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India
The Indian Oilseed Complex: Capturing Market Opportunities

(In Two Volumes) Volume I: Main Report

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Rural Development Sector Unit
South Asia Region

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Currency

Currency	Rs/ US$ Official	Unified	Market [a]
Prior to June 1966	4.76		
June 6, 1966 to mid-December 1971	7.50		
Mid-December 1971 to end-June 1972	7.28		
1971-72	7.44		
1972-73	7.71		
1973-74	7.79		
1974-75	7.98		
1975-76	8.65		
1976-77	8.94		
1977-78	8.56		
1978-79	8.21		
1979-80	8.08		
1980-81	7.89		
1981-82	8.93		
1982-83	9.63		
1983-84	10.31		
1984-85	11.89		
1985-86	12.24		
1986-87	12.79		
1987-88	12.97		
1988-89	14.48		
1989-90	16.66		
1990-91	17.95		
1991-92	24.52		
1992-93	26.41		30.65
1993-94		31.36	
1994-95		31.40	
1995-96		33.46	
1996-97		35.50	

Note: The Indian fiscal year runs from April 1 through March 31.
Source: IMF, International Finance Statistics (IFS), line "rf"; Reserve Bank of India.

[a] A dual exchange rate system was created in March 1992, with a free market for about 60 percent of foreign exchange transactions. The exchange rate was reunified at the beginning of March 1993 at the free market rate.

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ABBREVIATIONS & ACRONYMS

CACP	Commission on Agricultural Costs & Prices
CSIR	Council for Scientific Industrial Research
CSS	Centrally Sponsored Schemes
CV	Coefficient of Variation
DOA	Department of Agriculture
DOC	De-Oiled Cake
DRC	Domestic Resource Cost
EC Act	Essential Commodities Act
FAQ	Fair Average Quality
FC(R)	Forward Contracts (Regulation)
FFA	Free Fatty Acids
FMC	Forward Market Commission
f.o.b.	free on bord - fob
GATT	General Agreement on Trade & Tariffs
GCA	Gross Cultivated Area
GDP	Gross Domestic Product
GOI	Government of India
HVOC	Hindustan Vegetable Oils Corporation
ICAR	Indian Council of Agricultural Research
IFPRI	International Food Policy Research Institute
IPO	Integrated Policy for Oilseeds and Edible Oils
ITC	Indian Tobacco Company
MIO	Market Intervention Operation
MOA	Ministry of Agriculture
NABARD	National Bank for Agriculture and Rural Development
NAFED	National Agricultural Cooperative Marketing Federation
NCA	Net Cultivated Area
NDDB	National Dairy Development Board
NODP	National Oilseeds Development Program
NPC	Nominal Protection Coefficient
OGCP	Oilseed Growers Cooperative Project
OPP	Oilseeds Production Program
OPTP	Oilseeds Production Thrust Program
PDS	Public Distribution System
RBD	Refined, Bleached, De-odorized
RBI	Reserve Bank of India
SSI	Small Scale Industry
STC	State Trading Corporation
STE	State Trading Enterprise
TMO	Technology Mission of Oilseeds
TRIP	Trade Related Intellectual Property
UNCTAD	United Nations Conference on Trade and Development
URA	Uruguay Round Agreement
WTO	World Trade Organization

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Tables, Figures & Boxes

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ECONOMIC DEVELOPMENT DATA

GNP Per Capita (US$, 1995-96): 350 [a]

Gross Domestic Product (1995-96)

			Annual Growth Rate (% p.a., constant prices)					
	US$ Bln	% of GDP	70-71-75-76	75-76-80-81	80-81-85-86	85-86-90-91	91-92	92-93-95-96
GDP at Factor Cost	294.6	89.7	3.4	4.2	5.4	5.9	0.8	6.4
GDP at Market Prices	328.3	100.0	3.3	4.2	5.6	6.2	0.4	6.3
Gross Domestic Investment	86.1	26.2	5.3	3.7	5.7	9.5	-11.0	12.8
Gross National Saving	79.8	24.3	4.4	2.6	3.5	8.7	-0.3	10.7
Current Account Balance	-6.4	-1.9	--	--	--	--	--	--

Output, Employment and Productivity (1990-91)

	Value Added		Labor Force [b]		V. A. per Worker	
	US$ Bln.	% of Tot	Mill.	% of Tot.	US$	% of Avg.
Agriculture	82.5	31.0	186.2	66.8	443	46.4
Industry	78.0	29.3	35.5	12.7	2198	230.2
Services	105.7	39.7	57.2	20.5	1848	193.7
Total/ Average	266.2	100.0	278.9	100.0	954	100.0

Government Finance

	General Government [c]			Central Government		
	Rs. Bln.	% of GDP		Rs. Bln.	% of GDP	
	95-96	95-96	90-91-95-96	95-96	95-96	90-91-95-96
Revenue Receipts	2174.1	19.8	19.6	1101.3	10.0	10.1
Revenue Expenditures	2539.5	23.1	23.3	1398.6	12.7	13.2
Revenue Surplus/ Deficit (-)	-365.3	-3.3	-3.7	-297.3	-2.7	-3.1
Capital Expenditures [d]	416.2	3.8	4.2	305.1	2.8	3.4
External Assistance (net) [e]	3.2	0.0	0.6	3.2	0.0	0.6

Money, Credit, and Prices

	89-90	90-91	91-92	92-93	93-94	94-95	95-96
	(Rs. billion outstanding, end of period)						
Money and Quasi Money	2309.5	2658.3	3170.5	3668.3	4344.1	5308.0	6018.4
Bank Credit to Government (net)	1171.5	1401.9	1582.6	1762.4	2039.2	2224.2	2574.1
Bank Credit to Commercial Sector	1517.0	1717.7	1879.9	2201.4	2377.7	2896.6	3409.0
	(percentage or index numbers)						
Money and Quasi Money as % of GDP	50.6	49.6	51.4	52.0	53.7	55.7	54.8
Wholesale Price Index (1981-82 = 100)	165.7	182.7	207.8	228.7	247.8	274.7	294.8
Annual Percentage Changes in:							
Wholesale Price Index	7.4	10.3	13.7	10.1	8.4	10.9	7.3
Bank Credit to Government (net)	20.3	19.7	12.9	11.4	15.7	9.1	15.7
Bank Credit to Commercial Sector	14.4	13.2	9.4	17.1	8.0	21.8	17.7

a. The per capita GNP estimate is at market prices, using World Bank Atlas methodology. Other conversions to dollars in this table are at the prevailing average exchange rate for the period covered.

b. Total Labor Force from 1991 Census. Excludes data for Assam and Jammu & Kashmir.

c. Transfers between Centre and States have been netted out.

d. All loans and advances to third parties have been netted out.

e. As recorded in the government budget.

Balance of Payments (US$ Millions)

	1993-94	1994-95	1995-96
Exports of Goods & NFS	27,947	32,760	39,636
Merchandise, fob	22,683	26,857	32,467
Imports of Goods & NFS	29,798	38,150	48,540
Merchandise, cif	25,069	31,840	41,405
of which Crude Petroleum	3,407	3,285	3,442
of which Petroleum Products	2,244	2,396	3,759
Trade Balance	-2,386	-4,983	-8,938
Non Factor Service (net)	535	-407	34
Resource Balance	-1,851	-5,390	-8,904
Net factor Income[a]	-3,775	-3,621	-4,945
Net Transfers[b]	3,825	6,200	7,480
Balance on Current Account	-1,801	-2,811	-6,369
Foreign Investment	4,235	4,895	4,347
Official Grants and Aid	368	472	416
Net Medium & Long Term Capital	3,122	1,153	-1,036
Gross Disbursements	8,247	6,800	6,689
Principal Repayments	4,027	4,828	6,780
Other Capital Flows[c]	1,516	2,330	-308
Non-Resident Deposits	1,097	818	945
Net Transactions with IMF	189	-1,174	-1,719
Overall Balance	8,538	6,858	-2,005
Change in Net Reserves	8,727	5,684	-3,724
Gross Reserves (end of year)[d]	15,476	21,160	17,436

Rate of Exchange

End-March 1997[e]	US$ 1.00 = Rs. 34.80

Merchandise Exports (Average 1990-91-1995-96)

	US$ Mil	% of Tot.
Tea	404	2.1
Iron Ore	487	2.5
Chemicals	1,891	9.6
Leather & Leather products	1,439	7.3
Textiles	2,708	13.8
Garments	2,731	13.9
Gems and Jewelry	3,753	19.1
Engineering Goods	2,832	14.4
Others	3,423	17.4
Total [f]	19,667	100.0

External Debt, March 31, 1996

	US$ Mill.
Public & Publicly Guaranteed	79,725
Private Non-Guaranteed	6,618
Total (Including IMF and Short Term)	93,766

Debt Service Ratio for 1995-96

	% curr receipts
Public & Publicly Guaranteed	21.8
Private Non-Guaranteed	14.7
Total (Including IMF and Short Term)	28.1

IBRD/ IDA Lending, March 31, 1996 (US$ Mill)

	IBRD	IDA
Outstanding and Disbursed	9,767	17,499
Undisbursed	4,116	4,583
Outstanding incl. Undisb.	13,883	22,082

-- Not available.

a. Figures given cover all investment income (net). Major payments are interest on foreign loans and charges paid to IMF, and major receipts is interest earned on foreign assets.

b. Figures given include workers' remittances but exclude official grant assistance which is included within official loans and grants, and non-resident deposits which are shown separately.

c. Includes short-term net capital inflow, changes in reserve valuation and other items.

d. Excluding gold.

e. The exchange rate was reunified at the market rate in March 1993.

f. Total exports (commerce); net of crude petroleum exports.

India Social Indicators

	Latest single year			Some region/income group	
	1970-75	1980-85	1990-95	South Asia	Low-income
POPULATION					
Total population, mid-year (millions)	613.5	765.2	929.4	1,243.00	3,179.90
Growth rate (% annual average)	2.3	2.1	1.7	1.9	1.6
Urban population (% of population)	21.3	24.3	26.8	26.4	28.6
Total fertility rate (births per women)	5.6	4.8	3.2	3.5	3.2
POVERTY					
(% of population)					
National headcount index*	..	..	35.0	..	..
Urban headcount index	..	..	30.5	..	..
Rural headcount	..	..	36.7	..	..
INCOME					
GNP per capita (US$)	180	280	350	350	430
Consumer price index (1990=100)	36	70	165	..	..
Food price index (1990=100)	..	66	174	..	..
INCOME/CONSUMPTION DISTRIBUTION					
(% of income or consumption)					
Lowest quintile	5.9	8.1	8.5	..	..
Highest quintile	49.4	41.4	42.6	..	..
SOCIAL INDICATORS					
Public expenditure					
(% of GDP)					
Health	..	..	0.7	..	..
Education	2.1	2.5	2.9	..	..
Social security and welfare	..	..	..	..	..
Net primary school enrollment rate					
(% of age group)					
Total	..	..	..	..	..
Male	..	..	..	..	..
Female	..	..	..	..	..
Access to safe water					
(% of population)					
Total	31	54	63	63.2	53
Urban	..	..	..	..	..
Rural	..	..	..	..	..
Immunization rate					
(% under 12 months)					
Measles	..	..	84	80	77
DPT	..	41	92	84	80
Child malnutrition (% under 5 years)	..	..	63	61	42
Life expectancy at birth					
(years)					
Total	50	55	62	61	63
Male	51	56	62	61	62
Female	49	55	63	62	64
Mortality					
Infant (per thousand live births)	132	108	68	75	69
Under 5 (per thousand live births)	..	..	95	106	104
Adult (15-59)					
Male (per 1,000 population)	..	..	229	239	244
Female (per 1,000 population)	..	..	219	230	211
Maternal (per 100,000 live births)	..	460	437	..	..

* Data for 1993-94

Source: World Development Indicators CD-ROM, World Bank, February 1997 and India: Poverty Assessment Report.

Executive Summary

1. **General Overview:** Fifteen years of protection and three of partial trade liberalization have brought the millions of Indians who grow, store, crush, refine, transport and trade oilseeds, oil meals, and edible oils – along with the officials who regulate their activities -- to a critical juncture. The oilseed industry faces a choice between modernizing for international competition in which it can have significant advantages or perpetuating a fragmented structure whose inefficiencies are largely borne by growers who receive lower than international prices at one end of the production chain and consumers who pay higher than international prices at the other.

2. The import substitution strategy pursued until 1994/95 delivered significant benefits. Overcoming a once-rising deficit in the supply of edible oil for domestic consumption, India has seen oilseed production double and stabilize and – most importantly – diversify as new crops (soybean, sunflower) spread to rainfed regions where poor farmers typically face more limited growth opportunities. India had become virtually self-sufficient in edible oils by the early 1990s and a major exporter of oilseed meal, a high-protein animal feed for which demand is increasing in regional markets. But beginning in the mid-1990s, cheaper edible oil and faster economic growth are accelerating the growth in edible oil demand, which increasingly is being satisfied by imports liberalized in 1994/95. Inefficiencies in marketing and processing of oilseeds are preventing growers from capturing a larger share of these market opportunities.

3. Without further trade liberalization and de-regulation – going beyond the 1994 elimination of non-tariff barriers on edible oil imports, the removal of price stabilization and of some state controls on the internal movement of seeds and oils –incentives now in place actually preserve inefficiencies in processing and marketing. Hobbled by a regime that arbitrarily restricts the domestic movement of oilseed products and reserves the processing of the two most important oilseeds to small and usually inefficient enterprises, processors cannot invest in modern equipment and integrated processing plants that would enable them to reduce high losses of oil, improve the quality of oil meals, buy raw material from the cheapest sources on the domestic market, and raise their low capacity utilization rates. Banned from participation in forward and futures markets, traders and processors are at the mercy of price volatility and imperfect information flows in a fragmented market that is a far cry from a needed, common, domestic market.

4. In such conditions, crushing margin risks are particularly high for processors. They operate in a very unstable price environment regularly unsettled by shifts in the highly uncorrelated commodity markets for seeds, oils and meals. Firms in other countries can manage these risks through technical efficiency, economies of scale, flexibility in their sourcing of raw materials, and the use of hedging in futures markets. Indian crushers generally cannot. Predictably, they pass their risks back – as low purchase prices to growers – and forward – as higher sales prices to refiners and eventually to consumers. Even that reallocation of risks and costs, however, leaves the enterprises at the heart of the oilseed complex without the capital to grow and modernize, especially when the processing of certain kinds of oilseeds (groundnuts and rapeseed-mustardseed) with certain kinds of techniques is limited to small-scale firms who are barred from handling more than ten tons of oilseeds a day and, in many cases, operate for only a few post-harvest weeks or months a year.

5. Moreover, with so many roadblocks to integration and so many special policies – more social than economic in origin – designed to support small units, processing capacity is dramatically underutilized. Even in the most modern and fastest growing sub-division of the processing sector – the 130 firms that use solvent extraction technology to produce 9.5 million tons a day – only 30 percent of total capacity was actually being used in 1994/95, the same level as in 1987. That rate of utilization means that it costs 40 percent more to process a ton of soybeans in India than in China, 90 percent more than in the United States.

6. Firms in the oilseed complex and its regulators recognize the problems and are weighing various options for change. Among them, the idea of removing the ban on oilseed imports appeals to processors ready to invest in modern, large-scale facilities in port cities, gaining efficiency that small-scale crushers could not emulate. Another approach, favored by farmers, would raise tariffs on the import of edible oils, thereby strengthening the growers' position (and prices) in the domestic market --at the expense of consumers. A different strategy, one that would pay for itself, would focus on the domestic trade regime and on the central problem of the crushers' high margins and risks and the costs they impose on both growers and consumers. Its objective would be to stimulate the industry to perform better at home and compete more strongly abroad by freeing it from a host of unnecessary restraints and strengthening government's ability to promote quality and consumer health and safety.

7. That strategy envisions a series of coordinated reforms that:

- Liberalize edible oilseed exports, maintain unhindered imports of edible oil under current tariffs, and install a WTO-consistent set of tariffs, rules, and regulations to deal with international price spikes;
- Remove the oilseed complex from the purview of the Small-Scale Industry Reservation and the Essential Commodities Act to free it from multiple, legal controls on movement, storage and processing technology and scale and lift related limits on access to credit;
- Legalize access for oilseed products to forward and futures markets;
- Improve incentives -- including government enforcement capacity -- for quality management and pollution control. The incentives could include better labeling and quality standards that highlight healthier products and raise consumer and producer awareness of them, tightening food safety standards and pollution control, assuring better access to seed technology, and recognizing intellectual property rights in conformity with TRIPs under WTO;
- Strengthen the capacity of government to implement a complex reform process by establishing effective surveillance over trading and marketing in a decentralized, market-oriented economy;
- Improve market infrastructure to facilitate the flow of commodities and information both domestically and in external trade. This would involve a freer, wider spread of price information, and the promotion of private investment in market, transport, storage, and port infrastructure.

8. Having made such strong progress toward an oilseed industry capable of supplying domestic needs, providing attractive agricultural employment to rainfed farmers, and competing in world markets, India now has a promising opportunity to make the most of its successes by adopting further reforms. They should not only pay for themselves but repay some of the costs of the long years of protection and special treatment.

Some Terminology...

Edible oilseeds grown in India are classified into two groups: traditional (e.g., groundnut, rapeseed-mustardseed, safflower) and non-traditional (e.g., soybean, sunflower, cottonseed) which have been more recently introduced or promoted as sources of edible oil. The oilseed's oil content determines the most efficient technology used to extract the oil. The expelling process is typically used to extract oil from oilseeds with high oil content (groundnut, rapeseed-mustardseed, sunflower); while the solvent-extraction process is needed for soybeans, among others, and for oilmeals. Once processed, the seeds give two joint products: edible oils and oil meals. Edible oils can be refined (the refining stage), and then further processed into margarine or *vanaspati* using a hydrogenation process. Oil meals as well can be processed further to extract the residual oil, leaving a de-oiled cake.

9. **Evolution of Policy Regime.** Faced in 1979-80 with major imbalances between domestic edible oil supply – growing at only one percent a year – and per capita consumption -- rising by 16 percent – and edible oil imports amounting in consequence almost to a third of India's own consumption, the Government of India set itself the objective of achieving self-sufficiency and food security in the edible oil sector. The import-substitution strategy it adopted consisted of promoting technological change in oilseed production and processing, while shielding the sector from international price competition and instability. There evolved a wide range of complementary, sometimes conflicting, policies including (a) policies covering foreign trade, price support and stabilization, marketing, credit, and taxation; (b) regulatory controls on domestic trade — physical and futures — and on agro-processing; and (c) government-sponsored programs to support technological change in oilseed production and processing.

10. In addition to successive centrally sponsored schemes for oilseed production, the government all but banned oilseed imports and channeled large-scale edible oil imports through the Public Distribution System at prices well below market rates until 1989. Regulatory controls pervaded private-sector trading and agro-processing activities, and a Small-Scale Industry Reservation policy dating to 1977 still reserves the manufacturing of oilseed crushing equipment and the processing – except through solvent extraction -- of groundnut, rapeseed-mustardseed, sesame and safflower oils exclusively to small-scale enterprises. State governments restricted the movement of edible oilseeds and oils within and between states, and central authorities banned forward and futures contracts, prompting many processors to hedge their very considerable crushing margin risks through active but illegal trading in futures contracts, especially for groundnut oil and mustard oil. On top of the other rules and acting again as a spur to evasion, various government levels levied multiple taxes, further impeding the efficient allocation of resources and the development of a truly nationwide domestic market.

11. Further extension of government interventions in the oilseed complex began with the establishment of the Technology Mission on Oilseeds in 1986, which consolidated government programs to support rapid technological change in oilseed production and processing and extended them to address concerns about domestic price instability. The Integrated Policy on Oilseeds and Edible Oils in 1989 completed the policy coverage of Government interventions in the oilseed complex by introducing price stabilization operations (Market Intervention Operations), reducing the differential between the open market price and the Public Distribution System price of edible oils, curtailing drastically the volume of edible oil imports, and strengthening the administrative structure implementing Government policies toward the oilseed complex.

12. Far-reaching reforms began in the early 1990s. Registration and licensing requirements for the solvent-extraction and refining industry were dropped in 1991. Trade reforms in 1994/95 allowed the unrestrained import of major edible oils, with only a modest 20 percent tariff by 1996,

and thus exposing the oilseed complex for the first time to foreign competition and international price volatility. Domestic price stabilization policies had been disbanded, and domestic controls on storage and movement of seeds and oils are progressively and selectively being relaxed.

