POLICY BRIEF 49

Technology and Policy Options for Reducing India's Import Dependence on Edible Oils

Balaji S. J., Purushottam Sharma, Venkatesh P., and Shreya K.

India heavily depends on imports to meet its edible oil demand. In 2020-21, it imported 54% of the total edible oil demand, spending Rs. 1.17 lakh crores. Notably, most of the imports are from a few countries. About 94% of the crude palm oil and 99% of the RBD palmolein are imported from Indonesia and Malaysia; 97% of the soybean oil from Argentina and Brazil; and 97% of the sunflower oil from Ukraine, Russia, and Argentina. This means higher supply risks and price uncertainty, especially during climatic shocks, conflicts, and pandemics such as COVID-19. Uncertain supply inflates prices and erodes purchasing power, forcing governments to resort to subsidies and cash transfers to protect domestic consumers, and reduce import duties and provide other incentives for industries and importers. The surge in import bills due to rising international prices and increasing domestic support amplify fiscal deficits, curtailing investments that could have positively influenced economic growth.

Enhancing domestic production capacity should help bring down import bills. The Government of India has taken several policy measures to promote oilseeds and edible oil production. The production has increased, but the demand has outpaced it, leading to a continued increase in imports. The improvements in production technology and protective tariffs could be the instruments of choice. This brief looks at the recent trends in edible oil imports and the possibilities of reducing these by increasing domestic production, adopting yield-enhancing technologies, and raising import tariffs.

Edible Oil Demand and Import Dependence

India's edible oil demand is massive and has been increasing (Figure 1). It grew from 97 lakh tons in 2000-01 to 170 lakh tons in 2010-11 and 248 lakh tons in 2020-21. Simultaneously, import dependence increased, from 42 lakh tons in 2000-01 to 131 lakh tons in 2020-21. Notably, the unit price of imported edible oils also increased. For example, in 2020-21, India imported 131 lakh tons – the lowest in the past six years – spending Rs. 1.17 lakh crores. Compared to 2015-16, the quantity imported is less by 10%, but the spending is higher by 68%, leading to an 86% increase in unit price. Even if inflation is accounted for, the real cost of imports has risen faster.

The composition of the edible oil basket has remained almost unchanged (Figure 2). India's imports concentrate on a few nations, and the extent of import diversification has remained limited. Most crude palm oil (RBD palmolein) is imported from Indonesia and Malaysia, soybean oil from Argentina, and sunflower oil from Ukraine. In 2020-21, crude palm oil comprised 57% of the total imports, and 94% was imported from Indonesia and Malaysia. Soybean and sunflower oils accounted for 21.8% and 14.4% of the total edible oil imports. Argentina contributed 83% of the soybean oil, and Ukraine 74% of the sunflower oil imports.

Figure 1. Import dependence on edible oils, 2001-2021

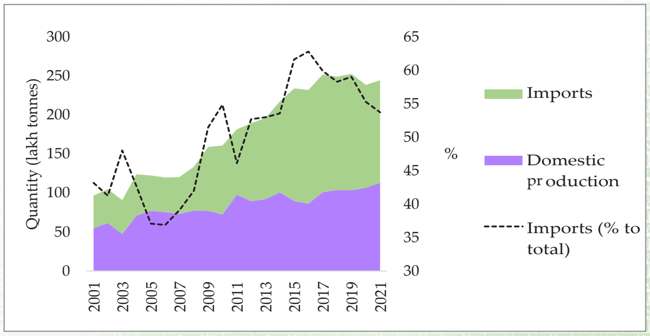

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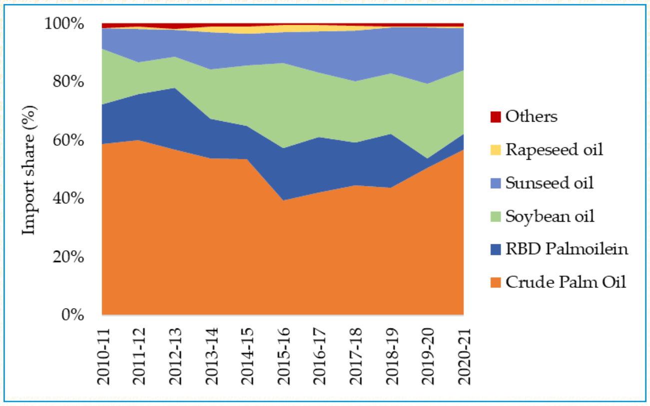
Figure 2. Changes in the edible oil import basket, 2011-2021



