Centre for CIVIL SOCIETY

SOCIAL CHANGE THROUGH PUBLIC POLICY

PEELING THE LAYERS

A look at the impact of trade restrictions on Onion farmers.

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A look at the impact of trade restrictions on onion farmers

New Delhi, India
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Centre for CIVIL SOCIETY

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Introduction

Government of India heavily restricts the international trade of agri commodities. The Government imposes frequent bans, minimum export prices, and quantitative limits on exporters of agri commodities.

Onions are an essential crop for both Indian farmers and consumers. Whenever there are price fluctuations in the domestic market, the Government changes the rules on the international trade of onions. Two Acts, the Essential Commodities Act, 1955 (ECA) and the Foreign Trade (Development Regulation) Act (FTDR), 1992 empower the Government to limit warehousing capacity and regulate the trade of commodities.

The ECA allows arbitrary imposition of warehousing capacity that can see warehouses turned illegal overnight. These restrictions have meant that investments in warehousing technology are poor. As a result, onion loss due to poor warehousing amounts to 30-40(Indian Council of Agricultural Research 2022). This wastage directly impacts the income of farmers, warehouse owners, and everyone in the supply chain.

The FTDR allows the Government to regulate the export and import of all commodities and services. This law means that bans on the trade of onions, for example, can be done by an executive decision without any justification. Farmers' cannot challenge these bans in the judicial system. Whenever the prices of commodities like onions go up, the government issues bans and limits the trade rights of farmers.

The FTDR empowers India's Government to formulate trade policy and issue orders prohibiting, restricting or otherwise regulating the export and import of goods.

Section 3 of the FTDR gives the Central Government power to prohibit, restrict or regulate the export of goods or services, including agri-goodts. Section 7 (Importer-exporter Code Number) and Section 8 (Suspension and cancellation of Importer-exporter Code Number) of the Act can restrict the trade of agri products. The Indian Government frequently uses the FTDR to prohibit, restrict or regulate the international trade of agricultural goods. The Directorate General of Foreign Trade (DGFT) uses its power to impose these myriad restrictions.

The provisions of this act allow the Government to prohibit, restrict or regulate the trade of goods. These provisions are particularly problematic for commodities like onions. There are three reasons for this. First, onions take around three months to harvest. This means that farmers plan well in advance about how much to produce, and sudden increases in crop production are impossible. Export restrictions reduce prices for consumers, but since they are arbitrarily imposed, farmers cannot predict what their optimal production should be. Second, onions set for export require sorting, grading, and packaging. Onions for the domestic market are not expected to meet these higher standards. When export restrictions are placed, the onions that were bound for international markets need to return to domestic markets. But the sellers have already borne the additional costs associated with exports. Finally, onions are a semi-perishable good. Onions on the way to ports for export that now need to return to domestic markets suffer from some degree of wastage and rotting. Immediacy of the change in export rules further exacerbates the wastage. Sellers get no time to prepare for this change.

The use of ad hoc trade policy decisions has created market uncertainty and hurt India's image as a reliable trade partner. Reforms that set clear limits and parameters on when and how this act can be used will lead to a more stable trade environment.

In the five years between 2015 and 2020, onion export rules changed 17 times (an average of 3.4 times a year) (Directorate General of Foreign Trade 2022). These policy changes include the imposition of quantitative limits, the imposition of Minimum Export Prices (MEP), and outright export bans.

These restrictions have an impact on farmer income since they are now able to access fewer buyers. This lost customer base is significant since the international price of onions is often higher than in domestic markets.

Impact of Policy Uncertainty

Trade restrictions cause a variety of problems. First, they make it difficult for farmers to plan production. Like any other entrepreneur, a farmer needs to plan their production cycle. They decide on the inputs to buy, goods to produce, quantity to produce, and how to prioritise their time. These decisions depend on expected demand, expected price, current costs, and other factors. Making such decisions becomes far more challenging, if not impossible, when the Government arbitrarily introduces restrictions on how people can ply their trade. Such sudden changes in the trade environment are uncommon for other economic participants. In September 2020, when the Government imposed a ban on the export of onions, Raju Shetti of the Swabhimani Shetkari Sanghatana said, "...farmers had been selling onions at throwaway prices at Rs.4-5 per kilo. Now, when farmers have started to make some money ... comes this astounding betrayal." (Banerjee 2022)

Second, India is not viewed as a reliable exporter. The Agriculture Export Policy, 2018, attributes India's low share in international exports to its "inward-looking policies aimed at food security and price stabilisation" (Department of Commerce 2017). It recognises that a stable and predictable trade policy, with limited interference from the state, is required to send a positive signal to the global market. However, while the policy vision envisages a freer trade environment, this has not translated into action. The lack of trade freedom hurts importer confidence in India as a supplier. For instance, during the onion export ban of 2020, Bangladesh expressed its disapproval of the move and decided to import onions from Egypt and Turkey (Basu 2020). There was also widespread global pushback against India's decision to restrict wheat exports on May 13 2022 (Kuwait Times 2022).

