

## Parameters for Performance Review of Commodity

### GUAR GUM

#### 1. Background

##### a. Brief about the commodity such as sample picture, lifecycle and various varieties/grade of the commodity found in India

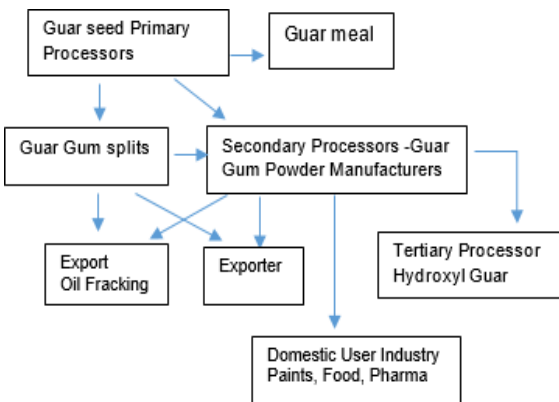
Guar gum is a processed product derived from Guar seed which is a legume crop. Guar processing is usually a two-stage process. The first stage of processing involves conversion of Guar seed into Guar gum (Splits). Guar meal (Churi and Korma) is produced as a by-product during this stage. The second stage of processing involves the conversion of Guar gum (Splits) into Guar gum powder (Guar gum treated and pulverized). Scientifically, Guar seed comprises three parts: the seed coat (14-17%), the endosperm (35-42%), and the germ (43-47%). It is from the endosperm that guar gum is derived, which is the prime marketable product of the plant. Guar Gum is a natural high molecular weight polysaccharide composed of galactose and mannose units combined through glycosidic linkages.



Guar gum has wide ranged industrial applications; the major one being that in oil drilling industry. Guar Gum is used as a controlling agent in oil wells to facilitate drilling and prevent fluid loss. Guar gum is the source of a natural hydrocolloid, which is cold- water soluble and forms a thick solution at low concentrations. Guar gum is used as a thickening and binding agent in the food, textile, finishing, printing, paper, pharmaceutical and oil industry. Highly refined guar gum is used in the food industry as a stabilizer in ice creams, as a meat binder and a stabilizer for cheeses, instant puddings and whipped cream substitutes. Guar gum is used in industrial applications including cloth and paper manufacture, oil well drilling, explosives, ore flotation, and many other applications.

Crop Cycle:

Guar gum is a processed commodity. The crop cycle is not applicable for it.

| Life Cycle: Value Chain of the Commodity  | Major Varieties / Grades  |                           |            |         |             |                   |        |   |             |                  |             |                  |              |          |    |   |              |
|---|---|---------------------------|------------|---------|-------------|-------------------|--------|---|-------------|------------------|-------------|------------------|--------------|----------|----|---|--------------|
|  <pre> graph TD     A[Guar seed Primary Processors] --&gt; B[Guar meal]     A --&gt; C[Guar Gum splits]     C --&gt; D[Secondary Processors -Guar Gum Powder Manufacturers]     D --&gt; E[Export Oil Fracking]     D --&gt; F[Exporter]     D --&gt; G[Tertiary Processor Hydroxyl Guar]     D --&gt; H[Domestic User Industry<br/>Paints, Food, Pharma] </pre> | <p>Major Varieties:<br/>Not applicable as it is a processed commodity.</p> <p>NCDEX: Important Quality Parameters</p> <table border="1"> <tr> <td>Residue insoluble in Acid</td><td>3.00%(Max)</td></tr> <tr> <td>Protein</td><td>5.00% (Max)</td></tr> <tr> <td>Undehusked Splits</td><td>10.00%</td></tr> <tr> <td>Black, dark red and brown coloured splits</td><td>1.00% (Max)</td></tr> <tr> <td>Through 14" mesh</td><td>3.00% (Max)</td></tr> <tr> <td>Through 20" mesh</td><td>0.10%(Basis)</td></tr> <tr> <td>Moisture</td><td>8%</td></tr> <tr> <td>Foreign Particles (all non-gum particles)</td><td>0.30%(Basis)</td></tr> </table> | Residue insoluble in Acid | 3.00%(Max) | Protein | 5.00% (Max) | Undehusked Splits | 10.00% | Black, dark red and brown coloured splits | 1.00% (Max) | Through 14" mesh | 3.00% (Max) | Through 20" mesh | 0.10%(Basis) | Moisture | 8% | Foreign Particles (all non-gum particles) | 0.30%(Basis) |
| Residue insoluble in Acid   | 3.00%(Max)  |                           |            |         |             |                   |        |   |             |                  |             |                  |              |          |    |   |              |
| Protein   | 5.00% (Max)   |                           |            |         |             |                   |        |   |             |                  |             |                  |              |          |    |   |              |
| Undehusked Splits   | 10.00%  |                           |            |         |             |                   |        |   |             |                  |             |                  |              |          |    |   |              |
| Black, dark red and brown coloured splits   | 1.00% (Max)   |                           |            |         |             |                   |        |   |             |                  |             |                  |              |          |    |   |              |
| Through 14" mesh  | 3.00% (Max)   |                           |            |         |             |                   |        |   |             |                  |             |                  |              |          |    |   |              |
| Through 20" mesh  | 0.10%(Basis)  |                           |            |         |             |                   |        |   |             |                  |             |                  |              |          |    |   |              |
| Moisture  | 8%  |                           |            |         |             |                   |        |   |             |                  |             |                  |              |          |    |   |              |
| Foreign Particles (all non-gum particles)   | 0.30%(Basis)  |                           |            |         |             |                   |        |   |             |                  |             |                  |              |          |    |   |              |