13. Although the enforcement of some (credit access and storage controls) regulations was lifted beginning in 1996, many programs established earlier and the regulatory framework on storage, movement, credit access, and agro-processing remain unchanged. The investment ceilings for the small-scale units have been raised to Rs. 30 million (less than $ 1 million) in 1996, but the Small-Scale Reservation in the oilseed complex continues. Futures trading continues to be restricted, although a high-level committee has recommended the introduction of futures contracts on major oilseeds, their oils, and cakes.

14. **Oilseed Production Impact.** On the production side, protectionism bought substantial gains, not only doubling output of oilseeds -- from 10 million metric tons in 1980/81 to over 21 million in 1993/94 -- but also, and just as vital from the food-security perspective, reducing production instability by 75 percent. The rapid growth in oilseed production also contributed significantly to the acceleration of agricultural growth since the early 80s and its more equitable distribution, since oilseeds are grown mainly in rainfed areas. At least 59 percent of the aggregate increase in oilseed production between 1979/80 and 1993/94 came from technological change -- 40 percent in the form of new oilseed crops (soybean and sunflower), 12 percent and 7 percent from pure yield increases in rapeseed-mustardseed and groundnut, respectively. Better access to market outlets and favorable prices, notably in the late 80s, played an important role in the adoption of new technology and expansion of production. Soybean and sunflower, in particular, were exempted from the Small Scale Industry Reservation so that they could be processed in larger scale and modern facilities.

15. In sum, technological change, fostered under protectionism, appears to have given India's oilseed complex a comparative advantage in oilseed production. Over the last two decades, deliberate technological advancements such as the introduction of soybean and sunflower, and of faster-growing seed varieties, improved resistance to pests and moisture stress, and higher yields have enabled the better integration of oilseeds into existing cropping systems. This has resulted in higher cropping intensity, notably in the case of soybean and sunflower, and a more efficient use of scarce resources — water in irrigated agriculture, labor in rainfed agriculture. In the case of irrigated agriculture, oilseed crops are likely to represent a more efficient use of scarce resources because of their relatively low water requirements.

16. **Future Demand and Supply Prospects.** Increasing oilseed production and high prices of edible oils in the 1980s to the early 1990s, which slowed domestic consumption growth, helped India achieve virtual self-sufficiency in edible oils. That status, however, is changing as the recent import liberalization of vegetable oils, by bringing domestic prices down, and faster GDP growth are boosting demand and putting an end to the decade-long stagnation in per-capita consumption. At 3 percent per-capita income growth, that demand will double by the year 2020 and treble if per-capita income growth is 5.5 percent per annum. Meanwhile, the country has developed sizable export markets for de-oiled cake, albeit at discounted prices due to quality problems, notably in South East Asia and the Middle East. If GDP growth at home also stimulates increased consumption of milk, eggs, and meat, meal products now being sold abroad could well go to feed India's livestock, now only low-intensity consumers of oilseed meals.

17. Faster GDP growth and free edible oil imports offer large opportunities for a rapid market-led growth of the Indian oilseed complex. But technical and economic inefficiencies of the processing industry, poor marketing performance, and low meal realization stand in the way of

sustaining the oilseed sector's past production achievements. Combined, these flaws act to dissipate the high level of effective protection enjoyed by the oilseed processing industry and deny most of its benefits to oilseed growers.

18. **Protectionism in the Oilseed Complex.** Edible oils received significantly higher levels of nominal protection, while oilseeds enjoyed only unstable and comparatively modest levels of nominal protection during the 1980s (with soybeans receiving none). In the mean time, protection levels for both edible oilseeds and edible oils have fallen dramatically since their 1987 peak as a result of several parallel developments: the devaluation of the rupee, an increase in domestic seed and oil availability, relatively high international prices of oils, and a decision to reduce tariffs on edible oils. By 1994/95, protection levels for all edible oils had fallen almost in line with the import tariff level prevailing that year (65 percent), except for groundnut oil whose price fell much lower as a result of supply conditions that year. By contrast, the protection level for all four major oilseeds, except sunflower, had actually become negative by 1994/95.

19. The Indian oilseed processing industry, however, continues to benefit from considerable effective protection except in the case of rapeseed since about 1992. Groundnut, soybean, and sunflower processors all enjoy sizable crushing margins. The level of effective protection appears remarkably stable in the face of rapidly falling protection levels for oils. This underscores the capacity of the processing industry to pass the costs of adjustment onto oilseed growers barred from exporting oilseeds (except for rapeseed and sunflower since 1995). Moreover, for all oilseeds, except groundnut and possibly rapeseed-mustardseed, the resources spent in processing oilseeds in India cost more than they are worth. The high effective protection together with the negative crushing margins (evaluated at world market prices), strongly indicate the presence of gross inefficiencies and lack of competitiveness of the oilseed processing industry.

20. **Obstacles to Progress in Marketing and Processing.** Among the many reasons, Indian processors – unlike their international counterparts – do not achieve high technical and economic performance levels is the fragmentation of their sector into four major segments, two involved with oilseed extraction and two with further processing of the oil.

- *Small-scale private expellers.* There are about 150,000 small-scale expellers in India. Some 20,000 of them process about 62 percent of output. These 20,000 firms consist mainly of groundnut and rapeseed-mustardseed small-scale expellers because the Small Scale Industry (SSI) reservation -- based on the expelling processing technology-- limits their scale to no more than tens of tons per day. Small-scale expellers crush oilseeds using metal screws which press ("expel") oil from seeds, leaving the cake behind, and sell only expeller oil and expeller cake with high residual oil content often exceeding 10 percent. *Ghanis*, another type of small-scale expellers, account for the remaining 130,000 or so units. *Ghanis* are very small crushers processing at the rate of kilos, not tons, per day, who now account for barely 1 percent of total output. The number of *ghanis* (and their share in total output) has come down over time (estimated at about 300,000 in 1956) as they are being displaced by the 20,000 small-scale expellers, and the solvent-extraction units.

- *Large-scale, modern solvent-extraction segment.* It consists of some 760 establishments, accounting for 37 percent of oilseed processing, that apply solvent-extraction technology to low-oil-content raw materials, primarily soybeans or cottonseed, and expeller oil meal. They tend to have a daily processing capacity of 125 to 150 tons -- barely 10 percent of the norm in North and South America or Western Europe. This group also includes processors who circumvent the SSI Reservation for groundnut and rapeseed-mustardseed by using a uniquely Indian, but technologically inefficient process known as expander-cum-solvent extraction.

- *Oil refiners.* Unlike other countries, because of the SSI-induced size limits, refiners in India are generally not linked to a solvent extraction plant. In addition, regulations require refiners to indicate whether the oil originates from expeller or solvent extraction process. The latter attracts lower prices. No other country insists upon this distinction which has little rationale in terms of quality.
- *Vanaspati industry.* The *vanaspati* sector hydrogenates refined oil to produce margarine and a vegetable shortening or spread, somewhat similar to *ghee* or butter. There are strict limits as to which oils can be used, and in what proportions, in the manufacture of *vanaspati.* These limits — often known to be flouted — have no logic in terms of the end product except to stimulate demand for particular vegetable oils.

21. Among the consequences of this fragmentation are generally poor technical standards of oil extraction and rampant low capacity utilization, ranging from an average of 10 percent for the *ghanis* to no better than 30 percent for small-scale expellers whose counterparts in developed economies achieve rates of 70 percent. Consequently, groundnut and mustardseed small scale-expellers in India have unit costs 17 percent higher than those in China and 40 percent higher than in the U.S. and Canada. Even though they are free from limitations on their size, the solvent-extraction, refining, and *vanaspati* industries also use only a fraction of their capacity — on the order of 30 percent in India compared to above 75 percent in developed economies and 50 percent in China. This low rate of utilization, combined with high operating costs — the best international soybean processing factories use only 12 percent of the solvent per ton of Indian factories, roughly half the steam, and three quarters of electric power — have left the solvent-extraction sector with a poor level of profitability, even though it should be the main beneficiary of the high processing margins determined by the expeller industry. Nonetheless, its share of the market has been expanding rapidly due to (a) the desire by the private sector to find an area of activity free from capacity ceilings; (b) tax incentives given for the use of non-traditional oils in the manufacture of *vanaspati*; (c) the investment and sales tax incentives offered by state governments for processors to establish solvent-extraction factories in their states; and (d) the realization by a few processors of the possibility to circumvent the Small Scale Industry Reservation by installing expanders linked to extraction units.

22. Higher meal realizations would permit processors to pay better prices to growers and to charge lower vegetable-oil prices to consumers, but earnings from the sale of meals falls far short of their true potential, a matter of great concern for the entire sector. There are four main reasons for this failure: (a) the fragmented structure of the processing industry which militates against quality consistency, (b) poor development of the domestic market for high quality animal feed, (c) very high costs of exporting de-oiled cake which reduce the net return to local producers, and (d) the low quality of a great deal of Indian de-oiled cake which is reflected in large discounts for some meals on the export market. In the livestock sector, characterized by indigenous animals with low productivity, concentrate feeding is uneconomic for small producers, a situation compounded by government interventions in the dairy sector to keep producer milk prices low. The reservation of poultry-feed manufacturing to small-scale industries, lifted in 1997, contributed to increased unit costs and lower quality of feed. Inadequate domestic transport and port infrastructure impose a high cost on de-oiled cake exports. The costs of land and sea transportation, of port operations, and of wastage en route are up to 50 percent of the ex-factory price. Exported meal (other than soybean) suffer from substantial quality discounts because Indian groundnut de-oiled cakes tend to be high in aflatoxin as a result of poor post-harvest handling, and rapeseed-mustardseed meal tends to be high in glucosinolates as a result of the failure to adopt patented varieties which are low in erucic acid and low in glucosinolate, conforming to the health norm in Western Europe and North America.

Discounts range from about 50 percent in the case of rapeseed-mustardseed and sunflower meals to 20 percent in the case of groundnut meals.

23. Markets do not reward quality. Due in large part to the lack of nationally recognized quality standards and the weak enforcement of those that do exist, Indian markets do not efficiently reflect quality through price differences. Traders continue to grade by visual means. Criteria of importance on health grounds in many countries — erucic acid, glucosinolate, aflatoxin — are almost virtually ignored. Partly for this reason and partly because of lack of intellectual property rights to protect plant patents, little attention has been paid to the availability of improved varieties of rapeseed-mustardseed or to promotion of improved post-harvest techniques to reduce aflatoxin. Of course, this limited attention to health aspects has adverse consequences on consumer safety. The many overlapping laws on quality standards with consequent overlapping jurisdictions of enforcement agencies and inspections only serve to increase the transaction costs for traders and processors.

24. Like their international counterparts, Indian crushers face large crushing margin risks. Whereas crushers in open international markets seek to maximize technical and economic efficiency, assure flexibility in sourcing raw materials, and hedging techniques to cushion against market volatility, Indian processors can pursue none of these goals effectively. Hedging through the use of futures or forward sales further than 11 days into the future is banned by Indian law. Domestic processors, therefore, are unable to avail themselves of the opportunity – open in Argentina, Brazil, the EU, Indonesia, Malaysia, and the US, and more recently, even in China -- to lock in satisfactory crushing margins. Nor do they have the option of exercising much flexibility in acquiring raw material, either domestically or on the international market. The absence of legal instruments to manage crushing margin risks --including those arising from unexpected changes in foreign trade policies -- forces processors and traders into speculative positions and to try to assure themselves acceptable returns by charging a sizable risk premium in the form of a higher processing margin than would otherwise be necessary.

25. On top of poor technical and economic performance in processing, the inefficiency of the market for oilseeds, oils, and meals operates further to erode the benefits processors receive from protection. Because of regulation, there is only scattered and high-cost stockholding by a multitude of small operators with little access to modern storage facilities and to formal sources of credit. Cooperatives, though exempt from regulatory barriers, have failed to play a significant role. As a result, storage is costlier than necessary. Not reflected in seasonal price fluctuations, the high storage costs show up instead in the high crushing margins and lower prices which oilseed growers receive on the domestic market.

26. Government policies and regulations explain much of the poor performance of the Indian oilseed processing industry. The artificial barriers that are responsible for the fragmentation of the industry, the predominance of less efficient small-scale factories with low utilization rates, and the lack of development of a common domestic market include the Small Scale Industry Reservation for the two most important oilseeds, the controls on the movement, and until 1996, controls on storage of oilseeds and oils and credit under the Reserve Bank of India's selective controls on credit for oilseed processors. The Small Scale Industry Reservation further increases the difficulty of controlling product quality and prevents small-scale expellers both from taking advantage of economies of scale and from achieving vertical integration of three processing operations in a single factory — expelling of the groundnuts and mustardseed, solvent extraction of the resultant oilseed meal, and refining of expeller and solvent-extraction oil — as is common elsewhere in the world. Moreover, the Small-Scale Industry Reservation on the manufacturing of oilseed-crushing equipment and the Reserve Bank of India investment guidelines encouraged processors to adopt

less efficient technologies. The ban on forward and futures trading in oilseeds and oilseed products (with the exception of castor seed, a non-edible oilseed), limits the options of traders and processors in hedging their price risks. It also limits their access to longer-term price information. Finally, government has a weak capacity to monitor and enforce environmental controls and food standards vigorously.

27. **Framework for Reform:** Maintaining past achievements will require that the Government establish a price and market environment in the oilseed complex that encourages sustained technological advance as domestic demand fuels an expanding market. Capitalizing on the remarkable stability in production provided by diversification will also require establishing a truly nationwide market stimulated by foreign competition to achieve higher levels of efficiency in marketing and processing.

28. Unless Indian processors and traders are allowed to trim marketing costs and crushing margins, recent gains in oilseed production will be put at risk. So far, Government policies in the oilseed complex have been shaped as much to achieve social objectives — primarily employment in the small-scale processing industry — as to promote efficiency and competitiveness. Unless the rigidities in current domestic policies are lifted and infrastructure improved, the high marketing costs and crushing margins will continue to be supported by farmers — 60 percent of whom live in rainfed areas — in the form of lower producer prices. Allowing oilseed imports, as has been recommended would not address the core problems. It would benefit only a few processors and possibly consumers, but hurt growers and the large majority of processors.

29. A strategy for reform – one that would generate most of the financial and institutional incentives for its own implementation and could stimulate significant efficiency gains equivalent to 30 percent of farmgate price gains -- would focus primarily on domestic policies to enhance the performance of marketing and processing. The objectives would be: (a) improve marketing and distribution of oilseeds and derived products; (b) improve the technical competitiveness of the oilseed processing industry; and (c) provide the means to mitigate price and crushing margin risks in a more liberal domestic and foreign trade environment which is WTO-consistent.

30. Piecemeal approaches will not release the untapped potential that is undoubtedly present. Characterized by a sequence of packages of internally consistent reforms to create a true nationwide market and remove the multiple anachronistic restrictions upon private sector activities (including those of cooperatives), a comprehensive approach is essential to lay the foundations for sustained growth in the Indian oilseed economy. A five-stage approach to reform is proposed:

A. **Fine-tune the external trade regime** consistent with WTO rules by:

- Extending the export liberalization to all oilseeds *(GOI)*.
- Legislating IPRs in conformity with the TRIPs agreement *(GOI)*.
- Completing the import liberalization of all edible oils and lifting uncertainty on tariffs; establishing the external trade rules and institutions, consistent with WTO rules, to deal with international price spikes.

31. This first set of reforms only departs from current policies in the liberalization of oilseed exports which would provide a badly needed floor to the local market so that farmers would not have to bear the brunt of any squeezes on processors' margins. At the same time, the recognition of intellectual property rights — to which India committed itself to under the Uruguay Round of the GATT — would give seed companies the needed incentives to sell improved varieties, especially rapeseed low in erucic acid and glucosinolate. Completing the liberalization of edible oil imports will help secure a ceiling on the level of domestic vegetable oil prices.

B. **Modernize the domestic trade and processing policy environment** by:

- Removing the oilseed complex from the scope of the Essential Commodities Act *(GOI)*.
- Removing permanently the oilseed complex from the Small-Scale Industry Reservation — crushing equipment; groundnut, rapeseed-mustardseed and safflower expelling; and poultry feed manufacturing *(GOI)*.
- Allowing forward and futures trading in oilseeds and derived products *(GOI)*; promoting the establishment, in coordination with the private sector, of standard quality norms and contracts, and improving contract arbitration procedures *(GOI)*.
- Harmonizing and standardizing the taxation of oilseeds and their products, at a rate consistent with processing margins, as by replacing sales taxes with an excise tax *(GOI, state governments)*.
- Phasing out government interventions in operations of cooperatives *(state governments)*.
- Establishing an agricultural price and trade surveillance unit *(GOI)*.

32. Although regulatory changes can be rapid, the implementation of the reforms and their gestation period is likely to take some time, an important reason for the creation of a surveillance unit to monitor in a transparent fashion the price and trade deregulation and the performance of agricultural markets and agro-industry. With vegetable oils freely importable and oilseeds and oilseed meals freely exported, the Essential Commodity Act restrictions will have outlived their usefulness, since foreign trade can overcome hoarding and price squeezes. Similarly, the credit controls applied by the Reserve Bank of India could be eliminated and the use of warehouse receipts as collateral promoted in order to facilitate access and reduce the costs of financing larger inventories than currently permitted. Allowing futures contracts would largely amount to the normalization of already widespread, but now illegal, futures trading, while improving its transparency, efficiency, and reliability. The impossibility of protecting the Small-Scale Industry Reservation from the advances of new technologies should be recognized by eliminating the Reservation in the oilseed expeller sector and expelling equipment. The distortions caused by different rates of taxation in different states need to be removed.

C. **Modernize the market, post-harvest, transport, and port infrastructure** by:

- Decentralizing the financial and management authority of regulated markets *(state governments)*.
- Developing grading facilities, facilities for the bulk transportation and handling of seeds in markets which should lead to the promotion of quality incentives in payment schedules by seed purchasers *(state governments)*.
- Disseminating price information *(state governments)*.
- Establishing the policy framework necessary to promote private investment in market, storage, transport, and port infrastructure *(GOI, state governments)*.
- Improving, in collaboration with the private sector, port infrastructure *(GOI; state governments)*

33. Since this third package of reforms is likely to require a long gestation period and complements the second set of reforms, it should be initiated early in the process.

D. **Improve the regulatory and institutional framework to raise health and quality performance** by:

- Tightening national food safety standards *(GOI)*.

- Improving monitoring and enforcement capacity of food safety institutions *(GOI, state governments).*
- Strengthening and directing pollution controls and enforcement towards better treatment of effluents and the reduction of hexane (a toxic solvent) losses in oilseed processing *(GOI, state government).*
- Rationalizing food labeling regulations, reinforcing monitoring capacity to raise awareness of health issues by product labeling that distinguishes between the traditional pungent mustardseed and healthier rapeseed oil manufactured from varieties with low amounts of erucic acid and glucosinolate.

34. This set of reforms – introducing strong, financial, market-based incentives for the oilseed complex to improve its performance on health and quality issues -- is likely to require the longest gestation period. Even among the most developed economies, quality regulations and standards keep evolving. Yet India's problems need to be addressed sooner rather than later., notably the lack of strict controls that other countries maintain over the erucic acid content of mustardseed-rapeseed oil and over the free, fatty-acid content of edible oils sold to the general public. Aflatoxin and glucosinolate levels are well above the levels accepted in many foreign markets. Adulteration of edible oils is widespread.

E. **Complete external trade liberalization** by:

- Liberalizing exports of vegetable oils *(GOI).*
- Liberalizing the importation of oilseeds *(GOI).*

35. This package represents the least critical reforms to improve the marketing and processing performance of the Indian oilseed complex and can be implemented last, although the liberalization of oilseed imports could begin earlier if there is evidence that crushing and marketing margins are fast declining and oilseed farmgate prices rising accordingly towards parity level. Eventually such imports, by putting a ceiling on oilseed prices, will be needed to protect oilseed processors from having their margins squeezed to uneconomic levels.

36. Finally, managing price instability will be critical to the success and political acceptability of the reform strategy. It can be accomplished through (a) provision of market-based instruments – among them, futures markets as recommended for a number of agricultural commodities by the Kabra Committee in September 1994 -- for managing oilseed price and crushing margin risks, and (b) establishment of instruments to deal with price spikes — sudden and short-lived, rapid price increases or declines — originating either from the domestic or the world market. Managing price spikes would probably require price-support operations limited to government interventions at low "safety net" price levels to protect growers from the most extreme fluctuations while leaving sufficient price volatility to provide financial incentives for storage and for risks to be covered through risk management techniques. India could deal with world price spikes by resorting to safeguard measures provided under the World Trade Organization which allow tariffs or quantitative restrictions to be imposed for a limited period if imports are growing in such a fashion as to cause serious injury to the domestic oilseed and edible oil industry.