The frequent usage of such policy instruments will hurt India's image as a reliable exporter, and importers may move to other markets. As a consumer, would you be comfortable relying on a store that frequently and unpredictably stops selling the things you want to buy?

Third, these trade instruments also hurt farmer income. An OECD and ICRIER study documented that the Government's control over agri-exports was a form of implicit taxation. The report estimates that this implicit taxation amounted to Rs 2.65 lakh crores per annum between 2000-01 and 2016-17, totalling Rs 45 lakh crore

Quantifying Price Differences

Export restrictions have been used as a trade policy instrument to control agricultural markets. India has justified these measures to contain the growth of domestic prices and ensure sufficient internal supplies to respond to rising food prices. Export restrictions and, in particular, export bans have had repercussions at domestic and global levels, with adverse effects on Indian farmers.

Comparing international and domestic onion prices illustrates the loss farmers suffer. A detailed methodology is attached in annexure 1. Between January 2015 and March 2020, the average price difference between domestic and international prices was $92 per metric tonne during restricted months. During months when the trade of onions was unrestricted, 179850.895 tonnes per month were traded compared to 82194.32 tonnes of onions when onions were restricted. During months where trading was restricted, 97656.575 tonnes per month that could have been traded was not traded.

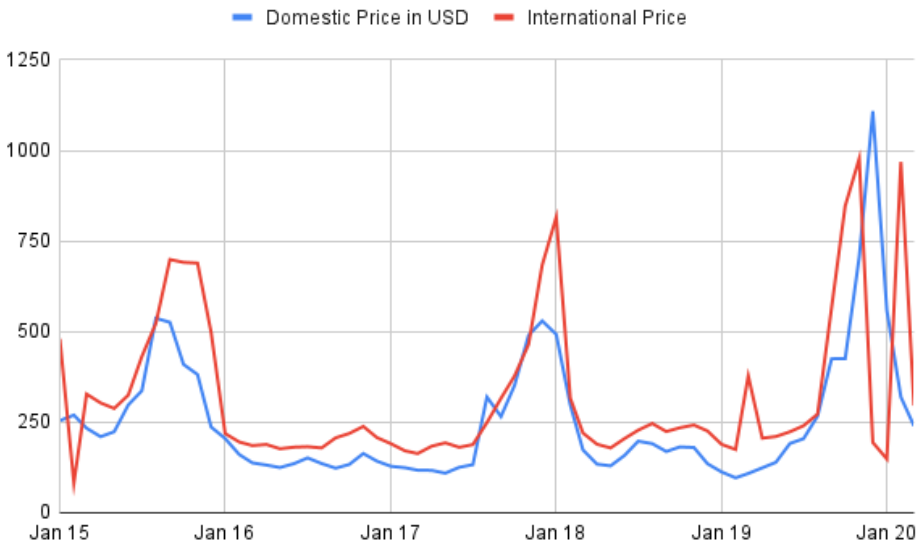

Figure 1: Gap between international prices and domestic prices

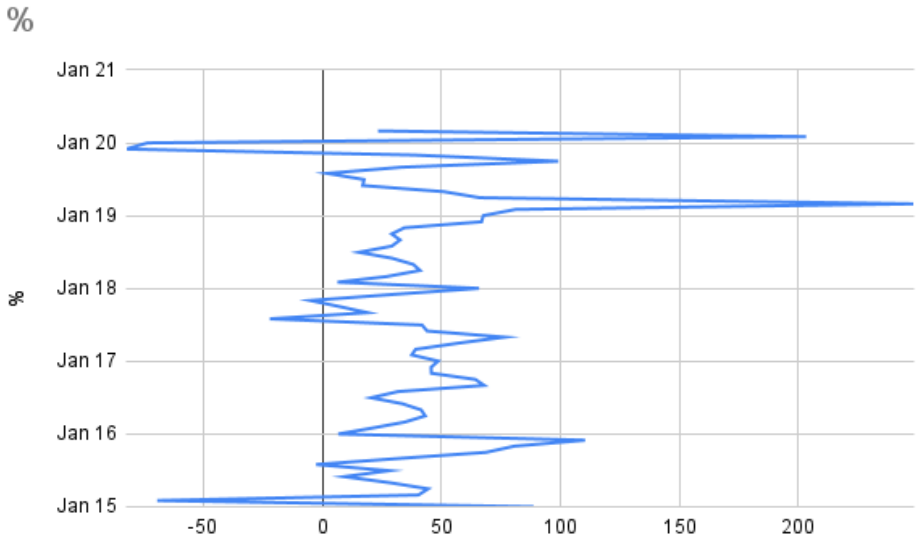

Figure 2: Price difference in percentage between domestic and international prices