**Table: Reference Years for Commodities**

| Sl. No.                                 | A   | B  | C  |
|---|---|--|--|
| Crop Season                             | Kharif  | Kharif<br>(Long Duration crop)   | Rabi   |
| Crops                                   | Paddy, Maize, Bajra, Moong, Soybean, Guar seed, Kapas, Sesame Seed                        | Castor seed and Turmeric   | Wheat, Barley, Chana, RM Seed, Coriander, Jeera  |
| Relevant Processed commodities          | Guar gum, Soybean meal, Soy oil, Cotton, Cotton seed Oil cake, Gur, CPO                   | Castor Oil   | -  |
| Sowing Time                             | July onwards  | July onwards   | October onwards  |
| Harvesting Time                         | Oct onwards   | Jan onwards  | March onwards  |
| <b>Reference Year</b>                   |   |  |  |
| <b>Financial Year 2022-23 (Apr-Mar)</b> |   |  |  |
| <b>Corresponding Years</b>              |   |  |  |
| Production Year (PY)                    | 2022-23 (July-Sept)   | 2021-22 (July-June)  | 2021-22 (July-June)  |
| Marketing Year (MY)                     | 2022-23 (Oct-Sept)  | 2022-23 (Jan/Feb-Dec/Jan)  | 2022-23 (Mar/Apr - Feb/Mar)  |
| Calendar Year (CY)                      | 2022 (Jan-Dec)  | 2022 (Jan-Dec)   | 2022 (Jan-Dec)   |
| Relationship b/w Various Years          | Current Financial Year = Current Production Year = Current Marketing Year = Calendar Year | Current Financial Year = Previous Production Year = Current Marketing Year = Current Calendar Year | Current Financial Year = Previous Production Year = Current Marketing Year = Current Calendar Year |
| Example                                 | FY 2022-23= PY 2022-23= MY 2022-23= CY 2022   | FY 2022-23= PY 2021-22 = MY 2022-23= CY 2022   | FY 2022-23= PY 2021-22 = MY 2022-23= CY 2022   |

Note: Coffee is a plantation crop; hence, it is not classified under either Kharif or Rabi season in the above table.

**Explanatory Notes:**

- India is a vast country and various crops are sown and harvested at different point of time. However, two major crop seasons, are there i.e. Kharif & Rabi. Apart from it, Zaid/Summer season is also there.
- Crop seasons are classified based upon sowing time. Normally Kharif season sowing starts from mid-June/July and new crop arrivals begin from Oct/Nov. However, early/late sowing/harvesting also takes place. Rabi season sowing usually takes place mainly from October/November and harvesting starts from March/April. Early/late sowing/harvesting also takes place. Summer crops/Zaid crops are short duration crops mainly sown during January-March and harvested during April-June.
- “Production Year” is considered as “July to June”. With the start of monsoon rains during June/July the sowing of Kharif season starts and they are harvested during Sept/Oct. From Oct onwards the sowing of Rabi season crops starts and harvesting usually takes place during March/April. Thus, a single production cycle completes between July-Sept period covering Kharif, Rabi and Zaid crops. Thus production year remains same for all season crops and the period corresponds to July-Sept.
- “Marketing Year” for each crops starts from beginning of the harvest time i.e. from start of new crop produce arrivals in the market. Thus, for Kharif crops Marketing Year is generally considered as “October to September”, while for Rabi crops Marketing Year is considered as “April to March”. However, Marketing Year may vary slightly for some of the crops depending upon early/late maturity/harvesting.

- For processed commodities, their production starts after the start of new season crop arrivals of their underlying crop.

