

Analysis Of The Changing Edible Oil Prices With Respect To Black Sea Grain Initiative And Its Impact On India

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Abstract

Oilseeds and edible oils are two essential commodities for food security and nourishment. India is the **largest** consumer of edible oil and has exhibited consistently high demand. Despite this, the country still imports a majority of its edible oil supply, making the country extremely vulnerable to geopolitics. India imports a sizable proportion of its agricultural goods from Ukraine and Russia. The ongoing Russo-Ukrainian conflict has thus, in recent times, had major implications for the Indian and global edible oil market and prices. To counter rising prices and risk of food insecurity, the Black Sea Grain Initiative(**BSGI**) was put forward by the United Nations (**UN**) and involved countries. BSGI allowed for the passing of ships with agricultural export from Ukraine, which was previously blockaded by Russia.

By analyzing import data, Consumer Price Index (CPI) movement, and consumption/demand in the domestic market, it can be seen that the implementation of BSGI is associated with a relevant rise in edible oil imports, and consequently declining prices. It must be noted that during some months that followed Russia's invasion, India had quickly found Ukraine's replacement in Russia, with the country exporting never before seen edible oil value in **US\$**.

BSGI was a successful initiative for India, and on a global scale. However, the implications of the Russo-Ukrainian conflict on food security are still profound and require grave attention . India's **high** consumption for edible oils and relatively low **self sufficiency** ratio demonstrates insufficiency on the part of the domestic edible oil sector . It is of utmost importance for the Indian government to move towards incentivizing the production of edible oils within the country. Policy measures that involve land aggregation from the disproportionately high number of small land and expansion of the scope of already existing programs must be emphasized. The adoption of appropriate modern technology to enhance productivity could also be pursued for this purpose. Policy measures should serve to incentivize both industrial farmers as well as small-scale farmers to utilize the large domestic gap in supply for edible oils.

Introduction

The ongoing Russo-Ukrainian conflict came to a turning point on 24 February, 2022 as Russia escalated the conflict by launching a full scale invasion on Ukraine. With Russia's full scale invasion came a number of economic consequences. A major economic consequence for Ukraine was the blockade of Ukrainian ports in the Black Sea and Sea of Azov by Russia. A senior industry official from Ukraine claimed that this blockade could cost Ukraine up to \$6 billion in grain exports¹.

The G7 openly condemned Russia's actions in a joint statement and claimed the Russian blockade of Ukraine via the black sea would push 43 million into famine². Ukraine's importance in global food supply and security cannot be understated. According to the World Agricultural Supply and Demand Estimates (**WASDE**), the country comprises 9% of the global **wheat** export, 12% of the **corn** market and a disproportionately high percentage (**46%**) of the global **sunflower** oil export. To add on to the country's role in global food security, The World Food Programme (*largest humanitarian organization*) had bought 50% of its grain stock from Ukraine before the war had started.

To address the increasingly important issue of food security in relation to the Russo-Ukrainian war, the United Nations (**UN**) facilitated discussions between Turkey, Russia and Ukraine to come to an agreement. Consequently, an agreement (**Black Sea Grain Initiative**) was signed on 22 July, 2022 in Istanbul as a means to 'provide for the safe navigation of vessels carrying grain and foodstuffs'. The initial agreement remained in effect for a period of 120 days from the signature date and could be extended for the same period of time unless one party wanted the modification or termination of the agreement.

The agreement dictated the formulation of a **Joint Coordination Center (JCC)** in Istanbul which included representatives from all of the concerned nations as well as the UN. The JCC would consist of a senior official from each party, and a number of required personnel. The JCC was required to

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<https://www.reuters.com/business/ukraine-could-lose-6-bln-grain-exports-with-ports-blocked-2022-03-21/>

² <https://www.theguardian.com/world/2022/may/14/ukraine-says-russian-forces-withdrawing-kharkiv>

approve schedules, verify details about personnel and loading port via close liaison with port authorities and ‘develop and disseminate’ detailed operational and communications plans. Furthermore, the agreement ensured that no military ships and aircrafts would be allowed to approach the maritime humanitarian corridor closer than a particular distance that was agreed upon by the JCC without authorization.

The agreement signed initially was set to expire on the 19th of November, 2022; the agreement was extended for a period of 120 days till March, 2023. After this, the deal was extended twice for a period of 60 days. 17th July, 2023 ultimately marked the expiration of the BSGI .

