EDIBLE OIL IMPORTS - ECONOMY

NEWS: Recently, a NITI Aayog stated that Genetically Modified (GM) crops are essential to reduce India's dependence on edible oil imports.

WHAT'S IN THE NEWS?

What are edible oils?

- Edible oil is a **liquid fat**, derived from **either plant or animal sources,** that is suitable for human consumption and is used in **cooking and food preparation**.

India's Rising Import Dependency

- **Import dependence declined from 63.2% (2015-16) to 54.9% (2021-22)** but surged back to **57% in 2022-23** due to rising demand.
- **Total imports skyrocketed** from **1.47 MT (1986-87) to 16.5 MT (2022-23).**
- **Breakdown of imports (2022-23):**
    - **Palm oil (59%)** – Mainly from Indonesia & Malaysia.
    - **Soybean oil (23%)** – Mainly from Argentina, Brazil.
    - **Sunflower oil (16%)** – Mainly from Ukraine, Russia.

Global Trends in Edible Vegetable Oils

- The global edible oil market is expanding, with production expected to grow by **2% in 2024-25**, reaching **228 million tonnes (MT)**.
- **Palm oil (75.5 MT), soybean oil (58.9 MT), rapeseed oil (25.1 MT), and sunflower oil (19.1 MT)** dominate production.
- **Palm oil** remains the most consumed due to its high yield (**14.6 t/ha**), followed by soybean oil, which benefits from its dual use in food and biodiesel.
- **Soybean** leads in oilseed cultivation, covering **127.2 million hectares (Mha)** globally, contributing **60% of total oilseed output (353 MT)**.
- **41% of global vegetable oil production is traded**, making it one of the most heavily traded agricultural commodities.
- **Palm oil dominates exports** – Indonesia & Malaysia account for **~60% of global palm oil exports**, shipping **over 70% of their production**.
- **India is the world's largest edible oil importer**, followed by China and the USA.

TABLE 1

INDIA'S EDIBLE OIL IMPORTS

Oil Year (Nov-Oct)	Quantity (million tonnes)	Value in (₹cr)	Value in US$ billion
2013-14	11.62	60,750	9.95
2014-15	14.42	62,862	9.65
2015-16	14.57	69,780	10.4
2016-17	15.08	75,125	11.55
2017-18	14.51	66,942	9.3
2018-19	14.91	62,933	9
2019-20	13.18	71,625	9.95
2020-21	13.13	117,225	15.6
2021-22	14.03	156,800	19.6
2022-23	16.47	138,424	16.65

TABLE 2

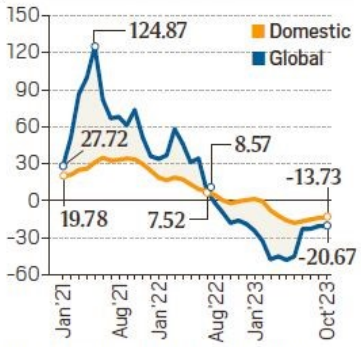
EDIBLE OIL PRODUCTION

	2013-14	2022-23
Mustard*	22.72	39.8
Soyabean	14.03	18.53
Cottonseed**	14.74	12.44
Rice Bran	9.3	11
Groundnut@	6.75	9.91
Copra/Coconut	4.55	3.9
Palm	1.1	3.5
Maize Germ	0.5	1.5
Sesame	1.13	1.06
Sunflower@@	2.43	1.03
Others	0.77	0.68
TOTAL	78.02	103.35

*Table 2 shows **Edible oil production from domestic sources** (lakh tonnes)*
**Includes oil from rapeseed cake and toria; **Includes cottonseed cake oil; @Includes groundnut cake oil; @@Includes sunflowerseed cake oil.*
Source: The Solvent Extractors' Association of India.

