

A Brief Note on Agricultural Producer Price Index (APPI) in Nepal

1. Introduction

The producer price index of agricultural production (APPI) provides information on variations and trends in farm-gate price of agricultural products as a whole in a particular time compared to the base year. APPI is an index that measures the average rate of change in the producer or farm-gate prices of goods sold by the farmers. Farm gate price is the amount received by the farmer from purchasers for a unit of good or services produced as output. It excludes any kind of taxes, supplier's retail and wholesale margins and transportation cost. So, the price received by the farmers for primary crops, livestock and poultry as primary products at the farm gate or at the first point of sale is known as producer price of agricultural products.

APPI is considered as one of the important economic indicators as it not only indicates an early signal of inflationary pressure in the economy before it reaches the consumer, but also records the evolution of prices of agri-products over longer time periods. APPI is also used as deflator to measure the contribution of agriculture sector in the National Accounting particularly Gross Domestic Product (GDP). Hence APPI is a useful tool for both the government and business community of the country like Nepal where Agriculture is the largest contributing sector in the GDP. Hence, CBS initiated to compile APPI since 2070/71 (FY 2013/14) and a series of APPI has been published upto 2072/73 (FY 2015/16).

2. Scope and Coverage

For the compilation of APPI, agricultural sector can be divided into two sub-sectors: (i) farming and (ii) animal husbandry. Further, farming sector can be divided into different groups such as Cereal Crops, Tuber Crops, Legumes/Pulses, Oilseed Crops, Fruit Crops, Vegetable Crops, Spices Crops and Other Crops. Similarly, animal husbandry sector can be classified into livestock, poultry, fish, milk and egg groups. The major products in agriculture are taken into account for the compilation of APPI excluding forestry, fishing, agricultural services and illegal products. A product list consisting of 50 products from farming sector and 8 products from animal husbandry sector is prepared for the calculation of APPI. The products are selected on the basis of their contribution to the economy.

As agricultural products are extremely seasonal products, the APPI measures change in price of variable basket with fixed quarterly weights in the base year. So, products are selected separately for each quarter on the basis of harvesting period. The selected products may not be identical for all quarters. So, separate product list is prepared for each quarter to compile APPI. The product lists for collecting price in first, second, third and fourth quarter consists of 34, 31, 35 and 38 products respectively.

3. Sample Design

The Sample selection for compilation of APPI is purposive sample. The 33 districts where Statistics Offices are located, are selected for the collection of price data. Each statistics office selects five

farmers from different locations of the district at the beginning of the fiscal year to collect farm gate price of selected products.

4. Crop calendar

Statistics Offices collect the producer price of each product for the months of harvesting. For this purpose, a crop calendar is prepared based on the month of harvesting of each selected agricultural product in 33 districts. The Statistics offices collect the information on the harvesting periods of each agricultural product from District Agriculture Development Office. CBS prepares aggregate crop calendar based on the information compiled by Statistics Offices.

5. Weight calculation

Weight refers to the relative importance of the items in the APPI basket in terms of their values. For compilation of APPI, only weight at national level is prepared. Since the value of market production is not available, the total production in value is considered as a proxy in calculation of weights. The production data of agricultural products was compiled from Ministry of Agriculture. Since, the climate of single year may not be favorable for all crops, production of each agricultural product was taken into account for three fiscal years; 2068/69, 2069/70 and 2070/71 and then the average annual production of each product is calculated. On the basis of average annual production, quarterly production is estimated using crop calendar. Further, quarterly production value of each product is calculated by multiplying the average quarterly product by three years average of unit prices of corresponding quarter and hence weight is derived for each quarter separately.

6. Data collection

Statistics offices (SO) in 33 districts collect prices of agricultural products from the selected five farmers residing in different locations of the district to get district representative prices of the selected products. A quarterly questionnaire has been developed based on the product list of each quarter. The selected farmers collect the price monthly, and forward the price to SOs in each quarter. SOs calculate the average price of the products and send to CBS on quarterly basis.

7. Index calculation

APPI is computed using a modified Laspayre's formula. It is a weighted average of price relatives of individual commodity. The steps in compilation of the indices are as follows:

In the first stage, the price relatives (P_1/P_0) of each product in each district is calculated (i.e., the ratio of current year price to the corresponding base year price) based on quarterly average price of the products from 33 districts. Then the average of price relatives is calculated by using geometric mean. The average of price relatives is the price index at product level.

In the second stage, APPI of each group is calculated using following formula.

$$I_j = \frac{\sum_{i=1}^n w_{ij} * PR_{ij}}{\sum_{j=1}^n W_j}$$

Where, I_j = Agricultural producer price index of j^{th} group

w_{ij} = Weight of i^{th} product in j^{th} group

PR^{ij} = Price relatives of i^{th} product in j^{th} group

W_j = Total weight of products in j^{th} group

I = number of products in j^{th} group

j = Number of groups

Finally, overall index of agricultural products is computed as the weighted average of the group index, using the following formula:

$$I_0 = \frac{\sum_{j=1}^n w_j * I_j}{\sum_{j=1}^n w_j}$$

Where,

I_0 = Overall Agricultural producer price index

W_j = weight for j^{th} group

I_j = Agricultural producer price index of j^{th} group

j = Number of groups

8. Frequency of Compilation

The Agricultural Producers' Price Index is compiled at quarterly and annual basis and the preliminary indices are released within two months after data collection. In the subsequent quarter, both the revised indices of the previous quarters and preliminary indices of the current quarter are published.

9. Limitations

APPI has following limitations:

- APPI is prepared for the broad agriculture headings in national level only.
- The price data is collected from five representative farmers from each of the 33 districts that may not be representative for all products in the nation.
- Not all harvested agricultural products could be included in indexation.
- Average prices of products at district level are unweighted.

Annex

Major Agri-Products Included for the compilation of APPI

S.N.	Product name
1	Cereals
1	Wheat
2	Maize
3	Paddy
4	Barley
5	Millet
2	Tubers
1	Potato
3	Leguminous
1	Soyabean
2	Chickpeas
3	Lentil
4	peas
5	Black Gram
4	Oilseed
1	Oilseed
2	Sesame
5	Fruits
1	Banana
2	Mango
3	Guava
4	Litchi
5	Lemon
6	Orange
7	Sweet Orange
8	Apple
9	Pear
6	Vegetables
1	Cabbage
2	Cauliflower
3	Board leaf Mustard
4	Water Melon
5	Sweet Pepper
6	Cucumber
7	Brinjal
8	Tomato
9	Bitter Gourd
10	Pumpkin
11	Bottle Gourd
12	Pointed Gourd
13	Okra
14	Chayote
15	Green peas
16	Cowpea
17	Radish
18	Carrot

S.N.	Product name
7	Spices
1	Garlic
2	Chili
3	Onion
4	Cardamom
5	Ginger
6	Turmeric
8	Other Crops
1	Green tea leaf
2	Sugarcane
3	Jute
4	Tobacco
9	Livestock
1	Buffalo
2	Goat
3	Pig
10	Poultry
1	Chicken (hybrid)
11	Fish
1	Fish
12	Milk
1	Cow milk
2	Buffalo milk
13	Egg
1	Egg(Layers)