Ukraine’s global influence in agricultural supply is exemplified by its activities with major nations and unions. The European Union (EU), China and India are, in order, the largest importers of Ukrainian agricultural products. ³ In the 2021 calendar year, the EU (\$7.7 billion), China (\$4.2 billion) and India (\$2.0 billion) accounted for **50%** of total Ukrainian **agricultural exports**.

Ukraine’s significance in agricultural exports in Europe, has earned it the term of ‘breadbasket of Europe’. Similarly, Russia and Ukraine combined are referred to as the “Global Breadbaskets”.⁴ This is also due to their significant contribution to the world’s exports in agriculture. These two nations accounted for 78% of the global export in sunflower oil and 30% of global wheat exports. The combined influence of Russia and Ukraine in the world’s agricultural exports deemed it necessary for an initiative like BSGI be taken for the strengthening and reinstatement of global food security.

The necessity in undertaking BSGI is even more exemplified while looking at export data of Ukraine and Russia. The pre-war contribution of agricultural exports to the total exports for Ukraine was at

³ <https://www.fas.usda.gov/sites/default/files/2022-04/Ukraine-Factsheet-April2022.pdf>

⁴ <https://www.idsa.in/issuebrief/improving-global-food-security-rkumaria-270323>

41%⁵. Ukraine's share in the global exports of agriculture declined massively; the global share of Ukraine's export in wheat, barley and sunflower oil declined from around 12%, 17% and 46% to 4%, 6% ,and 35% respectively.

Edible oils

Edible oil is fat of animal, plant or microbial origin that, at room temperature, is suitable for food use. They're derived from oilseeds ,which are the seed of plants that contain high levels of oils. Some common types of edible oil consumed in India are mustard oil, sunflower oil, soybean oil,groundnut oil and sesame oil. India's vast population and frequency of oil usage in food has made it the **largest** consumer of edible oil. To meet the vast demand, production capability, as well as exports have seen a continual increase. India is the fourth largest producer of oilseed, accounting for an impressive 10% of the global production.

Production of oilseeds in India

Domestic production of oilseed in India has seen an impressive improvement since the Yellow revolution in 1986-87, where domestic production was increased with an aim of meeting demand. During the period of 1986-87 to 2021-22, a threefold increase in production was seen as oilseed domestic production increased from 11.3 million tonnes to 45.7 million tonnes.

The recent growth in oilseed production can be owed to increasing demands, favorable weather conditions and improvements in technology.

However, the “National Mission on Edible Oils-Oil Palms” (NMEO-OP), a centrally sponsored scheme, approved in 2014-15, has played a significant role too. NMEO-OP's guidelines suggested that only 13% of the total potential land coverage has been utilized for cultivation of palm oil. The improvement in production capabilities of palm oil is especially important due to the fact that palm oil

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<https://www.trade.gov/country-commercial-guides/ukraine-agribusiness#:~:text=Pre%2Dwar%20annual%20agricultural%20exports.%244%20billion%20and%20%246%20billion.>

imports account for more than 55% of the total imports for edible oil. The period from 2014-15 to 2020-21 saw an astounding 42% increase in the production of crude palm oil, an impressive feat since the beginning of NMEO-OP.

