Respirer Living Sciences

# Assessing Food Price Dynamics through the Balanced Diet Consumer Index

## Why this study of food prices?

- Analysing food prices is crucial in addressing financial and health issues.
- By understanding the impact on different population segments, policymakers and stakeholders can develop policies to stabilise prices and ensure food security.
- Data-driven insights can guide the creation of policies that protect vulnerable populations from price shocks.
- Identifying inefficiencies and opportunities in the agricultural supply chain can lead to better resource management and increased productivity.
- By monitoring and controlling food prices, steps can be taken to ensure that all sections of society have access to affordable and nutritious food, thereby improving overall public health.
- Stabilising food prices can help reduce the financial burden on the poorest households, enabling them to allocate resources to other critical areas and break the cycle of poverty.

## Data Sources and Objective

- The data for food prices was obtained from the website of the Department of Consumer Affairs (DCA): https://fcainfoweb.nic.in/reports/Report_Menu_Web.aspx and available for analysis at: https://atlasaq.respirer.in/map.
- To build an index named Balanced Diet Consumer Index (BDCI).
- Helps producers set fair prices based on market trends.
- Provides insights into consumer demand for balanced diet components.
- Enables consumers to make informed decisions regarding their food purchases.
- Assists consumers in planning their food budget to maintain a balanced diet.
- Evaluates the accessibility and affordability of a balanced diet for various populations.

## Methodology and Data

- Daily food price data from all Indian states for the period 1st Jan 2018 – 30th June 2024 was collected with the help of https://atlasaq.respirer.in/map.
- The breakdown for balanced diet is:

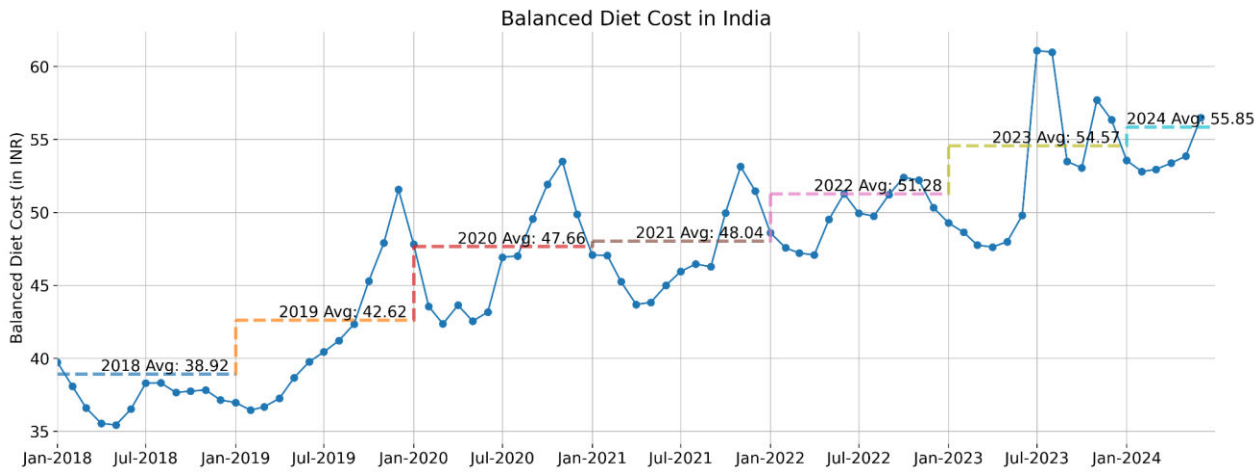
| Food | Quantity (grams or ml) |
|---|---|
| Nuts and seeds | 35 |
| Fats and oils | 27 |
| Milk/curd | 300 |
| Pulses and legumes | 85 |

| | |
|---|---|
| Fish and flesh foods | 30 |
| Cereals and nutri-cereals | 250 |
| Vegetables | 400 |
| Salt | 5 |
| Sugar | 25 |
| Fruits | 100 |

- The crops were grouped as per the following categories

| **Category** | **Crops in the category** |
|---|---|
| Cereals and nutri-cereals | Rice, Wheat, Atta (Wheat) |
| Milk/curd | Milk |
| Pulses and legumes | Gram Dal, Tur/Arhar Dal, Urad Dal, Moong Dal, Masoor Dal |
| Fats and oils | Groundnut Oil, Mustard Oil, Vanaspati (Ghee), Soya Oil, Sunflower Oil, Palm Oil |
| Salt | Salt |
| Sugar | Sugar |
| Vegetables | Potato, Onion, Tomato |

$$\text{Balanced diet cost} = \text{Sum}(\text{weightage of category in the BD} \times \text{average cost of foods in the category})$$



