banana	12.8	6.5
Pineapple	29.4	13.6
Other fruits	25.4	66.3
Oilseeds and oleaginous fruits	5.8	3.1
Groundnut	2.1	1.7
Coconut	3.7	1.3
Edible roots and tubers	39.3	21.1
Potato	30.8	13.8
Other Root crops	8.4	7.3
Stimulant and spices	14.6	13.4
Tea	12.0	5.9
Ginger	2.5	7.6
Flowers, ornamental plants	9.9	4.6
Anthurium	3.0	0.3
Rose	1.1	1.3
Other flowers	5.8	3.0
<u>Animals & Animal Products</u>	441.1	412.5
Cattle	43.7	20.0
Pigs	3.1	7.1
Goat	0.7	6.1
Deer	8.8	24.5
Poultry	283.9	323.8
Eggs	95.0	28.7
Milk	5.9	2.3
Overall Index	1,000.0	1,000.0

Note: The weights at product level may not add up to weight at commodity group level due to unrounded figures used for computation.

--- Not applicable in previous basket

10. Index calculation

The PPI will be calculated according to a Laspeyres formula:

$$I_t = \frac{\sum W_i (P_{ti}/P_{oi})}{\sum W_i} \times 100$$

Where:

- I_t** is the index for the current period t
P_{ti} is the price of commodity i in the current period t
P_{oi} is the price of the commodity i in the index reference period o (2025)
W_i is the weight associated with commodity i (Year 2023)

11. Uses of agricultural price indices

The construction of agricultural price index numbers may serve various purposes as shown below: -

- (i) Economic analysis, in particular the estimation of general price trends and their relationship with other pertinent variables, e.g. the study of domestic price changes in relation to prices observed in external markets or the movement of agricultural production.
- (ii) Monitoring the implementation of agricultural price policy decisions such as the introduction or modification of support prices
- (iii) Forecasting price movements in connection with market studies or business cycle research.
- (iv) Compilation of national accounts at constant prices. In order to estimate the growth of the real product of the agricultural sector, deflator indices are needed. They are appropriately weighted indices of agricultural commodities or input items.

12. Seasonality

Prices and quantities of many agricultural commodities show seasonal variations. As vegetables and fruits are extremely seasonal products, it is therefore decided to use the method of variable baskets with fixed monthly weights in the base year.

There are 12 monthly baskets of representative products. The weight structure of these baskets varies each month. Certain products whose marketing period covers the whole year appear in all 12 monthly baskets, while others, which are more seasonal, appear only in some of them. However, the composition of the basket for a given month is fixed over time; just the weights vary on a monthly basis.

13. Missing Prices

There is also, in the field of agricultural price observation, the case of missing prices for a product and this must be taken into account so that an index for each respective month can be computed. In these cases, imputation is carried out as per International Monetary Fund's recommendations.

14. Periodicity

The index is calculated on a monthly, quarterly as well as on an annual basis. While quarterly and annual price indices can normally be calculated as the simple (unweighted) average of the monthly indices, it is recommended that the monthly sales figures for the base year be used as weights to calculate the quarterly and annual indices. If sales figures are not available, total production can be used as a proxy when most of the production is available for sales. Such is the case in Mauritius and the values of total production have been used as weights.

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