**b. Commodity fundamentals and balance sheet as per the following format (to be prepared based on publicly available information on best effort basis):**

Table - Fundamentals & Balance sheet (quantity)

| (In Lakh MT)         |                        |                       |
|----------------------|------------------------|-----------------------|
| Global Scenario      | Previous FY (2021-22)* | Current FY (2022-23)* |
| Opening Stocks       | NA                     | NA                    |
| Production           | NA                     | NA                    |
| Imports              | 2.48                   | NA                    |
| Total Supply         | NA                     | NA                    |
| Exports              | 3.31                   | NA                    |
| Domestic Consumption | NA                     | NA                    |
| Closing Stocks       | NA                     | NA                    |

Source: UN Comtrade; HS codes used is 130232 (It is inclusive of Guar gum as well as other derivatives)

NA: Data is not available in the public domain;

\*Data is not available as per financial year. It is provided as per Calendar Year (Jan-Dec)

| (In Lakh MT)         |                       |                      |
|----------------------|-----------------------|----------------------|
| Indian Scenario      | Previous FY (2021-22) | Current FY (2022-23) |
| Opening Stocks       | NA                    | NA                   |
| Production           | 3.36                  | 5.94^                |
| Imports              | NA                    | NA                   |
| Total Supply         | NA                    | NA                   |
| Exports              | 3.81                  | 4.40                 |
| Domestic Consumption | 4.23                  | 4.89                 |
| Closing Stocks       | NA                    | NA                   |

Source: Guar Gum Production is back calculated based on Guar seed production considering Guar gum recovery is 30% of the Seed.

^: Data is Provisional and subject to further revision.

Total Consumption figures for Guar Gum are back calculated assuming that Guar Gum Exports (Refined Split + Treated and Pulverized) are 90% of total domestic consumption.

India does not import Guar Gum. For 2021-22, export data is for period Apr 2021 to March 2022. For 2022-23, export data is for period April 2022 to February 2023.

Export: Ministry of Commerce; HS codes used are Guar gum refined split (HS code: 13023220 and 7139010), Treated & pulverized Guar gum (HS code: 13023230)

| (In Lakh MT) |                                  |             |            |                                  |             |            |
|--------------|----------------------------------|-------------|------------|----------------------------------|-------------|------------|
| Rank         | Top 10 Major Producing Countries |             |            | Top 10 Major Consuming Countries |             |            |
|              | Country                          | Previous FY | Current FY | Country                          | Previous FY | Current FY |
|              | NA                               |             |            | NA                               |             |            |

NA: Data is not available in public domain.

As per market feedback, India is the largest producer of Guar gum in the world, which accounts for 80-85% of the world production followed by Pakistan.

(In Lakh Tonnes)

| Rank | Top 10 Major Exporting Countries |                       |                      | Top 10 Major Importing Countries |                       |                      |
|------|----------------------------------|-----------------------|----------------------|----------------------------------|-----------------------|----------------------|
|      | Country                          | Previous FY (2021-22) | Current FY (2022-23) | Country                          | Previous FY (2021-22) | Current FY (2022-23) |
| 1    | India                            | 2.41                  | NA                   | Germany                          | 0.32                  | 0.37                 |
| 2    | Pakistan                         | 0.30                  | NA                   | China                            | 0.27                  | 0.32                 |
| 3    | Spain                            | 0.11                  | NA                   | Canada                           | 0.07                  | 0.12                 |
| 4    | Italy                            | 0.11                  | NA                   | Australia                        | 0.07                  | 0.11                 |
| 5    | USA                              | 0.09                  | NA                   | Italy                            | 0.07                  | 0.08                 |
| 6    | Germany                          | 0.08                  | NA                   | United Kingdom                   | 0.10                  | 0.08                 |
| 7    | Netherlands                      | 0.06                  | NA                   | France                           | 0.05                  | 0.08                 |
| 8    | China                            | 0.03                  | NA                   | Japan                            | 0.06                  | 0.07                 |
| 9    | Switzerland                      | 0.03                  | NA                   | Netherlands                      | 0.09                  | 0.05                 |
| 10   | Denmark                          | 0.02                  | NA                   | Denmark                          | 0.05                  | 0.05                 |
|      | Others                           | 0.08                  | NA                   | Others                           | 1.33                  | 0.34                 |
|      | World                            | 3.31                  | NA                   | World                            | 2.48                  | 1.66                 |

Source: UN Comtrade; HS codes used is 130232 (It is inclusive of Guar gum as well as other derivatives).NA: Data is not available in the public domain

Data is not available as per financial year. It is provided as per Calendar Year (CY) (Jan-Dec);

Countries are arranged in descending order based on the data in the Current Year;

(In Lakh MT)

| Top 10 Major producing states in India |        |             |            |
|--|--------|-------------|------------|
| Rank                                   | States | Previous FY | Current FY |
|  | NA     | NA          | NA         |

NA: Data is not available in the public domain.