CHART

VEGETABLE OILS INFLATION: DOMESTIC vs. GLOBAL



Source: Domestic inflation based on Consumer Price Index for 'Oils and Fats' and Global inflation based on FAO's 'Vegetable Oils' price index.

India's Position in the Global Edible Oil Market

- India is the **4th largest vegetable oil economy** (after the USA, China, and Brazil), contributing:
    - **15-20%** of global oilseed cultivation area.
    - **6-7%** of vegetable oil production.
    - **9-10%** of global consumption.
- **World leader in rice bran oil (46.8% global share) and castor seed (88.48%).**
- **2nd largest** in cottonseed oil (28.41%), groundnut seeds (18.69%), and groundnut oil (16.34%).
- **3rd largest** in coconut oil (14.2%), sesame seed oil (8.73%), and rapeseed production (13.72%).
- **5th largest** in soybean and soybean oil (3.72% and 2.14% share) (behind Brazil, USA, Argentina and China).

Key Oilseed Crops and Their Contribution

- **Area under cultivation (2022-23):**
    - **Soybean (11.74 Mha, 34% of production)** – Dominates oilseed cultivation.
    - **Rapeseed-mustard (7.08 Mha, 31% of production)** – Key for mustard oil.
    - **Groundnut (5.12 Mha, 27% of production)** – Major source of edible oil.
    - **Others (sesame, castor, sunflower, etc.)** – Occupy smaller areas but have niche markets.

- **Domestic edible oil production share:**
    - **Mustard oil (45%)** – Largest contributor.
    - **Groundnut oil (25%) & soybean oil (25%)** – Major players.
    - **Minor oils (sunflower, sesame, safflower, nigerseed) – 5%.**

Regional Dominance in Oilseed Production

- **Top oilseed-producing states:**
    - **Rajasthan (21.42%) & Madhya Pradesh (21.42%)** – Lead in mustard and soybean.
    - **Gujarat (17.24%)** – Major groundnut producer.
    - **Maharashtra (15.83%)** – Key for soybean and cottonseed oil.
- **State-wise specialization:**
    - **Palm Oil:** Andhra Pradesh (87.3%), Telangana (9.8%), Kerala, Karnataka.
    - **Coconut:** Kerala, Tamil Nadu, Karnataka (84% of total).

Yield Variations Across States

- **National average yield: 1.27 t/ha (low compared to global standards).**
- **High-yielding states:** Tamil Nadu (2.5 t/ha), Gujarat (1.91 t/ha), Haryana (1.94 t/ha), Telangana (1.80 t/ha).
- **Low-yielding states:** Madhya Pradesh (0.99 t/ha), Maharashtra (1.18 t/ha), Karnataka (0.94 t/ha).

Reasons for High Import Dependency

- **Surge in Per Capita Consumption**: Per capita edible oil consumption in India rose sharply to **19.7 kg/year** (2022–23), significantly outpacing domestic production.
    - **As per** NITI Aayog, the rapid increase in demand — driven by **rising incomes, urbanization, and lifestyle changes** — is a major reason for the widening demand-supply gap.
- **Stagnant Yield Levels**: Yield of key oilseeds like soybean has **remained stagnant since the 1970s**.
    - **D**espite having the **largest soybean-growing area**, India has failed to improve productivity, limiting domestic supply growth.
- **Predominance of Rainfed Cultivation**: **76% of India's oilseed cultivation** occurs in rainfed areas, which are highly vulnerable to climatic stress.