In restricted months, 196194224.6 tonnes of trade is not realised. In 18 months, this accounts for a trade loss of approximately $430 million. In India, 1.04 million hectares of land are used for onion cultivation. This implies a loss of $413.5 per hectare for five years or $82.7 a year. The average farmer in onion-growing states owns 1.4 hectares of land, which implies a per-farmer loss of $115.78 a year during this period. The average farmer earns INR 3,798 a month from crop growing, or 45576 a year or $553.20. $115.78 accounts for a loss of 21% in income due to trade restrictions.

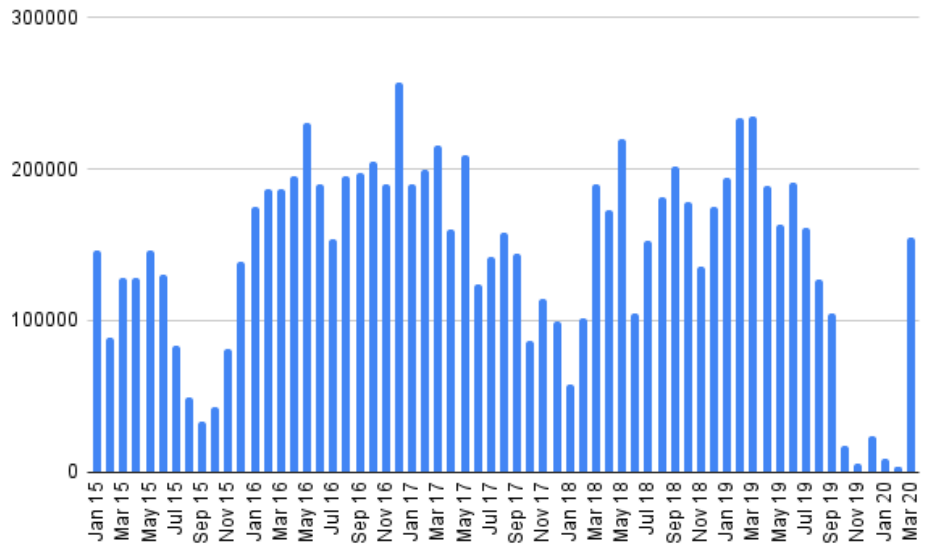

Figure 3: Volume of onion exported in metric tonnes

Other implications

The loss due to lower prices is not the only cost borne by onion farmers and traders. Take the case of Om Chauthani, a Lasalgaon-based onion trader. His trucks had reached the export centre, but he had to wait under the pretext that the transit permit system was under maintenance. At night, the circular for the ban on onion export was released, and the trading yard denied the permit to transfer their goods. In this case, he had to bear the losses of purchasing the goods from the farmers, grading, sorting, and packaging them.

There has also been a loss of trust in India in the international trade market. Importing nations like Bangladesh have started opting for onions from countries like Egypt. This is despite considerably higher transport costs. The 2014 Economic Survey of India said that

> ... an ad hoc trade policy has been followed for agricultural commodities ... [which] leads to erosion of confidence in India being a trustworthy supplier in the international market. A stable and long-term trade policy with respect to agricultural products is essential for increasing productivity.
>
> (Ministry of Finance 2014)

The current approach of tinkering with export restrictions frequently to balance the interests of farmers and consumers creates significant uncertainty.

Conclusion

The 2021 Trade Barrier Index ranks India 90th of the 90 countries surveyed for trade openness (Thompson 2021). The Indian agriculture industry and the regulations that govern it show why such a low ranking is warranted. Frequent restrictions and policy uncertainty have made importers nervous and impoverished farmers. Much of this thinking comes from India's past as a food insecure country. Now, India's production far outstrips domestic consumption. This mercantilist approach goes against the principles of basic trade theory. Indian onion farmers saw a loss of 20% in their crop income as a result of these various and frequent restrictions. Adopting a clear and predictable export policy will improve farmer income and encourage investment in infrastructure. If the government is serious about "doubling farmers income", Indian agriculture needs to be more integrated with global supply chains and make fundamental changes in its trade policy.