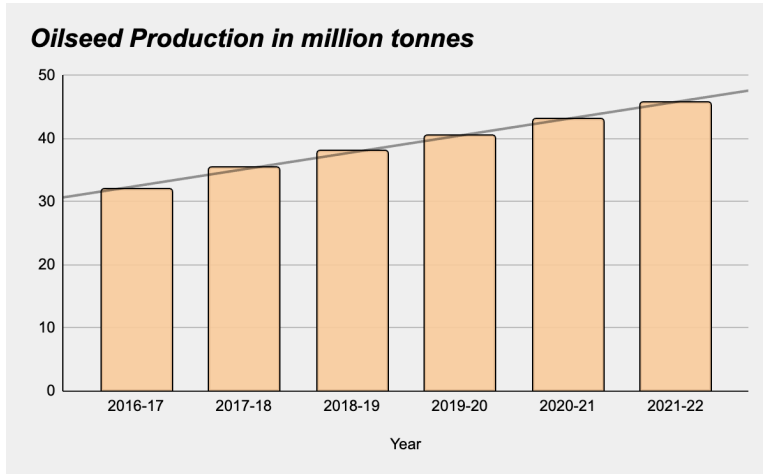


Fig 1.0 : Domestic Production of Oilseed in India (mT) from 2016-17 to 2021-22

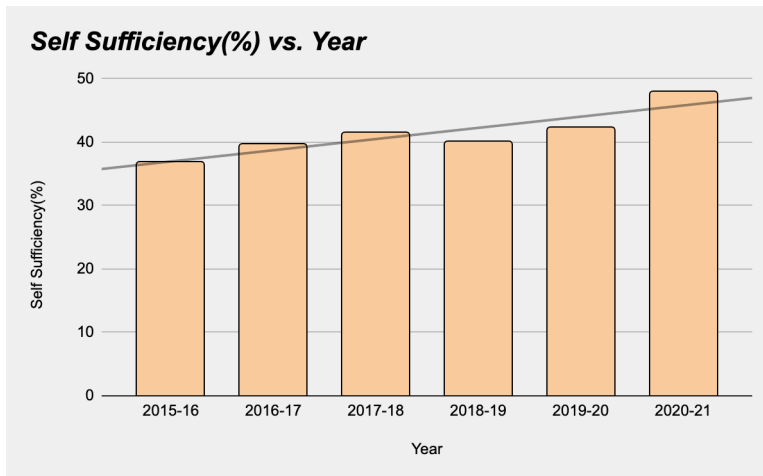


Fig 2.0 : Self sufficiency ratio (SSR) of edible oil sector in India from 2015-16 to 2020-21

$$SSR = 100 * (Production) / (Import + Production - Export)$$

As evident from *Fig 1.0 and Fig 2.0*, oilseed production has been steadily increasing in the recent past, with a CAGR of 8% and the self sufficiency ratio as a percentage has also seen an increasing trend, reaching almost 50% in the period 2020-21. It must be noted that the production of edible oil from oilseed typically yields, in India's context, 28%-35% of the mass of oilseed. This means that 1 kg of oilseed would yield around 280-350 grams of the respective edible oil in mass.

Role of Trade in Oilseed/Edible Oil

Despite India's rising production of oilseeds and an increasing self sufficiency ratio, total demands for edible oil still largely outweigh production. Therefore, imports account for the rest of the nation's availability of edible oil. Recent data shows that domestic production accounts for approximately 9-10 mT of edible oil whereas import accounts for the remaining 11-14 mT. Some commonly used edible oils include palm oil, sunflower oil, soybean oil and mustard oil.

Palm oil is the most widely consumed type of edible oil with an annual demand of 8 - 8.5 mT. Palm oil's demand heavily outweighs production as India's palm oil production was at around only 0.3 mT annually. The import of palm oils is a significant contributor to the edible oil import bill, with it comprising more than **55%** of the overall **bill**. This makes palm oil, the most highly demanded edible oil, highly **import dependent**.

Similarly, the availability of sunflower oil, the fourth most consumed oil, is also highly dependent on imports. India's production capacity of 0.05 mT is negligible when compared to the demand of 2-2.5 mT.

The Russo-Ukrainian war has had massive impacts on the edible oil market in India. With a large proportion of demand met by imports, this impact can be exemplified through the import quantity and import bill data as shown in **fig 3.0** and **fig 4.0**.