1 Setting the Scene

1.1 India's growers of groundnuts, rapeseed-mustardseed, and safflower and of newer crops such as soybean, sunflower, and cottonseed as well as the warehousers, processors, transporters and traders of edible oil, cakes and meal face remarkable opportunities to grow and profit in free-market conditions. For the oilseed complex to realize most of those possibilities, however, officials will have to dismantle and/or rationalize the exceptionally variegated protectionist regime behind which the oilseed complex sheltered and prospered during the last decade and a half. The sweeping liberalization of edible oil imports initiated in 1994 has yet to be matched by parallel actions to simplify and reduce the host of central as well as state government regulations that inhibit open markets -- sometimes even within states -- and that reserve the processing of some seeds and the manufacture of some oils and extracts to notably inefficient and often technologically retrograde firms. While past protection fostered major production gains for farmers, domestic regulations continue to stunt productivity growth and competitiveness of the oilseed processing industry. Unless domestic regulations are attended to, potentially large increases in future oilseed production will not be realized.

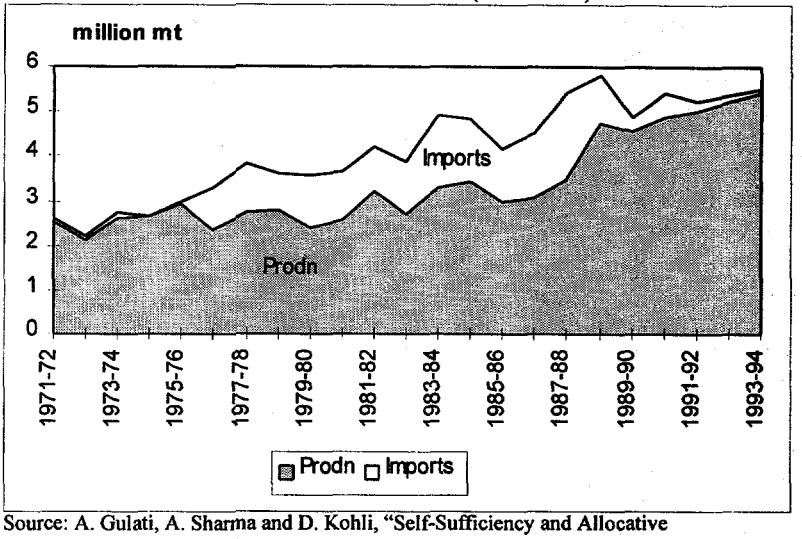
1.2 The situation represents the unintended consequence of the successful import substitution strategy that India adopted in the early 1980s after years when oilseed consumption so outpaced domestic supply that imports came to take almost a third of the market and substantial amounts of scarce foreign currency. Under a protectionist umbrella India's annual oilseed production grew more than 100 percent between 1980 and 1993/94 (from 10 to 21 million metric tons). It caught up with demand at home, allowing India to export oil meals. The strategy also brought a high degree of production stability by spurring the diversification of both oilseed crops and across the regions where they are grown. Along with these achievements and, to a degree, underpinning them, technological advance has permitted higher crop yields and more efficient use of such scarce resources as water in irrigated areas and labor where rainfall sustains agriculture.

1.3 The drawback to the strategy is an inefficient and non competitive oilseed industry that is being held back by a tangled network of policies, rules and regulations. Having served their purpose, these policies, rules and regulations need to be revised and simplified as India and its oilseed complex become exposed to foreign competition and move into the less-regulated market regime envisioned by architects of the broad economic policy reforms begun in 1991. Within the oilseed complex, different systems of support and different prohibitions apply to different crops and to different credit, storage, transport and processing activities. Deregulation is not a matter of undoing a few universally applicable policies. It will require a host of separate political and economic judgments and reform measures. To understand the scope of the challenge, this chapter's three main sections describe, first, the policies that currently govern the oilseed complex and the recent changes in them; second, analyze oilseed production performance, its sources of growth, and their relation to the policy environment; and, finally, examine the demand patterns for oilseed products, identify recent developments, and relate those to the oilseed complex policy environment.

A. Policies Governing the Oilseed Complex: RISE AND REVERSAL OF AN IMPORT-SUBSTITUTION STRATEGY

1.4 The basic impetus for early oilseed trade rules was the need to rectify major imbalances between domestic supply (that grew at just one percent a year from 1968 to 1981) and demand (escalating between 1965 and 1975 at annual per- capita rates of 16%). Imports filled the gap, supplying 32% of the domestic market (Figure 1.1) by 1979-80. A 1981 World Bank study, moreover, projected that by 1990 satisfying India's appetite for oilseed products "would mean spending between US$3-4 billion (6-8% of total imports) and absorbing between 8-10% of total projected world exports of vegetable oils."[1] Government of India (GOI) officials recognized that the drain on foreign exchange and the risks to both food security and price stability required policy change.

Figure 1.1
Domestic Production and Imports of Edible Oils for Human Consumption in India, 1971-72 to 1993-94 (million mt)



Source: A. Gulati, A. Sharma and D. Kohli, "Self-Sufficiency and Allocative Efficiency: The Case of Oilseeds in India," draft mimeo, January 1996.

1.5 In the early 1980's, building on green-revolution successes in wheat and rice, Indian policymakers set out to attain self-sufficiency and food security in edible oils by replacing imports with domestic production (Box 1.1). The initial (1979-80 to 1985-86) strategy consisted of promoting technological change in oilseed production and processing, while shielding the sector behind high trade barriers from international price competition and instability. That narrow policy focus gradually widened to a more comprehensive coverage of marketing and pricing (1985-86 to 1993-94), including special treatment for different crops and for different processors.

1.6 **Oilseed Production Stabilizes.** The strategy worked impressively in two respects. First, production of the nine major oilseeds jumped from less than 10 million mt in 1980 to more than 21 million mt in 1993/94. With a 5.8% growth rate per annum between 1981-82 and 1993-94, oilseed crops registered the fastest expansion of all major crops and not only contributed 22% to all-India crop growth but also, as a farm product found predominantly in rainfed areas, improved the regional balance in agricultural growth. Just as striking but much less known is the 75% drop in production instability which accompanied the rapid increase in production and made a vital improvement in food security.[2] Its coefficient of variation declined steadily from 20% in

[1] India: Demand and Supply Prospects for Agriculture. World Bank Staff Working Paper, No. 500. 1981

[2] See Annex 2 for a more detailed treatment of oilseeds recent production performance.

1971-77 to 5% in 1989-94 as regional, seasonal and varietal diversification of crops, along with the expansion of oilseed production into irrigated areas helped stabilize production (Table 1.1).

Box 1.1
Is the Yellow Revolution Sustainable?

There is considerable debate about the import substitution strategy for oilseeds pursued by India during the 80s and early 90s. While there is consensus about the achievement of virtual self-sufficiency by 1993/94, the controversy centers on the sources of growth in oilseed production and whether the "Yellow Revolution" is sustainable.

One view, shared by the World Bank in its 1991 CEM, argues that such a strategy was economically costly and unlikely to be sustainable. High prices explained most of the virtual achievement of self-sufficiency in oilseeds. It was economically costly since the high degree of protection to oilseeds (NPCs above unity) shifted the allocation of resources in agriculture towards crops for which India had little to no comparative advantage. The limited contribution of technological change to the growth in oilseed production, the significant contribution of area expansion, and large changes in cropping patterns at the expense of other crops, were seen as evidence of the inefficient allocation of resources prompted by the high oilseed prices. It was unsustainable since free imports of edible oils under modest tariffs would reverse the production achievements by driving down the prices of oilseeds.

The opposite view argues that the import substitution strategy was justified on food security grounds and the need to develop a comparative advantage in oilseed production through technological change. Proponents of this infant industry argument point that technological change in oilseed production, such as the rapid development of *rabi* oilseed crops and non-traditional oilseeds, played a major role in achieving self-sufficiency. Accordingly, free imports of edible oils under modest tariffs are unlikely to threaten the past achievement in self-sufficiency.

This report argues that the oilseed import substitution strategy was a conditional success. Rapid technological change in oilseed production did occur, and several indicators suggest the development of India's comparative advantage in oilseed production (see paras 1.31 and 1.32, and Annex 2):

- At least 59% of the aggregate increase in oilseed production increase between 1979/80 and 1993/94 came from technological change --40% in the form of new oilseed crops (soybean and sunflower), 12% and 7% from pure yield increases in rapeseed-mustard and groundnut, respectively.
- Rapid technological change in rapeseed-mustard (yield grew at more than 3% per annum) and groundnut (introduction of *rabi* crop) also caused their area expansion by inducing growers to devote more land to more profitable activities, even in the absence of higher oilseed prices.
- Higher oilseed prices further facilitated technological change by making the new technology even more profitable. High prices contributed to pure area expansion into oilseeds, notably in the late 80s and early 90s, possibly substituting for competing and more efficient crops.
- There is little evidence of inefficient crop substitution in the case of soybean and sunflower. The soybean and sunflower area expansion in Madhya Pradesh and Karnataka resulted in (statistically significant) higher cropping intensity by occupying land that would have remained idle otherwise.
- There is emerging evidence that area expansion of rapeseed-mustardseed may have contributed to a more efficient resource allocation. Although it did not lead to higher cropping intensity in Rajasthan and Madhya Pradesh,rapeseed-mustardseed (statistically) substituted for sugarcane and wheat, suggesting a more efficient use of scarce resources such as water or electricity.
- Soybean production is price competitive (NPCs below unity throughout).
- Indian groundnuts are cost competitive with other major producing countries (China, Senegal, USA); and most likely to be price competitive (India dominates world production --30%-- and NPC = 1 on average between 1965 and 1995).

Indian consumers, however, did bear the costs of the import substitution strategy in the form of high edible oil prices.

This report argues that marketing and processing improvements in the oilseed complex are now key to sustaining the recent production achievements while protecting Indian consumers from unnecessarily high edible oil prices.

1.7 **Reversing Course.** Starting in 1994, GOI introduced far-reaching reforms. It freed imports of major edible oils, cut tariffs from 65% to 20% by 1996 and thus, for the first time, exposed the oilseed complex to foreign competition and international price volatility. Central authorities also abandoned domestic price stabilization policies, and some state governments are

progressively and selectively relaxing domestic controls on the movement of seeds and oils. Left largely in place, however, are state taxes and central regulatory controls on physical and futures trade, as well as regulations favoring and/or penalizing processors of different sizes and levels of competence.

Table 1.1
Instability in Oilseed Production
(Coefficient of Variation)

Oilseeds	1971-77	1981-87	1989-95
Groundnut	0.269	0.267	0.144
Rape/must	0.285	0.259	0.116
Soybean	0.396	0.457	0.233
Sunflower	0.953	0.369	0.219
Others	0.183	0.242	0.121
Aggregate	0.203	0.185	0.049

Source: computed.

1.8 Much more, therefore, remains to be done to dismantle the wide range of complementary and overlapping, sometimes conflicting, policies administered by a multiplicity of central and state agencies that are the legacy of the GOI's import-substitution strategy. The policies cover foreign trade, price support and stabilization, marketing, credit, and taxation; regulatory controls on trade --physical and futures-- and agro-processing; as well as government-sponsored programs to support technological change in oilseed production and processing. The different policy instruments, and their evolution over time, are summarized in Table 1.2. A detailed treatment of individual policies governing the oilseed complex is provided in Annex One.

1.9 **Central Government Technology Support Programs.** Among the variety of schemes to foster the modernization of oilseed production, marketing, and processing, the Oilseed Growers Cooperative Project (OGCP) came first. Launched in 1979/80 in an effort to duplicate dairy cooperatives' production achievements under Operation Flood, OGCP's implementation was a responsibility of the National Dairy Development Board (NDDB). By 1994/95, it had created a network of 5,513 oilseed growers' cooperative societies with about one million members in 18 cooperative unions/federations. Cooperatives were to provide a market outlet for farmers' output and serve as a medium for delivering farm inputs and support services, such as credit, improved seeds, fertilizer and extension. Operating as fully integrated units, by 1994/95 the cooperatives had established a combined oil crushing capacity of 3,310 mt per day (1.8% of the national total), could solvent-extract 1980 mt of oil per day (2.1% of India's capacity), and could refine 733 mt per day (18% of the total.). The cooperatives' storage capacity reached 170,000 mt for oilseeds and 277,000 mt for oil during the same period.

1.10 Of the successive Centrally Sponsored Schemes (CSS) for oilseed production,[3] the first was the National Oilseeds Development Program (NODP), initiated in 1984-85 and launched in 1985-86 to consolidate numerous, scattered central oilseed development programs in a single system. The main objectives of the NODP and its successors --Oilseeds Production Thrust Project (1987/88), and the Oilseeds Production Program (1990/91)-- were to: (i) develop improved cropping practices and improved or hybrid seed varieties with higher yields, faster maturation, better tolerance of drought, pests, and diseases, and adaptability to a greater variety of agro-climatic situations; and (ii) accelerate, through extension services, the diffusion of the new crop technology among farmers across all major states by subsidizing mini-kits of improved seed varieties, rhizobium cultures, fertilizers, plant protection chemicals, and irrigation equipment. Substantial financial resources, reaching Rs. 1.3 billion in 1994/95, went into these initiatives to the point that by 1992/93, oilseed CSS alone accounted for 20% of all Ministry of

[3] Centrally Sponsored Schemes are financed predominantly (75%) by the central Ministry of Agriculture (MOA), and implemented by the state governments' Departments of Agriculture (DOA) under strict central guidelines.

Agriculture (MOA) spending on crop-oriented CSS, 3.7% of total central government expenditures on agriculture and allied services.

Table 1.2
Government Interventions in the Oilseed Complex, April 1997

Policies	*Status*	*Remarks*	*Implementing Agency*
Trade Policies			
• Import: Seeds	Canalized	Soybean special program in 95	Min Commerce - STC
Oils	Free	Tariff: 20%	Min Commerce
Meals	Restricted	-	Min Commerce
• Export :Seeds	Restricted	Free: Groundnut HPS; rapeseed & sunflower in 1995	Min Commerce
Oils	Restricted	-	Min Commerce
Meals	Free	-	Min Commerce
Price Policies			
• Price Support	Yes	Price support well below market prices	NAFED
• Stabilization	No	MIO under IPO disbanded in 1994	MIO -NDDB
• PDS	Yes	Since IPO (1989), small vol & price differential	Min of Food & C.A. - Empowered Committee
• Storage	Lifted	Cooperatives exempted; lifted in 1997	Min of Food & C. A.
• Movement	Yes	Periodic; Cooperatives exempted	State governments
• Working Capital	Lifted	Lifted in October 96; Cooperatives exempted	RBI
• Forward Trading	Ban	Permitted up to 11 days	Min Food & C.A. - FMC
• Futures Trading	Ban	Allowed for castorseed	Min Food & C.A. - FMC
Agro-Processing Policies			
• Small Scale Reservation	Yes	Expelling of rapeseed-mustardseed and groundnut, crushing equipment. Investment ceiling raised to Rs. 30 million in 1996. Cooperatives exempted	Min Industry
• *Vanaspati* Industry	No	Price & movement controls lifted in 1989	Min Food & C.A.
Food & Health Safety			
• Veg. Oil Products Order, 1947	Yes	Used to control *vanaspati* industry	Min Food & C.A.
• PFA Act, 1954	Yes	1992: blending of 2 oils allowed	Min Health
• S.E. Oil Order, 1967	Yes	1991: Licensing req. removed	Min Food & C.A.
• Pack'd Commodities Order, 1971	Yes	15kg tins exempted	Min Food & C.A.
• Blended Edible Veg. Oils			Min Food & C.A.
• Grad'g & Mark'g Order, 1991	Yes	Define grade, marking, packaging	Min Rural Development
• Weights & Measures Act	Yes	1992: volumetric packaging of edible oils allowed	Min Food & C.A.
Technology Programs			
Crop Research & Development	Yes	Under TMO, mini-mission I	ICAR - DOR
Crop Technology Dissemination	Yes	CSS; since 85/86: NODP, OPTP, OPP	MOA - DOA
Cooperatives	Yes	OGCP since 1979/80	NDDB
Processing Technology	Yes	Under TMO, mini-mission II	CSIR

Note: PFA Act: Prevention of Food Adulteration Act; S.E. Oil Order: Solvent Extracted Oil, Deoiled Meal and Edible Flour (Control) Order. Min Food & C.A.: Ministry of Food and Consumer Affairs

1.11 **A Virtually Closed Foreign Trade Regime Until 1994.** To protect its nascent oilseed complex, India maintained strict quantitative restrictions until 1994 on both imports and exports, except, notably, for oilseed meal exports. High non-tariff barriers, played a crucial role in setting domestic price levels for both oils and oilseeds above world price levels. In practice, only edible oils were imported. This meant that the protection level was directed at oilseed crushers, but not at oilseed farmers. As a result, protection has and continues to be much higher for edible oils than oilseeds, taxing Indian consumers much more than it protects growers (Table 1.3).

1.12 Again until 1994, the State Trading Corporation (STC) controlled (canalized) imports of both edible oil and edible oilseeds, the latter nonexistent in practice. The Ministry of Civil Supplies, Consumer Affairs & Public Distribution (now Ministry of Food & Consumer Affairs) set the volume levels of oil imports for eventual distribution at subsidized prices under the Public Distribution System (PDS) and, until 1988, to the *vanaspati* industry, which processes edible oils into hydrogenated oils such as margarine. While exports of oilseeds and oils were banned --with the exception of confectionery groundnuts (groundnut HPS) -- mostly free exports of oilseed meals also benefited from a variety of export incentive schemes developed during the 70s and 80s.

Table 1.3: Nominal Protection Coefficients in the Oilseed Complex - Importable Hypothesis [1]

Commodities	1980/81-1986/87	1987/88-1989/90	1990/91-1994/95
Groundnut	1.20	1.41	0.88
Rapeseed-Mustard-seed	1.06	1.44	1.19
Soybean	0.89	0.96	0.89
Sunflower	1.25	1.27	1.13
Groundnut Oil	1.87	1.88	1.34
Mustard Oil	2.41 (a)	2.60	1.88
Soybean Oil	-	2.50	1.96
Sunflower Oil	-	2.47	1.96 (b)
Coconut Oil	2.97	3.07	2.36
Groundnut Meal[2]		-	0.81
Rapeseed Meal[2]		0.45	0.41
Soybean Meal[2]		0.93	0.91
Sunflower Meal[2]		0.50	0.51

Note: 1 -Importable hypothesis for seeds and oils. 2 - Export hypothesis Quality Discount Coefficients. The oilseed meal coefficients are not NPCs but actually measure quality discounts faced on the export market.

Source: Oils - *Self-Sufficiency and Allocative Efficiency, Case of Oilseeds in India,* A. Gulati, A. Sharma & D.S. Kolki, January 1996. Oilseeds - *Trade Policies and Incentives in Indian* Agriculture, G. Pursell & A. Gupta, mimeo, 1996, World Bank. NPC estimates are adapted from the above sources but differ as a result of different methodological assumptions (see Annex 5) (a): 1984/85 - 1986/87; (b): 1990/91 - 1993/94.

1.13 **Public Distribution of Imports at Below Market Rates Backfires.** Vegetable oil became a PDS commodity in 1974, and the PDS sold the edible oil imported by STC at prices 40% to 80% below market rates. In spite of the low absolute volumes made available through the PDS (1.8 kg per capita in 1988), until 1988-89, the system handled a large (20-35%) share of domestically available edible oils. Since import prices were well below PDS prices, the GOI bore no explicit subsidies on account of the public distribution of oils. PDS interventions, however, led to two perverse side-effects on the performance of the oilseed complex: the massive diversion of PDS edible oils --estimated at 55% in 1986/87-- from their intended recipients into highly profitable, but illegal, blending with other oils, and a destabilization of producer prices when the bulk of imports coincided with the arrival of *kharif*[4] oilseeds on the market.

1.14 **Pervasive Regulation of Private Trading & Agro-Processing.** The Pulse, Edible Oilseeds, and Edible Oils (Storage Control) Order, 1977 issued under the Essential Commodities Act, 1955 (EC Act) requires the licensing of and strictly limits the storage (with occasional changes as recently as 1993[5]) of oilseeds and oils by traders, wholesalers and processors, but not by cooperatives or state-owned enterprises.[6] In April 1997, GOI announced in the Budget speech the lifting of the implementation of the Storage Control Order. Solvent-extracted oils, de-oiled cakes for export, imports of vegetable oils and oilseeds are also exempted from storage restrictions. Nor does the GOI restrict stockholding of solvent-extracted oils on the premise that

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[4] The *kharif* season covers the monsoon period lasting from about May to October, depending on the state. The *rabi* season covers the "winter" months, from November to April.