The increase in Balanced Diet cost in the periods **June 2022 to June 2023 and June 2023 to June 2024** are as following:

| | June 2022 & June 2023 | | | | June 2023 & June 2024 | | | |
|---|---|---|---|---|---|---|---|---|
| **Rank** | **States/UTs** | **Balance Diet cost in June 2022** | **Balance Diet cost in June 2023** | **% Increase** | **States/UTs** | **Balance Diet cost in June 2023** | **Balance Diet cost in June 2024** | **% Increase** |
| **1** | Goa | 53.53 | 56.71 | 5.94 | DNH and DD | 49.75 | 62.73 | 26.10 |
| **2** | Gujarat | 48.58 | 50.34 | 3.62 | Maharashtra | 50.83 | 61.13 | 20.27 |
| **3** | Telangana | 52.42 | 53.24 | 1.56 | Karnataka | 50.48 | 59.94 | 18.75 |
| **4** | Chandigarh | 48.07 | 48.68 | 1.28 | Telangana | 53.24 | 61.29 | 15.13 |
| **5** | Nagaland | 62.83 | 63.58 | 1.20 | Odisha | 47.60 | 54.75 | 15.01 |
| **6** | Himachal Pradesh | 48.28 | 48.29 | 0.02 | Gujarat | 50.34 | 57.87 | 14.96 |
| **7** | West Bengal | 49.87 | 49.78 | -0.17 | Chhattisgarh | 49.36 | 56.64 | 14.74 |
| **8** | Andhra Pradesh | 55.19 | 54.79 | -0.73 | Chandigarh | 48.68 | 55.51 | 14.04 |
| **9** | Uttar Pradesh | 48.90 | 48.52 | -0.76 | Goa | 56.71 | 64.56 | 13.84 |
| **10** | Assam | 54.73 | 54.27 | -0.85 | Punjab | 46.67 | 52.96 | 13.49 |

The list for the complete rankings for the % increase in June: June increases.xlsx

The Balanced Diet cost was plotted for all the states across different timeframes.

Here's a folder of graphs that contain the **daily** Balance Diet prices plotted for every state:
Daily BD Cost Plots

Here's a folder of graphs that contain the **monthly-averaged** Balance Diet prices plotted for every state:
Monthly BD Cost Plots

Here's a folder of graphs that contain the **yearly-averaged** Balance Diet plotted for every state:
Yearly BD Cost Plots

Here's a folder of rankings based on BD Cost: BD Cost Rankings

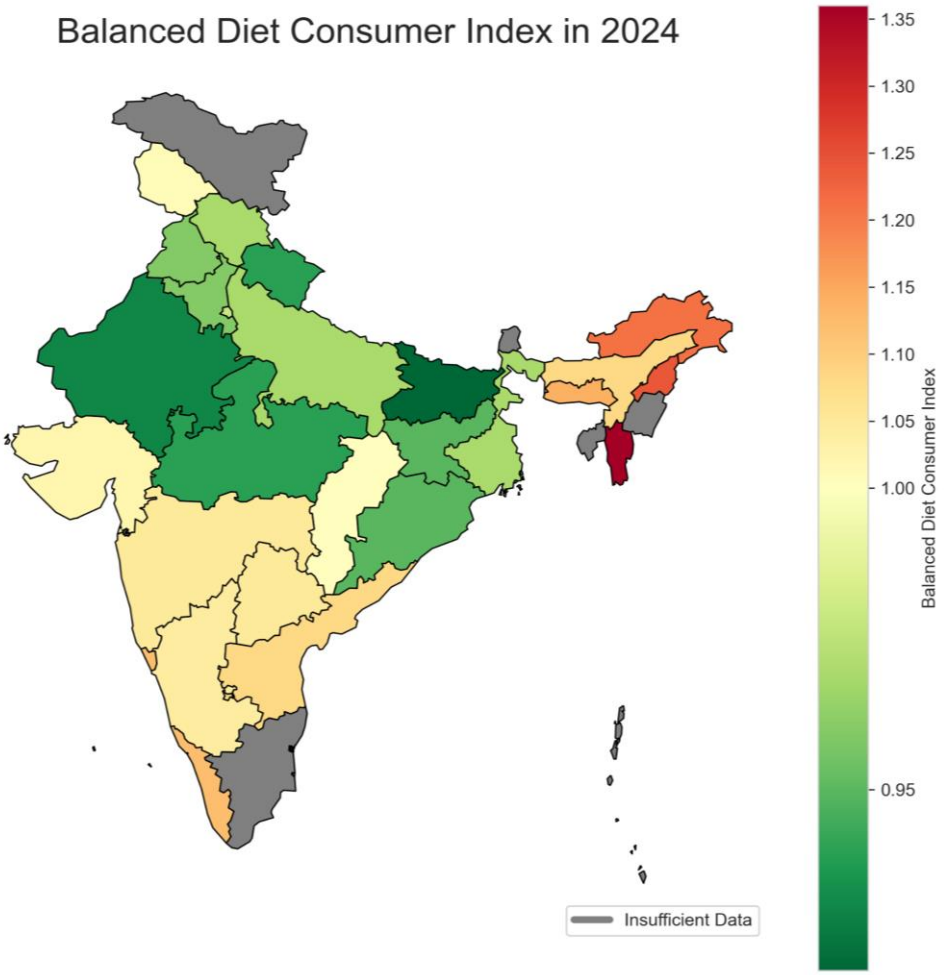
## What is Balanced Diet Consumer Index (BDCI)?

