Integration of ICP with CPI in India

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Abstract: ***Establishing synergy between Consumer Price Index (CPI) and International Comparison Programme (ICP) is the need of the hour to find the optimum solution of getting a regular flow of price data for estimating Purchasing Power Parity (PPP) for the benchmark year of the cycle of three years and extrapolating the indicator for the remaining period. There is a major challenge, in terms of non-commonality of the specifications of items, in achieving this convergence. This paper attempts to provide a feasible solution in this direction, which is very cost effective and yields robust estimate of national average prices for computation of PPP.***

1 Introduction

1.1 India has participated in all ICP rounds, except for 1993. The programme has generally been conducted at an interval of six to seven years. But it has now been decided[1]to carry out the programme with a cycle of three years, following rolling survey approach with middle year of the cycle as a benchmark period. On the same line, the current round of ICP 2017 has been conceived with 2017 as the benchmark year. The World Bank is proposing to close the cycle by the end of 2019; and simultaneously working out to start the next round of ICP with benchmark year 2020.

1.2 Most of the participating economies, including India, especially in the Asia-Pacific Region, have been conducting fresh surveys in a number of selected markets for collecting prices of a basket of goods and services in the reference years of respective ICP rounds. Conducting separate surveys requires deployment of additional manpower and financial resources, which results in delay in respect of many countries and the quality of national average prices for the reference period is consequently affected. In view of this, World Bank has been advocating for synergy of ICP and CPI so that there is a regular flow of quality data from the field and better estimate of Purchasing Power Parity (PPP) is computed for all the participating economies.

1.3 In the present situation, when the ICP has become a permanent element of global statistical programme, it has indeed become necessary to integrate ICP with CPI. Most of the countries produce CPI (monthly or quarterly) for which they collect prices of household consumable items. In ICP also, household items, put together, have share of more than 80% (in terms of number of items/products, not the GDP expenditure). Therefore, aforementioned synergy can reduce significant burden of

[1] Following the decisions taken in 47thSession of the United Nations Statistical Commission (UNSC), held in March 2016, ICP has now become a permanent element of global statistical programme.

survey for ICP and energy of National Statistics Office would more be devoted towards validation of national average prices.

2 Dimensions of ICP-CPI Synergy

2.1 There are two dimensions of ICP-CPI integration: (a) integration of sample design for selection of markets and outlets, and deployment of same manpower for conducting both the surveys of ICP and CPI; and (b) integration of baskets of household consumable goods and services. First dimension ensures good coverage of markets, at reduced cost, for estimating robust national average prices whereas second dimension emphasizes on regular flow of quality data and provides detailed information on important and less important items of the ICP basket.

2.2 Integration of sample design is easy to implement by any country. The entire set of markets of CPI or a subset thereof may be taken and the same manpower may be deployed for price collection of ICP. Problems may arise in respect of some of the countries where CPI is compiled on the basis of prices collected from capital or mega cities only. In these cases, these markets do not represent country as a whole and average of the prices are poor estimates of national average prices of ICP basket.

2.3 In the case of India, CPI is compiled using prices from 2295 markets (1181 rural covering almost all districts and 1114 urban markets of 310 towns) of the country. There is an adequate representation of each part of the country. Therefore, a subset of the markets (taking representation from each region) is sufficient to give good estimates of national average prices.

2.4 Implementation of second dimension has really a major challenge of weak commonality between Structured Product Descriptions (SPDs) of ICP and those of CPI baskets. ICP emphasizes on comparability whereas CPI hinges on representativeness. Enhancing comparability compromises on representativeness, which affect the quality of CPI and vice versa. Therefore, a model is required to be developed for integrating both the baskets without affecting the quality of these indicators.

3 Methodology proposed to be adopted for integration in India

Integration of sample design and manpower deployment

3.1 India used this dimension of convergence in earlier rounds of ICP, especially in 2011 and 2017 by taking a subset of the CPI markets. For ICP 2017, Prices were collected from 577 urban and 320 rural markets for items falling in the categories of Food (including beverages), Clothing & footwear and Education. These markets were subsets of 1114 urban markets CPI (Urban) and 1181 rural markets of CPI (Rural). Items falling in the category of other than Food, Clothing Footwear and Education were surveyed only in 108 million plus cities and capital towns of CPI (Urban).