It is a processed commodity. Thus, no such categorization is applicable for this commodity.

### c. Major changes in the policies governing trade in the spot markets of the commodity (FY 2022-23)

| Date | Major Policies Governing Trade and related Changes             |
|------|--|
| -    | No Guar gum specific policy change was there during FY 2022-23 |

### d. Geo political issues in the commodity and its impact on Indian scenario (FY 2022-23)

| Date | Event  | Key Details | Key Implications/Impact |
|------|--|-------------|-------------------------|
|      | No Guar gum specific geo-political issue was there during FY 2022-23 | NA          | NA                      |

NA: Not Applicable

## 2. Trading related parameter

### a. Monthly and Annual traded volume (quantity in appropriate units)

| Month  | Year | Symbol   | Traded volume (MT) |
|--|------|----------|--------------------|
| Apr  | 2022 | GUARGUM5 | 405                |
| May  | 2022 | GUARGUM5 | 270                |
| June   | 2022 | GUARGUM5 | -                  |
| July   | 2022 | GUARGUM5 | -                  |
| August   | 2022 | GUARGUM5 | -                  |
| September  | 2022 | GUARGUM5 | -                  |
| October  | 2022 | GUARGUM5 | -                  |
| November   | 2022 | GUARGUM5 | -                  |
| December   | 2022 | GUARGUM5 | -                  |
| January  | 2023 | GUARGUM5 | -                  |
| February   | 2023 | GUARGUM5 | -                  |
| March  | 2023 | GUARGUM5 | -                  |
| Annual Traded Volume (MT) (April'22 to March'23) |      |          | 675                |

### b. Annual traded volume as proportion of total deliverable supply (quantity in appropriate units)

| Symbol   | Traded Volume (MT) | Deliverable Supply( MT) | Proportion |
|----------|--------------------|-------------------------|------------|
| GUARGUM5 | 675                | 594,000                 | 0.0        |

### c. Annual traded volume as proportion of total annual production (quantity in appropriate units)

| Symbol   | Traded volume (MT) | Production( MT) | Proportion |
|----------|--------------------|-----------------|------------|
| GUARGUM5 | 675                | 594,000         | 0.00       |

### d. Annual average Open interest as proportion of total production

| Symbol   | Average Open Interest (MT) | Production( MT) | Proportion |
|----------|----------------------------|-----------------|------------|
| GUARGUM5 | 33.25                      | 594,000         | 0.00       |

### e. Annual average Open interest as proportion of total deliverable supply

| Symbol   | Average Open Interest (MT) | Deliverable supply( MT) | Proportion |
|----------|----------------------------|-------------------------|------------|
| GUARGUM5 | 33.25                      | 594,000                 | 0.00       |

### f. Monthly and Annual value of trade (in Rs. Crores)

| Month  | Year | Symbol   | Traded value (in Rs. Crores) |
|--|------|----------|------------------------------|
| Apr  | 2022 | GUARGUM5 | 5.92                         |
| May  | 2022 | GUARGUM5 | 3.94                         |
| June   | 2022 | GUARGUM5 | -                            |
| July   | 2022 | GUARGUM5 | -                            |
| August   | 2022 | GUARGUM5 | -                            |
| September  | 2022 | GUARGUM5 | -                            |
| October  | 2022 | GUARGUM5 | -                            |
| November   | 2022 | GUARGUM5 | -                            |
| December   | 2022 | GUARGUM5 | -                            |
| January  | 2023 | GUARGUM5 | -                            |
| February   | 2023 | GUARGUM5 | -                            |
| March  | 2023 | GUARGUM5 | -                            |
| Annual Traded Volume (in Rs Crores) (April'22 to March'23) |      |          | 9.86                         |

**g. Monthly and Annual quantity of delivery (in appropriate units)**

| Expiry Month   | Year | Symbol   | Total Delivery (in MT) |
|--|------|----------|------------------------|
| April  | 2022 | GUARGUM5 | -                      |
| May  | 2022 | GUARGUM5 | -                      |
| June   | 2022 | GUARGUM5 | -                      |
| July   | 2022 | GUARGUM5 | -                      |
| August   | 2022 | GUARGUM5 | -                      |
| September  | 2022 | GUARGUM5 | -                      |
| October  | 2022 | GUARGUM5 | -                      |
| November   | 2022 | GUARGUM5 | -                      |
| December   | 2022 | GUARGUM5 | -                      |
| January  | 2023 | GUARGUM5 | -                      |
| February   | 2023 | GUARGUM5 | -                      |
| March  | 2023 | GUARGUM5 | -                      |
| Annual value of delivery (in MT) (April'22 to March'23) (April'22 to March'23) |      |          | -                      |