Annexure 1: Methodology

Step I: Get the average price across India

We used the Agriculture Market website run by Government of India to collate monthly prices of onions across 28 mandis in the country. Using the average price per mandi and total volume per mandi, we calculated the average price per month. We summed up the total trade price in each mandi (average wholesale price multiplied by total volume) and summed it up across all mandis. We then totalled the volume across all mandis and divided it to get the average price across India in INR.

Step II: Standardise currency

To convert the INR prices to USD we used trading history and computed average monthly conversion rates. We divided these rates with the price per metric tonne in INR to get the price per metric tonne in USD. The tables are available in annexure 2.

Step III: Find information on trade restrictions

The DGFT website lists all the notifications issued by the department. We found all the notifications related to the trade of onions between 2015-2020. This gave us information about during which months trade was restricted. The dates and restrictions are available in annexure 3.

Step IV: Identify international trade price

We used the Agricultural and Processed Food Products Export Development Authority website to identify the monthly trade volume and price for onions. These were then divided to get the monthly per metric tonne price in USD. For more details, refer to annexure 4

Step V: Compute averages

We looked at trade volumes during open trade months to assess, on average, how many metric tonnes of onions are traded when farmers are free to trade. We then looked at trade volumes during months when trade is restricted. The difference between these two volumes is the unrealised trade volumes due to trade restrictions.

Step VI: Compute loss

There were 23 months during which trade was restricted. For 18 of these months, the international price of onions was higher than the domestic prices. We calculated the price difference between the international trade price and the domestic price of onions. This gave us the per metric tonne loss. We then looked at the gap between the actual trade volume and the average open trade volume. This gave us the total unrealised trade volume for those 18 months. We multiplied the monthly shortfall by the price difference to compute dollar losses during these 18 months. We calculated these losses to compute the total loss in this period. Detailed tables for Steps V and VI are available in annexure 5.

Step VII: Contextualise loss

We divided the total loss by five to get the annual loss due to onion trade restrictions. We then looked at the number of hectares used for onion farming to understand the annual loss per hectare due to trade restrictions. We multiplied this result with the average hectare holding in onion-growing states to identify per-farmer income loss per year. This was compared to farmers' per capita income from crop sources to identify the percentage loss of crop income based on trade restrictions.

Limitations and Assumptions

All the data in this study is from government sources. To compute the average monthly price of onions, we used agmarket website by the Directorate of Marketing & Inspection (DMI), Ministry of Agriculture and Farmers Welfare.[1] This provided information on the average wholesale price of onions

1. https://agmarknet.gov.in/

and the total arrivals across mandis in India. For most months, 28 mandis were available. However, our research's accuracy depends on the quality of this data. For some months in some mandis, no data is available. This is a problem since the price in those mandis would have impacted the average price.

For international trade prices, we relied on the APEDA statistics. The website presents the monthly total trade volume and price of various commodities.[2] We used this to compute the average price. The trade price is provided in USD. to convert from USD to INR, we used the average price of the dollar to rupee for the month. This assumes similar trade volumes throughout the month. It is possible that trade was more on some days of the month to the extent that the average would have been different if weighted for trade.

Two different categories of onions exist for the purposes of trade restrictions; the first is Bangalore rose and Krishnarajapuram onion, and the second is all others. The trade restrictions on these are not the same. Often, the trade of one is open while the other is prohibited, or both are restricted, but differently. The disaggregated trade volume and prices of these commodities are not available. As a result, one limitation faced by this study is that we used the aggregate data and treated months as binary, with restriction or without. Disaggregated data may have produced a different result.

One assumption we made was that trade volumes per month would remain constant. This is what underlies our analysis of income loss. If trade were unrestricted, trade would continue as it does if it were open. We also assumed the trade price would remain unchanged. This may not be true since additional onions in the market may lower the trade price.

While trying to assess the per-farmer loss of income, the average farm holding size in onion-growing states was used. This may be erroneous since onion farmers may have different farm sizes than general farmers. This could introduce a source of error. In addition, while trying to calculate income loss as a percentage, the average farmer's income from growing crops was used. Again, while this captures the average farmer's income from growing crops, onion farmers as a class may differ from the class of general farmers.