3.2 CSO, India is in the process of revising the Base Year of CPI from 2012 to 2019. While carrying out this exercise, it is also being envisaged to establish synergy between ICP and CPI in a more structured and comprehensive manner. The country has 29 States and seven Union Territories. Each State has been divided into one or more National Sample Survey (NSS) Regions[2]. List of selected villages and towns are being revised/updated on the basis of the results of Population Census 2011 and further developments taken place during 2012 to 2018. Now the sample size has been increased from 1181 villages to 1209 villages and from 1114 urban markets of 310 towns to 1150 markets of 328 towns. Market Survey is going on to identify shops/outlets; fix SPDs and collection of Base Year prices.

3.3 Ministry of Statistics and Programme Implementation (MoSPI) conducted Household Consumption Expenditure Survey (HCES) in 75th Round of NSS with reference period from July 2017 to June 2018. Results of this survey would provide weights of CPI basket of the proposed revised series. India was divided into 88 NSS Regions for conducting aforementioned HCES.

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[2] An NSS Region is a group of districts, within a State, having similar geographical features and population densities. This is a division of a State in such a way that homogeneity within the Region and heterogeneity between the NSS Regions are maximized.

3.4 All NSS Regions, except for one, have been considered for selection of villages and towns in the updated sample for the proposed revised series of CPI. State-wise distribution of NSS Regions, villages and urban markets of CPI sample, of proposed revised series, is given below in Table 1:

Table1. State-wise distribution of NSS Regions, rural& urban markets for the revised series of CPI

State/UT code	State/UT name	No. of NSS Regions	No of selected villages/rural markets	No of selected urban markets
01	Jammu & Kashmir	3	27	30
02	Himachal Pradesh	2	24	16
03	Punjab	2	36	26
04	Chandigarh	1	--	6
05	Uttarakhand	1	26	32
06	Haryana	2	39	30
07	Delhi	1	13	20
08	Rajasthan	5	64	58
09	Uttar Pradesh	5	140	94
10	Bihar	2	74	40
11	Sikkim	1	8	8
12	Arunachal Pradesh	1	16	16
13	Nagaland	1	16	18
14	Manipur	2	18	20
15	Mizoram	1	16	16
16	Tripura	1	9	16
17	Meghalaya	1	14	18
18	Assam	4	48	30
19	West Bengal	5	65	56
20	Jharkhand	2	38	38
21	Odisha	3	50	26
22	Chhattisgarh	3	33	34
23	Madhya Pradesh	6	72	66
24	Gujarat	5	53	72
25	Daman & Diu	1	7	6
26	Dadra & Nagar Haveli	1	8	6
27	Maharashtra	6	66	106
28	Andhra Pradesh	3	34	32
29	Karnataka	4	57	60
30	Goa	1	6	18
31	Lakshadweep	1	5	4
32	Kerala	2	29	32
33	Tamil Nadu	4	59	56

State/UT code	State/UT name	No. of NSS Regions	No of selected villages/rural markets	No of selected urban markets
34	Puducherry	1	8	12
35	Andaman & Nicobar Islands	1	8	8
36	Telangana	2	23	24
99	**All India**	**87**	**1209**	**1150**

-- There is no village in Chandigarh as per latest notification

3.5 All the major States (having population more than 5 million as per Population Census 2011), except for Delhi (population 16,787,941) and Uttarakhand (population 10,116,752), have more than one NSS Regions. At least four markets from each sector (rural and urban) have been selected from each NSS Region.

3.6 The most popular shops, preferably permanent retail establishment, catering to majority of population for a fairly long period of time, are being mapped in each market for each item of CPI basket of the proposed revised series. Similar two reserve shops are also being identified for the purpose of substitution in the case of causality.