[5] For example, stock limits of 150 tons of edible oilseed and 60 tons of edible oils for wholesalers in category of city A; and 1/8th of past annual output for oilseed processors.

[6] The exemption of the NDDB and cooperative oilseed federations was confirmed in 1995 by the Central Government, following litigation between NDDB and the state government of Gujarat.

they require further refining for human consumption. The *vanaspati* industry was also subject to movement and storage controls, along with price controls, until 1988 under the central government's Vegetable Oil Products (Control) Order, 1947.

1.15 Additionally, the Selective Credit Control Policy (1977) implemented by the Reserve Bank of India (RBI) further reinforced physical controls on storage by setting the rate of interest (up to 1994), the level of credit ceilings, and the minimum margins against stocks which the borrower has to self-finance. Until the RBI lifted the restriction in October, 1996, this credit policy covered *all* edible oilseed and oil stocks held by agro-processing units and traders (but not by cooperatives) except soybean, sunflower and safflower.[7] The same controls applied to all stocks, irrespective of additional security for stocks secured against warehouse receipts.

1.16 Invoking Orders or Notifications under powers delegated to them by the EC Act, state governments can act on their own whenever price-increase concerns arise to restrict the movement of edible oilseeds and oils within and between states for any length of time and with limited notice to traders and processors. In Gujarat, for example, the inter-state movement of groundnut oil was banned seven times between 1990 and 1995. Andhra Pradesh exercised the same powers in 1992. So far, the central government has not invoked its supervening power to prevent such restrictions on inter-state trade and commerce.

1.17 Three other kinds of government control further distort the oilseed market. The Small-Scale Industry (SSI) Reservation Policy, 1977, though it exempts cooperative processing units, reserves the manufacturing of oilseed crushing equipment, and the processing of groundnut, rapeseed-mustardseed and sesame oils to small-scale enterprises, unless solvent extracted. In 1996, the investment ceiling for SSI units was raised to Rs. 30 million. Safflower crushing was already reserved for cottage industries or *ghanis* even prior to 1977.[8] Additionally, the Forward Contracts (Regulation) Act of 1952[9] bans trading of futures contracts for oilseeds and their derivatives[10] and also restricts forward trade to "ready" or spot contracts which provide for the delivery of goods and full payment within 11 days of a contract's signing. To manage their risks despite this government intervention, traders have spawned an active, illegal commerce in oilseed futures contracts, notably for groundnut oil --in Rajkot, Dhoraji and other centers-- and mustard oil --in Delhi, Hapur, and Agra. Finally, several regulations govern quality, health, and safety standards. In addition to the Vegetable Oil Products (Control) Order, 1947, other interventions include the Solvent Extracted Oil, De-Oiled Meal and Edible Flour (Control) Order, 1967; the Prevention of Food Adulteration Act, 1954, the Weights and Measures Act; the Packaged Commodities Order, 1971; and the Blended Edible Vegetable Oils Grading and Marking Rules, 1991 under the Agricultural Produce (Grading and Marking) Act, 1937.

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[7] For example, on October 18, 1994, minimum margin requirements for oilseed and vegetable oils were set at 60, 75 and 60% for mills/processing units, others, and warehouse receipts, respectively. The credit ceiling was set at 85% of stock held in the three years ending November 1992 - October 1993.

[8] Small-scale enterprises, as defined by the Policy, are enterprises with investments of Rs 500,000 to Rs 7.5 million. Industrial units operating prior to 1977 were permitted to continue operations, but were barred from expanding their processing capacity.

[9] For a fuller treatment of commodity futures markets in India, see Managing Price Risks in India's Liberalized Agriculture: Can Futures Markets Help? World Bank-UNCTAD Report No 15453, 1996.

[10] It is only in the case of castorseed --a non-edible oilseed-- that futures (hedge) contracts have been allowed to be traded since 1982 in four recognized associations (Delhi, Ahmedabad, Bombay and Rajkot).

1.18 **Non-Unitary State Taxation of Oilseed Products Impedes Development of Common Market.** Among the multiple state-level taxes and levies imposed on oilseed products are a market cess (from 1 to 2% of market value), a rural development tax (e.g., in Punjab), and a purchase tax (from 2 to 4%) on oilseeds. Edible oils, oil meals and de-oiled cakes, are subject to both a sales tax and a surcharge on it ranging, in combination or apart, from 2 to 15%. While local governments impose an entry tax, or *octroi*, running from 0.5 to 1% of the product value, states do not tax inter-state trade on which a central sales tax is levied instead. The variety of state tax rates applied to different oilseeds without apparent justification along with the multiplicity of taxes, militate against efficient allocation of resources and the development of a truly common domestic market.

1.19 **Domestic Policy Focus Shifts Toward Managing Price Incentives (1986 to 1994).** The Technology Mission on Oilseeds (TMO), established in 1986 under the Ministry of Agriculture, represented a decisive step by GOI toward consolidating government programs to support rapid technological change and extending them to deal with domestic price instability. Four mini-missions were established under the TMO: (i) on varietal and agronomic research on oilseed crops; (ii) on technological improvements in oilseed processing; (iii) on the delivery of inputs and support services to oilseed growers; and (iv) on oilseed market development and price support. Existing and successive CSS on oilseed crops were brought under the TMO umbrella. The National Agricultural Marketing Federation (NAFED) was made responsible for price support operations for groundnut, rapeseed-mustardseed, soybean, sunflower, safflower for five years starting in 1985-86, using support-price recommendations issued by the Commission on Agricultural Costs and Prices (CACP). Since market prices were always higher than the announced support prices, NAFED's activity had no direct impact.

1.20 **The next step, the Integrated Policy on Oilseeds & Edible Oils of 1989** introduced additional GOI measures to restrain price instability. While the TMO was seen to be successfully integrating developmental activities pertaining to oilseed crop and processing technology, commercial operations in the oilseed commodity system remained uncoordinated. The fast-deteriorating foreign exchange situation also demanded a coordinated approach to managing imports and distributing edible oils. Recognizing the need to improve management of price incentives in terms of both level and stability, the IPO:

- Introduced Market Intervention Operations;
- Reduced the differential between the open market price and the Public Distribution System (PDS) price of edible oils and sharply curtailed the volume of edible oil imports;[11] and
- Transferred administrative control of the TMO to the Empowered Committee on Oilseed Policy, chaired by the Cabinet Secretary.

1.21 From April 1989 to April 1994, NDDB was entrusted with implementing the Market Intervention Operations (MIO), the first major GOI attempt to directly support and stabilize procurement prices of two major oilseeds -- groundnut and rapeseed-mustardseed -- and edible

[11] The difference between PDS and free market prices was brought down from about 40-80% to about 15-20%. In addition, the allocation of imported oils to the *vanaspati* industry was abandoned in 1989, and price controls on that industry lifted. Imports of edible oils were reduced by STC from a peak of about 2 million mt in 1987/88 to 0.3 million mt in 1989/90. The respective contribution of the IPO and the foreign exchange crunch of the early 90s in the decline of oil imports is too difficult to assess.

oils within a pre-determined price band " to at least 40% above the present levels recommended by the CACP"[12] by buffer stocking seeds and edible oils from both domestic sources and imports.

1.22 **Tax Incentives to the Crushing & *Vanaspati* Industries.** The central government levies excise duty on the manufacture of refined edible oils as well as *vanaspati*. In an effort to promote non-conventional sources of edible oils -- e.g., rice bran, cottonseed oil-- by the *vanaspati* industry, the central government introduced rebates in excise duties associated with their use, varying, however, across non-conventional sources of edible oils with no apparent technical justification.

1.23 With the onset of the liberalization program in 1991, state governments are becoming active in attracting new industries, including oilseed processing. Tax incentives announced by state governments in an effort to attract industrial investment, in particular in rural and/or backward areas take the form of deferred payments or exemption from the state sales tax. Tax exemption linked to the location of the industrial unit and the capital investment is typified by the rules in Madhya Pradesh, where enterprises in backward districts may spread their tax forgiveness of up to two and a half times their investments costs over a period of nine years.

1.24 **Liberalized Imports & Disbanding of MIO End the Integrated Policy on Oilseeds & Edible Oils in 1994.** Five years after its inception, in the wake of an estimated accumulated loss of about Rs 2.72 billion[13] during 1991-93, and following investigations by two separate government committees, MIO was dissolved with GOI and NDDB eventually reaching an agreement on compensation. In 1994, GOI announced that NDDB would be allowed to import 150,000 tons of edible oils at concessional customs duty.

1.25 **Freeing-up of Vegetable Oil Imports Since 1994.** Also in 1994, after having exempted the oilseed complex from the 1991 economic reforms, GOI introduced sweeping changes in an apparent effort to control food price inflation. In March 1994, palm olein imports --by far, the most common-- were put under Open General License (OGL) with a 65% import tariff, and a concessional tariff of 20% for the STC and the NDDB. In March 1995, import liberalization was further extended to all major vegetable oils, [14] and tariffs were brought down first to 30% and then to 20% in June 1996. In May 1995, quotas just on rapeseed-mustardseed and sunflower seed exports were lifted, as were remaining registration requirements on the export of oilseed meals in 1995. Imports of oilseeds remain canalized, except for a special soybean import, meal re-export program introduced in 1995 to assist the industry in meeting its export obligations in the event of a poor domestic harvest.

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[12] Shenoy, P.V. "Oilseeds Situation in India" Ministry of Agriculture (DARE), GOI, December 1989

[13] Rachna Burman, "Ministry favors 4 lakh tons duty-free oil import by NDDB," *Economic Times*, August 5, 1995.

[14] Coconut oil, RBD palm oil and palm stearin remain canalized. A subtle distinction has been introduced by the 1995 Export-Import Policy guidelines. The recently published guidelines classify all major vegetable oils in crude form -- the standard quality on the oil world trade-- as canalized by the STC, and only "edible grade" as freely importable. This distinction introduced by the Export-Import Policy may diminish the economic significance of the liberalization in the oilseed complex.

1.26 **India Keeps Freedom to Liberalize Oilseed Policy under WTO.**[15] Under the Uruguay Round Agreement (URA) of the GATT, India committed to establish maximum tariff ceiling bindings in converting its quantitative restrictions on imports of oilseeds, oils, and oilseed meals into tariffs. The tariff ceiling bindings are much higher than current tariffs: ranging from 100 to 300% in the case of oilseeds, and from 45% to 300% in the case of edible oils. Having chosen to set maximum ceiling bindings, India is not bound by minimum access commitments in edible oilseeds and oils; nor is it required to reduce import tariffs during the 10-year implementation period of the URA (1995-2004). India also registered STC and HVOC as State Trading Enterprises (STE), in effect retaining the power to continue the canalization of both imports and exports. The absence of minimum market access commitments implies that, with canalization, domestic prices of oilseeds (and potentially oils if canalization is re-introduced) can remain unlinked to world price levels, in spite of the WTO rules imposed on the mark-ups of STEs.

1.27 Except for the recent lifting of the controls on storage and access to trade credit, all other policies and programs established earlier, such as the oilseed CSS, the OGCP, the regulatory framework on storage, movement, credit access, futures trading and agro-processing remains unchanged. The New Industrial Policy, 1991, retained the small-scale reservation in the oilseed complex (with higher investment ceilings since 1996), although it lifted the registration and licensing requirements in the solvent-extraction and refining industry. On futures trading, the GOI-appointed Kabra Committee in its 1994 report recommended introducing futures contracts in a number of commodities, including all major oilseeds --groundnuts, rapeseed-mustardseed, cottonseed, sesame seed, sunflower, safflower, coconut, soybean, linseed and rice bran-- and their oils and cakes. In 1992, health safety regulations and quality standards underwent a few, significant changes to allow, for example, the blending of two oils and to require the specification of the composition of blended edible oils. The Weights & Measures Act also legalized the volumetric packaging of edible oils.

B. Production Performance

1.28 **Technological Change as the Major Source of Oilseed Growth.** Technological change, either in the form of new crops or through improved varieties, accounted for most of dramatic changes in oilseed production between 1980 and 1994, by which time output had more than doubled and fluctuations in overall harvest size had dropped by three quarters. Soybean in Madya Pradesh and sunflower in Karnataka --non-traditional oilseeds in Indian farming-- climbed from initial production shares of 0.3% and 1.4%, respectively, to contribute 41% to total growth in output (Table 1.4). In the case of the new oilseed crops, area expansion accounts for the bulk of their output growth, as should be expected. Rapeseed-mustardseed, a traditional oilseed, added another 33% to total growth in oilseed production through higher yields at first (the source of 75% of their increase up to 1986/87) and

Table 1.4
Contribution to Growth of Individual Oilseeds

Period	Groundnut effect (%)	Rape/mustard effect (%)	Sunflower effect (%)	Soybean effect (%)	Other Oilseeds (%)
TE 1979-80 to TE 1993-94	18.6	33.1	10.4	30.5	7.5

Source: Directorate of Economics and Statistics, *Agricultural Statistics at a Glance*, various issues

[15] For a more detailed treatment of India's commitments to GATT in the oilseed complex and its implications for domestic policies, the interested reader should refer to Annex 6.

then through area expansion (Table 1.5b).[16] Even during its rapid area expansion phase, rapeseed-mustarseed made strong gains in yields (from zero annual growth in the 1968-1981 period to 3.6 % a year between 1982 and 1994), increasing faster than rice and wheat yields. Groundnut performance -- a modest 2.6% growth rate annually -- was largely confined to the late 1980s and to its spread into new areas, rather than higher yields. It added relatively little to total oilseed production expansion (19%).

Table 1.5a: Sources of Growth in Aggregate Oilseed Production

Period	Area Effect (%)	Yield Effect (%)	Interaction of Yield & Area (%)	Increase in Oilseed production (%)
TE 1979/80 to TE 1985/86	33.24	61.59	5.73	27.96
TE 1986/87 to TE1993/94	52.68	34.37	12.98	88.21

Source: Computed using data from Directorate of Economics and Statistics, *Agricultural Statistics at a Glance*, various issues

Table 1.5:b Sources of Growth in Soybean Production

Period	Yield Effect (%)	Area Effect (%)	Interaction of Yield & Area (%)	Increase in Production (%)
TE 1979/80 to TE 1985/86	-3.6	101.5	-8.8	239.4
TE 1986/87 to TE1993/94	10.8	60.1	18.7	999.4

Sunflower Production

Period	Yield Effect (%)	Area Effect (%)	Interaction of Yield & Area (%)	Increase in Production (%)
TE 1979/80 to TE 1985/86	-5.8	125.2	-20.0	275.1
TE 1986/87 to TE1993/94	11.3	71.2	14.5	968.3

Rapeseed-Mustardseed Production

Period	Yield Effect (%)	Area Effect (%)	Interaction of Yield & Area (%)	Increase in Production (%)
TE 1979/80 to TE 1985/86	74.5	16.9	8.7	69.3
TE 1986/87 to TE1993/94	19.3	68.4	12.2	155.8

Source: Computed using data from Directorate of Economics and Statistics,
Agricultural Statistics at a Glance, various issues

1.29 **Better Access to Market Outlets and Price Incentives Facilitated the Adoption of the New Technology**. As Table 1.5 indicates, new oilseed crop technology, viewed over time, makes a large (62%) initial impact on modest (28%) overall production growth through higher yields but a very noticeable one as more and more growers adopt the new technology and contribute over half (53%) of the accelerating (88%) increase in output. One important stimulus to the spread of new oilseed crops was the assured market access that the GOI provided for soybean and sunflower products by favoring the establishment of modern processing facilities for them, freeing them, in effect, from the requirements of the Small-Scale Industry Reservation and the Selective Credit Control Policy that governed the groundnut and rapeseed-mustardseed market. Rising oilseed prices --in particular relative to wheat and coarse cereals between the late 70s and 1985/86-- further encouraged many farmers to switch crops by making the new technology even more profitable (see Figure A2.3 in Annex 2). In marginal areas where oilseeds enjoy less of a comparative advantage, however, that switch -- especially from wheat to oilseeds in the five years between 1987-88 and 1992-93 when the price gap between the two widened rapidly following the policy decision to drastically reduce edible oil imports-- is likely to be reversed as oilseed prices

[16] Soybean yields grew at 3.1% per annum between 1982 and 1994; annual growth in sunflower yields jumped from -2.8% (1968-1981) to 1% between 1982 and 1994.

decline. As a result, the success of import substitution policies in promoting new technology and in spurring production increases through crop substitution even in marginal areas is due to be at least partly undone by policies that, since 1992-93, are letting relative prices drop and allowing imports to rise.

1.30 **Major Changes in Cropping Patterns.** As oilseed cultivation took up 50% more area in 1993-94 than it had in 1979-80 -- an increase of nearly nine million hectares -- farmers both replaced existing crops and intensified the use of land under cultivation. During this rapid area expansion, land devoted to coarse cereals, for instance, shrank by 20% (8.32 million hectares), to cotton by 6.5% (half a million hectares), and to pulses by 3% (700,000 hectares.) As a share of the Gross Cultivated Area (GCA), oilseed crops occupied 14% in 1993/94 compared to only 10% in 1979/80. Not all area expansion, however, took place at the expense of other crops. Sixty percent of total area expansion in oilseeds came from higher cropping intensity -- increasing the number of cropping, not substituting one crop for another -- associated with soybean and sunflower cultivation in Madhya Pradesh and Karnataka. Much of the area expansion of rapeseed-mustardseed in Gujarat between 1978 and 1990 came from the same cause.

1.31 **Indian Oilseeds Develop a Comparative Advantage.** With and without protection at home, India's oilseeds appear overall to have developed a certain comparative advantage over other nations. Measured in field costs per ton, for example, Indian groundnuts tend to be notably cheaper than those of China, Senegal an the USA.[17] Although other oilseeds do not have this per-ton cost advantage, they are cost competitive on a per hectare basis because low yields for oilseeds other than groundnut are balanced by low costs of cultivation per hectare (see Annex 5 for details and figures). Another measure, Nominal Protection Coefficients (NPCs), indicate that Indian soybean production, which boomed without benefit of protection, is price competitive (Table 1.3). In contrast, other oilseeds --groundnuts, rapeseed-mustardseed and sunflower-- benefited from high protection levels during the 80s and in particular in the late 80s, raising concerns about India's comparative advantage in their production. The 1991 devaluation of the Rupee improved India's competitiveness in oilseed production as indicated by the corresponding decline in NPC; however, the lower NPCs since 1991 also reflect higher world prices. By 1994/95, the NPCs for all four oilseeds, except sunflower, had fallen below one, showing India's international price competitiveness, rather than any comparative advantage. Other indicators, such as Domestic Resource Costs, would be a more appropriate indicator of comparative advantage, but no DRC estimates are available to assess India's comparative advantage in groundnut, rapeseed-mustardseed and sunflower production.

1.32 The comparative advantage most likely to endure in all but marginal areas mentioned earlier (para 1.29) has come from technological change that introduced new crops (soybean and sunflower, which account for 40% of the growth in total oilseed production), faster-growing seed varieties with improved resistance to pests and moisture stress, and the higher yields that have enabled better integration of oilseeds into existing cropping systems. This technological change has brought higher cropping intensity and a more efficient use of scarce resources --water in irrigated agriculture, labor in rainfed areas. Rapeseed-mustardseed, which require relatively

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[17] In the case of soybeans, Indian average costs of cultivation per ton are the highest of the countries considered (Argentina, Brazil, China and USA). For rapeseed, Indian average cultivation costs are less competitive per ton than Canada and China, but lower than Germany. In groundnuts, note that US costs are not fully comparable to those in the other countries, since they refer mainly to high value confectionery nuts.

little water, represent a more efficient use of scarce water resources in irrigated areas, an advantage that should grow over time as electricity and water charges come closer to their true economic costs. For example, statistical district-level evidence indicates that improved oilseed varieties substituted for more water-intensive crops: sugarcane (rapeseed-mustardseed in Rajasthan, soybean in Madhya Pradesh), wheat (rapeseed in Madhya Pradesh). Because larger areas could be planted to oilseeds with available resources, area expansion also contributed to higher cropping intensity as well (e.g., soybean in Madhya Pradesh, sunflower in Karnataka). In rainfed areas, for oilseeds other than soybean and sunflower, there is less evidence of higher cropping intensity, and more evidence of crop substitution in particular with respect to coarse cereals and pulses. Even in these settings, however, oilseeds may very well represent an efficient use of scarce labor resources by substituting for crops with lower returns --coarse cereals because of limited demand potential, or pulses in spite of faster rising domestic prices because of the absence of profitable technology.