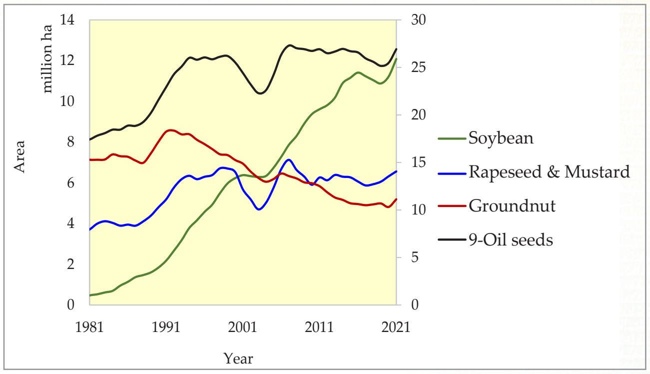
Such a heavy dependence on imports of edible oils from a few nations can make India vulnerable to supply and price shocks. For instance, the Russia-Ukraine war has forced many countries to ban exports of food and non-food commodities. Indonesia, the major palm oil supplier to India, announced a ban on RBD palmolein exports on 28th April 2022. Between February and April, the supply of sunflower oil from Ukraine fell by 93% and from Russia by 24%. This highlights the need for raising domestic edible oil production to substitute imports.

Oilseeds Production, Technology, and Tariffs

Demand for groundnut and rapeseed-mustard oils is met through domestic production. Groundnut contributes over 26% to the total oilseeds production, and rapeseed-mustard over 30%. Nonetheless, there is a continuous decline in the area under groundnut cultivation, while the area under rapeseed-mustard has remained almost stagnant (Figure 3). Historically, these crops have neither experienced any significant structural break in their yields[1] and the climate change is likely to negatively impact production of these crops[2]. Soybean is the only crop witnessing a sustained increase in its cropped area. At present, it occupies 45% of the total oilseed area. The trend in the case of sunflower is rather opposite. Its area expanded until the mid-1990s, and after remaining stagnant for a few years it declined sharply. At present, it is grown only on 0.2 million hectares, equivalent to 0.8% of the total area under oilseeds.

Technology can play an effective role in raising oilseeds production. Estimates show that the Total Factor Productivity (TFP) growth in oilseeds had been much lower than in other crops. TFP growth was less than 1% from the early 1970s till the mid-2000s[3,4], increasing marginally to 1.5% afterwards. On the other hand, tariffs can indirectly be considered an instrument to boost domestic production of oilseeds and edible oils. The higher tariff on edible oils means the higher cost of imports, hence the more demand for domestically produced oilseeds and edible oils. An increase in oilseeds prices encourages farmers either to allocate more area or higher use of inputs, leading to more production and less imports. The effects of such an intervention are observed to be moderate. A hike in tariffs by 50% is estimated to increase the oilseeds production by just 2% and edible oil production by about 3%[5].

Figure 3. Trends in area under major oilseeds, 1981-2021



Note: The area of all 9 oilseeds is on the secondary axis

Further, the response of edible oil imports to the tariff changes had been mixed (Figure 4). Tariffs have been hiked in the case of soybean, from *no-tariff* on crude during 2012 to 35% in early 2021, and on refined oil from 7.5% to 45%. A similar hike is observed for sunflower oil. Against the general belief that an increase in tariff on soybean oil will lead to higher production of soybean, it declined consistently between 2012-13 and 2015-16 due to rainfall abnormality and stabilized thereafter. So as in the case of sunflower. Still, one can not ignore the effects of tariffs on imports, hence on domestic production.

1 Balaji, S.J. (2018). Structural breaks, yield plateaus and long run yield trends in Indian crop sector. *Indian Journal of Economics and Development*, 14(1), 35-44.

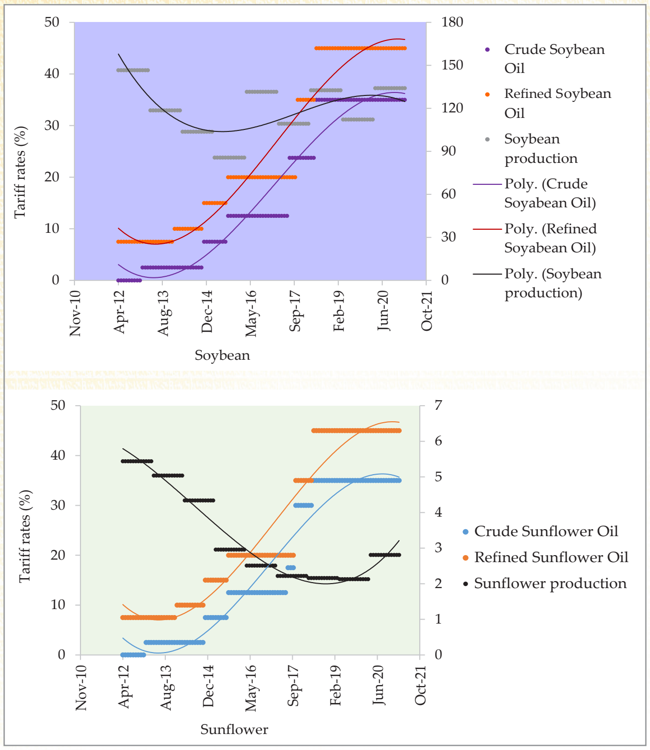
2 Birthal, P.S., Hazrana, J., Negi, D.S., and Bhan, S.C. (2021). Climate change and land-use in Indian agriculture. *Land Use Policy*, 109, 105652.