3.7 For ICP, subsets of aforementioned rural and urban markets (all markets of those large NSS Regions which have 12 or more markets in each rural and urban sector, ensuring at least one NSS Region in each State for giving nation-wide representation) would be taken in the rural and urban samples of markets for conducting the price survey of household items. State-wise distribution of NSS Regions, villages and urban markets having 12 or more markets in each NSS Region, of proposed revised series of CPI, is given below in Table 2:

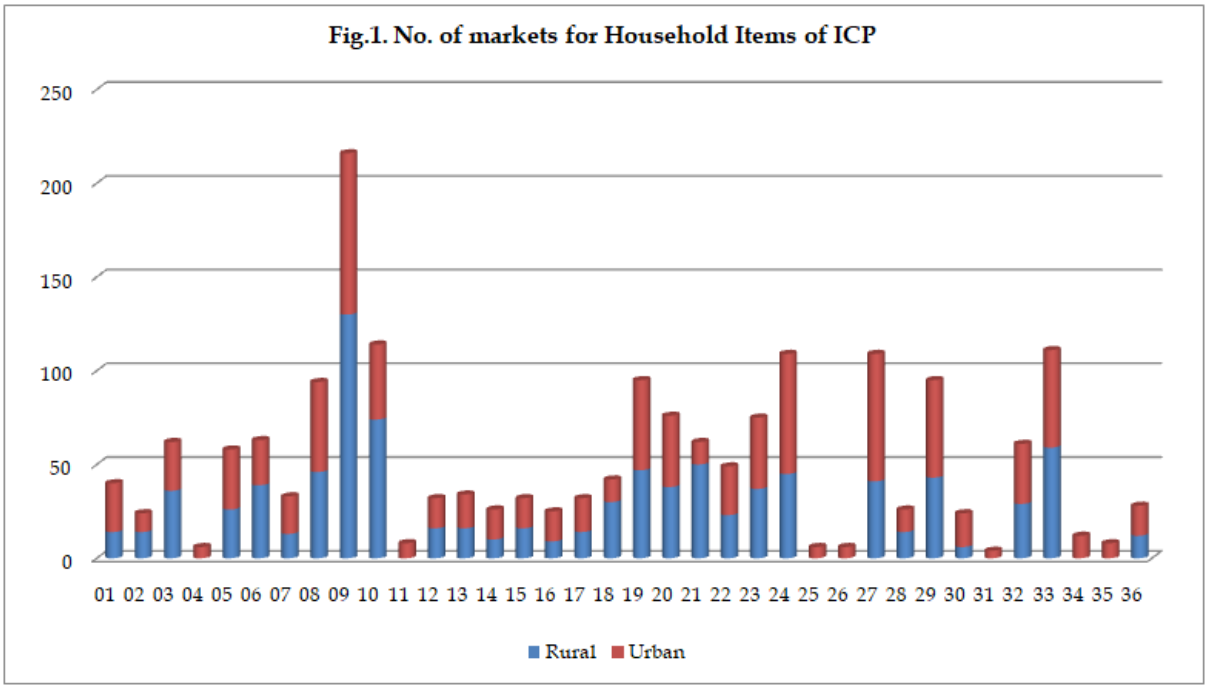
Table 2. State-wise distribution of NSS Regions, rural& urban markets, having 12 or more markets in each NSS Region, for the revised series of CPI

State code	State name	Rural		Urban	
		No of NSS Region	No. of markets	No of NSS Region	No. of markets
01	Jammu & Kashmir	1	14	2	26
02	Himachal Pradesh	1	14	1	10
03	Punjab	2	36	2	26
04	Chandigarh	1	--	1	6