- Balance Diet Consumer Index is a numeric score that tracks the performance of a particular location with respect to the overall average of the country in terms of Balance diet prices. The range for the index is (0, ∞).
- This formula can be used to calculate the BDCI:

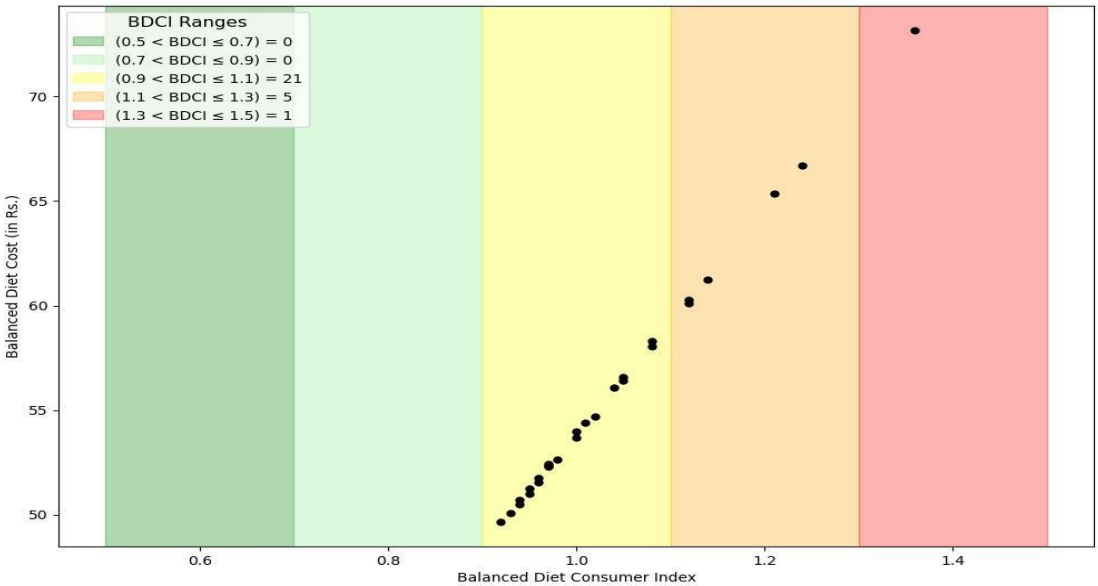
$$\mathrm{BDCI}_{2024} = \frac{\text{cost in 2024}}{\text{national average in 2024}}$$

It's basically the ratio of the cost of a balanced diet in any given year divided by the national average cost of a balanced diet for that given year.

- Summarises overall food price changes over time.
- Helps gauge market trends and inflation.
- Identifies patterns, anomalies, or disparities in food prices.
- Helps develop policies to stabilise prices.
- Guides policy-making to control food price inflation.
- Maintains transparency and accountability in the food supply chain.
- Helps consumers make informed food purchase decisions.
- Low-Income Households: Determines the need for subsidies or financial aid.
- Middle-Income Households: Manages food costs effectively without compromising on nutritional standards
- High-Income Households: Understands market trends for investment decisions and identifies areas for financial support or donations.



**Distribution of States in different Zones of BDCI in 2024**




The state in the red zone is Mizoram, with a BDCI of 1.36 (BD cost = 73.18). The five states in the orange zone are Nagaland, Arunachal Pradesh, Meghalaya, Goa, and Kerala, with BDCIs of 1.24, 1.21, 1.14, 1.12, and 1.12, respectively. This indicates that the North-Eastern states are highly affected by food price inflation, likely due to climate conditions and supply chain disruptions.

| BDCI Rank | 2023 | | | 2024 | | |
|---|---|---|---|---|---|---|
| | States/UTs | Balance Diet Cost | BDCI | States/UTs | Balance Diet Cost | BDCI |
| 1 | Mizoram | 70.31 | 1.33 | Mizoram | 73.18 | 1.36 |
| 2 | Nagaland | 66.11 | 1.25 | Nagaland | 66.72 | 1.24 |
| 3 | Meghalaya | 61.48 | 1.16 | Arunachal Pradesh | 65.35 | 1.21 |
| 4 | Goa | 57.89 | 1.1 | Meghalaya | 61.23 | 1.14 |
| 5 | Tamil Nadu | 57.8 | 1.09 | Goa | 60.29 | 1.12 |
| 6 | Manipur | 57.26 | 1.08 | Kerala | 60.12 | 1.12 |
| 7 | Assam | 57.07 | 1.08 | Andhra Pradesh | 58.29 | 1.08 |
| 8 | Andhra Pradesh | 56.58 | 1.07 | Assam | 58.05 | 1.08 |
| 9 | Telangana | 55.87 | 1.06 | DNH and DD | 57.35 | 1.07 |
| 10 | DNH and DD | 54.86 | 1.04 | Telangana | 56.59 | 1.05 |

Here's a folder of rankings based on BDCI: [BDCI Rankings]

# Sources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