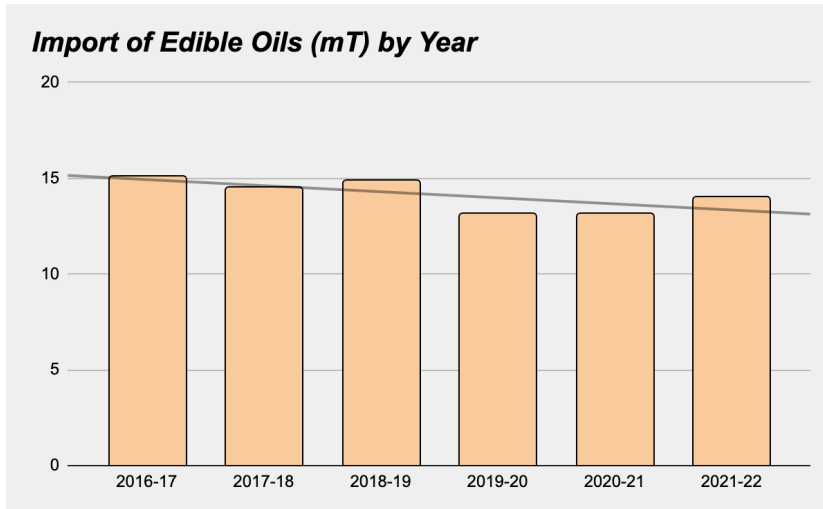


Fig 3.0

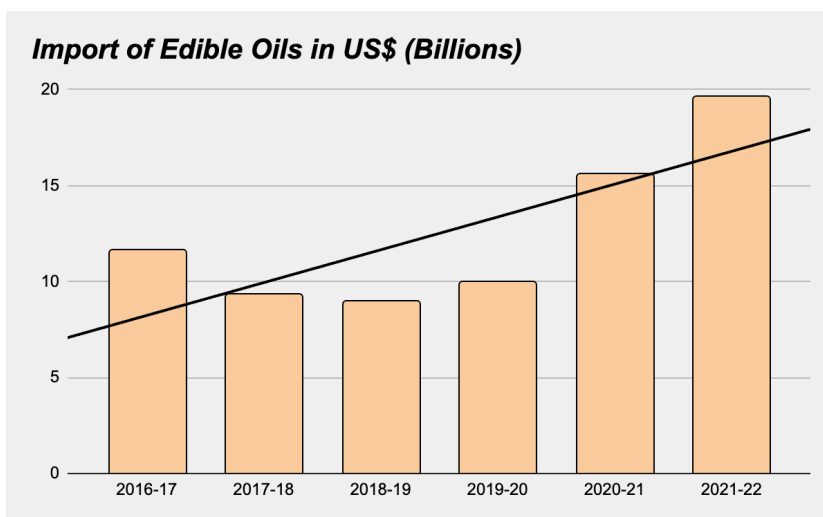


Fig 4.0

Figure 3.0 shows a **slight** decline in the import quantity of edible oils in recent years. Looking at individual years/periods allows us to see that the fluctuation has not been significant. The import quantity has stayed at a rough 13.5-15 mT value.

Figure 4.0 , on the other hand, depicts the fluctuation in import **value** in US\$ as opposed to the quantity. Despite the overall quantity having stayed at a modest range in the years, as suggested by figure 3.0, the import in US\$ has seen significant fluctuation. The trend is seen to be increasing due to

the special contributions of the time periods 2020-21 and 2021-22. The import bill for edible oil in 2021-22 was seen to be almost double to that of 2019-20. There is a visibly stark contrast in the fluctuation between quantity and fluctuation in prices.

Relative to imports, the export of edible oils by India is underwhelming. As seen in **figure 5.0**⁶, an increasing trend, with slight fluctuations, is seen in the exported quantity of edible oil. India's edible oil export quantity is disproportionately low compared to its domestic demand, which is largely met by imports.

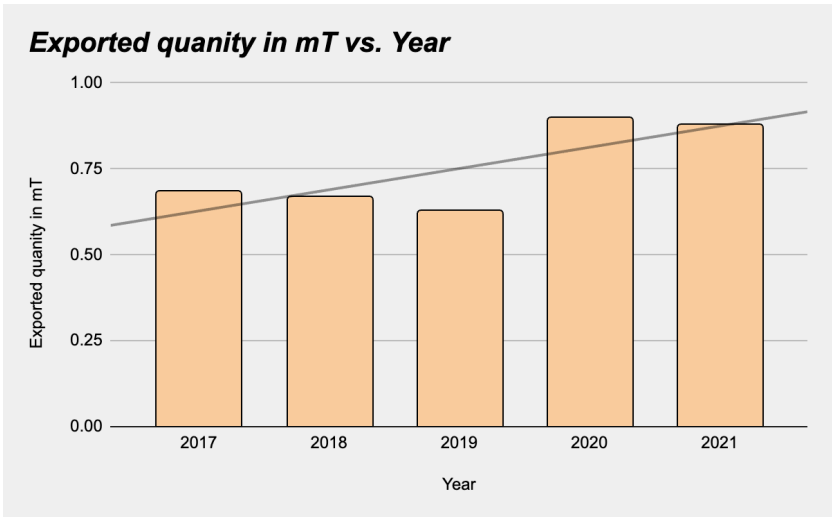
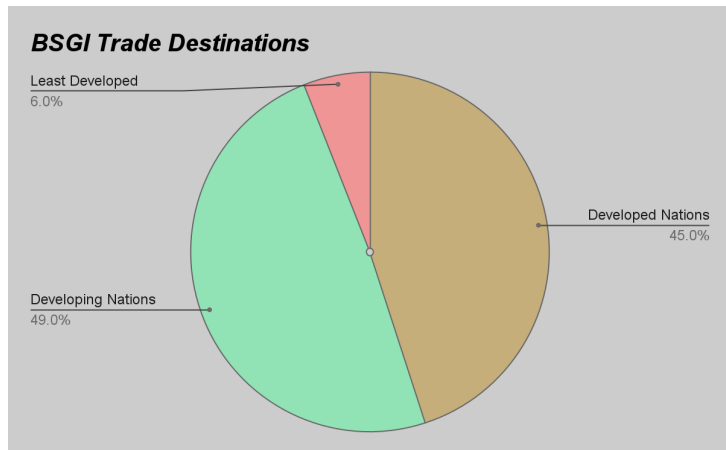


Fig 5.0: Exported quantity of edible oils in mT by year.