**h. Monthly and Annual value of delivery (in Rs. Crores)**

| Expiry Month  | Year | Symbol   | Total Delivery Value (in Cr) |
|---|------|----------|------------------------------|
| April   | 2022 | GUARGUM5 | -                            |
| May   | 2022 | GUARGUM5 | -                            |
| June  | 2022 | GUARGUM5 | -                            |
| July  | 2022 | GUARGUM5 | -                            |
| August  | 2022 | GUARGUM5 | -                            |
| September   | 2022 | GUARGUM5 | -                            |
| October   | 2022 | GUARGUM5 | -                            |
| November  | 2022 | GUARGUM5 | -                            |
| December  | 2022 | GUARGUM5 | -                            |
| January   | 2023 | GUARGUM5 | -                            |
| February  | 2023 | GUARGUM5 | -                            |
| March   | 2023 | GUARGUM5 | -                            |
| Annual value of delivery (in Crores) (April'22 to March'23) |      |          | -                            |

**i. Monthly and Annual Average Open Interest (OI) (in appropriate units)**

| Month   | Year | Symbol   | Average Open Interest (MT) |
|---|------|----------|----------------------------|
| Apr   | 2022 | GUARGUM5 | 282.89                     |
| May   | 2022 | GUARGUM5 | 141.43                     |
| June  | 2022 | GUARGUM5 | -                          |
| July  | 2022 | GUARGUM5 | -                          |
| August  | 2022 | GUARGUM5 | -                          |
| September                                     | 2022 | GUARGUM5 | -                          |
| October                                       | 2022 | GUARGUM5 | -                          |
| November                                      | 022  | GUARGUM5 | -                          |
| December                                      | 2022 | GUARGUM5 | -                          |
| January                                       | 2023 | GUARGUM5 | -                          |
| February                                      | 2023 | GUARGUM5 | -                          |
| March   | 2023 | GUARGUM5 | -                          |
| Annual Average OI (MT) (April'22 to March'23) |      |          | 33.25                      |

**j. Annual average volume to open interest ratio**

0.08

**k. Total number of unique members and clients who have traded during the financial year**

| Symbol   | Member Count | Client Count |
|----------|--------------|--------------|
| GUARGUM5 | 3            | 4            |

**l. Ratio of open interest by FPOs/farmers/Hedge/VCP positions to total open interest (Annual average as well as maximum daily value)**

|                     |       |
|---------------------|-------|
| Annual Average      | N/A   |
| Maximum Daily Value | 0.00% |

**m. Number of unique FPOs / farmers and VCPs/hedgers who traded in the financial year**

| Commodity | Count |
|-----------|-------|
| GUARGUM5  | -     |

Commodity wise client categorization is as per category details as provided by the members.

**n. Algorithmic trading as percentage of total trading**

| Commodity | %  |
|-----------|----|
| GUARGUM5  | 0% |

**o. Delivery defaults**

|                     |   |
|---------------------|---|
| Number of instances | 0 |
| Quantity involved   | 0 |
| Value involved      | 0 |

**3. Price Movements**
**a. Comparison, correlation and ratio of standard deviation of Exchange futures price vis-à-vis international futures price (wherever relevant comparable are available).**

NA

**b. Comparison, correlation and ratio of standard deviation of Exchange futures price vis-à-vis international spot price (wherever relevant comparable are available) and domestic spot price (exchange polled price).**

NA

**c. Correlation between exchange futures & domestic spot prices along with ratio of standard deviation.**

| Correlation |          |      |       |
|-------------|----------|------|-------|
|             | Futures  | Spot | Mandi |
| Futures     | 1        | -    | -     |
| Spot        | 0.723837 | 1    | -     |
| Mandi       | -        | -    | -     |