    - **R**ain-dependency affects both **stability and yield**, contributing to inconsistent supply and limiting scope for meeting growing demand.
- **Low Seed Replacement Rate (SRR)**: The SRR for oilseeds is significantly below the target of **80–85%,** with crops like **groundnut having only 25%.**
    - Low SRR hinders productivity gains, as the **lack of high-quality seeds** directly affects yield potential across major oilseed crops.
- **Processing Infrastructure Inefficiencies**: India's vegetable oil processing sector is dominated by small-scale, low-tech mills with **only 30% utilization** of refining capacity.
    - **T**his underutilization leads to inefficiencies and waste, reducing effective output and increasing dependence on refined oil imports
- **Limited Cultivation of High-Yield Oils Like Palm**: Palm oil, which has **much higher yield (14.6 t/ha)** than other oils, is underutilized domestically.
    - Despite identified potential in 284 districts, palm oil cultivation remains limited.
- **Trade Policy Reliance and Global Price Volatility**: India's edible oil import structure is highly exposed to international price and supply fluctuations.
    - With **16.5 MT imported in 2022–23, a**ny disruption in global markets (especially palm oil from Malaysia/Indonesia) severely impacts availability and price stability at home.

Genetically modified (GM) crops

- They are plants whose **DNA has been altered** using genetic engineering techniques to introduce new traits or enhance existing ones.
- This technology allows for the development of crops with **increased yield, pest resistance, herbicide tolerance, or improved nutritional value**.
- **Examples of GM Crops in India:**
    - **Bt Cotton**: The **only GM crop** approved for commercial cultivation in India.
    - **Bt Brinjal:** Approved for commercial cultivation by the **Genetic Engineering Appraisal Committee (GEAC) in 2009**, but a moratorium was imposed due to public concern.
    - **GM Mustard:** Development of a high-yielding **GM mustard variety (Dhara Mustard Hybrid-11)** has been approved for environmental release, but commercial cultivation has not yet begun.

- **Regulatory Authority in India:** Genetic Engineering Appraisal Committee (GEAC) under the Ministry of Environment, Forests and Climate Change (MoEF&CC)

Role of GM Crops in Edible Oil Self-Sufficiency

- **Boosting Yield in Stagnant Crops**: Despite being the largest soybean cultivator in the area, India's yields have remained **unchanged since the 1970s**.
    - GM crops can help break this stagnation by introducing transgenic varieties with higher productivity.
- **Reducing Edible Oil Import Dependency**: India imports around **57%** of its edible oil demand.
    - Advanced GM oilseed varieties can narrow the demand-supply gap by enhancing domestic production.
- **Enhancing Drought and Pest Resistance: 76% of oilseed area is rainfed**, vulnerable to climate shocks (e.g., soybean in MP/Maharashtra).
    - **Drought-tolerant GM groundnut and castor** can stabilize yields in dry regions (e.g., Gujarat, Rajasthan).
- **Improving Oil Quality for Health & Industry**: Traditional mustard contains high erucic acid; soybean oil lacks stability for frying.
    - **Low-erucic acid GM mustard and high-oleic GM soybean** improve nutritional profile and shelf life.
- **Leveraging Farmer Responsiveness**: Smallholder Indian farmers show high adaptability to new technologies.
    - Quick adoption of GM varieties by small farmers can drive national-level productivity gains.
- **Technology Integration in National Missions**: The NMEO mission supports integrating global technologies like **genome editing** for oil-rich seed development.
    - Forms part of the vertical expansion strategy in the roadmap to self-sufficiency.

Challenges of GM Crops in India's Edible Oil Self-Sufficiency Strategy

- **Increased Chemical Input Dependency**: Bt cotton in India initially reduced pesticide use, but over time led to higher insecticide costs.
    - Study, published in the Journal of Agrarian Change, reports **37% higher pesticide spending by 2018** than in pre-Bt cotton era.

About Jevons Paradox

- It is named after **English economist William Stanley Jevons**,
- It describes the **counterintuitive effect** where **increased efficiency** in resource use actually leads to **higher overall consumption** of that resource.
- **Instead of saving** resources as expected, efficiency gains can paradoxically **drive up demand** due to factors like lower costs, wider adoption, and increased usage.

