

Methodology for Agriwatch (AW) Price Index Computation

Agriwatch, on a daily basis, collects prices and arrivals of most major agricultural commodities and many minor agricultural commodities through a large network of traders established over the last 15 years. For each commodity, prices are collected for all the benchmark mandis (markets) in the country and many important primary and secondary mandis in the key growing regions of each commodity. Benchmark mandis are those markets which are the price setters due to their huge trading volumes. Primary and secondary mandis are closer to the farmers and it is here that farmers bring their produce after harvest. The commodities flow from these mandis to the benchmark mandis for further distribution across the country. The prices and arrivals data collected from all these mandis are validated and cross-checked for accuracy and consistency before being entered into the database.

The Agriwatch Price Index includes 29 Commodities in 9 WPI Groups, with a total weight of 10% in the WPI. The commodities, groups & weights are given in the Appendix.

The data is originally in the form of daily reported Minimum & Maximum prices & Arrivals from a total of over 100 trading centres for more than 150 varieties of the selected commodities. This is converted to weekly indices for individual commodities through the following steps:

Steps in index computation:

- A. Derive daily **price indices** for **each variety of every commodity**, in following steps:
 1. Construct a single “price” variable as the mean of the Minimum & Maximum price
 2. Calculate average (median) prices (& arrivals) over all Centres for each commodity-variety pair at each date
 3. These daily variety prices are then converted to daily indices in the following steps:

- a. Smoothen daily prices, by taking the 5-day moving average of prices—this smoothes out random daily variations in prices
- b. Decide the base date for the indices- we have used the earliest date/period for which the price is available for all varieties. [In the report, this is the year 2014]
- c. Calculate the price index for each variety as the ratio (percent) of the smoothed daily price to the base price (the price on the base date). i.e., if the base period is t=0, the index for variety j for date s is

$$I_{js} = 100 \times (P_{js} / P_{j0})$$

where P_{js} is the price of variety j at date s, and P_{j0} is its price on the base date

- B. Derive the index for each **commodity**, as the average (mean/median) of the variety indices on each date.
- C. Derive the weekly index for each commodity as the average (median) of the daily indices (median is generally preferable as it is free from extreme values).

In the next stage, Group indices are calculated for the various commodity groups, as weighted averages of the commodity indices. Conceptually the weights should be “value weights”, i.e., the weight for the j-th commodity, w_j , should be the ratio of its “value” to the total value, i.e.,

$$w_j = p_j q_j / \sum p_i q_i$$

where p_j & q_j are the price & quantity associated with commodity j and $\sum p_i q_i$ is the total value of all commodities in the relevant group. Now the quantity used could be the total quantity traded in wholesale markets (this approximates most closely to the weights in the WPI¹), the quantity purchased by the average consumer (used for the CPI) etc.

For our index, which is intended as a producer/trader price index, currently we are using the WPI weights for deriving our Group indices².

Finally, we combine the WPI data with our indices & compare. [The WPI numbers are rescaled, via splicing, to have a base that matches our base date-i.e., 2014=100]

1 See e.g., ‘Manual On Compilation Of Index Number Of Wholesale Prices In India’

2 Ideally, we would use the Arrival quantities in our data to derive value weights, but currently there are gaps in this information. As an alternative, we are also developing an index based on estimates of annual production.

APPENDIX

TABLE 1 WPI GROUPS

WPI Group	Actual Group WPI weight	Combined Group WPI weight (Included commodities)
CEREALS	3.37	3.13
PULSES	0.72	0.72
VEGETABLES	1.74	0.38
CONDIMENTS & SPICES	0.57	0.35
FIBRES	0.88	0.70
OIL SEEDS (OIL CAKES)	1.78	0.71
OTHER NON-FOOD ARTICLES	1.39	0.21
SUGAR, KHANDSARI & GUR	2.09	1.81
EDIBLE OILS	3.04	1.99
Total Weight	15.57	10.00

The Groups are mostly from the Food & Non-Food group in the Primary Commodities, except for OIL SEEDS (OIL CAKES), SUGAR, KHANDSARI & GUR, and EDIBLE OILS from the Manufactured Products Group

TABLE 2 COMMODITIES IN AGRIWATCH INDEX

S. No.	WPI Group	Commodity Name	COMMODITY/GROUP_NAME in WPI	Weight in WPI	WPI CODE
1	CEREALS	Rice	Rice	1.79	1101010101
2	CEREALS	Maize	Maize	0.22	1101010105
3	CEREALS	Wheat	Wheat	1.12	1101010102
4	PULSES	Tur	Arhar	0.14	1101010202
5	PULSES	Chana	Gram	0.33	1101010201
6	PULSES	Urad	Urad	0.10	1101010205
7	PULSES	Moong	Moong	0.08	1101010203
8	PULSES	Masur	Masur	0.06	1101010204
9	VEGETABLES	Potato	Potato	0.20	1101020101
10	VEGETABLES	Onion	Onion	0.18	1101020103
11	CONDIMENTS & SPICES	Black Pepper	Black Pepper	0.03	1101050001
12	CONDIMENTS & SPICES	Turmeric	Turmeric	0.08	1101050003
13	CONDIMENTS & SPICES	Cumin	Cummin	0.04	1101050007
14	CONDIMENTS & SPICES	Cardamom	Cardamom	0.02	1101050004
15	CONDIMENTS & SPICES	Red Chilli	Chillies(Dry)	0.16	1101050002
16	CONDIMENTS & SPICES	Coriander	Corriander	0.02	1101050009
17	FIBRES	Cotton	Raw Cotton	0.70	1102010001
18	OIL SEEDS	Soybean	Soyabean	0.37	1102020011
19	OIL SEEDS	Rapeseed	Rape & Mustard Seed	0.34	1102020002
20	OTHER NON-FOOD ARTICLES	Guar	Gaur Seed	0.05	1102030006
21	OTHER NON-FOOD ARTICLES	Rubber	Raw Rubber	0.16	1102030007
22	SUGAR, KHANDSARI & GUR	Sugar	Sugar	1.74	1301050001
23	SUGAR, KHANDSARI & GUR	Gur (Jaggery)	Gur	0.08	1301050002
24	EDIBLE OILS	Rapeseed Oil	Mustard & Rapeseed Oil	0.45	1301060006
25	EDIBLE OILS	Cottonseed oil	Cotton Seed Oil	0.26	1301060005
26	EDIBLE OILS	Sunflower Oil	Sunflower Oil	0.17	1301060009
27	EDIBLE OILS	Groundnut Oil	Groundnut Oil	0.30	1301060002
28	EDIBLE OILS	Palm Oil	Palm Oil	0.42	1301060003
29	EDIBLE OILS	Soy Oil	Soyabean Oil	0.38	1301060007