

The Role of Policy and Industry Structure in India's Oilseed Markets

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Introduction

Oilseeds and oilseed products emerged during the 1990s as one of the fastest growing components of global and U.S. agricultural trade, with developing countries accounting for most of the growth in both supply and demand. Many developing countries—including the rapidly expanding economies of China and India—have become the principal source of growth in demand for feed proteins and edible oils. And following a period of rapid production growth, soybean products from Latin America and palm oil from Southeast Asia now meet most of the growth in oilseed product demand.

U.S. exports of oilseeds and oilseed products—mostly soybeans and products—now account for declining shares of global trade in these products. This stems largely from the comparative advantage of Latin American soybean and Southeast Asian palm oil producers (Schnepf et al., 2001). Policies that affect production, trade, and processing in importing and exporting countries have also affected trade growth and the mix of raw materials and processed products that is traded. For example, government land, credit, and export tax policies support the expansion of production and processing infrastructure for soybeans in Latin America and palm oil in Southeast Asia. In China, rising incomes and trade policy reforms have fueled rapid growth in demand for vegetable oil and feed protein, as well as its shift from an importer of oilseed products to an importer of raw materials.

India is the world's second most populous country, the third largest economy in Asia, and one of the world's fastest growing developing economies since 1990. India is also a major producer and consumer of oilseeds and their products, emerging in the late 1990s as one of the world's largest importers of vegetable oils. Higher incomes, low productivity in domestic oilseed production, and more liberal policies for edible oil imports have driven expanding trade. Despite more open oil import policies, extensive policy intervention continues to affect oilseed production, trade, and processing in India, and policy change is likely to play a major role in the future growth and composition of India's oilseed and product trade.

India's Oilseed Sector

India, the world's seventh largest producer of oil crops (2001-03 average), is a major producer of soybeans, rapeseed, peanuts, cottonseed, and sunflowerseed and their derived products. India is traditionally an importer of vegetable oils and an exporter of protein meals, but a negligible trader in oilseeds. Oil imports have been on the rise as a result of strengthening consumer demand and import liberalization measures implemented in 1994. During 2001-03, India was the second largest edible oil importer in the world, behind the European Union (EU-25) and ahead of China. India is also the world's fifth largest exporter of oil meals, although exports of soybean and other meals have slowed due to rapid growth in domestic feed demand. And, despite substantial excess capacity in the domestic oilseed processing industry, imports of oilseeds remain restricted by tariff and non-tariff policies (Dohlman et al., 2003).

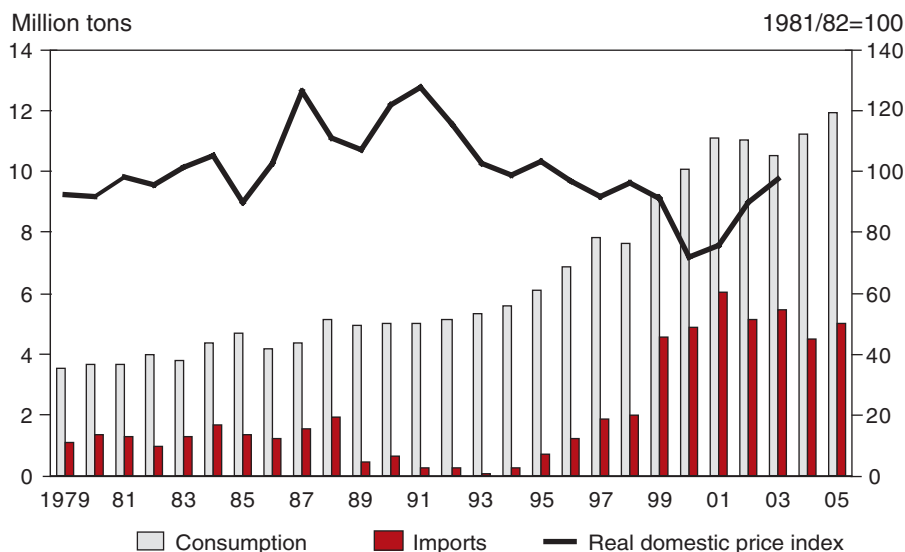
Oilseed Product Demand

India has been among the fastest growing developing economies since the late 1980s, with real growth in gross domestic product (GDP) averaging more than 6 percent annually. Rising incomes and steady growth in urbanization are stimulating demand for a more diverse array of foods, including fruit, vegetables, edible oils, milk, eggs, and poultry meat. Demand for these products is now outpacing demand for traditional food staples.

India's improved growth has been accompanied by a dramatic improvement in its balance of payments—once a chronic source of weakness. Although a large current account deficit persists, increased export competitiveness associated with more liberal trade and domestic policies has improved India's capacity to import and to borrow foreign capital. The improved payments position provides more flexibility for additional import liberalization.

Figure 1

Edible oil consumption, imports, and prices, India



Source: USDA Production, Supply, and Distribution database; Economic Survey, Government of India.