- **Regulatory Hurdles & Approval Delays:** India's GM crop approval process is slow and politicized (e.g., **GM mustard DMH-11** faced litigation despite clearance).
    - Delays prevent timely adoption, keeping yields stagnant.
- **Jevons Paradox Effect**: Efficiency led to more planting of GM crops, which ultimately increased input use.
    - The Jevons Paradox explains why GM crops may worsen resource overuse.
- **Farmer & Consumer Resistance:** Misinformation about GM safety reduces acceptance (e.g., "terminator gene" myths).
    - Low adoption even for approved crops (e.g., **Bt cotton succeeded, but GM food crops face backlash**).
- **Seed Cost & Corporate Dependence:** GM seeds are patented, raising costs and creating reliance on MNCs (e.g., **Monsanto's Bt cotton pricing disputes**).
    - Smallholders (80% of oilseed farmers) may struggle to afford GM seeds annually.
- **Biodiversity & Pest Resistance Risks:** Monoculture of GM crops (e.g., HT soybean) may reduce agro-biodiversity and increase herbicide-resistant weeds.
    - Long-term sustainability threats (e.g., **pink bollworm resistance to Bt cotton**).
- **Trade Barriers & Export Restrictions:** GM crops face export bans (e.g., **EU rejects GM-contaminated shipments**).
    - Limits market access for Indian oilseeds (e.g., **non-GM soybean fetches premium prices**).
- **Lack of Homegrown GM Alternatives:** Reliance on foreign GM tech (e.g., **DMH-11 uses Bayer's barnase/barstar genes**).
    - Royalty payments drain farmer incomes and limit R&D autonomy.

Key Government Schemes to Reduce Import Dependency in Edible Oils

- **National Mission on Edible Oils – Oilseeds**

    - Flagship scheme running from **2024–25 to 2030–31**.
    - **Objective**: Raise oilseed production from **39 MT to 69.7 MT**, and oil production from **12.7 MT to 20.2 MT**.
- **National Mission on Edible Oils – Oil Palm**
    - Launched in **August 2021 as a centrally sponsored scheme.**
    - **Objective**: To increase oil palm cultivation and Crude Palm Oil (CPO) production to 11.20 lakh tonnes by 2025-26.
- **Rashtriya Krishi Vikas Yojana – RAFTAAR (RKVY-RAFTAAR)**
    - It was launched in **2007 as the Rashtriya Krishi Vikas Yojana (RKVY)** and was renamed to **RKVY-RAFTAAR in 2017.**
    - Supports **state-level oilseed promotion** through funding approvals from State Level Sanctioning Committee.

NITI Aayog Strategies and Roadmap to Achieve Self-Sufficiency in Edible Oils (2024)

- **Horizontal Expansion: Increasing Cultivation Area**
    - Bringing more land under oilseed cultivation, especially in non-traditional regions.
    - **Strategies**:
        - Utilize **rice fallow lands** and **wastelands** (e.g., 2.43 Mha for palm oil).
        - Promote **intercropping** and **crop diversification** in major cereal-growing zones.
    - Could add **7.36 MT** from crop retention and **3.12 MT** from fallow land utilization.
- **Vertical Expansion: Increasing Productivity**
    - Raise yields of existing oilseed crops using better practices and technologies.
    - **Strategies**:
        - Adoption of **high-yielding varieties**, **hybrids**, and **GM crops**.
        - **Bridging yield gaps** – e.g., sunflower has a 96% gap, castor 12%.
        - Enhance **Seed Replacement Rate** (SRR); current rates fall short of 80–85% target.
    - Vertical expansion alone could boost production by **17.4 MT** and reduce

imports by **3.7 MT**.