BSGI's impact on global markets

The Black Sea Grain Initiative had a massive impact on the supply and prices of grains across the world. As of March 2023, before the initiative's termination, JCC reported that 23 million tonnes of grains had been exported under the initiative with 45% of exports going to developed nations, 49% going to developing nations and the remaining 6% going to least developed nations. 5% of the overall exports done under the initiative was sunflower oil, and played a role in meeting global demand for edible oil.

⁶ Global Trade Tracker



From Figure 6.0, we can see that global sunflower oil prices increased starkly on the March 2022 data point, owing to the Russian invasion. The prices, however, slowly declined as time went on. Prices can be seen declining continuously since June, 2022 onwards. BSGI was signed in July 2022, and is a potential contributor for the global oil prices reducing to a price lower than that of January 2021.

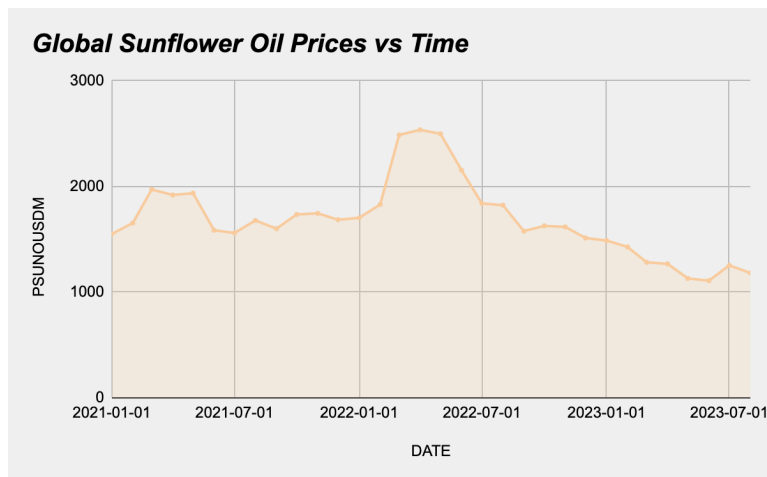


Fig 6.0

Despite BSGI facilitating large volumes of trade, trade levels were still below pre-war levels by a fine margin. Data from UNCTAD depicts the number of **port calls** before the war ranged around 120-170, a large increment from the BSGI period that hovered around 60-80 for the majority of the initiative's duration.

Similarly, food prices also declined after the signing of BSGI. However, their values remained high in comparison to pre-war and pre-pandemic levels.

All signs show BSGI was successful in mitigating stark increases in price levels of food commodities, although not enough to bring prices back down to pre-pandemic, or in some cases, pre-war levels.

Impact of BSGI on India's edible oil market

The Black Sea Grain Initiative (BSGI) was signed on 22nd July 2022, almost 5 months after Russia's invasion of Ukraine. With Ukraine accounting for a sizable portion of India's import of sunflower oil (75% of total imported mass) in the year 2020-21, India faced shocks in supply and consequently price.⁷ Similarly, palm oil, the most consumed edible oil, was imported mainly from Indonesia and Malaysia, with the two nations' exported palm oil accounting for more than 75% of the total palm oil imported.

The two goods exemplify the dependence of India on just a few nations for the import of edible oil. Due to such a type of dependence, it is more likely for price shocks caused by changes in supply to occur, as did during the Russo-Ukrainian war.

The Consumer Price Index (CPI) for food and beverages : Oils and Fats is a measure for the change in prices for consumer goods oils and fats with respect to time. The metric is a composite index that includes the pricing of a variety of commonly consumed edible oil and fats, and is used for this purpose as a substitute for edible oil prices. The CPI is measured such that CPI=100 in the year 2012, as the metric is on a relative scale.