State code	State name	Rural		Urban	
		No of NSS Region	No. of markets	No of NSS Region	No. of markets
05	Uttarakhand	1	26	1	32
06	Haryana	2	39	1	24
07	Delhi	1	13	1	20
08	Rajasthan	3	46	3	48
09	Uttar Pradesh	4	130	3	86
10	Bihar	2	74	2	40
11	Sikkim	1	#	1	8
12	Arunachal Pradesh	1	16	1	16
13	Nagaland	1	16	1	18
14	Manipur	1	10	1	16
15	Mizoram	1	16	1	16
16	Tripura	1	9	1	16
17	Meghalaya	1	14	1	18
18	Assam	2	30	1	12
19	West Bengal	3	47	3	48
20	Jharkhand	2	38	2	38
21	Odisha	3	50	1	12
22	Chhattisgarh	1	23	1	26
23	Madhya Pradesh	2	37	2	38
24	Gujarat	3	45	3	64
25	Daman & Diu	1	#	1	6
26	Dadra & Nagar Haveli	1	#	1	6
27	Maharashtra	3	41	2	68
28	Andhra Pradesh	1	14	1	12
29	Karnataka	2	43	2	52
30	Goa	1	6	1	18
31	Lakshadweep	1	#	1	4
32	Kerala	2	29	2	32
33	Tamil Nadu	4	59	3	52
34	Puducherry	1	#	1	12
35	Andaman & Nicobar Islands	1	#	1	8
36	Telangana	1	12	1	16
99	**All India**	**50**	**947**	**52**	**946**

-- There is no village in Chandigarh as per latest notification
 # No rural market has been allocated for the rural sector

From Table 2, it is obvious that most of the States/UTs, have representation of NSS Region having 12 or more markets of CPI. In addition, Manipur, Tripura and Goa, having less than 12 rural markets have been kept in the sample to ensure representation each State in national average. Similarly, Himachal Pradesh, Chandigarh, Sikkim, Daman & Diu, Dadra and Nagar Haveli, Lakshadweep, and Andaman & Nicobar Islands having less than 12 urban markets, have also been kept in the sample for ensuring representation in national average. Moreover, these States/UTs have not been included for rural sector because of rural markets are either very less in number or very sparsely located posing difficulty in price collection. Thus, a total of 947 rural and 946 urban markets are being covered for price survey for ICP. Distribution of number of markets in rural as well as urban sectors (given in Table 2) has been shown graphically in Fig. 1



3.8 The outlets identified for CPI are to be used for collection of prices for ICP items in the aforementioned rural and urban markets. It is important to mention here that shops selected for CPI items are the most popular outlets; therefore, there is a fair chance that products of different specifications of ICP are available on these shops.

Integration of ICP and CPI baskets

3.9 As mentioned before, the major challenge in establishing synergy in both the baskets is poor commonality. India is a vast country having changing consumption pattern, and preferences of goods and services at a very short distance. Therefore, a large sample size is required for compilation of CPI to capture all types of consumption behavior. SPDs of CPI items are fixed market wise so that the prices of most representative products are collected during the survey. As a result, SPDs of items differ from market to market. Even if some of the SPDs of CPI basket is identical to those of ICP basket, this would not hold true for all the markets of all different States. Therefore, those CPI prices may not be used to compute national average prices.

3.10 While examining the product catalogue of Asia and the Pacific Region, it has been found that the SPDs of fruits and vegetables may be considered common to those of CPI in a fairly large number of markets. But in case of other items of ICP, conducting parallel survey is required.

3.11 There are about 930 household items/products in ICP. Out of these, about 40 items fall in the category of fruits and vegetables. Even after excluding these items, about 890 items are there to be added to the list of CPI items, if their prices are to be collected along with the products contained in the CPI basket. Conducting survey for such a long list is practically not feasible.

3.12 In view of this, it is proposed that prices of fruits and vegetables collected in each market for CPI would be used for ICP baskets also; and for the remaining household items, ICP basket would be divided into 12 parts. One part thus arrived would be allotted to one market of that NSS Region of the respective sector. Here it is important to reiterate that these are large NSS Regions having 12 or more markets in each sector. Thus, there would be addition of only 890/12 = 74 items to the CPI basket of a particular market of the respective NSS Region. If number of markets in a NSS Region is more than 12 then the items falling in the category of Food, Clothing and Footwear (about 415 to 420 items) would be distributed in the remaining

markets (other than the aforementioned 12) of the respective sector. For instance, there are 23 markets in the rural sector of an NSS Region of Chhatishgarh (Table 2.). In this case, 12 different sets of 74 items would be added to CPI baskets of 12 markets. Then in the remaining 11 markets, 11 different sets of 38 items (420/11 = 38) of Food, Clothing and Footwear would be added to the CPI baskets. These ICP items would be clearly classified as ICP items in the schedule of price collection and data entry software in order to avoid confusion.