C. Oilseed Trade: Trends & Prospects

1.33 **India Becomes a Major Oilseed Products Exporter.** India's growing advantages as an oilseed producer transformed it from a net importer of oilseed products (costing it Rs. 8,000 million in 1987-88) to a major exporter (earning Rs. 21,000 six years later). Once heavily dependent on foreign vegetable oil, the percapita consumption of which grew very rapidly until the mid-70s (15% per annum between 1965 and 1975), India became instead both nearly self-sufficient in vegetable oils and a major source of oilseed de-oiled cake for its neighbors in the Middle East and Southeast Asia. Table 1.6 documents the transformation, but not the factors behind it. They include a sharp halt to the growth in domestic consumption in the mid-1970s, with growth rates of only 1.2% between 1976 and 1985, and of 0.5% between 1986 and 1993 (Figure 1.2). Unchanged at about 6 kg per capita since the mid-80s, India's consumption rates proved very sensitive to income levels and prices, falling sharply among the poor (earning below Rs. 9,000 a year)[18] as reduced imports drove up consumers prices. Although India's consumption rates are almost on a par with average levels in developing economies -- though only half the levels of Pakistan and Indonesia -- the roughly 500 million predominantly rural Indian poor, more than half the total population, consume less than half the amount used by the wealthier remainder of the population -- three kilos a year less per capita than the next highest income group (Table 1.7).

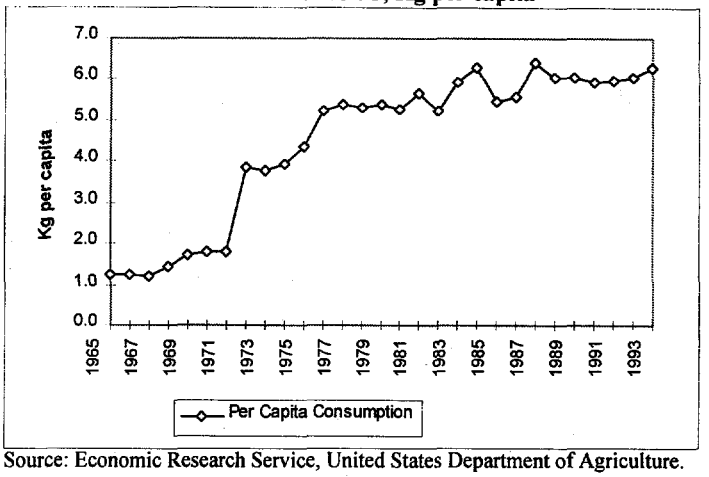
Table 1.6
Foreign Trade in Oilseeds and Derivatives
(Million Rupees)

Year	Imports of edible oils	Exports of oil meals, oilseeds & castor derivatives
1987-88	10,690	2,322
1988-89	2,457	5,000
1989-90	3,263	8,574
1990-91	734	8,067
1991-92	1,650	10,310
1992-93	1,765	11,610
1993-94	1,631	22,775

Source: NDDB, ANAND.

[18] In rural areas, income growth and changes in preferences each contributed about 75% of the observed growth in consumption over the period 1972/73 to 1987/88, while higher prices reduced that growth by a third. In urban areas, higher vegetable oil prices played a larger dampening effect (37%) on consumption growth, while changes in preferences contributed little (32%), in comparison to rural areas. Source: Radakrishna & Ravi, mimeo 1995.

Figure 1.2
Per Capita Vegetable Oil Consumption in India 1965-93, Kg per capita



Source: Economic Research Service, United States Department of Agriculture.

1.34 **Domestic Demand Repressed, Exports of Meals Surge.** The stagnant consumer demand for edible oil was reflected in the market for oil cakes as well, but price was less a factor than the low value attached to the product. While 70% of oil cake production is used domestically, it serves two primary purposes: as animal feed and as fertilizers/soil improvers. A substantial amount of oil cakes is used as fertilizers for plantation crops, such as rubber and banana, in Southern India, but the livestock industry's demand for the product as feed has remained well below reasonable expectations, given the extremely large size of the cattle, buffalo and poultry population in the country.[19] Because of low domestic demand, exports have grown rapidly since the late 1980s, with oilseed meal exports increasing significantly from 71,000 mt in 1987 to 3 million mt in 1993, accounting for 3 percent of the value of total exports. The rapid diversification of oilseed meal exports -- away from groundnuts and towards soybean-- played a critical role in this export performance. It allowed Indian exporters to minimize the quality problems associated with groundnut meal exports and reversed prevalent expectations about India's trade outlook in the oilseed sector. World Bank forecasts made in 1981, for instance, predicted a large, and growing, deficit in edible oil in the country. In reality, the net import requirement was brought down to very modest levels by the early 1990s, and the country's trade balance in the range of oilseed products was changed radically, from net imports of over Rs. 8,000 million in 1987/88 to net exports of over Rs. 21,000 million in 1993/94. The switch of the Indian oilseed trade balance from deficit to surplus has been caused by the expansion in oilseed meal exports (Table 1.6).

Table 1.7
Edible Oil Consumption in India, 1988-89

Income per annum Rupees	Estimated Population million	Consumption Total estimated million mt	Consumption Annual per capita kg
up to 9,000	515	2.89	5.6
9,001-18,000	199	1.72	8.61
18,001-30,000	55	0.64	11.54
30,001-42,000	12	0.14	11.91
ABOVE 42,001	8	0.12	14.37
ALL	789	5.51	6.97

Source: NCAER household consumption survey, reported in Phansalkar and Gulati, 1994.

1.35 Although India has developed sizable markets for de-oiled cake (DOC) exports, notably to South East Asia and the Middle East, it has not maximized the potential value of these exports. The problem is one of quality. Some Indian DOC tend to be either high in aflatoxin -- groundnut meal-- as a result of poor post-harvest handling, or high in glucosinolates --rapeseed-

[19] 280 million cattle and buffaloes, 110 million goats, 47 million sheep, 11 million pigs and around 300 million poultry birds.

mustardseed meal-- as a result of a failure to adopt double zero[20] rapeseed varieties, which are the health norm in Western Europe and North America. As a consequence, a large proportion of Indian meal exports sell at significant discounts on the world market (Table 1.3), and are only acceptable in less demanding import markets.

1.36 A final factor, but likely to disappear as the economy liberalizes further and foreign exchange controls ease, is the export incentive that arises when DOC exporters get import licenses and, hence, foreign exchange either by selling either cakes for their own account or export contracts to trading houses seeking import licenses. The incentives to both legal and illegal actions arise from the quantitative import restrictions on consumer goods which give oilseed crushers who are able to export cake, for example, extra income opportunities. Given the difficult business environment in which they operate and the tradition in the oilseed complex of Indian processors to use all sorts of means, some of them illegal, to assure themselves an adequate return, protectionism becomes a stimulus both to exports. The premium for this "export performance" averaged 3%-4% in 1995. Yet another way to earn extra revenue from export sales is through the sale of DOC to Russian trading companies within the framework of the yearly balancing of the Rupee:Rouble escrow account. The escrow account premium was in the 5%-8% range in 1995. A fourth and illegal means to earn extra Rupees consists of selling DOC to Russian companies for final delivery to non-Russian destinations, in return for payment in Rupees held within the blocked Rupee escrow account. This blocked account originated in accumulated imbalances in past trade between the two countries and is meant to be used solely on exports destined for Russia. Cases have arisen in which exports were made under this scheme, but in which the cargoes were sent to third countries — "switch trading". The premium offered for illegal switch trades is over 30%, divided equally between the Russian trader and the Indian exporter.

1.37 **Oilseed Prices to Drop, Demand to Rise:** As at least some of those factors spurring exports diminish in strength along with broader trade reforms, the liberalization of vegetable oil imports will bring domestic prices down and help to end the decade-long stagnation in per capita consumption (Table 1.8). Faster per capita income growth, moreover, will give an added stimulus to demand for both vegetable oils and oilseed meals,[21]

Table 1.8
Demand Projections to the Year 2020 (million mt)

Commodity	1990 Actual	2020 Baseline Scenario: 3% per capita income growth	2020 Baseline Scenario: 5.5% per capita income growth	2020 & Poverty Removed Scenario: 1990	2020 & Poverty Removed Scenario: 3% per capita income growth	2020 & Poverty Removed Scenario: 5.5% per capita income growth
Edible Oils	4.1	11.4	18.8	4.7	13.2	21.7
Milk	42.5	193.8	479.0	48.2	219.7	543.1
Eggs	1.1	3.8	7.2	1.3	4.4	8.4
Total Meat	1.5	4.9	9.4	1.7	5.6	10.7
Livestock feed with feed coeff.:						
Indian	1.9	7.4	15.9	2.2	8.4	18.3
Indonesian	3.4	14.8	35.7	3.8	16.8	40.5

Source: G.S. Bhalla, P.B.R. Hazell, Prospects for Balancing Food Needs with Sustainable Resources Management in India to 2020, IFPRI, mimeo 1996.

[20] Low in erucic acid, and low in glucosinolate.

[21] Futures demand projections are borrowed from G.S. Bhalla and P.B.R. Hazell *Prospects for Balancing Food Needs with Sustainable Resources Management in India to 2020*, IFPRI, mimeo 1996.

doubling it for oils by the year 2020 at 3% per capita income growth, and trebling it if per capita income growth accelerates to 5.5% per annum (Table 1.8). The consumption of milk and milk products, white meat, eggs and fish in India, as elsewhere, is highly income elastic. At 3% per capita income growth, there is threefold increase in the demand for milk, eggs and meats. If per capita income growth accelerates to 5.5%, there is a further doubling in demand for livestock products. In turn, these increased demands for livestock products will spur livestock industry growth and, with it, demand for livestock feed such as oilseed meals (Table 1.8). Intensification of the livestock industry would mean, among other things, the adoption of more intensive feeding practices as a result of a shift towards improved animals or crossbreeds, and improved management practices (e.g., stall feeding for dairy, etc.). Projected figures, contrasting current low-intensity Indian feed coefficients with Indonesian higher feed coefficients, indicate that the impact on demand of livestock feeds and oilseed meals can be substantial (Table 1.8; see also Annex 2).

2 Marketing & Processing Performance: Assessment & Key Determinants

2.1 Although elements of India's oilseed complex have gained the strength to compete internationally, especially *against* imports of edible oils and *for* regional sales of some meals, the domestic marketplace remains a jumble of regulatory arrangements and lapses that penalize growers above all by perpetuating inefficiency and low capacity utilization in processing, and impeding the development of an integrated market. The preceding chapter described the process through which trade protectionism, by encouraging the spread of new oilseed varieties in particular, positioned oilseed growers and processors, in theory, to expand profitably along with a growing economy. In practice, as this chapter discusses, that expansion faces a host of obstacles: technical and economic inefficiencies in processing, poor marketing performance, and low returns on meals that, together, undo the benefits of residual protection. These factors stand in the way of improved performance by the private sector, cooperatives included, in the processing and distribution chain. After a preliminary discussion of the high degree of protection the complex still enjoys (section A), this chapter examines the patterns that steer the bulk of oilseed processing to the smallest and poorly-equipped enterprises (Section B), that raise marketing costs and crushing margins (Section C), and that block higher returns from sales of oilseed meals at home and abroad (Section D).

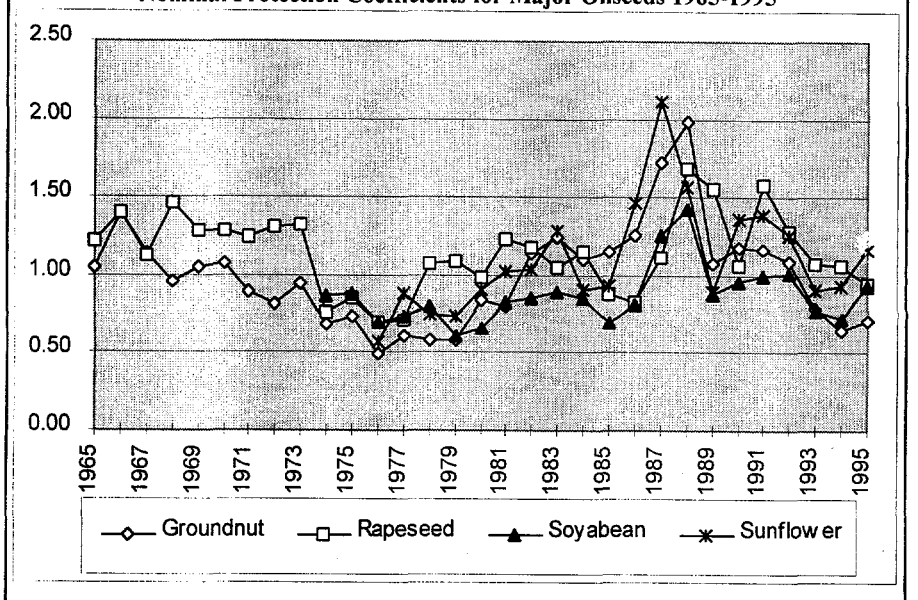
A. High Effective Protection of the Oilseed Complex

2.2 **Protection: Low for Growers, High for Crushers.** Despite the relaxation of barriers that kept foreign vegetable oil out of the Indian market until the early 1990s, imports of oilseeds remain restricted as do their exports, except for confectionery groundnuts and – since 1995 – sunflower and rapeseed-mustardseed. A comparison of nominal protection coefficients (NPCs)[1] for the 1981-91 period shows that the traditional oilseeds – groundnuts and rapeseed-mustardseed -- fared slightly less well (with average NPCs of 1.26 and 1.21) than sunflower, an average of 1.27 (Figure 2.1). Soybean, with an average NPC of 0.95, went basically unprotected because its processors depend heavily on export sales for the meal which accounts for 80 percent of the weight of the bean. Between 1990 and 1995, as rising domestic supplies brought domestic prices down and a devalued Rupee pushed border prices up, nominal protection dropped significantly: from a 1.17 NPC for groundnut to 0.72, from 1.06 to 0.95 for rapeseed-mustardseed, and from 1.36 to 1.16 for sunflower. Protection levels have also dropped for edible oils, falling rapidly and consistently since 1987 (Figure 2.2). By 1994/95, protection levels for all edible oils had fallen almost in line with the import tariff level prevailing that year (65%), except for groundnut oils whose price fell well below. By contrast, the protection level had actually turned negative by 1994/95 for all four major oilseeds, except sunflower (for more details see Table 1.3).

2.3 The chief beneficiaries of continuing protection are the firms which crush oilseeds – banned from export – to obtain edible oils or meals. As Tables 2.1-2.4 show, the crushers of groundnut, soybean, and sunflower operate at very high (but generally declining) gross margins created by India's trade-distorting tariff and non-tariff barriers. Rapeseed processors are an exception, but groundnut, soybean and sunflower processors all enjoy sizable crushing margins

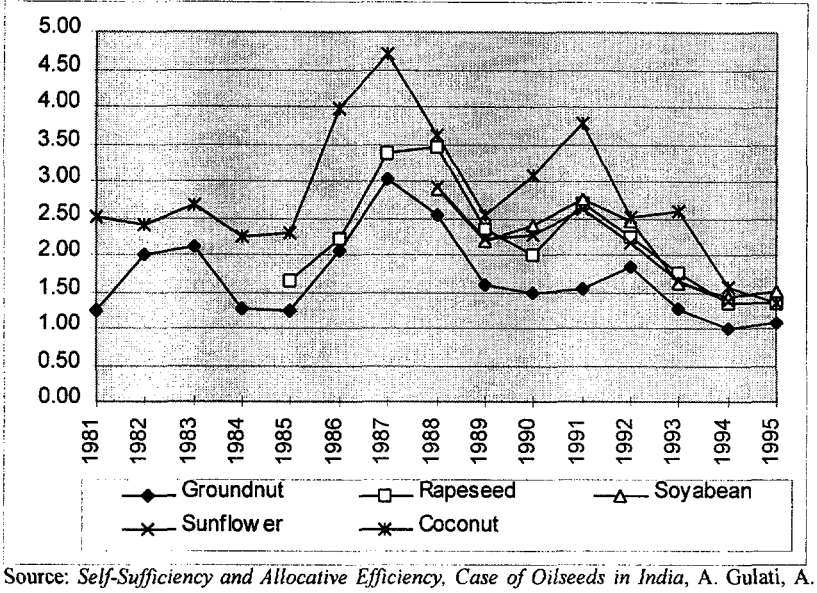
[1] The Nominal Protection Coefficient is the ratio of domestic market prices over world prices at the same physical location, taking into account transport costs and quality differentials.

Figure 2.1
Nominal Protection Coefficients for Major Oilseeds 1965-1995



Source: G. Pursell and A. Gupta, 1996, "Trade Policies and Incentives in Indian Agriculture," World Bank.

Figure 2.2
Nominal Protection Coefficients for Major Oils 1981-1995



Source: *Self-Sufficiency and Allocative Efficiency, Case of Oilseeds in India*, A. Gulati, A. Sharma &D.S. Kolhi, 1996

and significant levels of effective protection --in the US$ 120 to 150/ton range on average between 1990/91 and 1994/95. Their level of effective protection appears remarkably stable in the face of declining crushing margins and rapidly falling protection levels for oils. This underscores their capacity to pass the costs of adjustment onto oilseed growers and to compensate for their relative

lack of success in selling meals on the poorly developed domestic market[2] or – after covering heavy transport costs and discounts for the low quality of their product – to customers abroad.

Table 2.1
Groundnut: Effective Protection ($/mt)

Year	Domestic Margin (at factory)	World Price Margin (at factory)	Effective Protection
Extraction Rate	41%/57%	41%/57%	
87/88	n/a	113	
88/89	n/a	148	
89/90	n/a	165	
90/91	297	151	146
91/92	216	23	191
92/93	187	63	124
93/94	260	126	133
94/95	262	94	168

Note: Extraction rates from Oil World. India prices are from NPC tables.
Source: World Bank estimates.

Table 2.3
Soybean: Effective Protection ($/mt)

Year	Domestic Margin (at factory)	World Price Margin (at factory)	Effective Protection
Extraction Rate	18%/82%	18%/82%	
1987/88	-6	-18	12
1988/89	49	-91	141
1989/90	87	-76	163
1990/91	101	-41	142
1991/92	45	-64	109
1992/93	58	-64	121
1993/94	57	-76	133
1994/95	43	-53	96

Note: Extraction rates from Oil World. India prices are from NPC tables.
Source: World Bank estimates.

Table 2.2
Rapeseed: Effective Protection ($/mt)

Year	Domestic Margin (at factory)	World Price Margin (at factory)	Effective Protection
Extraction Rate	37%/60%	37%/60%	
1984/85	18	-171	189
1985/86	53	-170	223
1986/87	172	-112	285
1987/88	156	-44	200
1988/89	-7	-19	13
1989/90	74	-50	124
1990/91	26	-39	64
1991/92	66	-17	83
1992/93	25	-8	33
1993/94	5	4	1
1994/95	-5	-66	61

Note: Extraction rates from Oil World. India prices are from NPC tables
Source: World Bank estimates.

Table 2.4
Sunflower: Effective Protection ($/mt)

Year	Domestic Margin (at factory)	World Price Margin (at factory)	Effective Protection
Extraction Rate	35%/49%	35%/49%	
1987/88	110	-47	157
1988/89	118	-141	258
1989/90	48	-68	116
1990/91	72	-96	169
1991/92	57	-51	108
1992/93	62	-61	123
1993/94	55	-37	92

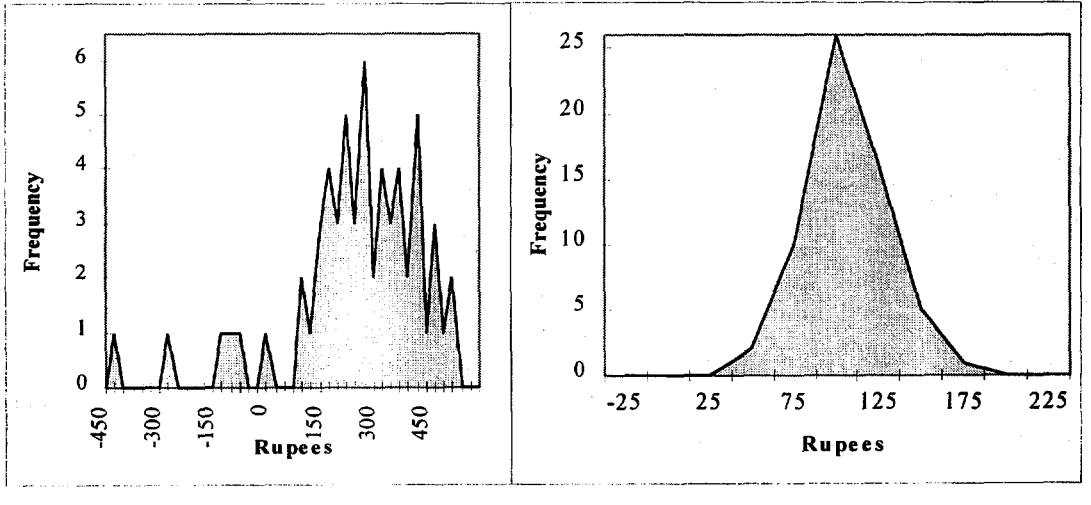
Note: Extraction rates from Oil World. India prices are from NPC tables.
Source: World Bank estimates.

