

# A brief Note on Production and Producer's Price Indices in Nepal

## Introduction

Central Bureau of Statistics (CBS) has been compiling and publishing Manufacturing Production Index (MPI) since 1974/75 and Manufacturing Producers' Price Index (MPPI) since 1987/88. However, to meet the demand of the users, CBS initiated Quarterly MPI and Quarterly MPPI. The Manufacturing Production Index is a quantity index that aims at measuring the periodic changes in the level of manufacturing output of Nepal. Instead of producing the point to point based MPI and MPPI, an effort is made to produce these indices in time series since fiscal year 2010/11. The initiation of the indices in series makes it possible to compare between quartiles.

A Producer Price Index (PPI) is a price index for Nepal that measures the average periodic changes in prices received by domestic producers for their output. It covers producer price of four industrial sectors (*Mining and quarrying, Manufacturing, Electricity, gas, steam and air conditioning supply, Water supply; sewerage, waste management and remediation activities*). Producer price is a price of goods produced as output minus any VAT, or similar deductible tax invoiced to the purchaser. Producers' price does not include any kinds of transport charges invoiced separately by the producer. It can be defined as: *"A producers' price for a product is the Basic price plus any nondeductible tax on products paid by the producer less any subsidies on products received by the producer."*

The Index of Industrial Production (IIP) is an index for Nepal which details out the growth of various sectors in an economy such as mining, electricity and manufacturing etc. From the fiscal year 2015/16, Central Bureau of Statistics (CBS) has extended the coverage of MPI and started to produce Index of Industrial Production (IIP) including four sectors of economic activities. and these indices on the new base. In this new base MPI change to Index of Industrial Production (IIP) which covers four industrial sectors (*Mining and quarrying, Manufacturing, Electricity, gas, steam and air conditioning supply, Water supply; sewerage, waste management and remediation activities*).

## Scope and Coverage

The production and price indices include only the domestic industrial products at national level. The industrial production and producer price indices includes International Standard Industrial Classification (ISIC Rev. 4) and Central Product Classification, (CPC Ver. 2). Both indices cover 29 three – digit NSIC (ISIC Rev. 4) groups and 54 four – digit CPC (CPC Ver. 2) group of commodities. The NSIC and CPC level weights for these indices are derived from outputs of Census of Manufacturing Establishments (CME) 2011/12. This CME covers entire domestic manufacturing establishments with 10 or more employees. The revision is based on the quinquennial census of manufacturing establishments. Index of Industrial Production (IIP) and Producer Price Index (PPI) covers only four economic sectors mining, quarrying, manufacturing, electricity, gas and water supply and this PPI is output producer price index.

## **Weighting System**

The weights for MPI and MPPI is based on census output of CME 2011/12. The census output has been re-adjusted to assign the weight for index purpose. Weights have been assigned at two stages. At the first stage weights are assigned at three-digit NSIC industry group and for second stage, the weight of the particular three-digit NSIC industry group is redistributed among the selected commodities within that particular three-digit NSIC industry group. The redistribution of the weight at the commodity level is based on their share on total value of shipment within that particular three-digit NSIC industry group. The weight for the overall Index of Industrial Production, IIP and Producer's Price Index, PPI is taken from the percentage contribution in GDP by four industrial sectors in the base year (*Mining and quarrying, Manufacturing, Electricity, gas, steam and air conditioning supply, Water supply; sewerage, waste management and remediation activities*).

## **Sample Design**

Different sampling designs are used in different industrial sectors for PPI and IIP sampling.

### **Manufacturing Sector:**

The sample design for the present manufacturing production and price indices are based on the census output provided by the CME 2011/12. For this purpose, the industries are selected by using cut off sampling method for data collection.

### **Selection of Three-digit NSIC Industry Group:**

All the four-digit NSIC industry groups contributing 0.3 percent or more to the total census outputs are included in the sampling frame. Accordingly, 29 three-digit NSIC industry groups are selected.

### **Selection of Manufacturing Establishments:**

Manufacturing establishments are selected by applying cutoff sampling technique. The selection of the manufacturing establishments within the each selected four-digit NSIC industry group has been categorized in two ways. In one hand, only five largest establishments are selected with certainty that have concentration ratio 80% or more within the same industry group. On the other hand, for those having concentration ratio less than 80%, the five largest establishments with certainty as well as the other sampled establishments are selected for the sample depending upon share of concentration ratio occupied by them. Two stages of sample selection are:

In first stage, five largest establishments within each NSIC 4-digits have been selected with certainty.