2. https://agriexchange.apeda.gov.in

Annexure 2: Domestic trade volume and price

The table below shows the month and year and the corresponding average price per metric tonne of onions [3]

Date	Price per metric tonne (In Rs)	Conversion rate	Domestic Price in USD
Jan 15	15812.0053	62.1764	254.308794
Feb 15	16721.86426	62.0428	269.5214313
Mar 15	14586.34713	62.5031	233.3699789
Apr 15	13151.83527	62.6574	209.9007503
May 15	14248.29395	63.7135	223.6306897
Jun 15	18983.23954	63.807	297.5102973
Jul 15	21409.92103	63.6	336.6339785
Aug 15	34947.20324	65.0852	536.945469
Sep 15	34809.97176	66.2377	525.5311063
Oct 15	26626.30812	65.0274	409.4629052
Nov 15	25219.06486	66.121	381.4077957
Dec 15	15727.64333	66.4892	236.544331
Jan 16	13786.4995	67.283	204.9031628
Feb 16	10979.21199	68.2812	160.7940691
Mar 16	9213.549223	66.9023	137.7164794
Apr 16	8746.205838	66.4686	131.5840237
May 16	8352.436928	66.913	124.8253243
Jun 16	9112.643567	67.256	135.4919051
Jul 16	10169.17087	67.1823	151.3668164
Aug 16	9088.870237	66.9438	135.7686632
Sep 16	8217.855665	66.7569	123.1012175
Oct 16	8888.13507	66.7048	133.2458094
Nov 16	11059.63916	67.6687	163.4380321
Dec 16	9659.743673	67.8108	142.4514041
Jan 17	8728.125999	68.0766	128.2103689
Feb 17	8321.280258	66.9645	124.2640542
Mar 17	7733.310108	65.8646	117.4122383
Apr 17	7545.464061	64.5344	116.9215808
May 17	7039.261472	64.4263	109.2606819
Jun 17	8087.204965	64.4544	125.4717283
Jul 17	8550.128918	64.4352	132.6934489
Aug 17	20432.41715	63.9769	319.3717912
Sep 17	17102.19215	64.4164	265.4943795

3. For a more detailed breakdown of the computation, please refer to https://cutt.ly/zNPLI1l

Date	Price per metric tonne (In Rs)	Conversion rate	Domestic Price in USD
Oct 17	22872.81159	65.0627	351.5502983
Nov 17	31760.96987	64.8443	489.8035736
Dec 17	33999.55236	64.2151	529.4635119
Jan 18	31326.60996	63.6448	492.2100464
Feb 18	19175.4081	64.4559	297.4965535
Mar 18	11274.19387	65.0353	173.3549914
Apr 18	8806.6842	65.6749	134.0951292
May 18	8742.393225	67.5296	129.460166
Jun 18	10739.60402	67.7862	158.4334868
Jul 18	13563.08609	68.6785	197.4866383
Aug 18	13261.74737	69.5434	190.6974259
Sep 18	12193.32238	72.1397	169.0237467
Oct 18	13370.92754	73.6061	181.6551555
Nov 18	12937.74406	71.8394	180.0925963
Dec 18	9565.767653	70.7411	135.2222068
Jan 19	7962.824366	70.6595	112.6929056
Feb 19	6863.259052	71.1954	96.40031592
Mar 19	7540.947368	69.5846	108.3709236
Apr 19	8604.549384	69.4124	123.9627125
May 19	9712.97071	69.7688	139.2165368
Jun 19	13269.7727	69.4234	191.1426507
Jul 19	14044.02434	68.7375	204.3138656
Aug 19	18980.52017	71.1661	266.7073251
Sep 19	30310.41491	71.3203	424.9900086
Oct 19	30196.0314	71.01	425.2363245
Nov 19	50446.41722	71.4973	705.5709407
Dec 19	78887.12762	71.1728	1108.388705
Jan 20	39811.5076	71.2719	558.5863096
Feb 20	22853.63523	71.5847	319.2530699
Mar 20	17855.46309	74.5236	239.594747

Annexure 3: Export restrictions by year

Between 2015 and 2020, restrictions were applied 17 times to the trade of onions. These restrictions are listed by year below

Sl No.	Date of imposition	Policy change	Rationale	Date of policy end
1	7th April 2015	the MEP for all onions, including Bangalore Rose and Krishnapuram onions was reduced from $300 to$250	To increase India's onion exports to increase incomes of onion farmers	26th June 2015
2	26th June 2015	the MEP for all onions, including Bangalore Rose and Krishnapuram onions was increased from $250 to $425	This was intended to increase the onion supply in domestic markets to reduce in domestic markets	24th August 2015
3	24th August 2015	the MEP for all onions, including Bangalore Rose and Krishnapuram onions was increased from $425 to $700	This was intended to increase the onion supply in domestic markets to reduce the in domestic markets.	11th December 2015
4	11th December 2015	the MEP for all onions, including Bangalore Rose and Krishnapuram onions was reduced from $700 to $400	This was intended to boost India's exports and increase farmer incomes	24th December 2015
5	24th December 2015	the MEP for all onions, including Bangalore Rose and Krishnapuram onions was abolished	This was intended to boost India's exports and increase farmer incomes. Moreover, the Government wanted to reduce the supply in domestic markets to prevent a price crash because onion supply was projected to drastically increase because of an overlap between Kharif and late Kharif output.	23rd November 2017
6	23rd November 2017	the MEP for all onions was reimposed and set at $850 and export was only permitted with a letter of credit (LOC)	Through this policy, the Government intended to increase the supply of onions in domestic markets to mitigate the surge in the price of onions, which was hurting the Government politically.	31st December 2017
7	29th December 2017	MEP was extended from 31 December to 20th January		20th Jaunuary 2017