2.4 **Managing Low and Volatile Crushing Margins.** In contrast to the Indian experience, the international oilseed industry is characterized by crushing margins that are typically very low and sometimes even negative (see Diagrams A5-21 to A5-23 in Annex 5). They are low because the activity is a low value-added one where economies of scale are quite large. The international and Indian oilseed industries both share highly unstable crushing margins, a typical feature of that industry (Figure 2.3). The volatility in crushing margins arises from the interaction of three

[2] See Chapter One, paras 1.34; or Annex 2 for a more detailed treatment.

markets --seeds, oils and meals-- that each face extreme competition and are unrelated to one another. The prices of individual oils are highly correlated with one another, by virtue of their substitutability one for another; the same is true of meals which compete with other livestock feed ingredients. Since crushing margins are determined as the comparatively small gap between the values of oil and meal on the one hand, and the prices of oilseeds on the other, their values are derived as the result of the interaction of three quite different and unrelated markets: (a) the market for oils, and the position of the individual oil in the entire constellation of other oils; (b) the market for meals, and the standing of the relevant meal in the much broader market for livestock feed; and (c) the supply and demand conditions of the individual oilseeds in question. In order to survive financially, crushers operating in open international markets have to first maximize technical and economic efficiencies -- economizing on inputs per unit of output, minimizing oil losses, and holding down production costs. Second, they need to manage their risks to take full advantage of the brief periods when crushing margins are favorable through hedging on futures markets against day-to-day fluctuations in seed, oil and meal prices. Third, they need flexibility in the sourcing of raw materials, either on the domestic or the international market to acquire raw material at the best price. Processors, therefore, usually locate their facilities in a port where large sea vessels could deliver large and uniform quantities of imported seeds, when the use of domestic products become less profitable. Expertise in risk management techniques (e.g., futures trading), not just technical expertise about processing technologies, is so important that, since the 1970s, the restructuring of the oilseed crushing industry in the large producing countries has occurred primarily under the lead of large international commodity trading firms. Their trading expertise, as well as the benefits from the integration of new flows of products into their trading activities, became key elements in the restructuring of crushing enterprises which were often chronic loss-makers.

Figure 2.3
Crushing Margin Risks are High
Frequency Distribution of Real Monthly Gross Crushing Margins
for Groundnut in Rajkot, Jan 88 to Dec 92. for Rapeseed in Kanpur, Jan 88 - Dec 92



Source: Annex 4.

2.5 To protect farmers from the adverse effects of price instability, some countries operate partial producer-price stabilization programs. While such stabilization programs carry the risk of making oilseed futures markets non-viable, undermining the financial viability and competitiveness of the crushing industry, experiences in America and Europe indicate that partial

producer stabilization programs need not necessarily conflict with the viability of futures markets, and the critical role futures markets play for the oilseed processing industry. These programs are described in Text Box 2.1.

BOX 2.1
Producer Price Stabilization: International Experience

The major edible oil producing countries apply different policies to provide partial price stabilization to their producers.

- In the European Union, the system of direct income support to oilseed farmers operates in such a way that any substantial decline in free market seed prices is offset to a large extent by increases in income supports.
- The US Government provides a safety net for its farmers via marketing loans, which prevent net receipts to farmers from falling below a pre-determined level. European and US oilseed processors are not, however, protected from crushing margin risks by government interventions which they have to cover through risk management techniques. Also, the US Government still has an Export Enhancement Program for oilseed products, which is intended to allow US exporters to remain competitive in the export market; although this is being phased out under the terms of the Uruguay Round.
- Argentina and Brazil have no formal method of price supports, but past experience in agricultural export sectors has suggested that these governments may reduce taxes on exports if world prices fall excessively low.
- The South East Asian palm oil exporters' method of price stabilization is more direct. The taxation of exports is implemented in a progressive manner, rising as a proportion of the export price increase.

2.6 **Protection Masks Inefficiencies.** Denied access to futures markets for their products, Indian processors get the perverse benefit of other restrictions on competition which enable them to operate inefficiently. Measured against world reference prices, Indian crushing margins are actually negative for all oilseeds except groundnut (Tables 2.1-2.4). The cost of processing soybean, sunflower, and --except for one year (1993/94) out of 11— rapeseed in fact exceeded the economic value of the oil and meals produced. That reality is hidden by high effective protection which permits processors to mask gross inefficiencies and the industry's lack of competitiveness, and to pass those failings on in the form of lower farmgate prices (except in the case of groundnuts) to oilseed growers.

2.7 **Distributional Implications of the Existing Price Structure.** The net effect of the present structure of prices in India and of the tariff, non-tariff, and natural protection granted to domestic processors is to leave the domestic consumer of edible oils paying a substantial premium over world prices. Only a small proportion of the high margins and effective protection imparted to oilseed processors, moreover, trickles down to oilseed farmers. With the possible exception of groundnut processing, the oilseed crushing industry is inefficient and passes onto farmers fully the costs of its inefficiencies. Cheaper edible oil imports would therefore benefit Indian consumers, but the costs of adjustment would be fully borne by oilseed growers, most of whom live in rainfed areas where opportunities for growth are limited. The remainder of this chapter examines the industry's processing and marketing inefficiencies and particularly the reasons that Indian processors cannot yet achieve the technical and economic sophistication of their international counterparts.

B. ROOTS OF PROCESSING INEFFICIENCIES

2.8 **Main Features of the Oilseed Processing Industry.** The main reasons for the poor technical and economic performance of Indian oilseed processors originate in the small-scale and very fragmented structure of the industry (Table 2.5), in artificial barriers imposed by

Table 2.5
Structure of the Industry in Oilseed Processing

Segment	No. of Units	Total Capacity (million tons)	Average Capacity	Capacity Utilization	Output (million tons)
Mechanical Crushing					
A. Cottage Industry	131,600	2	18 (60kg/Day)	10%	0.2
B. Expellers	20,000	53	2,650 (9 T/Day)	30%	16.0
Solvent Extraction	761	28	36,800 (123 T/Day)	34%	9.5
Oil Refining	130	1.2	7,692 (26 T/Day)	50%	0.6
Hydrogenation (*Vanaspati*)	145	2.45	16,900 (56 T/Day)	37%	0.9

Notes:

a) Reliable data for cottage industry units are available only for 1977. It is expected that this number has since shrunk.

b) According to industry sources, of the given number of solvent extraction units, 100 are closed; of the given number of *vanaspati* plants, 31 are closed. All hydrogenation plants have refining facilities integrated in the plant. In 1993-4, the *vanaspati* factories produced about 50,000 tons of refined oils. The exact use of refinery capacities (whether stand-alone or otherwise independent of *vanaspati* plants) is not known, but may be judged from industry estimates that about 400,000 tons of soybean oil and 100,000 tons of safflower, cottonseed and sunflower oils are refined.

c) Capacities are expressed as tons/year (of seed for expellers, of cake and seed for solvent extraction units, and of oil for refining and *vanaspati* units, respectively), and are given on a 24 hours/day, 300 working days per year, basis.

Source: Gulati & Phansalkar, 1994; Ministry of Civil Supplies.

government policies to foster small-scale activity and impede risk management and in the consequent powerlessness of most producers in the marketplace.[3] For processors to overcome their competitive disadvantages – high relative costs, low extraction rates, and limited flexibility in obtaining raw materials – Indian regulation of the oilseed complex will have to encourage more rational, market-oriented domestic development than the limited relaxation of trade protection has so far brought about.

2.9 **A Fragmented Industry**. The processing sector of the oilseed complex is now divided into six distinct segments and dominated numerically but not quantitatively by micro-scale, traditional crushers, *ghanis* to whom the Small Scale Industry (SSI) policy of 1977 reserves the processing of groundnut and rapeseed-mustardseed processing. These 131,600 cottage industrialists produce on average only 60 kilos a day, one tenth of their total capacity, using either animal or electric power to extract oil from seeds usually through a simple screw press. Despite their large numbers, *ghanis* account for a small and declining share of the oilseed complex's output (Table 2.5). The next most numerous class of processors, who use similar, simple technology to turn out 58 percent of the oilseed complex's output and achieve a 30 percent capacity utilization, are the 20,000 or so small-scale expellers (barely 1% of international norms) limited by the SSI Reservation to a daily production of no more than ten tons but rewarded by sharing in the monopoly on groundnut and rapeseed-mustardseed processing with the *ghanis*. Only a few pre-1977 units and some expellers who have been able to negotiate special exemptions for their factories manage to turn out higher volumes and thus somewhat

[3] Annex 3 contains a more detailed presentation of these issues.

reduce the endemic high production costs of the technologically inefficient, small-scale oilseed processing that is the standard for over 60 percent of the oilseed crushing (mechanically and solvent extracted) industry's output.

2.10. Where the two classes of small-scale producers turn out only oil (*ghanis)* or oil and expeller cake with a high (often over 10%) residual oil content, the next largest class – second in terms of capacity and total output – contains the 761 solvent extractors who use modern technology to process low oil and high meal seeds (e.g., soybeans, cottonseed) or low oil by-product materials (e.g., expeller cake, rice bran) into edible oil and de-oiled cake suitable as a high-protein animal feed. Even though they process as much as 125-150 tons a day, these "large-scale" solvent extractors utilize only 34 percent of their own capacity and are only 10 percent of the norm in Europe and North and South America (Table 2.9). A sub-division of this class – only a few factories in all – has recently been created just to get around the SSI Policy that reserves groundnut and rapeseed-mustardseed to *ghanis* and small-scale expellers for processing. Using expanders to heat the raw material and solvent to extract the oil – a technology outside the scope of SSI rules – these firms manage to pre-process groundnuts and rapeseed-mustardseed but in a technologically inefficient manner that is unique to India, and with consequently poor profitability levels. In other countries, soft seeds (e.g., groundnuts, rapeseed-mustard seed and sunflower seed) are crushed in medium to large-scale expeller factories, and the expeller cake undergoes further processing through solvent extraction, integrated in the same factory. This internationally standard technological process is virtually impossible in India for groundnuts and rapeseed-mustard seed, because of the SSI Reservation.

2.11 Finally, 130 traditional oil refiners and 145 *vanaspati* enterprises which hydrogenate refined oil to produce vegetable shortening and margarine make up the high end of the processing sector. Both are subject to inconsistent rules. In the case of refiners, unlike foreign competitors who usually are linked to a solvent-extraction plant and refine both expeller and solvent-extraction oils, India's Food Adulteration Act of 1954 requires refined oil to be labeled as to its origin, a restriction which penalizes the producers of solvent-extraction oil in terms of price and consumer acceptability. No other country insists on this distinction for which there is little rationale in terms of quality. For their part, the *vanaspati* producers are supposed to observe (but often flout) strict limits on the kinds and proportions of oils they use. Designed simply to stimulate demand for particular crude oils without logical connection to manufacturing processes or the end product, these restrictions are mirrored by positive incentives – rebates on the excise tax on *vanaspati* sales – to reward producers who use non-traditional raw materials such as expeller cake, rice bran, mango seed and neem seed.

2.12 **Forces for Modernizing Change.** Despite this fragmented setting, the processing sector is undergoing two noticeable structural changes in the direction of more modern and efficient performance. One has to do with the slow marginalization of the smaller producers and the other with the strong growth of solvent extraction.

2.13 *Ghanis,* to start with, are seeing their already small share of the edible oil market shrink as other market segments expand, notably in the solvent extraction segment, and as the poor economics of their operation take their toll on existing *ghani* operators. *Ghanis* have generally catered mainly for two audiences: those farmers who want their seeds crushed in order to use the oil and meal; and those consumers who want pungent mustard seed expeller oil. Not only are both groups on the decline; their demand can also be satisfied, at a lower cost, with the products supplied by small-scale expellers, themselves well protected by SSI policies. Even with a 60

percent share of edible oil supply, however, the *ghanis* and small-scale expellers' market power is weakening as soybean production grows and as the processing of expeller cake and low-oil content materials through solvent extraction plants enables larger units to increase their share of the oil market (Table 2.6). Furthermore, the development of expander-cum-solvent factories to process groundnuts and mustard seed has made it possible for larger plants to compete in the sector traditionally controlled by the small-scale expellers. Where consumer preferences are for unrefined, filtered expeller oil, and especially where pungent mustard oil is required, the small-scale units remain unaffected by competition. The policy significance of the solvent-extraction factories arises from the fact that they ultimately supply refined oil which is the smallest --5 to 6 percent of total liquid oils consumed in India-- but fastest growing segment of the oil market --increasing at 17 to 18 percent a year. Over time, therefore, with increasing sophistication of the Indian edible oil market, expellers will see their market shares decrease further, even without the rescinding of SSI Reservation.

Table 2.6
Capacity Utilization
Indian Solvent Extraction Processing Sector

Year	No. of Units	Average Capacity per Unit (tons)	Average Processing per Unit (tons)	Utilization Rate (%)
1987	305	34,815	10,449	30%
1990	395	39,381	15,020	38%
1991	396	41,574	15,718	38%
1992	494	43,608	15,298	35%
1993	516	47,562	15,226	32%
1994	550	48,890	14,691	30%
1995	553	53,885		

Source: Indian Solvent Extractors' Association, World Bank estimates

2.14 The other force weakening the position of expellers is their failure to achieve a high extraction of oil from their raw materials. Rapeseed expeller cake contains upwards of 7.5 percent oil, and can contain well over 10 percent from *ghanis*, yet a great deal of the resulting cake is not sent to solvent-extraction plants, where the DOC has only 1 percent or so oil content. Although there is partial recognition of the oil content of expeller meal in its market price, there remains a considerable loss of value for the processor.

2.15 The most significant trend in patterns of processing has undoubtedly been the rapid expansion in the solvent extraction share of the market. It has been associated with (a) the desire by the private sector to find an area of activity free from capacity ceilings; (b) the tax incentives given for the use of non-traditional oils in the manufacture of *vanaspati*; (c) the investment and sales tax incentives offered by state governments for processors to establish solvent extraction factories in their states; and (d) the realization by a few processors of the possibility to circumvent the SSI Reservation for soft seeds by installing expanders, linked to solvent extraction units. Table 2.6 describes the rapid growth which occurred in installed capacities in the solvent extraction sector. Despite the striking evidence of very low utilization rates, investors continued to enter the sector at a remarkable rate, attracted by special investment incentives offered by State Governments and access to export earnings from meal export sales. As a result, utilization rates, which improved from 30 percent in 1987 to 38 percent at the start of the 1990s, had fallen back to 30 percent in 1994.

2.16 Alongside the surge in solvent extraction capacities, there has been a steady concentration of power in the hands of a small number of the largest solvent extractors (Table 2.7). The shares of the five largest companies in soybean crushing capacities doubled from 8 percent to 15 percent between the 1990 and 1993 crop years. The top five companies' share of

the actual volumes of soybeans processed increased from 16 percent to 24 percent. In the export of meal, however, the five leading companies' share of the market rose from 22 percent to 30 percent over the same period.

Table 2.7
Consolidation in Soybean Processing

Share of Top Five Companies in:	1990-91	1993-94
Soybean Crushing Capacity	8%	15%
Actual Soybean Crushing	16%	24%
Export of Soymeal	22%	30%

Source: ITC, Agro-Business Division

Technical Performance Below International Standards

2.17 Despite these favorable indicators, Indian processors – except for groundnuts -- fall below international technical performance in oil extraction rates. Only China, among major producing nations, does worse (See Table 2.8). Technical efficiency analysis of the four major sub-divisions of the processing sector (excluding *ghanis* and the few SSI-exempt units that use expanders and solvent on soft seeds) reveals almost consistently higher levels of oil in the processors' meal product than is the standard internationally. While wastage levels are not out of line with other nations and are exceptionally low for soybean crushing, the deficiency in the key oil extraction rates points to technical shortcomings – most acute in the SSI-protected processors – in achieving high capacity utilization, efficient use of inputs such as solvents, steam, and electricity; and economies of scale in labor use. In the following paragraphs the Indian results of measuring these factors are compared with normal operating efficiencies for West European and North American factories ("NORM"), and with the typical best practice expected of new factories in those countries ("BEST").

Table 2.8
Average Extraction Rates 1992/3-1994/5

	Soybeans (%)			Rapeseed (%)			Sunflower (%)			Groundnut		
	Oil	Meal	Waste	Oil	Meal	Waste	Oil	Meal	Wastage	Oil	Meal	Waste
India	17.6	82.0	*0.5*	37.3	60.3	*2.4*	35.3	48.8	*16.0*	41.4	56.6	*2.0*
US	18.2	79.2	*2.6*	40.0	57.0	*3.0*	39.5	50.1	*10.4*	40.2	57.0	*2.8*
EU	17.9	79.1	*3.0*	40.8	58.1	*1.1*	40.6	54.0	*5.4*	38.5	59.9	*1.6*
China	16.1	79.5	*4.4*	35.0	63.6	*1.4*	26.0	58.0	*16.0*	38.5	59.5	*2.0*
Argentina	18.8	81.0	*0.3*	-	-	-	40.6	42.5	*16.9*	-	-	-
Brazil	18.9	78.2	*2.9*	-	-	-	-	-	-	-	-	-
Canada	-	-	-	41.7	58.0	*0.3*	-	-	-	-	-	-
Ex-USSR	-	-	-	-	-	-	42.1	42.0	*15.9*	-	-	-

Note: Dashes indicate that the values were not calculated since the country is not a major producer of the relevant oil.
Source: Oil World, USA.

2.18 These weaknesses are most apparent in the SSI sector, which is characterized by extremely low utilization rates, inefficient input use, lack of scale economies, and a failure to achieve good rates of extraction of oil from seed. SSI Reservation for groundnut and rapeseed-mustardseed expelling leads to highly inefficient processing --i.e., use of inputs such as labor, steam, and electricity-- of these two oilseeds because technical economies of scale cannot be attained.[4] In addition, SSI Reservation prevents the vertical integration of three processing operations -- expelling of groundnuts and rapeseed-mustardseed, solvent extraction of the resultant oilseed cake, and refining of expeller and solvent extraction oil-- from being integrated within one factory, as is standard practice elsewhere in the world. The separation of these three processing

[4] See Annex 5 *Technical and Economic Performance in Oilseed processing* for actual data and analysis.

stages contributes to high oil losses along the processing chain, as well as an inability to share infrastructure overhead, which jeopardizes the quality of the expeller cake entering the solvent extraction plant. In most instances, the resulting high-oil-content expeller cake is fed to local cattle, without the product's earning the full value of its oil content. Industry sources estimate that about 700,000 tons of recoverable oil is lost in cake sold to final users as expeller cake or low oil content materials, such as rice bran. In addition to spillage in transit between expeller and extractor, there are losses, which often exceed 1 percent, as a consequence of the wastage of cake during the bagging, loading, transportation, unloading, and slitting of bags.

2.19 Very similar inefficiencies afflict Indian oilseed processing factories in the modern sector -- i.e., the solvent extraction plants for soybean, the integrated expellers/expanders and solvent extraction factories for sunflower, and oil refineries. As a group, they operate at capacities barely 10 to 15 percent of international processing capacity norms. In the case of soybean, economies of scale are most important in the efficient use of solvents, moderate for steam, and small in respect of electric power. The best international factories use only 12 percent of the hexane per ton that Indian factories consume, with consequent environmental benefits; roughly half as much steam; and three quarters of the electric power (Table 2.9). In the soft seed -- i.e., non-soybean-- integrated expelling/expander and solvent extraction industry,[5] the size of average Indian factories is well below international norms. Again, the best international factories use only 10 percent of Indian volumes of hexane, roughly 60 percent of the steam; and half of the electric power (Table 2.9)

Table 2.9
International Comparison
Economies of Scale &
Technical Efficiency Indicators

Industry Segment/ Indicator	EU & USA as % of India NORM	BEST
Soybean Solvent Extraction		
Capacity (tons/day)		
Cooperative	700%	1050%
Private	480%	720%
Indian Ave.	600%	900%
Input/ton processed		
Electric Power	86%	75%
Steam	55%	46%
Hexane	17%	12%
Soft Seed Integrated Factories		
Capacity Indian average	860%	1290%
Input/ton processed		
Electric Power	66%	53%
Steam	72%	60%
Hexane	19%	10%
Vegetable Oil Refining		
Capacity		
Cooperative	670%	670%
Private	850%	850%
Indian Ave.	790%	790%
Input/ton processed		
Electric Power	36%	30%
Steam	49%	42%

Source: Mission estimates. Annex 5

2.20 Tending to be even less efficient than other processors, cooperatives have a lower average capacity than private firms and use more inputs of steam and electricity per ton of oil. In part because of the financial support and numerous regulatory exemptions they receive, cooperatives, however, have a larger processing capacity in the oil refining sector (Table 2.9). Compared with EU and US best practice, the Indian average size is considerably smaller (about 13%). The best international factories operate using only 40 percent of the steam per ton and 30 percent of the electric power of Indian factories.