In second stage, certain number of establishments are selected with probability proportional to size. the no. of establishments is decided on the basis of concentration ratio. The method of identifying the number is as follows.

If  $0.6 \leq C.R. < 0.8$  then select 4 establishments

If  $0.4 \leq C.R. < 0.6$  then select 6 establishments

If  $0.2 \leq C.R. < 0.4$  then select 8 establishments

If  $< 0.2$  then select 10 establishments

Where

$$\text{ConcentrationRatio} = \frac{T}{G}$$

T = Sum of value of outputs of largest 5 Establishments

G = Total value of outputs of particular 4-digit NSIC group .

This method of selection gives the maximum number of establishment to be selected within each four digit NSIC group is 15. Applying this method, 400 establishments have been selected for quarterly survey from 37 districts of Nepal.

### **Selection of Commodities**

The commodities are selected within the each selected four-digit NSIC industry group. Commodities are selected on the basis of its share on the total value of shipment as provided by Census of Manufacturing Establishment, CME 2011/12. In the first round, selected commodities are verified after four rounds quarterly surveys of the selected establishments. In this way, 54 manufacturing commodities are selected under the 29 three-digit NSIC industry group.

### **Other Sectors:**

For the sampling of other sectors (Mining and quarrying, Electricity, gas, steam and air conditioning supply, Water supply; sewerage, waste management and remediation activities) purposive/Judgmental sampling technics is applied.

### **Reference Period**

The reference period of assigning weight for manufacturing sector is fiscal year 2011/12 whereas the base period for producer's price and production indices is 2013/14. For overall weights of four sectors, the reference year is base year.

### **Data Source/Data Collection**

The required data for indices are collected through the quarterly surveys of different sectors. In manufacturing sectors, the first quarter is commenced from the beginning of the fiscal year. The quarterly survey is conducted every third month of the current quarter. While collecting the data in each quarterly survey, final output of the last quarter and first two months of the current quarter are collected. The expected output of the third month of the current quarter is collected. Similarly, the producers' price is collected for the last quarter and first two months' of the current quarter in each quarterly survey of manufacturing establishments. The field works of the quarterly surveys are conducted by the concerned Statistics Offices (SOs) as per the guidelines provided by the Price Statistics Section, CBS. Similar types of quarterly surveys for data collection of other sectors are also conducted by SOs and CBS.

Index of Industrial Production, IIP aims at change in value added, for this purpose from the quarterly survey production quantities are collected from Mining and Quarrying, Electricity and Gas sectors whereas production in values are collected from Manufacturing and water supply sectors.

## Index Compilation

The production and price indices are compiled at two stages, on the basis of industrial classifications system i.e. 3-digit NSIC industry group. While compiling indices at 3-digit NSIC level, the price relatives of the selected commodities under the particular industry group is calculated as follows:

$$I_{ij} = \frac{\sum_{i=1}^n (w_{ij} * PR_{ij})}{\sum_{i=1}^n w_{ij}}$$

Where,  $I_{ij}$  = Manufacturing Producers' Price Index for  $i^{\text{th}}$  commodity at  $j^{\text{th}}$  3-digit NSIC

$w_{ij}$  = Weight of the  $i^{\text{th}}$  commodity of  $j^{\text{th}}$  3-digit NSIC

$PR_{ij}$  = Price Relatives of the  $i^{\text{th}}$  commodity of the  $j^{\text{th}}$  3-digit NSIC

$W_{ij}$  = Total weight of the commodities at the  $j^{\text{th}}$  3-digit NSIC

$i = 1, 2, 3, \dots$

$n$  = Number of price relatives or, commodities at  $j^{\text{th}}$  3-digit NSIC

In second stage, while compiling the overall index, the weighted average of all the indices at 3-digit level are computed as follows:

$$I_k = \frac{\sum_{j=1}^n (w_j * I_j)}{\sum_{j=1}^n w_j}$$

Where,  $I_k$  = Producers' Price Index of Manufacturing Sector

$w_j$  = Weight of the  $j^{\text{th}}$  3-digit NSIC

$I_j$  = Manufacturing Producers' Price Index of 3-digit NSIC

$\sum w_j$  = Total weight of the 3-digit NSIC

$j = 1, 2, 3, \dots$

$n$  = Number of 3-digit NSIC

### **Frequency of Compilation**

The Index of Industrial Production, IIP and the Producers' Price Index, PPI are compiled and released at quarterly and annual basis within two months after data collection. Preliminary indices for the current quarter and revision of the previous quarter are made available.