3 Kumar, P., Mittal, S., and Hossain, M. (2008). Agricultural growth accounting and total factor productivity in South Asia: a review and policy implications. *Agricultural Economics Research Review*, 21(2), 145-172.

4 Chand, R., Kumar, P., and Kumar, S. (2012). Total factor productivity and returns to public investment on agricultural research in India. *Agricultural Economics Research Review*, 25(2), 181-194.

5 Balaji, S.J., Umanath, M., and Arun, G. (2021). Welfare gains of inward-looking: an *ex-ante* assessment of general equilibrium impacts of protectionist tariffs on India's edible oil imports. *Agricultural Economics Research Review*, 34 (Conference issue), 1-20.

Figure 4. Response of production to tariff changes



Notes: Values in secondary axes refer to production and are in lakh tonnes; solid lines are polynomial trends of orders two or three.

Impacts of Technology and Tariff

A rise in TFP growth of oilseeds since the mid-2000s correlates well with an improvement in oilseeds production, signaling the impact of technological change reflected in improvements in productivity and production and its spillover effects. For instance, an increase in production or supply causes prices to fall. As a significant part of the production goes for industrial processing, the industries gain through cost reduction, which gets translated into lower consumer prices. Estimates for 2016-17 show that 39% of the oilseeds produced, much of which is groundnut, are consumed at the household level. The food and edible oil industries use over 52% of the oilseeds produced, and the rest is either used for sowing or exports. Farmers, as net consumers, also benefit from falling prices due to the adoption of improved technology as long as the additional revenue outweighs the cost of adoption.

Higher tariffs, other than regulating imports, also protect domestic industries and farmers. In our case, the impacts of technological improvements in oilseeds are measured at different levels of tariffs on edible oils. The International Food Policy Research Institute's (IFPRI) Standard Computable General Equilibrium (CGE) model[6] is calibrated to a Social Accounting Matrix (SAM) for 2017-18[7] to estimate the impacts on domestic oilseeds production, edible oil imports, rural income, and inflation. For model closure, investment is presumed to drive savings; the Government's savings and foreign exchange are presumed to be flexible, and the producer prices are set to remain constant at the national level.

The following scenarios are analyzed (Table 1). Scenarios A and B provide the impacts of rising tariff rates. Scenario A presumes that the tariff level rises by 50% and it doubles in Scenario B. Scenarios C and D assume a moderate increase in TFP growth of oilseeds when the tariffs are hiked as in Scenarios A and B. Having experienced TFP growth of 1.5% after the mid-2000s, we assume it to grow at a rate of 2% in the future. Scenarios E and F presume a higher rate of TFP growth of 3% to continue up to 2036-37. As a reference case, trade liberalization is also studied (Scenario G).