3.13 This model has been adopted because NSS Regions are homogeneous in terms of geographical features and population densities. For that reason, it is expected that price behavior/dynamics within the region would be quite similar, especially in the case when SPDs of ICP basket are fixed for all the markets. One quotation from each NSS Region should reflect the representative price for that area for computation of national average. And, in the case of larger NSS Region (having more than 12 markets) number of quotations of items falling in the category of Food, Clothing and Footwear would be more than one. Thus, following this approach there would be at least 102 quotations (50 rural and 52 urban NSS Regions) for all the ICP products and in respect of Food, Clothing and Footwear, it would more. In fruits and vegetables, where the prices fluctuate very much over time and space, number of quotations for ICP would be equal to that of CPI items.

3.14 There is another option of splitting the ICP basket over time; for instance, 1/3 of the basket is surveyed in first, second and third months of a Quarter. Durable items (other than Food, Clothing and Footwear) may be even surveyed six monthly. Similar approach was followed by India in ICP 2011 and 2017. But the strategy mentioned in 3.12 has been found more appropriate because of following reasons: (a) the proposed method adds only 75 items to the CPI basket of a particular market whereas another approach include more number of items; and (b) prices are collected every month, which captures month to month fluctuations in prices without compromising the coverage of space (since even one quotation from a NSS Region is representative for the whole region because of aforementioned

homogeneity). Adoption of this approach neither affects the representativeness of CPI baskets not compromises on spatial comparability of ICP items.

3.15 Increasing the size of basket leads to reluctance on the part of a shopkeeper, which results in non-response and not reporting the actual transaction prices (if it is other than MRP). Therefore, it is necessary that the basket should of optimum size. In order to compensate the additional load of about 75 ICP items on CPI basket, a methodology has been worked out to reduce the size of CPI basket.

3.16 There are three kinds of CPI items, in terms of price dynamics: first, items - prices of which vary from market to market and also consumption pattern or preferences changes across the space at very short distance e.g. 'Food', 'Pan Tobacco and Intoxicants', 'Clothing and Footwear', 'Fuel and Light' etc.; second, items – prices of which does not vary too much in the markets of nearby districts for instance items of consumer durables, electronics, education, health transportation, services etc.; and third, items – prices of which are administratively decided e.g. Petrol, Diesel, LPG, PNG, Railway Fare, Electricity tariff etc.

3.17 Prices, of first category items, must be collected from each market. In the case of second category, one item may be priced only from two to three markets (rural as well as urban separately) in each NSS Region. Prices of third category of items are generally same for the entire State/UT. Therefore, their prices are proposed to be collected centrally at State Headquarters and the prices of such items of respective States would be applicable to all NSS Regions of that State.

3.18 The experience of the existing series of CPI says that names of the item containing word 'other' under each sub-group poses problem in price collection since the SPD is not well defined. Therefore, such items would be removed from the CPI Basket of the revised series, their weights, is any, be pro rata distributed on the remaining items of the respective sub-groups.

3.19 This strategy, explained in 3.16 to 3.18, is expected to reduce about 70 to 80 items in the baskets of CPI of a particular market, which gives sufficient scope to add 75 ICP items to CPI basket without giving additional load on the data collectors.