Sl No.	Date of imposition	Policy change	Rationale	Date of policy end
8	19th January 2018	the MEP of onions, including Bangalore Rose and Krishnapuram onions, was reduced from $850 to $700, but export was only allowed with a letter of credit (LOC)	: Through this policy, the Government intended to boost the export of onions to increase farmer incomes.	2nd February 2018
9	2nd February 2018	the MEP of onions, including Bangalore Rose and Krishnapuram onions, was abolished.	Through the abolition of the MEP, the Government intended to ameliorate the competitiveness of Indian onion exports in international markets to boost exports and increase the incomes of farmers	13th September 2019
10	13th September 2019	the Government reimposed MEP and set the MEP for all kinds of onions, including Bangalore Rose and Krishnapuram onions, at $850. Furthermore, exports were only permitted provided the buyer was able to provide a letter of credit (LOC)	Through this policy, the Government intended to prevent an anticipated price surge in domestic markets due to hoarding and floods in Karnataka and Maharashtra, which were projected to result in reduced onion supply.	29th September 2019
11	29th September 2019	the export of all kinds of onions, including Bangalore Rose and Krishnapuram onions, was banned. This was imposed alongside hoarding restrictions, which prohibited traders from stocking more than a certain quintal of onions.		28th October 2019
12	28th October 2019	the ban on exports for all kinds of onions continued, the Government permitted the export of up to 9000 MT (metric tons) of Bangalore Rose Onions for the period until 30th November 2019	the Government intended to increase the demand for Bangalore Rose Onions to increase farmer incomes, which had been adversely affected by the export ban.	6th February 2020
13	6th February 2020	export of most kinds of onions was prohibited, the Government permitted the export of 10,000 MT (metric tons) of Krishnapuram onions for the period up to 31st March 2020. These onions were to be exclusively exported from the Chennai port.	the Government intended to increase the demand for Krishnapuram onions to farmer incomes, which had been adversely affected by the export ban.	2nd March 2020

Sl No.	Date of imposition	Policy change	Rationale	Date of policy end
14	2nd March 2020	the Government withdrew all restrictions pertaining to the export of all kinds of onions, including Bangalore Rose and Krishnapuram onions. Therefore, the export status was changed from ”prohibited” to ”free” so no letter of credit (LOC) or MEP was required		14th September 2020
14	14th September 2020	export of all kinds of onions, including Bangalore Rose and Krishnapuram Onions, was banned. Although, the export of sliced, powdered, or broken onions was permitted. However, the export of onions under certain transnational trade agreements was permitted	Government intended to increase the supply of onions to domestic onions to quell the price increases caused by shortages and increasing exports amidst COVID-19.	28th December 2020
15	14th September 2020	while the ban on the export of all kinds of onions continued, the Government permitted the export of 10,000 MT (metric tons) of Bangalore Rose and Krishnapuram onions each for the period up to March 31st. The onions were to be exported exclusively from the Chennai port.	Through this policy, the Government intended to increase the demand for Bangalore Rose and Krishnapuram onions to increase farmer incomes, which had been adversely affected due to the pandemic.	31st March
16	28th December 2020	export of all kinds of onions, including Bangalore Rose and Krishnapuram Onions, was made completely free, so all restrictions such as MEP and requirements of LOCs had been withdrawn.	Government intended to improve the competitiveness of India’s onion exports to increase exports and increase farmer incomes.	Current

Annexure 4: International trade price and volume

The below table shows the total quantity and value of onion exports for 2015-2020 in USD. The average price was determined by dividing these two.