⁷ <https://tradedstat.commerce.gov.in/eidb/lcomcnt.asp>

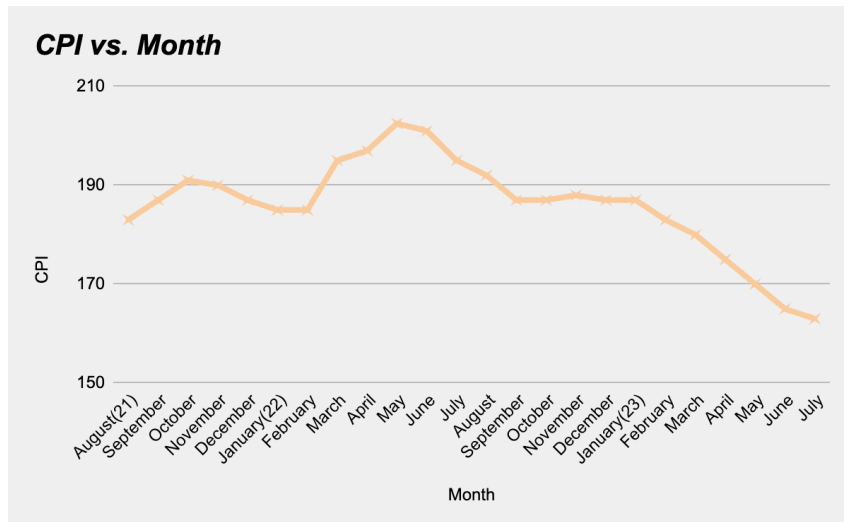


Fig 7.0

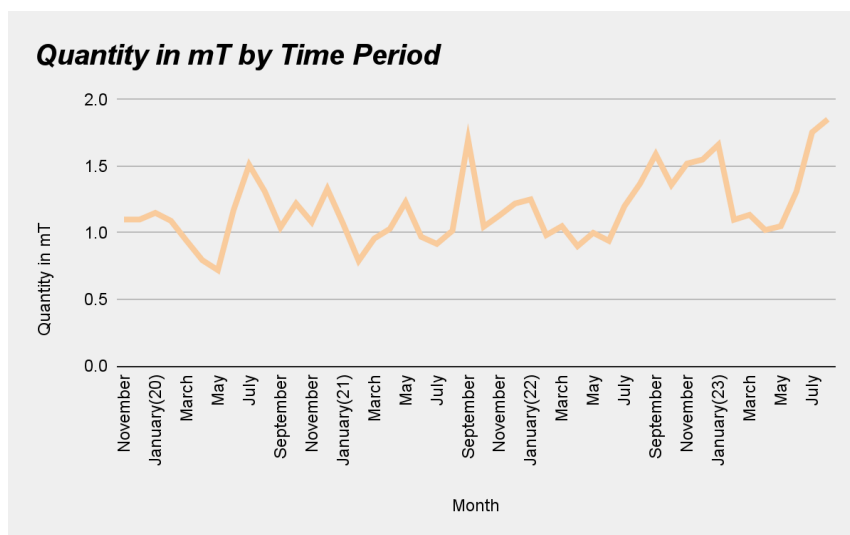


Fig 8.0

Fig 7.0 and Fig 8.0 represent the change in CPI value and the quantity (mT) of edible oil imported by India with respect to time respectively. Fig 8.0 marks a **decline** in the **import (supply)** of edible oils, which is accompanied by a sharp **increase** in **price** from February 2022 onwards on Fig 7.0. These fluctuations in price and imports are due to the invasion of Ukraine by Russia in 2022.

Similarly, the two charts allow us to understand the impact of BSGI on prices of edible oil as well as imports (**supply**) in India. At the signing of BSGI in July 2022, imported **quantity** of edible oil by India is seen to starkly increase and hover around a value **1.5** times that of pre-BSGI levels. Similarly,

on fig 7.0, July 2022 onwards sees the CPI at a value similar to that of pre-war levels; the downtrend in CPI after this point onwards is such that CPI levels drop **below** pre-war level continuously till available data in July, 2023. This suggests an increase in supply **relative** to the demand for composite goods (oils and fats)

The data points marked on fig 7.0 can also provide insight into the volatility of imported edible oil quantity by India, resulting in a supply-demand mismatch, and consequently increase in price levels. When an equivalent number of import quantity data points were taken for **before** and **after** the signing of BSGI (19 each) , a standard deviation of 0.202 mT and 0.27 mT were found respectively. This seems to suggest that, despite there being a larger volume of imported edible oil, quantity of import fluctuated more, i.e higher volatility.