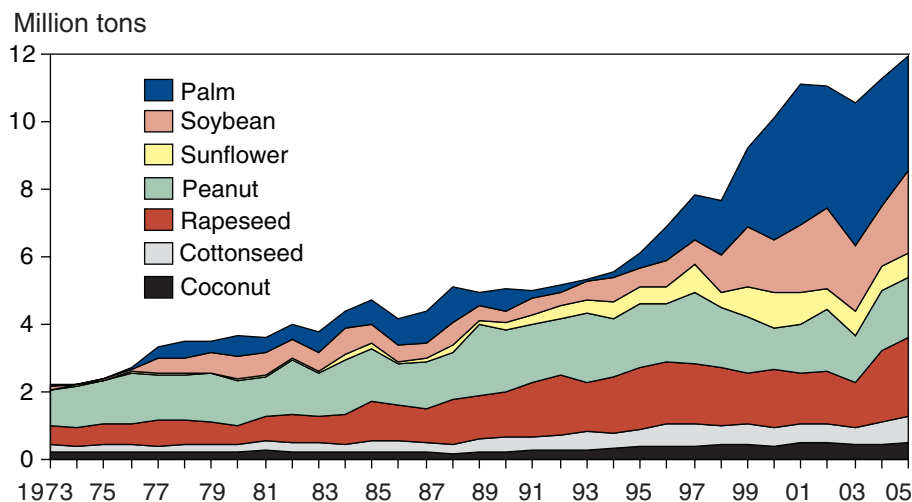
Oil demand. Indian edible oil consumption is now growing at more than 6 percent annually, but per capita consumption (9.6 kg) remains below the world average of 11.1 kg. Most oil is used in food preparation, mostly in the home, but also in food shops, restaurants and, to a lesser extent, food processing firms. Driving consumption growth has been rising incomes and a more open trade regime, which has led to increased edible oil supplies and lower domestic prices (fig. 1). In 1994, India shifted from a restrictive state trading regime for oil to unrestricted imports (subject to tariffs) by private traders. Although tariffs remain high, imported oils—mostly palm and soybean oils—have accounted for most of the growth in consumption. Together, these nontraditional imported oils now account for about half of the oil consumed in India, replacing the higher priced, domestically produced oils such as peanut and rapeseed oil.

Indian consumers spend a large share of their income on food—about 55 percent compared with just 10 percent in the United States (USDA, 2005a)—and are generally highly responsive to prices. Middle- and lower income consumers, in particular, substitute items in and out of the diet based on relative prices. Despite high tariffs, prices for edible oils—led by imported palm and soybean oils—have tended to decline compared with other foods since the early 1990s, stimulating increased per capita oil consumption (fig. 2).

Meal demand. Faster income growth is also strengthening demand for animal products and the derived demand for coarse grain and oil meal for feeding. India has a large animal product sector, and both supply and demand have responded to stronger income growth. Since the early 1990s, the dairy, poultry, egg, and aquaculture sectors have registered strong expansion. The dairy sector—now the world’s second largest after the EU-25—is expanding at 4 percent annually, eggs at nearly 5 percent, poultry meat at 12.5 percent, and freshwater fish production at 6.1 percent.

Figure 2

Oil consumption in India by major type

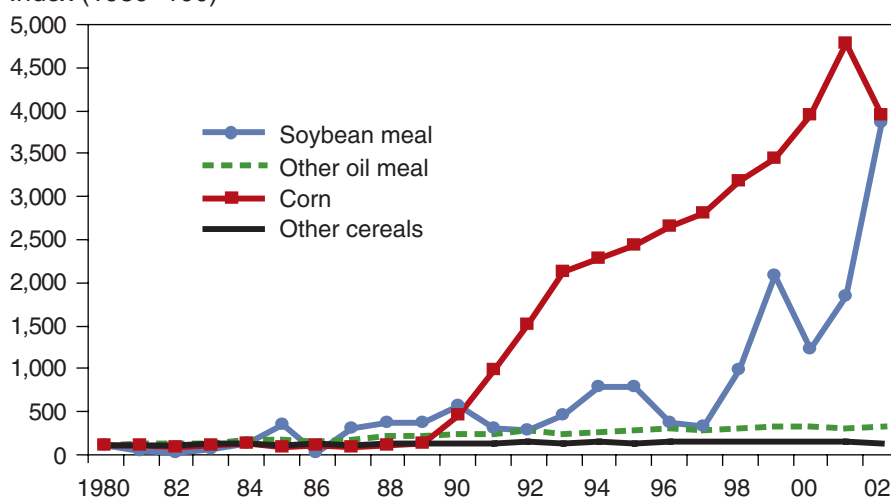


Source: USDA Production, Supply, and Distribution database.

Figure 3

Growth in Indian feed demand

Index (1980=100)



Source: FAOSTAT, May 2005.

The surge in animal product production has been accompanied by accelerated growth in feed use (fig. 3). The poultry and egg sectors—which rely heavily on rations of corn and soybean meal—have been the main drivers of commercial feed demand. During 1990–2001, feed demand for corn and soybean meal grew at annual rates of 21 percent and 17 percent.

The consumer-driven emergence of India's animal products sector, and accompanying growth in demand for commercial feeds, is significant for the future development of India's oilseed and products industry. Historically, returns to oilseed processors and producers have been undermined by weak domestic demand for oilseed meals for feed purposes. Since meals account for the largest physical fraction of most oilseeds, poor market returns from meal have tended to reduce the profitability of processing and returns to growers. Meal exports have buoyed demand and prices for soybeans and soybean meal, but most other meals face weak domestic and export demand and are of poor quality, with significant shares traditionally disposed of as fertilizer.¹ The expanding domestic feed market may reduce India's exportable surpluses of meal, but also strengthen the returns to domestic oilseed production and processing and improve the quality of the meal produced.

Oilseed and Product Trade

The role of trade in India's oilseed economy is determined primarily by trade policy (see box). India's recent large imports of edible oil have been the result of reduced border protection beginning in 1994. Oilseed imports, though no longer restricted by quantitative measures, are prevented by prohibitive tariffs and sanitary regulations. Exports of oil meals have been aided both by traditionally weak domestic feed demand and by the implicit support that the protected oil market affords to domestic oilseed processors.

Edible oil trade policy. From the 1970s until 1994, most edible oil imports were conducted by the Government's State Trading Corporation, with annual import quantities determined by an interministerial committee based on

¹ Indian rapeseed varieties are high in glucosinolates (a growth inhibitor in livestock) and indigestible fiber, and low in metabolizable energy and key amino acids. They also contain erucic acid, which causes liver necrosis and thyroid enlargement. Indian peanut meal is low in quality due to aflatoxin, which results from poor postharvest handling.