- **Palm Oil Focus: High-Yield Oil Source**
    - Palm oil yields 14.6 t/ha — the highest among all oil crops.
    - **Strategies**:
        - Expand palm cultivation in 284 ICAR-IIOPR identified districts.
        - Use **two-thirds of 6.18 Mha suitable wastelands** for palm.
    - Potential addition of **34.4 MT** of edible oil from palm alone.
- **Secondary Oil Sources:** Enhance extraction from **rice bran**, **cottonseed**, and **tree-borne oilseeds (TBOs)**.
    - **Strategies**:
        - Improve processing of rice bran oil (0.85 MT potential untapped).
        - Expand TBO value chains for oils like mahua, kokum, and mango kernel.
    - Additional **3.3 MT** edible oil through secondary sources.
- **Processing & Infrastructure Improvement:** India's edible oil refining sector runs at **only 30% capacity**.
    - **Strategies**:
        - **Modernize mills**, encourage **PPP** in seed and oil extraction units.
        - Improve **cold chain**, storage, and logistics.
    - Combined with seed traceability and tech adoption, can improve efficiency and reduce wastage.
- **Quadrant Strategy: State-Specific Interventions**
    - **Clusters states into:** HA-HY (High Area-High Yield); HA-LY (High Area-Low Yield); LA-HY (Low Area-High Yield); LA-LY (Low Area-Low Yield)
    - **Strategy**:
        - Tailored interventions (e.g., vertical expansion in HA-LY; horizontal in LA-HY).
        - Focused resource allocation for each cluster.
    - Optimizes policy actions and ensures region-specific productivity gains.
- **Demand-Supply Gap Management:**

- **Approaches**:
    - **Static/Household Approach**: Based on current per capita consumption.
    - **Normative Approach**: Based on ICMR dietary guidelines.
    - **Behavioristic Approach**: Based on lifestyle and income-based future consumption.
- **Target**: Achieve **70.2 MT** supply by 2047 to meet all but the highest consumption scenario.

Way Forward to Achieve Self-Sufficiency in Edible Oils

- **Prioritize High-Yielding & Oil-Rich Seed Varieties**: Accelerate development and distribution of **genome-edited and GM seeds**.
    - High-quality seeds can contribute up to **45% yield improvement** when supported by good agronomic practices.
- **Leverage Rice Fallow and Wasteland Areas**: Expand oilseed cultivation into **rice fallows** (post-Kharif season) and degraded lands.
    - Using just **one-third of fallow land in 10 states** can add **3.12 MT** to oilseed output.
- **Modernize Processing and Supply Chain Infrastructure**: Upgrade existing mills, improve logistics, and increase processing capacity utilization (currently just 30%).
    - Reduces post-harvest losses and improves overall oil yield.
- **Strengthen R&D and Public-Private Partnerships**: Boost investment in biotech research, precision farming, and oilseed-specific innovation hubs.
    - Sustained R&D is key to **closing India's yield gap with global leaders**.
- **Create Dynamic, Balanced Trade and Price Policy**: Maintain a flexible import duty regime while ensuring profitable MSPs and procurement for oilseeds.
    - Ensures farmer interest, consumer price stability, and resilience against global shocks.
- **Cluster-Based Seed Villages:** Inadequate access to quality seeds and low SRR.
    - Implement the **"One Block-One Seed Village"** model via FPOs/FPCs (Farmer Producer Organization/Farmer Producer Company).
- **Scaling Up Newly Bred ICAR Varieties**: Newly bred varieties match global genetic potential (e.g., 3–3.5 t/ha for mustard).
    - Expand production and availability through focused scaling.

- **Promote Rice Bran Oil for Blending**: Rice bran can add nearly **1 MT/year** oil.
    - Standardize blending regulations in collaboration with rice-producing countries.

Conclusion

India's edible oil **self-sufficiency** hinges on adopting **high-yielding GM crops**, expanding palm oil cultivation, and **modernizing processing infrastructur**e. Strategic interventions like leveraging rice fallows, enhancing seed replacement rates, and state-specific quadrant strategies can significantly **reduce the 57% import dependency**.

Source: http://business-standard.com/industry/agriculture/india-edible-oil-consumption-tripled-imports-health-obesity-palm-oil-125042100484_1.html