Year	Month	Total quantity exported (in MT)	Total Value of Exports (in $)	Average Price of Per MT exported (in $)
2015	January	146645.14	70406557	480.1151746
2015	February	88351.32	7280819	82.40758599
2015	March	128279.34	42014604	327.5243231
2015	April	127959.38	38782584	303.0851197
2015	May	146319.49	42121260	287.8718344
2015	June	130758.11	42439200	324.56266
2015	July	82989	35769430	431.0141103
2015	August	49793.1	26029770	522.758575
2015	September	33534.48	23434533	698.8190364
2015	October	42792.16	29573726	691.1015008
2015	November	81368.78	56058582	688.944605
2015	December	139092.61	69212225	497.598147
2016	January	174729.43	38184426	218.5345995
2016	February	186557.1	36441815	195.3386657
2016	March	187065.9	34685104	185.4164976
2016	April	194974.17	36735299	188.4111059
2016	May	230366.51	40688074	176.6232166
2016	June	189528.8	34302332	180.9874383
2016	July	154069.24	28084251	182.2833098
2016	August	194856.06	34869118	178.948081
2016	September	197167.29	40767115	206.7640885

Year	Month	Total quantity exported (in MT)	Total Value of Exports (in $)	Average Price of Per MT exported (in $)
2016	October	204331.12	44711231	218.8175301
2016	November	189585.84	45171115	238.2620717
2016	December	256921.05	53309736	207.4946214
2017	January	189680.39	36144215	190.5532512
2017	February	199271.35	34058098	170.9131694
2017	March	214987.24	35124357	163.3787987
2017	April	160471.93	29477024	183.6895961
2017	May	209483.22	40400240	192.856688
2017	June	123543.75	22319586	180.6613932
2017	July	142322.8	26784990	188.198869
2017	August	158123.29	39357441	248.9035043
2017	September	144384.82	45592894	315.7734587
2017	October	86832.12	32786148	377.5808768
2017	November	114327.48	53171832	465.0835652
2017	December	99557.68	68031774	683.3402908
2018	January	58111.66	47418269	815.9854494
2018	February	101461.42	32097343	316.3502245
2018	March	190365.55	41883377	220.015528
2018	April	172740	32660810	189.0749682
2018	May	219534.89	39276379	178.9072297
2018	June	105253.69	21563071	204.8676013
2018	July	153006.88	34872823	227.9166989
2018	August	181110.4	44608610	246.3061757

Year	Month	Total quantity exported (in MT)	Total Value of Exports (in $)	Average Price of Per MT exported (in $)
2018	September	201843.43	45246765	224.1676383
2018	October	177980.02	41738371	234.5115536
2018	November	135536.78	32818561	242.1376766
2018	December	174826.17	39447459	225.6381811
2019	January	194208.81	36678286	188.8600522
2019	February	233441.6	40761876	174.612734
2019	March	234165.53	88457105	377.7545952
2019	April	188947.92	38897361	205.8628695
2019	May	163417.27	34373168	210.3398741
2019	June	191035.51	42694316	223.4889
2019	July	160645.55	38566211	240.0702105
2019	August	126722.38	34504423	272.2835777
2019	September	104860.97	59395014	566.4167898
2019	October	17494.96	14812068	846.6477203
2019	November	5925.58	5790974	977.2839114
2019	December	23420.4	4542796	193.9674813
2020	January	8911	1321889	148.343508
2020	February	3653.6	3537038	968.0966718
2020	March	154861.7	45767258	295.5363269

Annexure 5: Computing Loss

The following table details the numbers and computation we used to compute loss per month.

Date	Domestic Price in USD	Global Price	Price difference	% difference	Trade Volume	Open/Close[4]	Volume gap in closed	Loss
Jan 15	254.31	480.12	225.81	88.79	146645.14	0	33205.75	7498231.58
Feb 15	269.52	82.41	-187.11	-69.42	88351.32	0	91499.58	NA
Mar 15	233.37	327.52	94.15	40.34	128279.34	0	51571.56	4855462.99
Apr 15	209.90	303.09	93.19	44.40	127959.38	0	51891.52	4835731.35
May 15	223.63	287.87	64.24	28.73	146319.49	0	33531.41	2154034.33
Jun 15	297.51	324.56	27.05	9.09	130758.11	0	49092.79	1327945.24
Jul 15	336.63	431.01	94.38	28.04	82989.00	0	96861.90	9141440.29
Aug 15	536.95	522.76	-14.19	-2.64	49793.10	0	130057.80	NA
Sep 15	525.53	698.82	173.29	32.97	33534.48	0	146316.42	25355009.68
Oct 15	409.46	691.10	281.64	68.78	42792.16	0	137058.74	38600823.95
Nov 15	381.41	688.94	307.53	80.63	81368.78	0	98482.12	30286421.91
Dec 15	236.54	497.60	261.06	110.36	139092.61	0	40758.29	10640181.36
Jan 16	204.90	218.53	13.63	6.65	174729.43	1	NA	NA
Feb 16	160.79	195.34	34.55	21.48	186557.10	1	NA	NA
Mar 16	137.72	185.42	47.70	34.64	187065.90	1	NA	NA
Apr 16	131.58	188.41	56.83	43.19	194974.17	1	NA	NA
May 16	124.83	176.62	51.79	41.49	230366.51	1	NA	NA
Jun 16	135.49	180.99	45.50	33.58	189528.80	1	NA	NA
Jul 16	151.37	182.28	30.91	20.42	154069.24	1	NA	NA