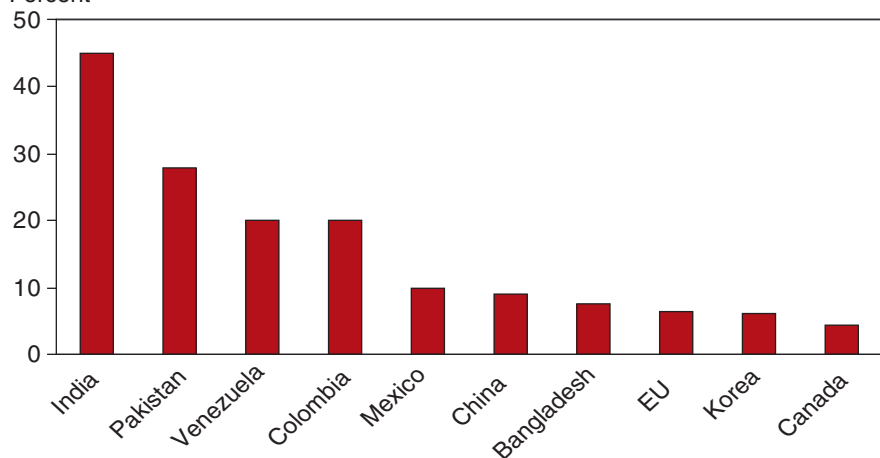
India's Oilseed and Product Tariffs

India's applied tariffs for soybeans and products—as well as other oilseeds and products—are high by global standards. For soybeans, for example, India's seed, meal, and oil tariffs are all sharply higher than for any of the world's major producing and consuming countries. The principal reason for India's high tariffs is to protect the welfare of oilseed producers, most of whom are small-scale, limited resource farmers operating under conditions of erratic rainfall.

Although India's soybean and product tariffs are higher than for other major countries, it is common for soybean producing countries, including the United States, to provide tariff protection for their soybean and product sectors. For nearly all major producers, the common pattern of protection is to place higher tariffs on products than on raw materials, thus supporting higher margins for processors than without protection. As a result, tariff policies play a role not only in where soybeans are produced, but also where they are processed.

Applied soybean oil tariffs for major importers

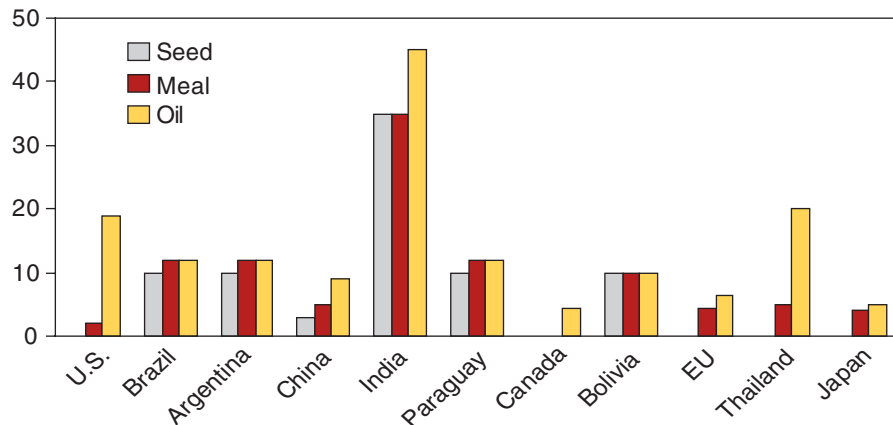
Percent



Source: Agricultural Market Access Database (AMAD).

Applied soybean and product tariffs for major producers and consumers (ranked by 2002-04 average production)

Percent



Source: Agricultural Market Access Database (AMAD).

Table 1

Bound and applied tariffs in India's oilseed sector

Commodity	Bound rate	Applied rate ¹
	<i>Percent, ad valorem</i>	
Oilseeds	30	30
Oils		
Crude		
Soybean	45	45
Palm oil	300	80
Peanut	300	75
Sunflower ²	300	50/75
Rapeseed	75	75
Refined		
Soybean	45	45
Palm oil	300	90
Peanut	300	85
Sunflower	300	85
Rapeseed ³	75	45/85
Oilmeals	100	30

¹ Applied sales as of March 2006.

² Applied rate of 50 percent within 150,000-ton quota; 85 percent above quota.

³ Applied rate of 45 percent within 150,000-ton quota; 75 percent above quota.

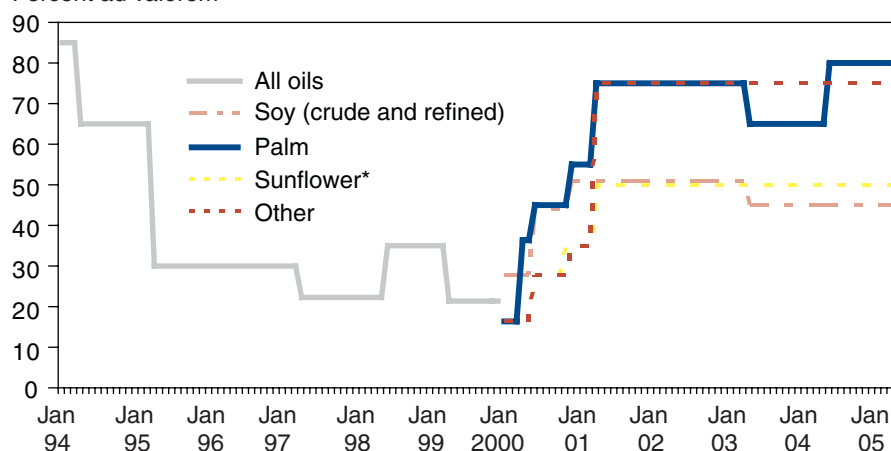
Source: Ministry of Commerce and Industry, Government of India; USDA/Foreign Agricultural Service attache reports.

domestic supply, demand, and balance-of-payment conditions. Imports were particularly restricted during 1989-94, a period corresponding with the Technology Mission on Oilseeds, a government initiative to boost self-sufficiency in edible oils. Since 1994, when India began conforming to WTO rules and replacing quantitative trade restrictions with tariffs, oil imports have been placed under Open General License (OGL), allowing unlimited imports by private traders subject to applied tariffs (table 1).