### **Limitations of Indices**

1. These indices (IIP and PPI) covers only Mining and Quarrying, Manufacturing, Electricity and Gas, Water Supply.
2. Manufacturing Production Index, (MPI) and Manufacturing Producer's Price Index, (MPPI) cover only the establishments having 10 or more employees.
3. The selected establishments are representatives at national level. Therefore, the indices are available at national level only.
4. Only annual production value is available for quarrying sector.
5. In water supply, it covers only Nepal Water Supply Corporation (NWSC) and Kathmandu Upatyaka Khanepani Limited (KUKL). Water supplied by user groups is not taken into account in computation of the IIP and PPI.

## Annexes

### 1. Share distribution of Economic sectors in base year

NSIC	Economic Sector	Weight	Share in GDP
<b>B</b>	Mining and quarrying	3.07	0.48
<b>C</b>	Manufacturing	87.37	12.69
<b>D</b>	Electricity, gas, steam and air conditioning supply	9.31	1.51
<b>E</b>	Water supply; sewerage, waste management and remediation activities	0.25	0.04
<b>Total</b>		<b>100</b>	<b>14.72</b>

### 2. Number of establishment selected in each 4 digit NSIC for Manufacturing Sector

NSIC	No. of Establishment	NSIC	No. of Establishment	NSIC	No. of Establishment	NSIC	No. of Establishment
1040	11	1200	5	1920	5	2511	9
1050	9	1311	5	2011	11	2512	5
1061	15	1312	13	2022	5	2599	13
1071	15	1393	13	2023	5	2640	5
1072	5	1410	9	2100	11	2732	5
1073	5	1511	5	2220	13	3100	15
1074	5	1520	13	2391	15		
1079	11	1610	15	2394	13		
1080	9	1621	15	2395	13		
1101	9	1701	5	2396	15		
1103	5	1702	13	2410	11		
1104	5	1811	11	2420	5	<b>Total</b>	<b>400</b>

### 3. Weight of in 3-digit NSIC in Manufacturing Sector

S.N.	NSIC	NSIC Name	Weight
1	104	Manufacture of vegetable and animal oils and fats	6.64
2	105	Manufacture of dairy products	2.04
3	106	Manufacture of grain mill products, starches and starch products	6.16
4	107	Manufacture of Other food products	4.98
5	108	Manufacture of prepared animal feeds	6.95
6	110	Manufacturing of beverages	5.03
7	120	Manufacture of tobacco products	5.03
8	131	Spinning, weaving and finishing of textiles	3.19
9	139	Manufacture of other textiles	0.60
10	141	Manufacture of wearing apparel, except fur apparel	0.98
11	151	Manufacturing of leather and related products	0.44
12	152	Manufacture of footwear	0.48
13	161	Sawmilling and planing of wood	0.73
14	162	Manufacture of products of wood. Cork. straw and plaiting materials	1.07
15	170	Manufacture of paper and paper products	1.01
16	181	Printing and service activities related to printing	0.40
17	192	Manufacture of refined petroleum products	0.37
18	201	Manufacture of basic chemicals	0.51
19	202	Manufacture of other chemical products	3.19
20	210	Manufacture of pharmaceuticals, medicinal chemical and botanical products	1.52
21	222	Manufacture of plastics products	5.75
22	239	Manufacture of non-metallic mineral products n.e.c.	12.81
23	241	Manufacture of basic iron and steel	18.24
24	242	Manufacture of basic precious and other non-ferrous metals	2.14
25	251	Manufacturing of other fabricated metal products: metalworking service activities	1.40
26	259	Manufacturing of other fabricated metal products: metalworking service activities	0.45
27	264	Manufacture of consumer electronics	0.06
28	273	Manufacture of wiring and wiring devices	0.90
29	310	Manufacture of furniture	0.83

### 4. Selected Districts for the Quarrying

S.N.	District	S.N.	District	S.N.	District
1	Morang	6	Bara	11	Rupandehi
2	Sunsari	7	Dhading	12	Dang
3	Udayapur	8	Makawanpur	13	Banke
4	Siraha	9	Kaski	14	Kailai
5	Sarlahi	10	Kapilwastu	15	Kanchanpur

**6. Mining:**

1. Chundhunga
2. Coal

**7. Electricity**

1. Nepal Electric Authority

**8. Gas**

1. Nepal Oil Corporation (L.P. Gas)

**9. Water**

1. Nepal Water Supply Corporation (NWSC)
2. Kathmandu Upattekha Khanepani Limited (KUKL)