Import Data for India's import from Ukraine and Russia

	Import of Edible Oils from Ukraine (US\$)			Import of Edible Oils from Russia (US\$)		
	2021	2022	2023	2021	2022	2023
January	203.28	340.05	179.73	18.77	62.09	144.9
February	115.63	160.85	75		44.24	130.43
March	162.32	238.03	50.94	16.93	119.78	46.1
April	150.82	15.25		33.43	82.99	45.95
May	182.1	4.6	107.9	47.57	74.49	79.44
June	206.8		24.53	48.18	101.19	106.3
July	76.36		31.77		70.06	140.97
August	51.01			7.31	113.94	
September	116.27	44.97		89.16	50.21	
October	113.46	104.32		6.35	19.26	
November	150.05	103.82		21.32	32.05	
December	324.24	26.24		14.71	138.48	

Table 1.0 : Imported quantity, and expenditure (US\$) for edible oil imports were not available for various months, and have been left blank in the table.

The Table 1.0 gives insight into the pattern of edible oil imports by India from the two economies afflicted by the Russo-Ukrainian war, as well as by the BSGI. However, it must be noted, as the data dictates, that since Russian ports were not blockaded and consequently did not suffer the same fate as Ukrainian exports.

Ukrainian imports by India (**edible oils**) in the year 2021 averaged at more than \$150 million per month. A similar trend was continued at the beginning of 2022 till March, which then faded into just \$15 million and \$4.6 million in the following two months; this drastic decline in import value from Ukraine can be attributed to the blockades imposed on Ukrainian ports. The import expenditure did pick up from September onwards, as per available data. This could be attributed to the BSGI which allowed for the safe passage of Ukrainian ships from its ports. Till July 2023, ebbs and flows in import expenditure are observed, with just a single month having expenditure above the 2021 average level and most months seeing a drastic decline. Despite there being inconsistent imports, expenditure experienced during the months immediately following Russia's invasion and before the signing of BSGI have not been reached.

Russia's data suggests a very different economic condition to that of Ukraine's. Despite their being unavailable for some months, the average of available data in 2021 depicts the average Russian edible oil exports to India being \$30 million, a fifth of that of Ukraine's. The import expenditure by India for Russian edible oils only increased in the year 2022, with the average expenditure reaching a value of \$75 million, 2.5 times that of the previous year.

Figure 9.0 shows the trend of expenditure of Russian goods in the pre-war and war period. A general increase in the import value is seen from the pre-war period to the present day.

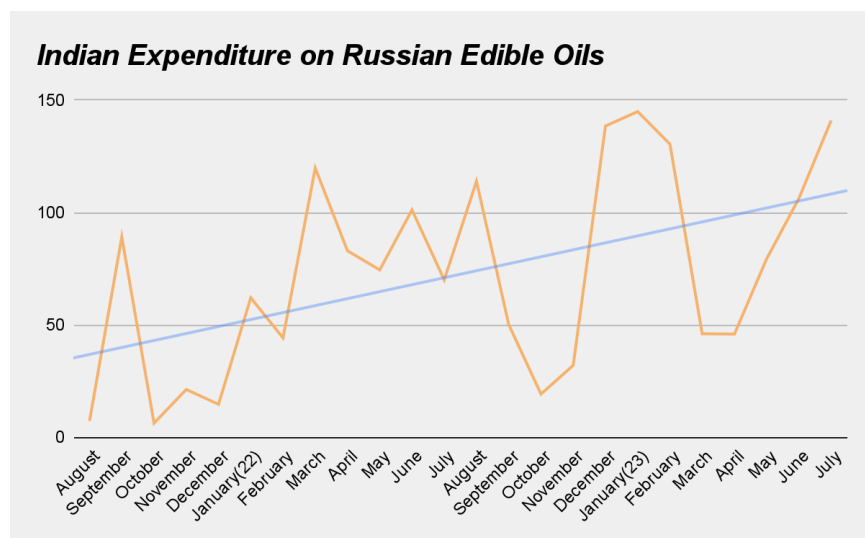


Figure 9.0

An Analysis of Policies of Flagship Edible Oil Producing Nations

The two most consumed edible oils in India are palm oil and soybean oil. **Indonesia** and **Malaysia** produce the largest quantity of palm oil annually, and **China** and the **US** produce the largest quantity of soybean respectively. Interpreting the role that policy implementation has played in fostering the production capabilities of these nations could allow us to understand relevant policy interventions. Hence, we shall briefly take a look at the respective nations and their distinct **policy initiatives**.