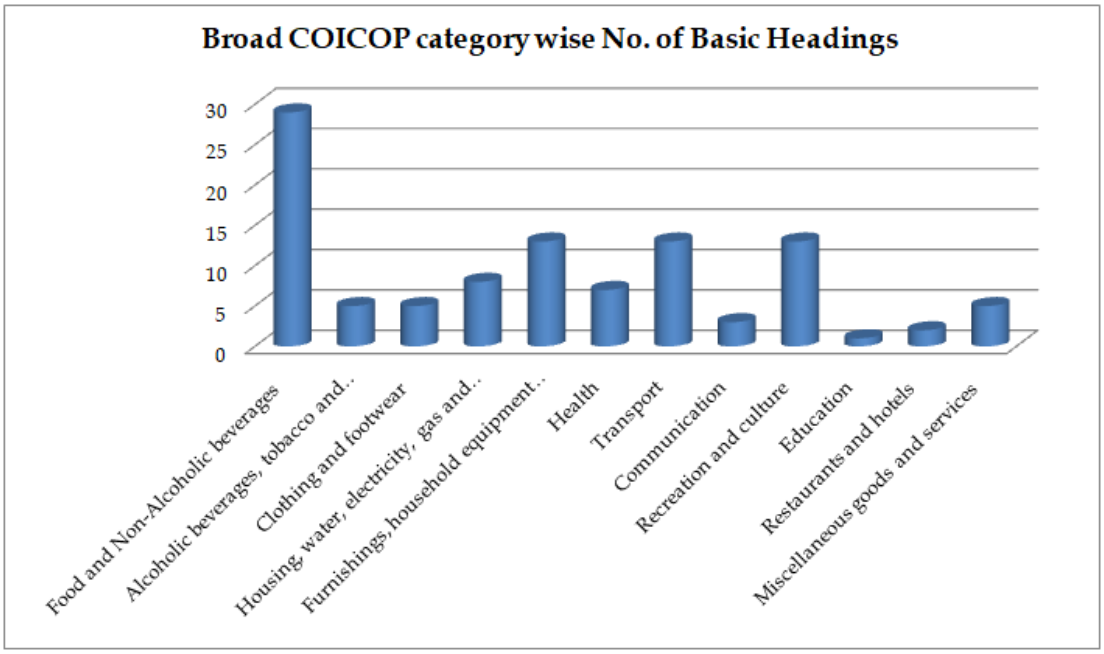
3.20 The collected ICP prices would pass through scrutiny checks every month along with CPI data and validated data be stored for computation of national average prices as and when required by the Asian Development Bank (ADB), the Regional Coordinator of ICP for Asia and the Pacific Region.

Methodology for preparation of different sets of 75 ICP items

3.21 Out of 155 Basic Headings (BHs), 104 belong to household sector. Distribution of these BHs in different COICOP categories are as follows:

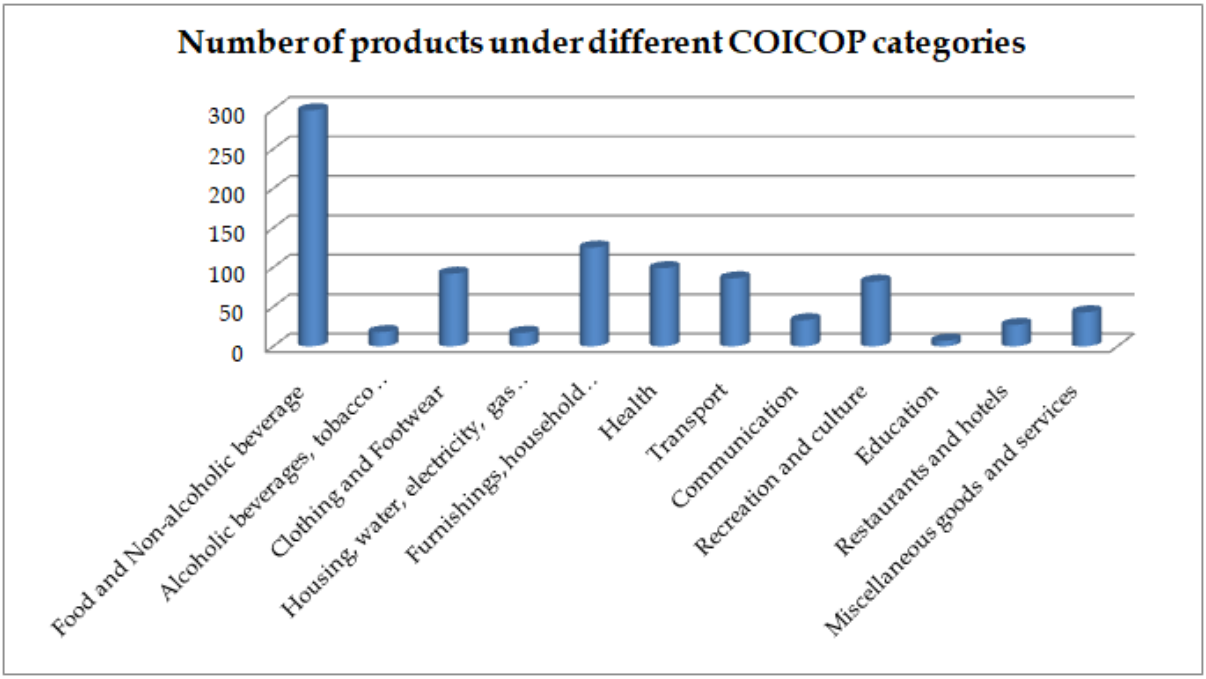
Table 3. Distribution of Basic Headings in different COICOP categories