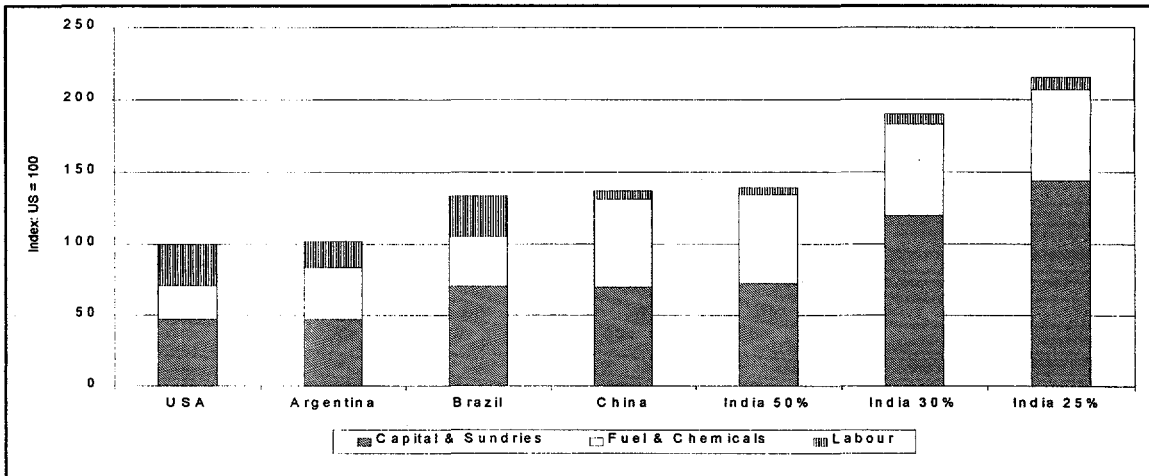
[5] The small sample of factories for which data are available did not make it possible to distinguish between cooperative and private factories.

Compared to Others, India's Processors Are High-Cost Operators

2.21 **Inefficient Performance Leads to Lack of Cost Competitiveness.** Judging by comparisons with processing costs in four other countries and using average utilization rates of 50 percent, 30 percent (close to the recent Indian average), and 25 percent, Indian solvent extraction factory costs– at the 30 percent rate -- are about 90 percent higher than US factory costs and 40 percent higher than Chinese factory costs. Raising capacity utilization rates to 50 percent, would lower average fixed costs to the level of Chinese factories but still leave Indian processors costs about 40 percent higher than those in the US (See Figure 2.4). Similar cost comparisons (Figure 2.5) show again that if integrated soft seed crushing and solvent extraction could reach 50 percent utilization rates – as compared to the 30 percent average that reflects the sub-sector's considerable excess capacity – India could compete with China but still have costs 20 percent higher than those in the US and Canada. With two thirds capacity utilization rates, total soft seed processing costs start to become competitive at international levels.

2.22 The costs of groundnut and mustard seed small-scale expellers in India are also indicated in Figure 2.5 since they account for about 60 percent of the oils produced in India. Their unit costs of production are at least 17 percent higher than Chinese costs, and 40 percent higher than US and Canadian levels. These expellers operate within the framework of the SSI Reservation, and are penalized both by their low scale of operations and by their poor utilization rates (30%). The data in Figure 2.5 actually underestimates the true costs of the small-scale expellers, whose competitiveness is further weakened by their much lower rate of oil extraction than the integrated expeller/solvent extraction plants. Those low extraction rates should be reflected in an extra cost corresponding to the loss of revenue.

Figure 2.4
Average Processing Costs per Ton of Soybeans

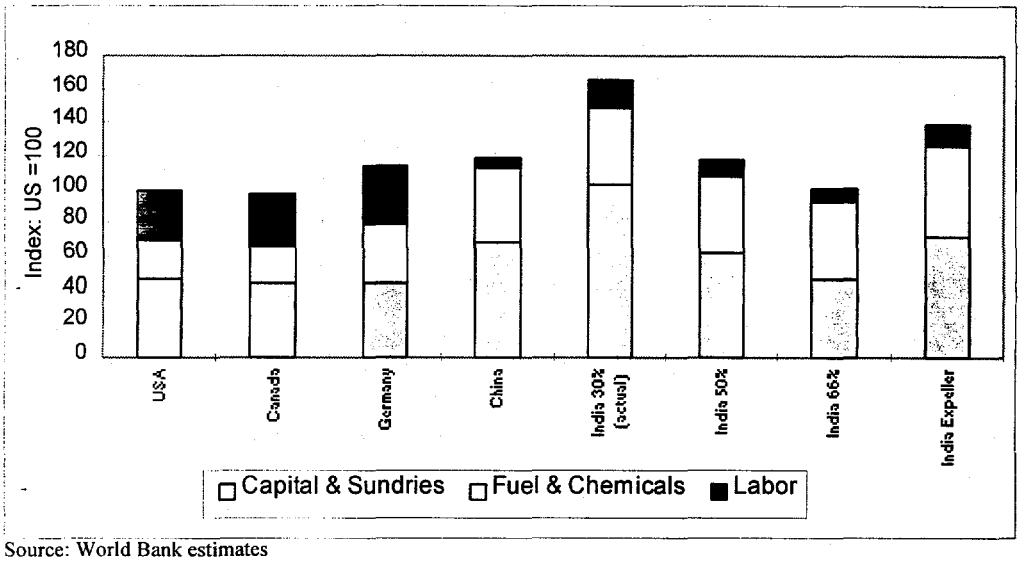


Source: World Bank estimates.

Old Ways Die Hard

2.23 **Factors Impeding Change.** The high level of technical costs that Indian processors incur and their low rates of capacity utilization argue for systematic modernization. But even

Figure 2.5
Average Integrated Factory Costs per Ton of Soft Seeds



Source: World Bank estimates

though modern organization and organizations are slowly bringing change to an industry whose most advanced sector still accounts for just a third of crushing capacity and of raw edible oil production, other factors – geographic imbalances, habitual illegality, and, above all, governmental restrictions on market development keep the technical performance of Indian oilseed processors low and their exposure to crushing margins risks high. The first two concerns pale in significance next to the third.

2.24 Regional distribution of processing capacity, to begin with, does not reflect the balance of seed and cake availability. Particularly poorly placed, the North has a vast excess of local processing capacity over actual supplies of seeds for expelling and of raw materials for solvent extraction. By contrast, the much smaller Eastern solvent extraction sector is actually confronted with a local over-supply of low-oil content material such as cakes (Table 2.10).

Table 2.10
Comparison of Processing Capacity
& Availability Of Raw Materials (million tons)

Segment	West	North	East	South	Center
Mechanical Expulsion Capacity	11.1	13.8	6.2	13.0	9.0
Oilseeds Available for Crushing	4.85	1.72	1.33	4.91	1.5
Observed Excess Capacity	+56%	+87%	+78%	+62%	+83%
Solvent Extraction Capacity	7.0	5.2	0.5	6.5	9.3
Oil Cakes and Seeds Available for Extraction	2.9	1.03	0.7	2.9	4.3
Observed Excess (+)/ Deficit (-) Capacity	+59%	+80%	-40%	+55%	+54%

Notes:
1. The quantity of oilseeds available for crushing is assumed to be 85% of production, after allowing for sowing, wastage and direct consumption.
2. n these estimates, only soybean and oilseed cakes from conventional oilseeds (assumed to equal 60% of the quantity of oilseeds) are assumed to be processed in these solvent extraction plants; thus materials such as cottonseed cake and rice bran are excluded.

Source: World Bank estimates

2.25 Theoretically more amenable to reform are the very large incentives that prompt processors to evade paying as much as 70 percent of the sales tax due on their products. By a wide variety of means --direct bribery, by-passing regulated markets, tax breaks or incentives for new factories, and legal devices such as going bankrupt before tax payments are due-- processors

tend to avoid a sales-tax burden that exceeds 1.5 percent-2 percent, and a few state governments have reduced or considered reducing their taxes towards these levels. Elsewhere, where state sales taxes on oilseed range from zero to 8 percent in different states, on de-oiled cake from zero to 6 percent, and on vegetable oils from 1.5 percent , the tax burden becomes a spur to evasion, a very heavy weight in relation to the margins to be earned from legitimate oilseed processing. Gross margins on crushing are often no more than 10 percent of the value of the seeds being crushed. Once inputs have been paid for, the net margin for crushers is typically at most 1 percent or 2 percent of the seed value. Against this, market cess and other market levies range from 1.5 percent to 5 percent across states even before sales taxes are collected, if they are.

2.26 A further means of surviving in the face of low net processing margins, is through the adulteration of oil products, commonly by blending castor oil, an industrial oil, with other oils in edible uses. It is widely asserted in industrial circles that castor oil accounts for 2 percent of the edible oil consumed in India, and that the proportion ranges up to 10 percent in extreme cases of adulteration. One company's analysis of a broad sample of edible oils on sale in different markets revealed that close to 85 percent of the sample had been adulterated. Similarly, amounts of high quality *vanaspati* are used to adulterate *ghee*.

Artificial Barriers Impede Modernization

2.27 The key to competitiveness for Indian processors is to raise their capacity utilization – now lower than in any other country of the world. The pervasive low capacity utilization rate results in a low-level equilibrium in the modern technology solvent extraction sector, where the financial benefits of high crushing margins are eroded away in wasteful, under-used new investments. Instead of an industry with low crushing margins and high capacity utilization which would operate to the benefit of the country, the consumer and the oilseed grower, India has an industry with high crushing margins and low capacity utilization.

2.28 To a considerable extent, however, the key to competitive progress is held not by processors but by India's government. Officials are not directly responsible for the low wage rates that bring low labor productivity in their train, but official policies are behind the distortions that produce poor use of steam and electricity, waste of solvents such as hexane. low capacity utilization, and high processing costs. The distortions and their policy causes are summarized below:

- Artificial barriers imposed by such government policies as the SSI Reservation, the controls on the movement and storage of oilseeds and oils, and the RBI's Selective Credit Controls explain the predominance of small-scale factories with low utilization rates in the Indian crushing industry. The 20-year-old SSI Reservation -- adopted with the social goal of encouraging employment in small towns and the countryside where almost 75 percent of all Indians and 80 percent of the poor still live -- now hinders processors' efforts to exploit economies of scale and to minimize losses through vertical integration of production. Movement and storage restrictions, together with restricted access to working capital imposed by the RBI credit guidelines, act to further reduce the scale of operation as well as utilization rates of Indian oilseed processors. Attractive tax concessions and backward-area incentives offered irrespective of economic viability, stimulate investment throughout the country, providing – in effect -- financial compensation for low utilization rates. Additional factors which help explain the small size of Indian factories but are not directly related to government policies include the low oilseed yields and poor transport infrastructure.

Industry sources estimate the optimal crushing factory size to be in the vicinity of 1,200 tons of oilseeds per day – 4 to 6 times larger than today's observed average.

- The use of sub-optimal processing technology results from: (a) the SSI Reservation for oilseed crushing equipment;[6] (b) the SSI Reservation for oilseed crushing which encourages the private sector to adopt expanders, a far-from-advanced processing technique; and (c) RBI investment credit guidelines that also encourage processors to remain technologically inefficient. RBI investment credit guidelines which stipulate the appropriate capital costs for a particular scale of processing plant take no account of the increased capital costs associated with more advanced technologies. The effect is to reward companies that chose cheap, local, low technology machinery in the hope of financing their investment almost entirely through bank credit.
- Rather than intrusive regulation, a failure of enforcement enables processors to make up in taxes they evade for low productivity and low capacity utilization. Although gross crushing margins are often actually smaller than a law-abiding processor 's tax burden, widespread cheating on tax payments makes it possible for many processors to remain in business, even processing seeds for as few as one or two months of the year. Such a regime creates unfair competition between the tax-abiding oilseed processors --largely in the organized, modern and large-scale segments of the industry, potentially more efficient-- and the small-scale oilseed processors which operate largely out of the unorganized sector. Trading profits, rather than technical excellence, are the secret to survival and success in the oilseed processing sector.
- Lastly, weak government capacity to monitor and enforce environmental controls and standards rigorously contributes – among other things – to the wasteful use of the solvent, hexane.

2.29 **Even Little-Regulated Cooperatives Perform Poorly.** In such a constraining regulatory setting, cooperative processors might be expected to achieve economies of scale and record excellent financial results. Unaffected by the SSI Reservation and exempt from both storage controls under the EC Act and the RBI's Selective Credit Controls, they also do not have to pay *mandi* fees. Yet, the evidence is that, with few exceptions, processing cooperatives suffer from a great shortage of working capital, are under-utilized and even less efficient than their more regulated counterparts. Accordingly, their profit record is very poor.

2.30 **The Denial of Legal Risk Management Tools.** Whereas crushers in open international markets seek to maximize technical and economic efficiency and use hedging techniques to cushion against market volatility, Indian processors can pursue neither goal effectively. In the case of hedging, the use of futures or forward sales further than 11 days into the future is banned by Indian law. Domestic processors, therefore, are unable to avail themselves of the opportunity – open in Argentina, Brazil, the EU, Indonesia, Malaysia and the US, and more recently, even in China -- to lock in satisfactory crushing margins.

2.31 **Little Flexibility in Input Sourcing.** Nor do they have the option of exercising much flexibility in the acquiring raw material, either domestically or on the international market. Foreign sourcing is out of the question. Oilseed imports remain canalized. Domestically, the movement and

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[6] The *ghanis* visited during the mission put their seeds/meals through their simple expellers as much as four times for rapeseed, and seven times for soybean. They also suffered from worn worms in the expeller, which had to be replaced as frequently as one day in eight.

storage restrictions on oilseeds and edible oils, the Selective Credit Controls on working capital, the SSI reservation, the non-unitary tax regime, all militate against technological flexibility in acquiring and processing oilseeds. This lack of flexibility on the domestic market contrasts sharply with the dramatic improvement in aggregate oilseed production stability achieved over the last decade. Although the rapid diversification across seeds, seasons, and regions and states has been the major factor underlying the reduction in aggregate production instability, current domestic marketing and processing restrictions actually prevent India from taking full advantage of its remarkable production achievements. As a result, processors are limited in their efficiency, and oilseed growers and consumers suffer from limited choices as well.

2.32 **Without Risk Management Tools, Crushing Margins Rise.** The absence of legal instruments to manage crushing margins risks --including those arising from unexpected changes in government policies -- forces processors and traders to speculate and to try to assure themselves of acceptable returns by charging a sizable risk premium, in the form of a higher processing margin than would otherwise be necessary. Likewise, there is limited scope for foreign exchange hedging for larger companies, dealing with the international market. Where export or import contracts have been signed, there is provision for a certain amount of forward trading in foreign exchange under RBI supervision, but the wider use of foreign exchange hedging within the legitimate framework of oilseed processing and trading activities is not permitted. The effect of these prohibitions and limits is to strengthen both small-scale industry in arguing for continued protection against freer vegetable-oil imports and the cooperative sector as well in requesting special privileges.

C. POOR MARKETING PERFORMANCE DISSIPATES PROTECTION

Main Features of Oilseed Marketing

Table 2.11: Relative Importance of Different Oilseed Marketing Channels (%)

Marketing Channel	Share of Marketed Surplus
Producer to *Ghani*	5%
Producer to oil miller through trader	20-80%
Cooperative Channel	1-8%
Regulated market yards	10-70%

Note: This table attempts to summarize differing state situations and hence the ranges are so broad.
Source: Phansalkar and Gulati 1994, p. 104 and World Bank estimates.

2.33 **Small, Private-Sector Dominance.** Of the approximately 22 million mt of oilseed produced in India, about 10 percent is kept by farm households as seeds. For the rest, farmers have the choice of taking the surplus from their harvest either to the *ghani* to be crushed for own consumption, or to the local regulated market yard or *mandi*, or to a local trader, or to a cooperative. Although virtually all oilseeds are required by law to be traded through *mandis* and subjected to *mandi* fees --typically between 1 percent and 2 percent of the product value-- many farmers prefer alternative market channels, such as the direct sale of their products to a local trader or a village cooperative society (Table 2.11). As a result, the *mandis* handle only an estimated 30 percent of the marketable surplus of the oilseed crop in Andhra Pradesh, 45 percent in Madhya Pradesh, and 75 percent in Rajasthan. The remainder -- a large but varying quantity -- is traded illegally.

2.34 **Cooperative Purchases Negligible Despite Official Benefits.** Of the four marketing options, farmers are choosing cooperatives so rarely (Table 2.12) that their share of production dropped from 3 percent in 1990-91 and 1992-93 to less than 1 percent by 1993-94 and 1994-95 and their procurement in absolute terms over the same period shrank from 489,000 mt in 1990-91 to 63,000 in 1994-95. The bulk of cooperative procurement is concentrated in two states,

Gujarat and Madhya Pradesh, despite the fact that throughout India cooperatives benefit from several exemptions: from paying *mandi* fees, from SSI reservation, from storage controls under the EC Act, and from Selective Credit Controls of the RBI. These exemptions, combined with the technical and financial support under the OGCP, have not, however, put them in a strong competitive position. Instead, acting more as a buyer of last resort, some cooperative expelling units are so restricted by lack of adequate working capital that they operate for barely one month a year.

Table 2.12: Cooperative Procurement of Edible Oilseeds

State	*Share of Total Oilseed production (1990/91 to 1992/93)*
Gujarat	7.13
Madhya Pradesh	8.28
Tamil Nadu	1.61
Karnataka	1.95
Orissa	2.73
Maharashtra	1.28
Andhra Pradesh	0.80
Rajasthan	0.65
Uttar Pradesh	-
Total	2.99

Source: NDDB.

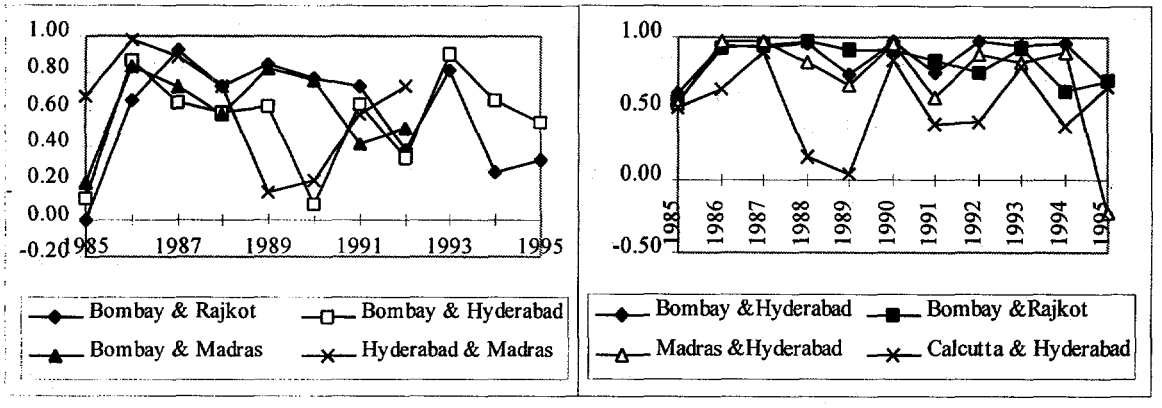
2.35 **Active Trading in *Mandis*.** More popular with farmers, the *mandis* constitute a dense network of delivery points throughout the country. Administered by state governments, the main *mandis* are very active, with a large number of commission agents and traders, who bid for commodities on the basis of visual grading, with no formal testing for oil content. Rural *mandis* are more harvest-oriented – very active at seasonal peaks since farmers have little storage capacity of their own – but often operating for only three months or so after the harvest, with trading concentrated within the first two months. In principle, edible oilseeds are traded on the basis of a fair average quality (FAQ), the definition of which varies across region and also from one year to the next. Buyers from local processing plants operate at the *mandis*, either directly or through agents.