Figure 4

Applied crude vegetable oil tariffs in India

Percent ad valorem



*Tariffs for imports within tariff-rate quota.

Source: Ministry of Commerce and Industry, Government of India; USDA/Foreign Agricultural Service attache reports.

Since the introduction of a tariff-based import regime in 1994, applied tariffs have evolved from initially high rates (65-85 percent) during 1994-1995 to lower (20-30 percent) tariffs during 1996-2000. They escalated again during 2001-04 (fig. 4). High WTO bound rates of 300 percent for most oils have afforded India the flexibility to adjust tariffs upward. The major exceptions are crude and refined soybean oils, which are bound at 45 percent. Crude sunflowerseed oil (50 percent) and refined rapeseed oil (45 percent) also have relatively low bound tariffs within 150,000-ton tariff-rate quotas, but only small amounts of these higher priced oils are imported.

The comparatively low 45-percent bound tariff on soybean oil has tended to limit the scope for upward adjustment of applied tariffs on other oils. This has been controversial among Indian policymakers who would like to increase protection for domestic oil and oilseed producers. Large differentials between soybean and palm oil tariffs, such as the current 35 percentage points, create a market advantage for soybean oil that forces palm oil suppliers to cut prices. The scope for reducing oil imports by raising palm oil tariffs has been limited because palm oil exporters reduce prices to remain competitive with soybean oil, and because importers substitute soybean oil for palm oil.

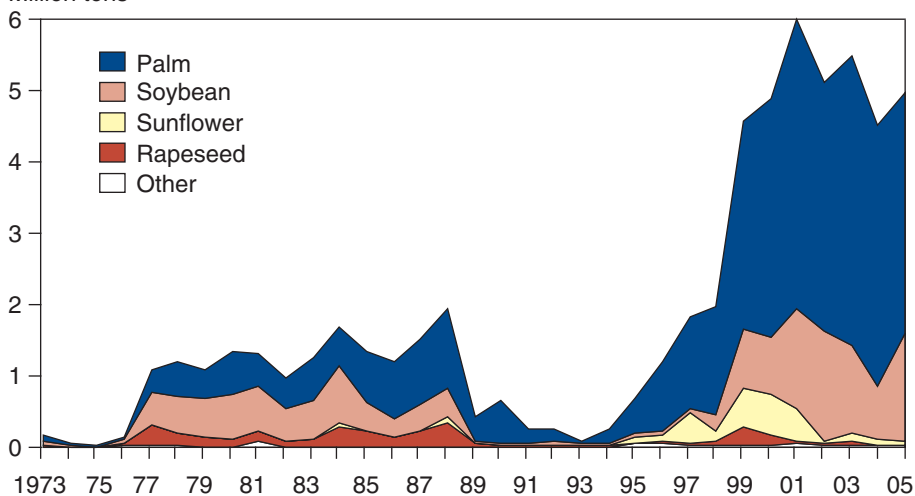
In addition to adjusting tariffs, the Government influences the cost of imported oils through a system of “tariff rate values,” or administered import prices used to calculate the tariff revenue due to the Government for each ton of imported oil. These were introduced in 2000 to prevent under-invoicing of prices by importers. The tariff values are adjusted periodically based on world prices. On occasion, however, tariff-rate values for soybean oil have been above actual market prices, resulting in an effective tariff above the 45-percent bound rate (Dohlman et al., 2003).

Edible oil trade. India’s oil imports expanded rapidly following the removal of quantitative restrictions in 1994, rising from an average of about 200,000 tons annually in the early 1990s to 5 million tons, or about 44 per-

Figure 5

Edible oil imports by type, India

Million tons



Source: USDA, Production, Supply, and Distribution database.

cent of domestic consumption, during 2003-05. Import growth was most rapid during 1996-2000, when tariffs were relatively low, and was slowed by higher tariffs during 2001-05 (fig. 5).

Mindful of the price sensitivity of Indian consumers, India's oil importers have been highly price sensitive in determining the composition of oils imported. Palm oil, generally the lowest priced oil, has dominated Indian imports since the mid-1990s, accounting for about 75 percent of oil imports during 2003-05. Soybean oil, generally the second cheapest oil in the market, accounted for about 23 percent of imports during 2003-05. Higher priced oils—including sunflower oil and oils traditional to the Indian diet, such as peanut and rapeseed oil—were imported in only small amounts.

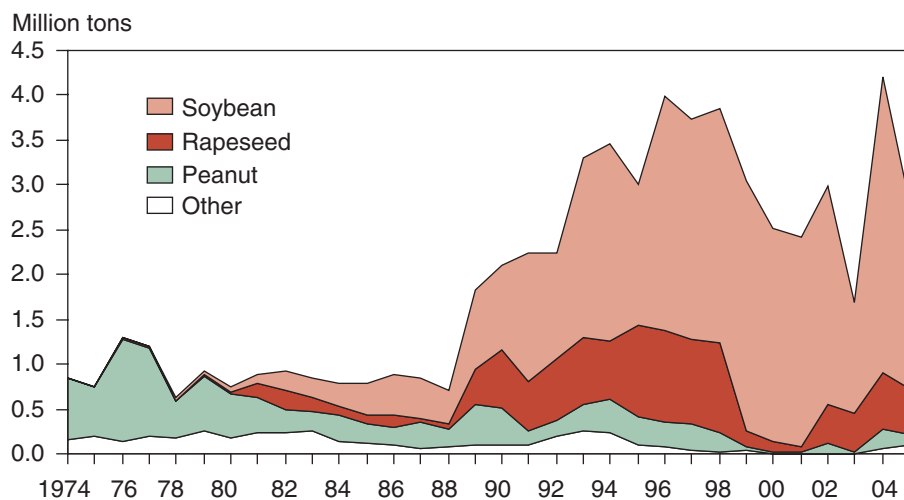
Price is also a key determinant of the origin of oils purchased by Indian importers. The U.S. share of the Indian soybean oil market declined sharply when U.S. exports shifted from concessional shipments to commercial sales after the mid-1990s. The Indian soybean oil market is dominated by Argentina and Brazil, who offer consistently lower prices than U.S. suppliers (Dohlman et al., 2003; Schnepf et al., 2001).