4. 0 means trade was closed or restricted while 1 means trade was open

Date	Domestic Price in USD	Global Price	Price difference	% difference	Trade Volume	Open/Close	Volume gap in closed	Loss
Aug 16	135.77	178.95	43.18	31.81	194856.06	1	NA	NA
Sep 16	123.10	206.76	83.66	67.96	197167.29	1	NA	NA
Oct 16	133.25	218.82	85.57	64.22	204331.12	1	NA	NA
Nov 16	163.44	238.26	74.82	45.78	189585.84	1	NA	NA
Dec 16	142.45	207.49	65.04	45.66	256921.05	1	NA	NA
Jan 17	128.21	190.55	62.34	48.62	189680.39	1	NA	NA
Feb 17	124.26	170.91	46.65	37.54	199271.35	1	NA	NA
Mar 17	117.41	163.38	45.97	39.15	214987.24	1	NA	NA
Apr 17	116.92	183.69	66.77	57.11	160471.93	1	NA	NA
May 17	109.26	192.86	83.60	76.51	209483.22	1	NA	NA
Jun 17	125.47	180.66	55.19	43.98	123543.75	1	NA	NA
Aug 17	319.37	248.90	-70.47	-22.07	158123.29	1	NA	NA
Sep 17	265.49	315.77	50.28	18.94	144384.82	1	NA	NA
Oct 17	351.55	377.58	26.03	7.40	86832.12	1	NA	NA
Nov 17	489.80	465.08	-24.72	-5.05	114327.48	0	65523.42	NA
Dec 17	529.46	683.34	153.88	29.06	99557.68	0	80293.22	12355237.95
Jan 18	492.21	815.99	323.78	65.78	58111.66	0	121739.24	39416723.86
Feb 18	297.50	316.35	18.85	6.34	101461.42	0	78389.48	1477911.78
Mar 18	173.35	220.02	46.67	26.92	190365.55	1	NA	NA
Apr 18	134.10	189.07	54.97	41.00	172740.00	1	NA	NA
May 18	129.46	178.91	49.45	38.20	219534.89	1	NA	NA
Jun 18	158.43	204.87	46.44	29.31	105253.69	1	NA	NA

Date	Domestic Price in USD	Global Price	Price difference	% difference	Trade Volume	Open/Close	Volume gap in closed	Loss
Jul 18	197.49	227.92	30.43	15.41	153006.88	1	NA	NA
Aug 18	190.70	246.31	55.61	29.16	181110.40	1	NA	NA
Sep 18	169.02	224.17	55.15	32.63	201843.43	1	NA	NA
Oct 18	181.66	234.51	52.85	29.10	177980.02	1	NA	NA
Nov 18	180.09	242.14	62.05	34.45	135536.78	1	NA	NA
Dec 18	135.22	225.64	90.42	66.87	174826.17	1	NA	NA
Jan 19	112.69	188.86	76.17	67.59	194208.81	1	NA	NA
Feb 19	96.40	174.61	78.21	81.13	233441.60	1	NA	NA
Mar 19	108.37	377.75	269.38	248.57	234165.53	1	NA	NA
Apr 19	123.96	205.86	81.90	66.07	188947.92	1	NA	NA
May 19	139.22	210.34	71.12	51.09	163417.27	1	NA	NA
Jun 19	191.14	223.49	32.35	16.92	191035.51	1	NA	NA
Jul 19	204.31	240.07	35.76	17.50	160645.55	1	NA	NA
Aug 19	266.71	272.28	5.57	2.09	126722.38	1	NA	NA
Sep 19	424.99	566.42	141.43	33.28	104860.97	0	74989.93	10605824.45
Oct 19	425.24	846.65	421.41	99.10	17494.96	0	162355.94	68419011.31
Nov 19	705.57	977.28	271.71	38.51	5925.58	0	173925.32	47257083.72
Dec 19	1108.39	193.97	-914.42	-82.50	23420.40	0	156430.50	NA
Jan 20	558.59	148.34	-410.25	-73.44	8911.00	0	170939.90	NA
Feb 20	319.25	968.10	648.85	203.24	3653.60	0	176197.30	114325073.96
Mar 20	239.59	295.54	55.95	23.35	154861.70	0	24989.20	1398026.84
TOTAL LOSS	-	-	-	-	-	-	-	**429950176.54**

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