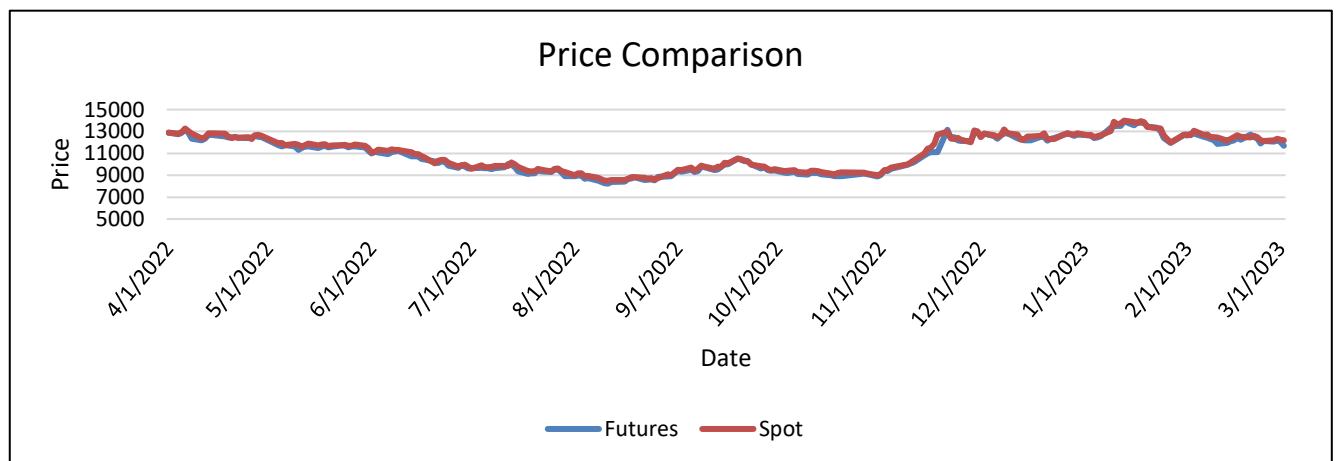
| Standard Deviation |          |          |       |
|--------------------|----------|----------|-------|
|                    | Futures  | Spot     | Mandi |
| Futures            | 1        | 0.991033 | -     |
| Spot               | 1.009048 | 1        | -     |
| Mandi              | -        | -        | -     |

**d. Correlation between international futures & international spot prices along with ratio of standard deviation (wherever relevant comparable are available).**

NA

**e. Comparison of Exchange polled price and mandi price (in case of agricultural commodities) /other relevant price (in case non-agricultural commodities) at basis centre.**

As Guar gum is a processed commodity mandi prices for the same are not available



Source: Spot and Future Prices: NCDEX

**f. Maximum & Minimum value of daily futures price volatility and spot price volatility along with disclosure of methodology adopted for computing the volatility. (Volatility calculated by Square root of Standard Deviation of daily returns for the period from 1 April 2022 to 31 March 2023)**

Value of daily futures price volatility (April 2022- March 2023)

| Volatility | Month | Value |
|------------|-------|-------|
| Max        | Nov   | 0.030 |
| Min        | Oct   | 0.012 |

Value of daily Spot price volatility (April 2022- March 2023)

| Volatility | Month | Value |
|------------|-------|-------|
| Max        | Nov   | 0.031 |
| Min        | Oct   | 0.011 |



**g. Number of times the futures contract was in backwardation/ contango by more than 4% for the near month contract in the period under review**

|               |   |
|---------------|---|
| Contango      | 3 |
| Backwardation | 0 |

#### 4. Others parameters

- a. Qualitative and quantitative measure for Hedge effectiveness ratio and basis Risk (Volatility of Basis) along with disclosure of methodology adopted for such calculations

|                  |          |
|------------------|----------|
|                  | GUARGUM5 |
| Basis Volatility | 7.24     |
| Hedge efficiency | 0.77     |

The methodology for hedge efficiency ratio calculation is appended as Annexure 1

- b. Details about major physical markets of the commodity vis-à-vis market reach in terms of availability of delivery centers (information to be provided state-wise and UT-wise).

| State     | Major Physical Markets | Availability of NCDEX Delivery center |
|-----------|------------------------|---------------------------------------|
| Rajasthan | Jodhpur                | Basis Center                          |
|           | Bikaner                | ADC                                   |
|           | Sri Ganganagar         | ADC                                   |
|           | Hanumangarh            |                                       |
|           | Barmer                 |                                       |
|           | Jaisalmer              |                                       |
|           | Nokha                  | ADC                                   |
| Haryana   | Bhiwani                |                                       |
|           | Siwani                 |                                       |
|           | Hisar                  |                                       |
|           | Sirsa                  |                                       |
| Gujarat   | Banaskantha            | ADC (Deesa)                           |
|           | Ahmedabad              |                                       |

- c. Details about major physical markets of the commodity and average Open Interest for each month generated from those regions.

**Note – The OI for each month is classified based on the Member level. The Average OI is on gross level (Long OI + Short OI)**

| State        | Rajasthan | Gujarat | Haryana |
|--------------|-----------|---------|---------|
| April-22     | 520       | -       | -       |
| May-22       | 270       | -       | -       |
| June-22      | -         | -       | -       |
| July-22      | -         | -       | -       |
| August-22    | -         | -       | -       |
| September-22 | -         | -       | -       |
| October-22   | -         | -       | -       |
| November-22  | -         | -       | -       |
| December-22  | -         | -       | -       |
| January-23   | -         | -       | -       |
| February-23  | -         | -       | -       |
| March-23     | -         | -       | -       |

**Note -** The OI for Custodian Participant is not mapped to any State/ location and hence not considered in the above data.