Meal trade. India is the fifth largest exporter of both soybean meal and total oil meals, although its exports trail those of the major global suppliers—Argentina, Brazil, and the United States—by a wide margin. Indian soybean meal is more competitive in world markets in terms of both quality and price than other domestically produced meals (fig. 6). Because soybeans (and sunflowerseed) have been cultivated in India only since the 1970s, they are processed in relatively modern, small- and medium-scale solvent extraction facilities. Indian soybean meal is competitive in small, regional markets that favor India's bagged, as opposed to bulk, product.

The once strong growth in India's exports of soybean meal has slowed due to expanding domestic feed use and slower growth in soybean production. Rapid growth in demand from domestic poultry meat and egg producers has

Figure 6

Oilmeal exports by major type, India



Source: USDA, Production, Supply, and Distribution database.

increased domestic soybean meal prices relative to world prices, reducing their competitiveness in world markets and their appeal to exporters.

Oilseed trade. India is not a significant trader in oilseeds for processing. Oilseed imports are restricted by both a 30-percent tariff and by nontariff barriers. Imports of genetically modified oilseeds are not permitted unless approved by the Government's Genetic Engineering Approvals Committee (GEAC). The GEAC currently has no policy that would permit such approvals. In addition, a 2002 Plant Quarantine Order requires that shipments be certified free of certain pests or that seeds be "devitalized." At present, the only permissible means of "devitalization" is to mechanically split the seed, a process that adds considerable cost and, if done at the point of origin, would lead to unacceptable deterioration in quality during transit.

Oilseed Production

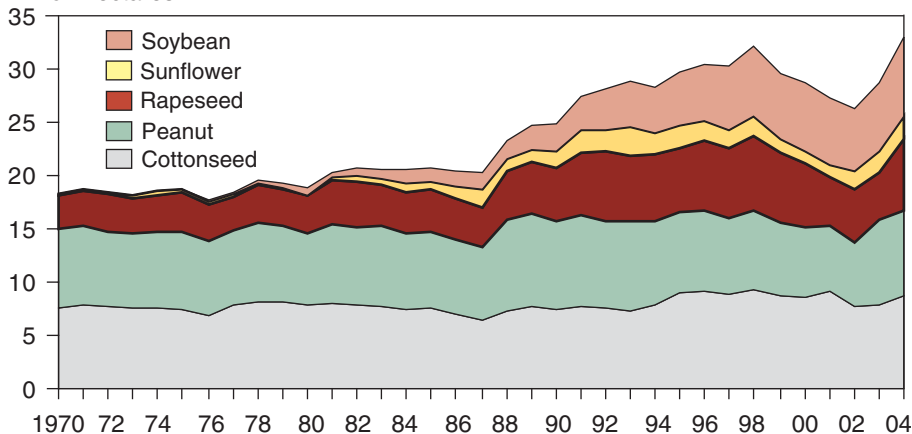
India produces a broad range of oilseeds, ranking among the world's largest producers of peanut, rapeseed, soybean, cottonseed, and a number of minor oilseeds. Oilseed yields, however, remain well below world averages, with limited success in sustaining productivity growth. Government policy gives priority to protecting oilseed producers by placing quantitative restrictions or high tariffs on imports of oilseeds and products.

Trends in oilseed area and yields. Area planted to oilseeds has generally responded to changes in domestic prices associated with changes in trade policy, and in price policy for competing crops. Growth in oilseed area accelerated—and grew faster than the world average—during the 1980s, when stricter controls on imports of oilseeds and products strengthened oilseed prices relative to competing crops (table 2, fig. 7). However, during 1990–2002—a period that includes the liberalization of oil imports—domestic prices of oilseeds and oils declined relative to other crops and oilseed area growth slowed significantly. Higher Government minimum support prices (MSPs) for wheat and rice, important competing crops for oilseeds in some regions, also slowed the growth in oilseed area during the late 1990s.

Figure 7

Harvested area of major oilseeds in India

Million hectares



Source: FAOSTAT, May 2005.

Table 2

Growth rates of oilseed area, yield, and production, India and world average

Oilseed	Area			Yield			Production		
	1970-80	1980-90	1990-02	1970-80	1980-90	1990-02	1970-80	1980-90	1990-02
<i>Percent change</i>									
India									
Cottonseed	0.4	-0.5	0.5	1.6	3.4	0.8	1.9	2.9	1.3
Peanuts	-0.3	1.8	-1.2	0.6	0.5	-0.1	0.3	2.4	-1.1
Rapeseed	1.7	3.4	0.3	-0.4	5.8	0.7	1.4	9.4	1.1
Soybeans	32.3	17.6	7.2	4.5	2.5	0.5	38.3	20.4	7.8
Sunflowerseed	7.1	26.7	1.1	-1.7	-0.1	0.3	5.4	26.5	1.4
Five oilseeds	0.7	2.8	1.0	0.6	2.5	0.5	1.3	5.3	1.6
World									
Cottonseed	0.0	-0.3	-0.2	1.9	2.8	0.7	1.9	2.5	0.5
Peanuts	-0.4	0.8	1.7	0.8	1.6	1.3	0.4	2.4	3.1
Rapeseed	3.7	4.6	2.1	1.8	3.5	1.2	5.4	8.3	3.3
Soybeans	5.6	1.2	3.1	1.4	0.9	1.5	7.0	2.1	4.7
Sunflowerseed	3.7	2.9	2.1	0.0	1.5	-0.8	3.7	4.5	1.2
Five oilseeds	2.5	1.3	2.0	1.8	1.6	1.2	4.3	3.0	3.2

