A note on methodology for construction of Consumer Price Index Numbers (with base year 2003=100) for rural and urban areas of Maharashtra.

1. **Introduction**

The Directorate of Economics & Statistics, Govt. of Maharashtra collects retail prices of essential commodities and services, since 1962, on a regular basis from selected centers in rural and urban areas of Maharashtra. On the basis of these prices, monthly Consumer Price Index (CPI) numbers are constructed separately for rural and urban areas of the State. For construction of CPI Numbers, it is essential to find out items normally consumed by the population and the importance they attach to each of them in their budgets. As the consumption pattern of the population changes over time, it is necessary to incorporate these changes in the CPI at regular interval of time. This necessitates revision of the current series of CPI with a new base year. The current series of CPI for rural and urban areas of Maharashtra (Base year 1982 = 100) has now been revised with a new base year 2003 = 100.

2. **Weighting Diagram**

For ascertaining the consumption pattern, usually, Family Living Survey (FLS) is specially conducted. This survey provides information regarding the items normally consumed by the population and the expenditure incurred on them. The proportion of expenditure in total expenditure forms the basis for weighting diagram of the Index Number. However, for the State CPI series, no such special FLS is conducted. The consumption pattern available from the household consumer expenditure surveys conducted by National Sample Survey (NSS) (State Sample) is made use of for deriving the weighting diagram. For the series with base year 2003, the results of the 59th round (2003) of NSS survey are used for preparing weighting diagram.

The details of weighting diagrams for rural and urban areas are shown in Appendix I.

3. **Item Basket**

Although the consumption data on number of items are collected in NSS, only those commodities/ items on which significant expenditure had been incurred are included in the item basket and for collection of price data. The number of commodities included in the item basket of new series (Base year 2003 = 100) are 106 for rural index and 127 for urban index.

4. **Coverage, price collection agency and supervision**

For rural index, prices are collected from 68 rural centers and for the urban index, prices are collected from 74 centers in all the district headquarters (8 centers from Mumbai). The agency for price collection is primary teachers/ health assistants in local bodies appointed on part-time basis on payment of honorarium. The price collection work is regularly supervised by the District/ Regional level Officers of this Directorate.

5. **Selection of Markets/shops for price collection**

The markets/shops from which weekly price data are to be collected are decided by price collectors in consultation with District Statistical Officers. The price collection day is fixed as weekly market day for rural centers and Friday for urban centers.

6. **Periodicity of price collection**

The prices of most of the commodities are collected on weekly basis. However, the prices (of services) such as railway fare, bus fare, postal rates, cinema rates, etc. are collected annually or whenever they are changed.

7. **Monthly average prices**

On the basis of weekly prices, monthly average price is worked out as simple average of weekly prices, for each commodity and for all centers.

8. **Treatment of prices of commodities supplied through Public Distribution System (PDS)**

The commodities rice, wheat and sugar are supplied through Fair Price Shops (Public Distribution System) and the same are also available in open market. For these commodities dual prices exist. However, weighted average prices worked out by using the open market and fair price shop quotations are utilized in the calculation of Index numbers. For obtaining the weights, the per capita requirement of the above commodities is first taken into consideration on the basis of per capita consumption of these commodities based on the household expenditures survey, during 2003. From this survey the quantity of the commodity required per person is available for rural and urban areas separately. Out of this total requirement, the quantity supplied through fair price shops is obtained from the data on off-takes, which are supplied by Food, Civil Supplies

and Consumer Protection Department of the State Government. It is presumed that the remaining required quantity is purchased from open market. Using the quantity supplied through fair price shops and the quantity required to be purchased from open market as weights for the respective prices, the weighted average prices for the commodities are calculated.

The weighted average prices are required for rural and urban areas separately for calculation of index numbers for rural and urban areas. But the data, on off-take of the commodity is not separately available for rural and urban areas. The off-takes for urban and rural areas are therefore, estimated using the census population for rural and urban areas.

The weighted average price is calculated as follows:-

(i)   Suppose the basic per capita requirement of the commodity = X.

(ii)   The quantity supplied through fair price shop = Y.

(iii)   The quantity required to be purchased from open market = X – Y.

(iv)   Let P1 be the price of commodity in fair price shop.

(v)   Let P_2 be the price of commodity in open market.

(vi)   The weight to be attached to prices in fair price shop is $= \dfrac{Y * 100}{X} = Z_1$

(vii)   and weight to be attached to open market price is $= \dfrac{X - Y}{X} * 100 = Z_2$

Weighted average price = $\dfrac{P_1Z_1 + P_2Z_2}{Z}$

(Where $Z = Z_1 + Z_2$)

9. **Treatment to seasonal Commodities**

Different fruits and vegetables are available according to their seasons. Hence, for off-season months weight for a particular item is imputed to the corresponding fruits/vegetables as the case may be and distributed prorata amongst the remaining priced items available in that particular month. The monthwise weights of seasonal items are shown in Appendix II.

10. **Method of computation of Index Number**

The price relative is worked out, for each commodity and for each centre on the basis of its current month's price and base period price. For a particular commodity, average price

relative of all centrewise price relatives is worked out; this gives the commodity index. These commodity indices are used for compilation of sub-group/group indices as weighted average. With the help of these groupwise indices the general index is compiled as weighted average. The formula used for calculation of price relatives and index numbers are given below.

Notations :-

$Pijk_1$:- Current month price of jth commodity in the ith group for k^{th} centre.

$Pijk_0$:- Base year price of jth commodity in i^{th} group for k^{th} centre.

Price relative of jth commodity in i^{th} group for k^{th} center.

$$Rijk = \frac{Pijk_1}{Pijk_0} *100$$

Average price relative of jth commodity in the ith group or commodity index.

$$Rij = \sum_{k=1}^{n} Rijk/n$$

n : Number of centres.

Let Wij = Weight of jth commodity in i^{th} group

Index for i^{th} group is $$I_i = \frac{\sum W_{ij} \; X \; R_{ij}}{\sum W_{ij}}$$

Let Wi= Weight for i^{th} group in general index

General Index is $$I = \frac{\sum Wi \; X \; Ii}{\sum Wi}$$