**d. Details, such as number and target audience, of stakeholders' awareness programs carried out by the exchange.**

Following list of Awareness programme, Stakeholder engagement programme has conducted for FY 2022-23

| Sr. Number | Programme           | Location                  | Number of Participants |
|------------|---------------------|---------------------------|------------------------|
| 1          | Awareness Programme | Lucknow                   | 38                     |
| 2          | Awareness Programme | Mysore                    | 25                     |
| 3          | Awareness Programme | Thane, Maharashtra        | 52                     |
| 4          | Awareness Programme | Hanumangarh               | 70                     |
| 5          | Awareness Programme | Sadul Shahar, Hanumangarh | 70                     |
| 6          | Awareness Programme | Niwai                     | 22                     |
| 7          | Awareness Programme | Ahmedabad, Gujarat        | 32                     |
| 8          | Awareness Programme | Rajkot, Gujarat           | 55                     |
| 9          | Awareness Programme | New Delhi                 | 32                     |
| 10         | Awareness Programme | Unjha                     | 60                     |
| 11         | Awareness Programme | Andheri, Mumbai           | 37                     |
| 12         | Awareness Programme | Hyderabad                 | 25                     |
| 13         | Awareness Programme | Bangalore                 | 25                     |
| 14         | Awareness Programme | Jodhpur, Rajasthan        | 36                     |
| 15         | Awareness Programme | Bikaner, Rajasthan        | 47                     |
| 16         | Awareness Programme | Bhilwara, Rajasthan       | 35                     |
| 17         | Awareness Programme | Padampur, Rajasthan       | 35                     |
| 18         | Awareness Programme | Sri Ganganagar            | 53                     |
| 19         | Awareness Programme | Suratgarh                 | 88                     |
| 20         | Awareness Programme | Kolkata                   | 35                     |
| 21         | Awareness Programme | Surat                     | 18                     |
| 22         | Awareness Programme | Guna, Madhya Pradesh      | 30                     |
| 23         | Awareness Programme | Anjar, Lutch, Gujarat     | 38                     |
| 24         | Awareness Programme | Raipur, Chhattisgarh      | 112                    |
| 25         | Awareness Programme | Patan, Gujarat            | 104                    |
| 26         | Awareness Programme | Nashik                    | 200                    |
| 27         | Awareness Programme | Udaipur                   | 150                    |
| 28         | Awareness Programme | Rajkot                    | 100                    |
| 29         | Awareness Programme | Hissar                    | 100                    |
| 30         | Awareness Programme | Nagpur, Maharashtra       | 120                    |
| 31         | Awareness Programme | Raipur                    | 100                    |
| 32         | Awareness Programme | Gwalior, Madhya Pradesh   | 78                     |
| 33         | Awareness Programme | Bhopal , MP               | 54                     |
| 34         | Awareness Programme | Indore, Madhya Pradesh    | 47                     |
| 35         | Awareness Programme | Siliguri, West Bengal     | 39                     |
| 36         | Awareness Programme | Alipurduar, West Bengal   | 31                     |
| 37         | Awareness Programme | Meerut, Uttar Pradesh     | 30                     |
| 38         | Awareness Programme | Bhopal, Madhya Pradesh    | 44                     |
| 39         | Awareness Programme | Indore, Madhya Pradesh    | 80                     |
| 40         | Awareness Programme | Chennai, Tamil Nadu       | 24                     |
| 41         | Awareness Programme | Kanpur, Uttar Pradesh     | 60                     |
| 42         | Awareness Programme | Chindwara, MP             | 50                     |
| 43         | Awareness Programme | Seoni , MP                | 40                     |
| 44         | Awareness Programme | Kolkata                   | 25                     |
| 45         | Awareness Programme | Raipur, Chattisgarh       | 136                    |
| 46         | Awareness Programme | Lucknow                   | 177                    |
| 47         | Awareness Programme | Rourkela                  | 65                     |
| 48         | Awareness Programme | Muzaffarnagar             | 70                     |
| 49         | Awareness Programme | Kochi                     | 86                     |