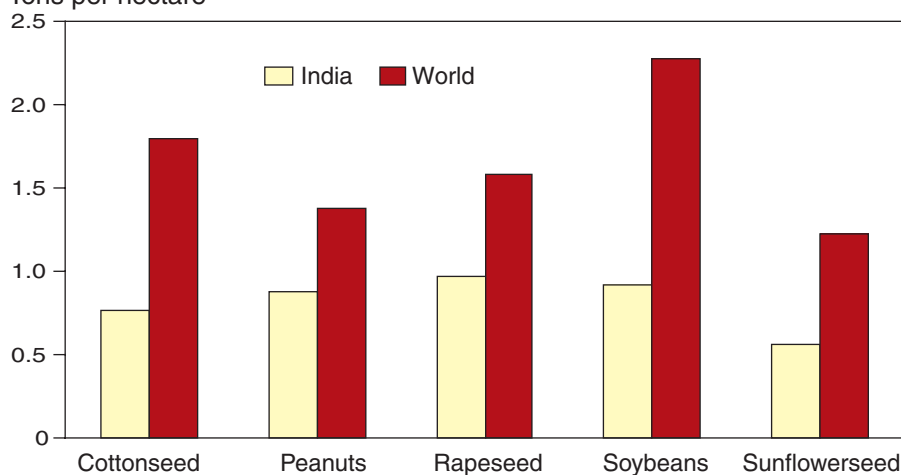
Source: Computed from FAOSTAT data.

India's average yields for major oilseeds are 40-60 percent below world averages and, with the exception of the 1980s, have been growing at a substantially lower rate (fig. 8). Most oilseeds are grown by small-scale, limited-resource farmers in areas that are dependent on erratic monsoon rainfall, with only about 24 percent of oilseed area irrigated. Faced with considerable weather-related risk, oilseed producers invest little in improved seeds, fertilizer, and pesticides. Oilseed farmers also face considerable price risk because the minimum support prices set for oilseeds are typically either too low to influence market prices or are not adequately defended by Government purchases. Government initiatives to extend credit and technology to oilseed producers, including the 1988-94 Technology Mission on Oilseeds, have had very fleeting impact.

Figure 8

Oilseed yields, Indian and world average, 2002-04

Tons per hectare



Source: FAOSTAT, May 2005.

Soybeans and rapeseed are the two oilseeds that may have the most potential for improvements in area, yield, and production. Soybean area continues to expand outside the traditional area of Madhya Pradesh into the neighboring areas of Rajasthan and Maharashtra, where it competes for land with other dryland crops, including sorghum, millet, and pulses. Returns to soybean cultivation are helped by strong demand for soybean meal and by excess capacity in solvent extraction, which creates some competition for supplies of raw material.

Rapeseed, grown in the winter often in competition with wheat, is the most heavily irrigated of all the oilseeds, with about 63 percent of area irrigated. Rapeseed area and yield increased during the 1980s and early 1990s when high prices boosted plantings on irrigated land. Rapeseed production was slowed by large hikes in wheat MSPs during the late 1990s, but higher oil tariffs and lower relative wheat prices could now stimulate another expansion of output.

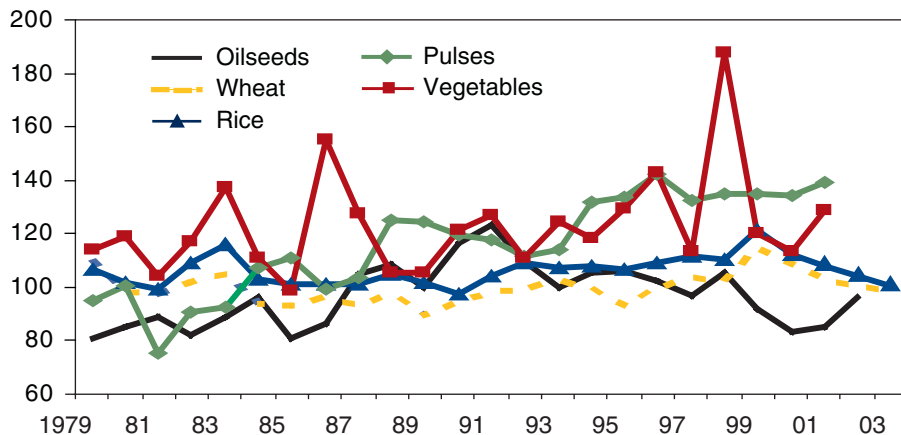
Producer price policy. The MSP system has had little impact on oilseed prices, which are formed primarily by trade policy and domestic and world market prices for oilseeds and products. With India's large-scale imports, domestic prices for edible oils are linked closely to tariff-adjusted world prices, although domestic supplies affect prices during the harvest period. Similarly, domestic prices of traded oil meals are linked to world prices and domestic seasonal factors, although some meals are often priced below world levels. With oilseed imports restricted by tariff and nontariff barriers, domestic oilseed prices are shaped largely by the prices of their derivative products, their respective oil and meal extraction rates, and processing costs.

Historical trends in prices for oilseeds reflect the impact of trade policy (fig. 9). Oilseed prices tended to rise relative to other crops through the early 1990s when vegetable oil imports were restricted, then decline following the liberalization of oil imports. Oilseed prices have turned up in the early 2000s, reflecting oil tariff hikes during 2000-2002 and, possibly, the impact of higher oilseed MSPs.

Figure 9

Trends in real wholesale prices for selected crops, India

Index (81/82=100)



Source: Government of India, Ministry of Finance.