COICOP Category Code	COICOP Category Description	No. of Basic Headings
01	Food and Non-Alcoholic beverages	29
02	Alcoholic beverages, tobacco and narcotics	5
03	Clothing and footwear	5
04	Housing, water, electricity, gas and other fuels	8
05	Furnishings, household equipment and routine household maintenance	13
06	Health	7
07	Transport	13
08	Communication	3
09	Recreation and culture	13
10	Education	1
11	Restaurants and hotels	2
12	Miscellaneous goods and services	5
	Total	**104**



3.22 Distribution of products of ICP 2017 under different categories of COICOP are as follows:

Category	Description	No. of Items
01	Food and Non-alcoholic beverage	299
02	Alcoholic beverages, tobacco and narcotics	18
03	Clothing and Footwear	92
04	Housing, water, electricity, gas and other fuels	17
05	Furnishings, household equipment and maintenance	125
06	Health	99
07	Transport	86
08	Communication	33
09	Recreation and culture	82
10	Education	7
11	Restaurants and hotels	27
12	Miscellaneous goods and services	43
	Total	**928**



3.23 While preparing sets of 75 ICP items/products, it would be ensured that all categories of COICOP are proportionately represented in each set and all items of a particular BH would be surveyed together in the same market. Further, deviations of SPDs of CPI items from that of ICP items would be examined market wise. If there is difference in terms of variety, brand, quality, model etc. then items of both the basket would be considered not-common, on the other hand if deviation occurs due to difference in unit and quantity, then items of both the baskets may be considered as approximately common. If such commonality is found, in respect of a particular product, in majority of the markets, then that item would be classified as important item. This analysis would help in providing information on 'Important' and 'Less important' ICP items for assigning suitable weights by the PPP compiling agency.

House Rent

3.24 CSO conducts House Rent survey every month for compilation of House Rent Index as part of CPI. At present, the rental data is collected from urban areas only since rented dwellings are either not available or available in very negligible number in rural areas. With the passage of time, economic activities have expanded in rural areas also. In view of this, the MoSPI is exploring the possibility of compiling House Rent Index for rural areas as well. When the data of 75th Round of

Consumer Expenditure Survey become available, weights of House Rent in the CPI basket would be computed State-wise; accordingly appropriate decision on compilation of House Rent Index for rural sector would be taken. By the time, a parallel exercise to select rented accommodations in rural area is also being carried out as part of aforementioned Market Survey for Base Revision of CPI.

3.25 CSO has classified stock of rented dwellings into four categories: One Room Set; Two Room Set; Three Room Set; and Four and more Room Set. Rented dwellings are selected in the sample in each State from each category proportionately. While carrying out the rental survey, additional information of different characteristics viz. area, basic amenities, period of tenancy etc. are also collected. Using this information, national average rent would be computed for different categories of houses of ICP basket. Unlike other household consumable items, additional rented dwelling (as per the SPD of ICP) would not be added to the CPI sample.

4 Conclusion

4.1 ICP has gained a lot of importance and recognition over a period of time. It has now become the permanent element of the global statistics programme and is being conducted with a cycle of three years following rolling survey approach. In this situation, there is a need for instituting a system that gives regular flow of price data at sustainable cost. Establishing synergy between CPI and ICP is the best option to meet this requirement.

4.2 To achieve this objective, approach of diving country into different homogeneous regions and covering the basket of household items of ICP in each region by splitting the basket over different markets of the respective region is the optimum and feasible solution for a vast country like India.

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