|     |                     |                |    |
|-----|---------------------|----------------|----|
| 50  | Awareness Programme | Bhilai         | 70 |
| 51  | Awareness Programme | Thalamadla     | 80 |
| 52  | Awareness Programme | Kolkata        | 45 |
| 53  | Awareness Programme | Online         | 30 |
| 54  | Awareness Programme | Online         | 18 |
| 55  | Awareness Programme | Online         | 23 |
| 56  | Awareness Programme | Odisha         | 9  |
| 57  | Awareness Programme | Odisha         | 15 |
| 58  | Awareness Programme | Karnataka      | 5  |
| 59  | Awareness Programme | Bihar          | 18 |
| 60  | Awareness Programme | West Bengal    | 6  |
| 61  | Awareness Programme | Andhra Pradesh | 29 |
| 62  | Awareness Programme | Online         | 11 |
| 63  | Awareness Programme | Online         | 7  |
| 64  | Awareness Programme | Online         | 21 |
| 65  | Awareness Programme | Online         | 6  |
| 66  | Awareness Programme | Online         | 9  |
| 67  | Awareness Programme | Online         | 14 |
| 68  | Awareness Programme | Online         | 82 |
| 69  | Awareness Programme | Online         | 28 |
| 70  | Awareness Programme | Online         | 25 |
| 71  | Awareness Programme | Online         | 50 |
| 72  | Awareness Programme | Online         | 30 |
| 73  | Awareness Programme | Online         | 25 |
| 74  | Awareness Programme | Online         | 5  |
| 75  | Awareness Programme | Online         | 10 |
| 76  | Awareness Programme | Online         | 7  |
| 77  | Awareness Programme | Online         | 13 |
| 78  | Awareness Programme | Online         | 16 |
| 79  | Awareness Programme | Online         | 23 |
| 80  | Awareness Programme | Online         | 53 |
| 81  | Awareness Programme | Online         | 17 |
| 82  | Awareness Programme | Online         | 30 |
| 83  | Awareness Programme | Online         | 15 |
| 84  | Awareness Programme | Online         | 25 |
| 85  | Awareness Programme | Online         | 35 |
| 86  | Awareness Programme | Online         | 10 |
| 87  | Awareness Programme | Online         | 30 |
| 88  | Awareness Programme | Online         | 12 |
| 89  | Awareness Programme | Online         | 6  |
| 90  | Awareness Programme | Online         | 7  |
| 91  | Awareness Programme | Online         | 20 |
| 92  | Awareness Programme | Online         | 50 |
| 93  | Awareness Programme | Online         | 30 |
| 94  | Awareness Programme | Online         | 13 |
| 95  | Awareness Programme | Online         | 10 |
| 96  | Awareness Programme | Online         | 6  |
| 97  | Awareness Programme | Online         | 6  |
| 98  | Awareness Programme | Online         | 8  |
| 99  | Awareness Programme | Online         | 13 |
| 100 | Awareness Programme | Online         | 6  |
| 101 | Awareness Programme | Online         | 25 |
| 102 | Awareness Programme | Online         | 8  |
| 103 | Awareness Programme | Online         | 14 |
| 104 | Awareness Programme | Online         | 11 |
| 105 | Awareness Programme | Online         | 10 |
| 106 | Awareness Programme | Online         | 6  |
| 107 | Awareness Programme | Online         | 9  |
| 108 | Awareness Programme | Online         | 14 |
| 109 | Awareness Programme | Online         | 16 |
| 110 | Awareness Programme | Online         | 11 |
| 111 | Awareness Programme | Online         | 8  |

|     |                     |        |    |
|-----|---------------------|--------|----|
| 112 | Awareness Programme | Online | 8  |
| 113 | Awareness Programme | Online | 13 |
| 114 | Awareness Programme | Online | 15 |
| 115 | Awareness Programme | Online | 25 |
| 116 | Awareness Programme | Online | 25 |
| 117 | Awareness Programme | Online | 26 |
| 118 | Awareness Programme | Online | 18 |
| 119 | Awareness Programme | Online | 52 |
| 120 | Awareness Programme | Online | 16 |

**e. Steps taken / to be undertaken to improve hedging effectiveness of the contracts as well as to improve the performance of illiquid contracts.**

1. Identifying new value chain participants in the in the region of Lunkarsar, Khajuwala and Hissar.
2. Conducted awareness programs at Sirsa and Hissar in Haryana.
3. One on one meeting with market participants and hedgers.

**5. Any other information to be disclosed as deemed important by the exchange or as suggested by the PAC**

**N.A**

**ANNEXURE I**

Qualitative and quantitative measure for Hedge effectiveness ratio

**Methodology**

Regression analysis is carried out between near month futures returns and NCDEX polled spot prices/returns of the FY2022-23.

The R-Square value of the Regression analysis represents the “**Hedging Efficiency**”.

Note: -

Date for which spot prices were not available is not used for analysis.

Weekly returns are used for performing Regression Analysis.

The method used to calculate Hedging Efficiency does not consider liquidity risk because of this reason illiquid commodities can have high hedging efficiency.

**References:**

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