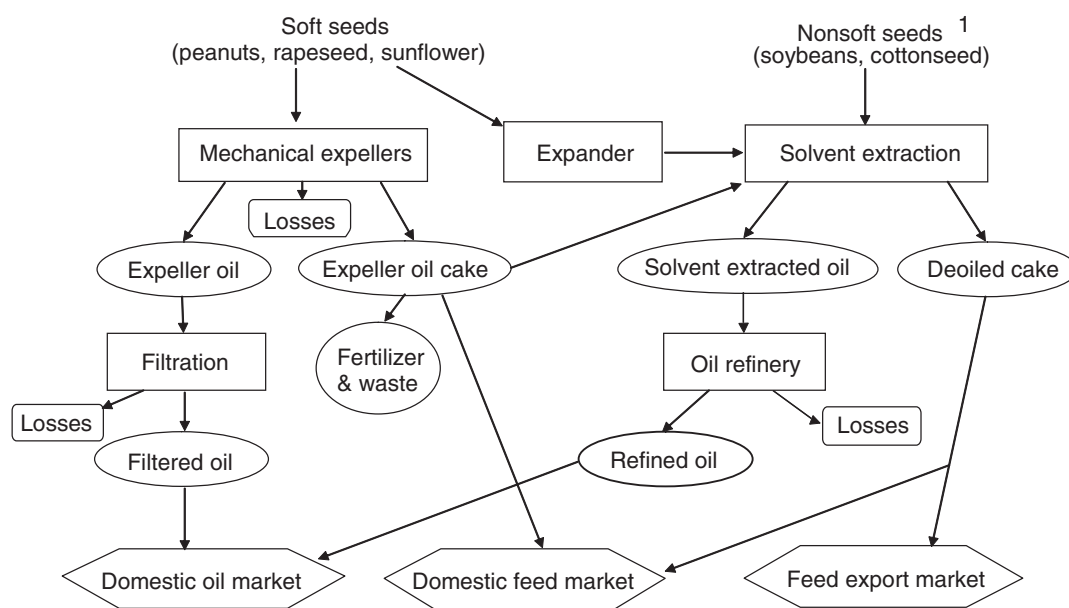
Although oil and oilseed tariffs emerged as primary policy instruments during the 1990s, it is unclear how effectively-and how efficiently-higher tariffs can achieve the avowed policy objectives of supporting small oilseed producers and reducing dependency on oil imports. Because oil accounts for the smallest physical fraction of the oilseed—ranging from 18 percent for soybeans to 40 percent for sunflower—the impact of oil tariffs on the oilseed price is also proportionally small. Benefits to producers are further reduced if processors and traders fail to transmit the full impact of the oil tariff into the oilseed price. Another constraint is that high oil tariffs place most of the proportionally large cost burden of supporting oilseed producers on India’s mostly low-income consumers.

Oilseed Processing

The Indian oilseed processing sector is characterized by a large number of relatively small-scale, low-technology plants and substantial excess capacity. The structure of the industry has been heavily influenced by Government policies that have: regulated plant scale, capital intensity, and oilseed/product marketing; provided incentives for building new capacity; and prevented imports of oilseeds for processing. Also shaping the industry has been a domestic demand preference for crude traditional oils, weak effective demand for quality feed protein, and diverse and erratic supplies of domestic oilseeds for processing.

Processing sector structure, capacity, and costs. The Indian oilseed processing industry includes three major processing technologies: (1) traditional mechanical crushing, or expelling, used for oilseeds with relatively high oil content; (2) solvent extraction for processing oilseeds and expeller cake

Figure 10
India’s oilseed processing sector



¹ Solvent extraction is used for raw materials, such as soybeans, cottonseed, and expeller oil cake with less than 20 percent oil content.

Table 3

Structure of India's oilseed processing sector

Process	Units	Capacity ¹		
		Total	Average	Use rate
	<i>Number</i>	<i>Million tons</i>	<i>Tons/day</i>	<i>Percent</i>
Mechanical crushing:				
"Ghanis"	130,000	2.0	0.05	10
Expellers	20,000	40.5	7	30-40
Solvent extraction ²	766	36.0	157	30-40
Vanaspati	241	4.8	66	35
Oil refining	800	4.7	20	35

¹ Capacity and use based on raw material; 300 days/year, 24 hours/day basis.

² Includes expander units.

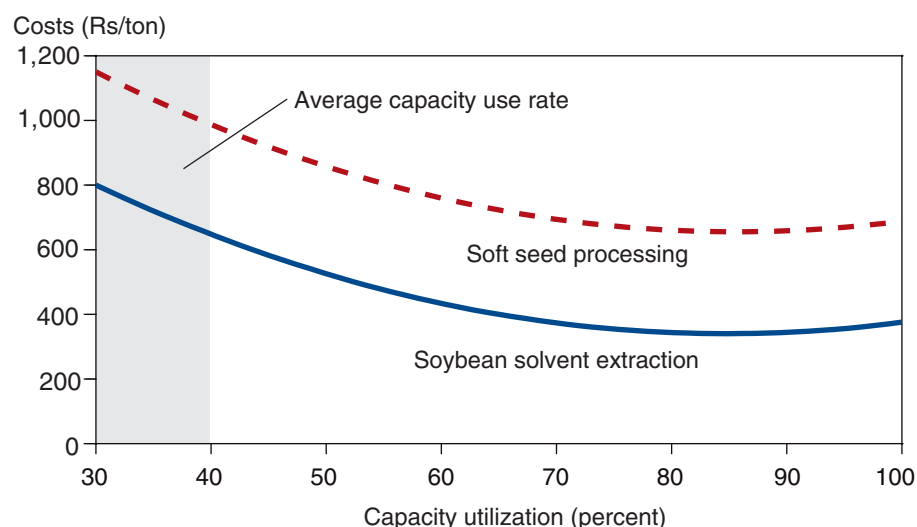
Source: Solvent Extractors' Association of India.

with less than 20 percent oil content; and (3) expander-solvent extraction, a hybrid process used for raw materials with higher oil content (fig. 10, table 3). The traditional mechanical crushing industry has two segments: the very small-scale "ghanis" and the small-scale expellers. The processing industry also includes an oil refining sector, which primarily refines domestic solvent-extracted oils and imported crude and solvent-extracted oils, and a "vanaspati" (hydrogenated oil) sector that refines and hydrogenates domestic and imported oils.