Indonesia (Palm Oil)

The National Action Plan of Sustainable Palm Oil (NAP SPO) is a comprehensive road map for the improvement of **sustainable** palm oil production. This initiative aims at strengthening coordination and infrastructure, improving **smallholder** capabilities, conflict resolution and ISPO certification access. According to the Inter-Censal Agricultural Survey of 2018, of the 69.4% of the landowners in Indonesia, 59% of them were categorized as smallholders. This further emphasizes the need for strengthening the contribution of smallholders' in the national agricultural output.

Malaysia (Palm Oil)

The National Biofuel Policy of 2006 dictated a **B5 policy** whereby diesel for land and sea transport were mandated to mix 5% of **processed** palm oil. Over the course of the long run, the percentage composition was to be increased.

Similarly, the world's largest palm oil company (plantation area, fresh fruit bunch production) was created through a Malaysian government initiative.

China (Soybean Oil)

China's 5 year policy to shift utilization from maize to other crops involved soybeans as well. A subsidy of CNY 350 per mu, consisting of CNY 200 of producer subsidy and CNY 150 of premium for the plantation of soybean instead of maize was awarded. This served to increase the gross income by 50-75% per mu for soybean farmers.

USA (Soybean Oil)

The **Biodiesel Blending Mandate** is a federal program implemented by the Environment Protection Agency (**EPA**). It dictates that any diesel fuel sold in the solid form must contain a certain percentage of biofuel (>5%). This program has been successful in reducing greenhouse gas emission and increasing the production of oilseed including soybean oilseed.

Policy Recommendations

Defragmentation of land

The cost of production of Oilseeds is much higher for small farmers than for larger ones.

An approximate 85% of farm land holdings in India are of 2 hectares or less. This implies that a significant portion of oilseed producers belong to the category of small farmers. Fragmentation of agricultural land may undermine any programs, campaigns and operations done for the promotion of oilseed and edible oil production.

The Government must run large scale **consolidation** or **land banking**; this would allow the government to unite fragmented land, decrease cost of production and improve profits. Furthermore, land banking can allow farmers to take risks in investments via technology and other productivity inducing factors of production. Since land banking illuminates the need for farmers to hold land, it effectively funnels investment into more productive activities in agriculture.

Expansion of Scope of NMEO-OP

A fundamental consideration to be made while increasing agricultural output is that more input does not equate to more output. Productivity plays a large role too. Although the 'strategy' for NMEO-OP includes the "improvement" of productivity, official guidelines lack specific targets to be reached as compared to the well defined area expansion goals. This issue could be tackled by promoting and expanding the role that irrigation plays on palm oil productivity.

India's palm oil productivity is at around 4.5 tonnes/hectare, which is relatively low when compared to Malaysia and Indonesia. Although climatic factors play a role, **drip irrigation** can improve productivity by up to 20%. India's palm oil production would highly benefit from a readjustment of NMEO-OP's goals for 2025-26 or 2028-29.

Biofuel mandate for Diesel (B5, B20)

Similar to what the US and Malaysia have already done, India could apply a mandate of 5% (B5 mandate), and gradually a 6-20% (B20 mandate) whereby diesel producers would be required to mix the relevant percentage of diesel with biofuel, which could comprise of palm oil or soybean oil. This would serve to increase the domestic production of edible oils, by effectively creating a new market. Since biofuels can come from a wide range of **food** sources and **non-food** sources, it is possible to enhance oilseed production while simultaneously ensuring a large proportion of it remains untouched by the diesel market.

In India's context, it is essential this mandate be implemented gradually, or even regionally. This policy could initially be implemented in regions with sufficient **supply** of biofuels so that no logistic failures can undermine the effectiveness of this policy.

Conclusion

The Black Sea Grain Initiative, facilitated by the United Nations, was an integral component in ensuring food security on a global level. With Ukraine and Russia combined accounting for a large percentage of various agricultural goods, the war and its consequent blockades resulted in supply disruptions for the goods. BSGI allowed for the safe passage of Ukrainian goods through its ports, and contributed to the increase in global supply of goods, especially sunflower oil.

Analysis has shown that BSGI's signing resulted in the increase in India's import bill for Ukrainian which was highly depleted in the initial stages of the war. The increase in import value resulted in supply of edible oil increasing, which resulted in the continuous decline in the prices of edible oils; this was observed in the form of CPI for oils and fats.

Analysis shows that Russia's export of edible oils to India only increased after the war's commencement. A potential explanation for this is due to the massive vacuum for edible oil supply that was formed in India due to Ukraine's absence. This gap was quickly filled by Russian edible oils.

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