Table 1. Presumed rates of technology growth and tariff hikes

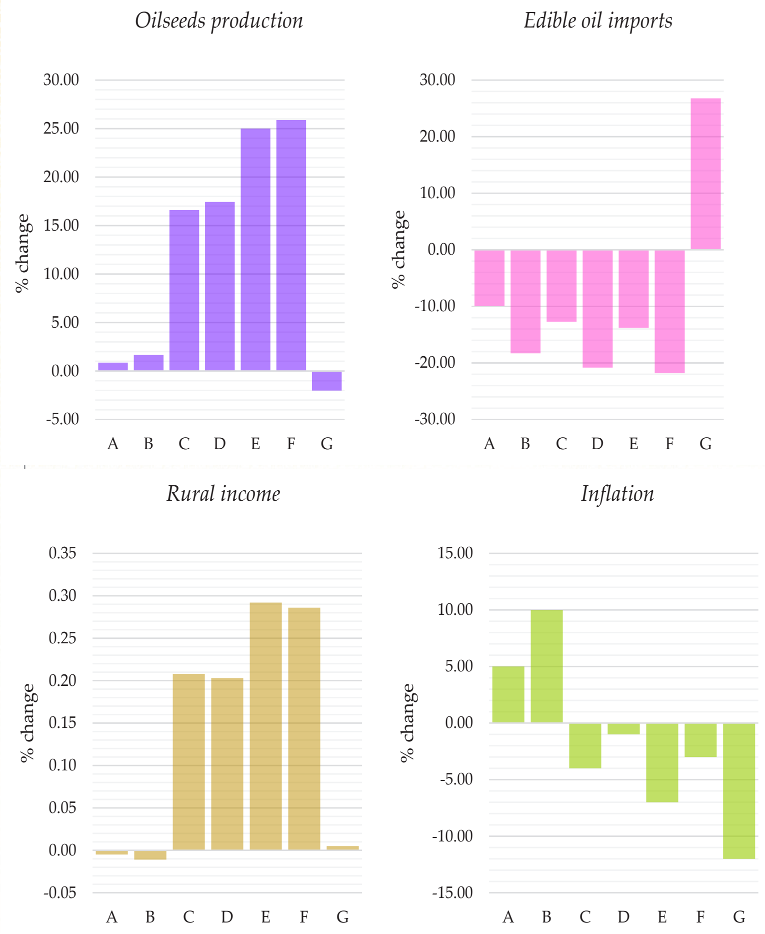
Scenario	Detail
A	Hike in import tariff on edible oils by 50%
B	Hike in import tariff on edible oils by 100%
C	Increase in TFP growth of oilseeds by 2% a year with a hike in import tariff on edible oils by 50%
D	Increase in TFP growth of oilseeds by 2% a year with a hike in import tariff on edible oils by 100%
E	Increase in TFP growth of oilseeds by 3% a year with a hike in import tariff on edible oils by 50%
F	Increase in TFP growth of oilseeds by 3% a year with a hike in import tariff on edible oils by 100%
G	Zero tariffs on edible oils

Among several economic outcomes, the focus is on the impact on domestic oilseed and edible oil production, rural income and general price level. Estimated impacts are presented in Figure 5. As expected, the contribution of technology is higher than that of tariff hikes. When the existing tariff rates are doubled, edible oil imports are observed to decline by over 18% due to a rise in import prices. As it inflates the prices of edible oils, oilseed prices also increase through the

[6] Lofgren, H., Harris, R.L., and Robinson, S. (2002). *A standard computable general equilibrium (CGE) model in GAMS*. International Food Policy Research Institute, Washington DC, USA.

[7] Pal, B.D., Pradesha, A., and Thurlow, J. (2020). *2017/18 Social Accounting Matrix for India*. International Food Policy Research Institute, Washington DC, USA.

Figure 5. Impact of technology growth on selected macro-economic outcomes in different scenarios



Note: a) Labels in horizontal axes are different scenarios as mentioned in Table 1; b) Impacts are derived for 2036-37.

demand effect. Still, the response of production is observed low, only 1.7%, far below the requirement to compensate for the edible oil demand. This leads to a rise in the overall price levels to the extent of 10%.

When the TFP grows at an annual rate of 2%, the oilseed production increases by 17% even after imposing higher tariffs. It also leads to a higher rate of reduction in edible oil imports. As part of the production is consumed by the households, the marginal reductions are less. A greater rate of response is observed in both the oilseed and edible oil production when TFP increases. And unlike tariffs, which inflate prices when these are imposed without adequate capacity to increase the oilseeds production, TFP growth brings about a decline in prices even when such tariff hikes are maintained, raising the real income of the consumers. Rural income, which derives a considerable share from the farm sector, also rises when the production technology improves despite a fall in oilseed prices. The impact of removing tariffs on oilseeds works in the opposite direction. It leads to a surge in edible oil imports and fails to increase the oilseeds production. Although the consuming segments benefit through price gains, the cost to the Government inflates, pushing up the deficits.

Policy Implications

Oilseed production is increasing gradually, and it has gained momentum in the past few years. Still, in the presence of huge edible oil demand and a state where imports are rising faster than domestic edible oil production, the present growth in oilseed production is insufficient. Tariffs could be an instrument to regulate edible oil imports but not to boost oilseeds production. To this end, an improvement in technology shall contribute significantly. The existing rate of Total Factor Productivity (TFP) growth is less than 1.5%. Note, that of the total expenditure on agricultural research, oilseeds and oil palm share only 2.2%. Higher allocations, either through redistribution or addition, are expected to bring innovations.

Opportunities also lie in exploiting yield gaps, which range from 36% to 57% for major oilseeds, i.e., soybean, rapeseed-mustard, and groundnut, and are as high as 149% for sunflower. They are mostly grown under rainfed conditions on marginal lands. Less than one-third of the oilseed area is irrigated, with significant inter-state disparities. An expansion in irrigation, accompanied by the provision of quality seeds, can help bridge the yield gap. Oilseed crops are susceptible to several insect pests and diseases; hence agricultural practices controlling pests and diseases should be encouraged. Finally, understanding the comparative advantage of oilseeds vis-à-vis other crops at regional level will provide useful insights for devising comprehensive regionally differentiated strategies for promoting the cultivation of different oilseeds.

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