Each segment of India's oilseed processing industry has small capacities and low technical efficiency compared with other major processing countries. On average, India's solvent extraction plants are about one-sixth the size of those in the United States and the EU and use significantly more power, steam, and hexane solvent per unit of oilseeds processed. Even India's largest integrated expeller-solvent extraction plants are small and high-cost by international standards.

Indian processing units also have more excess capacity than units in other major processing countries. On average, Indian expeller and solvent extrac-

Figure 11

Average cost curves for oilseed processing in India

Source: ERS estimates.

tion plants operate only around the domestic raw material harvest, or at about 30-40 percent of capacity. This contrasts with capacity utilization rates of 92-96 percent for U.S. plants (Reca, 2003). Low rates of capacity use compound relatively poor technical efficiency and further increase the average and marginal costs of processing raw materials, because fixed costs must be recouped over fewer units of output (fig. 11).

Additional inefficiency arises because some processes are not well integrated. While it is common to see an oil refinery and/or vanaspati unit combined with a solvent extraction plant, expeller units are often not integrated with solvent extraction units. As a result, oil and meal production is lost because significant amounts of expeller cake are not solvent-extracted. In addition, the costs of solvent-extracting the expeller cake rise, and processing delays reduce the quality of the oil and de-oiled cake.

India's oilseed processors are able to operate profitably despite their high costs largely because of the high border protection afforded to vegetable oils. In addition, because the price of oilseeds is determined by the cost of processing—together with the market value of the derived oil and meal—high processing costs dampen oilseed prices, partially offsetting benefits to producers from India's tariffs on oilseeds and oils.

In the short run—with existing processing capacity and low capacity use—India's processors operate their plants at a level where average costs are high. They can reduce unit processing costs by increasing capacity use. In the long run, costs can drop further if larger, more technically efficient plants are built and can operate at high levels of capacity use. Lower processing costs would create a stream of benefits to processors that could be shared with producers (in the form of higher oilseed prices) and consumers (in the form of lower oil prices).

Processing sector policies. The fragmentation, low technical efficiency, and excess capacity of India's oilseed processing industry are largely the result of government regulatory and trade policies:

- *Plant scale restrictions.* Under the Small Scale Industry (SSI) reservation policy, expelling of peanut, rapeseed, sesame, and safflower oils is restricted to units with investment of Rs 0.5-7.5 million (\$10,000-\$170,000), effectively restricting capacities to units small by international standards. In addition, firms that manufacture oilseed crushing equipment are subject to the same scale limits, restricting use of more modern technology. These restrictions do not apply to the processing of soybeans or sunflowerseed, or to the manufacture of solvent extraction equipment, so these commodities are processed in relatively large units.
- *Movement and storage restrictions.* The central and state Governments have the authority, through the Essential Commodities Act (ECA) and an array of control orders, to regulate and restrict movement and storage of farm commodities, including oilseeds and products. These regulations are now seldom enforced, but remain a source of risk that reduces incentives to invest in larger or vertically integrated units.

- *Selective credit controls.* Oilseed processors face restrictions on the availability and cost of credit from commercial banks for storage of oilseeds and oils. The regulations raise the cost of credit and further limit the size and capacity use of processing firms.
- *Restrictions on oilseed imports.* Tariff and nontariff barriers to oilseed imports limit average capacity use in the processing industry to what can be achieved from low and variable domestic production. This raises average processing costs.
- *Taxes and tax incentives.* Oilseeds and products are subject to taxes at the point of sale and—if transported across state borders—to turnover, entry, and central sales taxes. These taxes raise the cost of operating larger enterprises that assemble raw materials or transport products across state borders. Central, state, and local governments also provide tax exemptions and other tax incentives to promote construction of new processing plants, particularly in backward areas. This contributes to excess processing capacity and to the location of plants where they are not economically viable or sustainable (World Bank, 1997).
- *Futures trading restrictions.* From the 1960s until very recently, futures trading in nearly all oilseeds and products was illegal and oilseed processors were unable to legally use futures contracts to manage price risk. The recent legalization of futures trading may eventually provide an effective risk management tool but, at present, traded volumes remain small.

Industry consolidation. The last several years have witnessed a trend toward consolidation of ownership of oilseed processing units by larger domestic and multinational companies. The trend appears to be driven partly by short-term factors, particularly financial distress in the industry following several poor harvests. But these larger players are also responding to the potential for cutting costs and increasing profitability, as well as the appeal of participating in a large and expanding market.

Key to larger players' efficiency advantage is the cost of investment and operating capital. Multinational and large domestic firms typically have access to capital near the London Inter-Bank Offer Rate (LIBOR), which has averaged between 1 and 4 percent over the last 3 years. In contrast, domestic firms must borrow commercially at rates ranging from 14-16 percent for smaller firms to 8-10 percent for larger ones. As a result, the consolidating companies will be better able to acquire and store raw material and boost capacity use rates. Consolidating firms are also likely to achieve cost savings by establishing backward (to primary markets or farmers) and forward (to wholesaling and retailing) links. They may also have the advantage of investing in larger, more efficient solvent extraction plants.

Consolidating firms face risks from enforcement of movement or storage restrictions under the ECA, as well as higher costs from taxes on interstate movements. So far, these factors have not been significant deterrents to consolidation. It is not yet clear how significant the consolidation trend will become, but it could lead to closure of some surplus capacity as smaller firms with high operating costs and low capacity use find it difficult to compete.