2.36 **Little Forward Trading or Contract Farming.** In general, supply contracts between farmers and private processors are few. Traders, rather than millers, provide occasional credit or advances for inputs, in return for the right to buy the resulting crop. The only tangible evidence of contract-farming or forward purchases by mills is from the fledging oil-palm sector being established in southern India. In view of the deterioration in the oil quality in freshly harvested oil palm fruit bunches, mills have to be situated close to farms, and proximity encourages longer term contractual links between the two parties. Direct sales of oilseeds outside *mandis* are usually made using the price observed at the local *mandis* as a reference. Therefore, the pricing system at the *mandis* is of great importance for both traders and farmers, as well as for processors. Although, as noted above, forward trading for more than 11 days is illegal, contracts for one month and up to three months are reportedly common practice, and defaults are a common problem in the absence of legal sanctions to enforce forward commitments.

No Common Market

2.37 A crucial measure of marketing performance is the effectiveness with which markets move goods across space and time at the lowest possible costs. Market integration indicators are typically used to measure the performance of markets. Perfection is rare, but India's oilseed markets do not begin to approach it, denying operators full flexibility in transporting and storing products, in arbitraging across markets and time, in accessing credit and good market information, and effective contract enforcement procedures. Annex 4 presents a more detailed analysis, but the following discussion gives a clear picture of oilseed market integration which is poor in the short run, weakest in markets separated by large distances and stronger within regional markets relative

Figure 2.6
Markets are Poorly Integrated in the Short Run
Correlation Coefficients of Monthly
Groundnut Prices **Groundnut Oil Prices**
in Selected Markets.



Source: Annex 4

to the national market. Regardless of distance, stronger integration generally comes linked to the traditional reference markets, such as Bombay for groundnuts and Hapur for rapeseed.

2.38 **Short-Run Performance.** Market integration analysis involves the study of the price relationships between homogeneous commodities sold in geographically separated markets. Markets are integrated when prices in different locations move together in response to changes in demand and supply, and other economic variables. For this report, the level of short-run (within a year) integration in selected Indian oilseed or oil markets was examined using two approaches: correlation analysis and the Ravallion market integration model.[7] The degree to which prices were correlated varied significantly between different types of products (oilseeds, oils and meals) and across markets for the same product. But in general, the correlation coefficients display a high degree of instability from year to year. Figures 2.6 provide illustrative examples in the case of groundnuts and groundnut oils. The Ravallion model confirms the results of the correlation analysis. Most of the pairs of oilseed and oil markets were found not to be integrated in the short run.

2.39 **Long-Run Integration.** The long-run market integration in pairs of oilseed, oil and oil meal markets were tested using the Johansen vector auto-regressive cointegration model.[8] This approach (See Table 2.13) found that most pairs of oilseed oil and oil meal markets were co-integrated in the long run.. Of the markets analyzed, the only ones not integrated in the long run were the Delhi and Sinhind rapeseed markets, the Delhi and Hindaun rapeseed markets, and the Calcutta and Hapur rapeseed oil markets.

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[7] Correlation coefficients of monthly prices and monthly price differences were calculated as a rough measure of the degree to which prices in two markets move together in response to demand and supply conditions in the same trading area. The Ravallion econometric model is a statistically more solid test of short run market integration. See Annex 4 for more details.

[8] See S. Johansen and K. Juselius, 1990, "Maximum Likelihood Estimation and Inference of Cointegration--with Applications to the Demand for Money," Oxford Bulletin of Economics and Statistics, Vol 52:2 pp. 169-210, for more detailed elaboration of the Johansen vector autoregressive cointegration model. In this test, the null hypothesis is that markets are not integrated and pairs of markets which exhibit a likelihood ratio greater than the specified critical values can be characterized as integrated in the long run (at different levels of statistical confidence).

2.40 **Differing Degrees of Long-Run Vertical Integration.** The degree of long-run market integration across oilseed products was also tested in selected markets. In Rajkot the groundnut and groundnut cake markets appear integrated in the long run, while the groundnut and groundnut oil markets do not. In contrast, the groundnut and groundnut oil markets in Bombay are integrated, but the groundnut and groundnut meal markets are not. All the pairs of rapeseed and rapeseed oil and rapeseed and rapeseed meal markets are integrated in the long run in each of the selected markets. In general, however, in all pairs of markets, rapeseed and rapeseed oil markets exhibit stronger levels of integration than the rapeseed and rapeseed meal markets.

Table 2.13
Are Groundnut Markets Integrated in the Long-Run ?
Results of the Johansen Vector Auto-Regressive Cointegration Model

Groundnut	Nandyal	Hyderabad	Rajkot	Madras	Villapuram
Nandyal					
Hyderabad	Yes*				
Rajkot					
Bombay	Yes*	Yes*	Yes*	Yes*	
Madras	Yes*	Yes*			Yes*
Villapuram					
Groundnut Oil	Nandyal	Hyderabad	Rajkot		
Nandyal					
Hyderabad	Yes*				
Rajkot					
Bombay	Yes*	Yes*	Yes*		
Madras	Yes*	Yes*			
Delhi					
Calcutta	Yes*	Yes*			

Note: Null hypothesis was that markets are not integrated in the long run.
* - significant at 0.1 percent,. See Annex 3 for computed values.
Source: Computed.

2.41 **Small Seasonal Price Movements Discourage Storing of Oilseeds.** Seasonal price behavior is a regularly repeating, twelve-month price pattern resulting from seasonality in demand, supply, or marketing. In the case of oilseeds and oilseed products, pricing largely reflects seasonal cycles in production and marketing; consumption tends to remain uniform. Seasonal price indexes provide a rough measure of seasonal price patterns and can be used as an indicator of whether price increases adequately cover storage costs during the year. A comparison of the percentage seasonal price increase with the cost of working capital per year provides an indication of financial incentives for storage.[9]

2.42 Taking 15 percent as the reference interest rate per year on working capital loans, the percentage seasonal price increase in different oilseed markets (6 to 12% in the 1990s) was less than the cost of capital. During the 1990s, the only exceptions were the groundnut market in Villapuram (17%) and the sunflower markets in Madras (29%) and Bihar (20%). Elsewhere, seasonal price fluctuations give little financial incentives for the storage of oilseeds, although price behavior does vary considerably across oilseeds. As should be expected, those grown primarily in one season (e.g. rapeseed, soybeans) generally exhibited a greater seasonal price rise than those grown in both the *rabi* and *kharif* seasons (e.g. groundnuts). For example, the seasonal price rise is less sharp in groundnut markets and prices tend to dip twice, around March and again to a lesser extent in September.[10]

2.43 **Low Price Incentives for Edible Oil Storage.** Prices of edible oils tend to mimic closely the behavior of the seasonal behavior of the oilseed prices. For example, in groundnut

[9] The cost of capital generally accounts for the largest share of storage costs.

[10] These markets were selected largely on the basis of data availability.

markets where *kharif* and *rabi* arrivals show up in the seasonal behavior of prices, the same can be observed in the groundnut oil prices. But these seasonal price movements in the edible oil markets (increases of 4 to 12% in the 1990s) offer little incentive for storage, because they are well below the cost of working capital. Although the seasonal price rise tended to be higher in the late 1980s, especially for groundnuts, it declined somewhat during the early 1990s. For the markets for which the price series for the period 1985 to 1993 were available, seasonal price indexes during the two periods reflected only a slight reduction in the amplitude of price seasonality possibly attributable to the Market Intervention Operations. Numerous other factors have also contributed to this reduction in amplitude: increased diversification in domestic supplies, fewer imports and their better timing, more intense competition among the larger number of oilseed processors bidding prices up at harvest.

2.44 **Low Price Instability.** To measure appropriately the degree of price instability in oilseeds and their products, the seasonal, trend and cyclical components of price movements were filtered out. The resulting analysis shows that with the exception of rapeseed in the late 1980s, groundnut, soybean, sunflower, groundnut oil and rapeseed oil exhibited only a small degree of instability. The remarkable stability in oilseed production achieved through diversification of production over seasons, regions and states clearly contributes to the small, observed degree of price instability.

Over-Regulation Raises Marketing Costs

2.45 The lack of integration in oilseed marketing, which raises both costs and crushing margins, is largely attributable to government policies discussed earlier. Among these barriers the SSI Reservation Policy and storage limits and the RBI's Selective Credit Controls inhibit the free movement of oilseeds and oils in response to supply and demand signals. The effect of these restrictions and their uncertain enforcement is to reduce competition, sacrificing efficiency for protection. Additionally, the non-unitary and multi-point taxation regime and the complexities of the system in collecting local taxes and government fees, add considerably to the cost of transporting oilseeds from one location to another and stand in the way of establishing a common, national market. Other policies which also prevent the development of a common market for oilseeds and oilseed products in India include the following:

- *Scattered and High Cost Stockholding in the Oilseed Complex.* Due to the physical (i.e., stock limits) and financial (i.e., RBI's storage credit limits) restrictions on storage activities, intra-seasonal trading of oilseeds and oilseed products by the private, non-cooperative sector is highly restricted. Faced with these constraints, little real investment has been made by the private sector in modern, bulk storage facilities. Cooperatives, in spite of their exemptions from regulatory barriers and public financial support, have failed to play a significant role. Consequently, storage is made unnecessarily costly by being scattered over a multitude of small operators, who have little access to modern storage facilities and to formal sources of credit. The high costs of storage, unreflected in seasonal price fluctuations, show up in the high crushing margins identified earlier in this chapter, and in lower prices to oilseed growers. Farmers, in effect, bear the brunt of a policy initially designed to protect them from hoarding. Storage limits also have a downstream impact on processors; they limit the capacity of oilseed suppliers to purchase, store, and mix seeds of differing oil content to achieve precise quality requirements. The only exception lies in the support provided to farmers who can use storage facilities built with *mandi* fees, but only for a few days until the actual sale of the produce.

- *Lack of Hedging Instruments to Manage Risks of Price Fluctuations During Storage.* Since – except for castorseed[11]-- forward and futures trading in oilseeds and oilseed products is banned, traders and processors have very limited options for hedging price risks and no access to any long-term future price reference to guide operational decisions. The current pricing system for oilseeds and edible oils is based on cash sales for immediate or very short term delivery (with a maximum of 11 days), and market information systems operating in India only report cash prices for spot delivery. In the absence of risk management instruments, traders' risk premiums become fully reflected in marketing and storage costs at the expense of both oilseed growers and consumers.

- *Poor Quality And Poor Dissemination Of Information On Prices and Other Data..* With the exception of a few key reference markets, it remains relatively difficult to gain access to detailed price information, even though detailed statistics are collected, on a daily basis, at each *mandi*. Local and national newspapers regularly report price data for only a few important locations, and the limited success of arbitrage in achieving price stabilization over space may also come from the poor reliability of the prices that are reported. Although such reliability is difficult to assess, it appears to be viewed in quite a good light by most local oilseed traders. Also, it is evident that many of the larger oilseed processors each day determine the prices offered by their buyers on the basis of daily quotations from one or two major urban centers, such as Bombay and Delhi. Several companies in the cooperative sector and among leading end-users claim that the prices published by the Bombay Exchange are not representative of actual trading terms. Additionally, information on volumes traded, though collected each day in the *mandis* are not diffused across markets nor collected for the main commodity exchanges, hence reducing the significance of the prices reported on these markets. As a result, arbitrage trading and the integration of markets are made difficult. Nevertheless, there is firm evidence that large processors and traders in several regions of India believe otherwise and use Bombay prices to determine their daily strategy regarding the purchase prices at which their buyers make their offers at the *mandis*. The valuable information collected and submitted by *mandi* officials to state and central government ministries does not appear to be disseminated further inside India, and even the Bombay Exchange, which offers to fax and mail its daily prices, has a very small number of subscribers. Leading international specialized videotext systems, such as Reuters and Knight Ridder, however, are now collecting and disseminating this information in real time on their networks.

- *The mandi marketing system, due to diversion of revenues, does not fulfill its function of improving commodity marketing and supporting services.* The network of *mandis* collect substantial marketing fees originally intended to maintain the smooth operations of markets and investments in marketing facilities and infrastructure (storage, grading, bulk handling, market information systems). However, the current practice of diverting revenues to non-market related activities undermine the *mandis*' capacity to improve the operations of its markets. For example, *mandis* lack the bulk-handling facilities that could significantly reduce handling costs.

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[11] As seen above, the Bombay Oilseeds and Oils Exchange trades castorseed futures. Castorseed does not belong to the list of oilseed producing edible oils: futures trading is therefore permitted.

Markets Do Not Reward Quality

2.46 **Quality Differentials Poorly Reflected.** Price differences in Indian markets currently do not efficiently reflect quality as between different types of refined oils (such as rapeseed oil relative to soybean oil), for example. Prices which fluctuate significantly and are sometimes even negative behave in that fashion mainly because – in addition to the web of overlapping regulations and institutions governing quality control-- nationally recognized quality standards either do not exist or are weakly enforced. As detailed below, grading is haphazard; oil blending is often done for product adulteration; consumer safety is a low priority; and the multiplicity of regulations invites confusion and charges of harassment.

2.47 **Grading.** Oilseed grading is generally undertaken in an unscientific manner in nearly all markets. In the regulated markets or *mandis*, grading by traders continues to be done by visual means (in terms of color, dust, moisture and foreign matter) by buyers who claim they can assess the oil content of seeds without using any testing equipment. In principle, edible oilseeds are traded on the basis of a fair average quality (FAQ), but FAQ definitions vary from region to region and from year to year. Traders discount the price of seeds when foreign matter exceeds a certain level -- commonly 1 percent for groundnuts and 0.5 percent for soybeans. Traders and processors state that the oil content is often not an issue per se, since they have a good understanding of the normal oil content at each local market. Therefore, they price the seeds on the basis of the average content which they believe to be representative of each specific *mandi*. Criteria of importance on health grounds in many other countries --erucic acid, glucosinolate, aflatoxin-- are almost virtually ignored. Partly for this reason, partly because of lack of intellectual property rights, little attention has been paid to the introduction of improved varieties, such as "double zero" rapeseed (e.g., canola), or to the promotion of improved post-harvest techniques. Private seed companies -- domestic and/or foreign -- are cautious about entering the Indian seed market, both because there appears to be little demand for such improved varieties where low quality is not penalized and because they remain unsure about the standing of their intellectual property rights over their commercial seeds.

2.48 **Weak Enforcement of Blending Standards.** Although the Prevention of Food Adulteration Act now permits blending of two pure oils and requires that package labels inform consumers of the ingredients used, product adulteration is widely alleged in these cases. Reports that high-quality *vanaspati* (with a color close to white) is sold for adulteration with *ghee*, a much more expensive and popular dairy product, are as persistent as allegations that castor oil, an industrial oil, is widely blended with other oils sold for edible purposes. These charges are surprisingly precise: it is said that castor oil accounts for 2 percent of the edible oil consumed in India, and that the proportion ranges up to 10 percent in extreme cases of adulteration.

2.49 **Adverse Consequences on Consumer Safety.** Health hazards associated with aflatoxin in groundnuts, or erucic acid and glucosinolates in mustardseed and rapeseed are not being addressed in India but are imposing large discounts on Indian DOC destined for foreign markets.[12] In other countries, these problems have resulted in significant changes in the choice of varieties and post-harvest techniques, but Indian officials and the private sector do not give them high priority, claiming that the relatively low per capita consumption of oils reduces the

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[12] Other reasons exist for the discounts suffered by Indian meal exporters, as explained in Annex 5. These include the very slow pace of the loading of vessels in the ports and the disruptions often observed in the supply of such products to the ports.

potential health hazards for the average consumer. It is also reported that, the strong pungent taste of raw mustard oil which northern regions' consumers prefer, is correlated with the presence of erucic acid, the harmful effects of which are supposedly neutralized, according to widespread belief, in the cooking of fish. No research has been reported into ways of catering to consumer preferences for pungent oils in several regions in India, while also reducing the health hazard resulting from the presence of erucic acid.

2.50 **Overlapping Quality Rules Complicate Enforcement.** In addition to the Vegetable Oil Products Control Order, 1947 and the Solvent Extracted Oil, Deoiled Meal and Edible Flour (Control) Order, 1967, which both regulate the quality and packaging of edible oils to ensure consumer health and safety, subsequent and more comprehensive GOI legislation -- such as the Prevention of Food Adulteration Act, 1954, the Weights and Measures Act, the Packaged Commodities Order, 1971 and the Blended Edible Vegetable Oils Grading and Marking Rules, 1991 under the Agricultural Produce (Grading and Marking) Act, 1937 -- also govern edible oil quality and safety standards. This multiplicity of rules and the consequent overlapping jurisdictions of enforcement agencies and inspectors increase the transaction costs for traders and processors who perceive the inspections as a form of harassment designed to elicit bribes. Although the GOI is aware of the overlapping regulations and enforcement responsibilities, few steps have been taken to rationalize the control system.

D. EARNINGS FROM MEALS: CRUCIAL BUT LOW

2.51 **Introduction.** The more that processors earn from their sales of meal the higher the prices they can pay growers and the lower their vegetable oil prices are for consumers. Unfortunately for the entire oilseed sector, these revenues fall far short of their true potential. There are three main reasons for this failure: (a) the poor development of the domestic market for high-quality animal feed, even though, in comparison with recommended feeding practices, local demand for protein feeds falls substantially short; (b) the very high costs of exporting de-oiled cake (DOC), which reduce the net return to local producers; and (c) the low quality of a great deal of Indian DOC, which is reflected in the large discounts noted earlier for some meals on the export market. The remainder of this section describes the contribution of each of these factors to low meal realizations and suggests the underlying causes.

2.52 **Restrictions in the Livestock Industry Artificially Depress Oil Cake Demand.**[13] India has become a net exporter of de-oiled cake (DOC) despite a potentially large domestic market for high- protein animal feed. Because a high proportion of indigenous livestock are low in productivity and because government interventions in the dairy keep farmgate milk prices low and make concentrate feed uneconomical to use, the market for DOC is under-exploited. Government interventions include foreign trade restrictions on dairy products, reservation policy for cooperative dairy plants, and administrative barriers to private-sector investments in the dairy industry. A particular problem confronting the oilseed meal sector in a country with limited large-scale pig farming, and even more limited beef farming, has been the failure of the poultry industry to profit from low domestic oilseed meal demand. Here, the reservation of poultry feed manufacturing to small scale industries has led to increased unit costs and lower quality of feed.

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[13] For a fuller treatment of livestock policies, *see INDIA Livestock Sector Review: Enhancing Growth and Development*, World Bank Report No. 14522-IN, October 1995.

The elimination of the SSI Reservation to poultry feed manufacturing announced in the 1997/98 budget speech should give a fillip to domestic demand for oilseed meals.

2.53 **Transport System Inefficiencies Add Costs to Meal Exports.** Inadequate domestic transport and port infrastructure impose a high cost on DOC exports. The costs of land and sea transportation, of port operations, and of wastage en route are extremely high, up to 50 percent of the ex-factory price of the DOC (Table 2.14). Correcting these problems by introducing an efficient system for the bulk transportation of DOC inside India and for the rapid loading of bulk cargoes directly into the hold of the export vessel, it is estimated, could save exporters Rs 570 per ton -- equal to up to 50 percent of current export costs. These savings would be in addition to the potential gains from higher quality DOC exports and from eliminating the large discounts revealed by the NPC calculations discussed below.

Table 2.14
Costs Of Exporting De-Oiled Soybean Cakes through Bedi Port (Rs/mt)

Item	By rail	By road
Freight from Indore, MP to Bedi port	350	600
Port and handling charges	154	125
Godown charges (1 month)	50	50
Handling & Moisture Losses	175	150
Other Losses (bags)	60	60
Increases freight costs (slow loading rate)	320	320
Total Transport & Handling Cost to and Within Port	**1,109**	**1,305**

Source: World Bank estimates.

2.54 The costs of inefficient transport can be traced to the following factors:

- *Transport Losses*: For example, DOC transport losses from Madhya Pradesh to the two main Gujarat ports of Bedi and Kandla are three times greater than those incurred between Illinois and New Orleans, in the US;
- *Pilferage Losses*: Losses during handling are very high and built into Indian import and export contracts, encouraging pilferage. Overall weight losses between the processing plant and the ship's can climb above 3 percent, which includes a moisture loss of up to 1 percent, resulting from the gradual drying of the DOC during transportation. The latter loss is higher for rail shipments which take longer to reach the export port;
- *Handling costs*: Multiple handling is typical, with DOC delivered to the port in bags, which are often moved once or twice at the port before being put on barges for eventual loading – often depending on tides -- on board export vessels;
- *Costs of Delays in Loading Export Cargoes*: Port procedures which are slow and unreliable cause Indian imports and exports to be subject to a much higher ship charter cost than would apply to more efficient freight-handlers. The equivalent of almost US$ 10 per ton is added to Indian freight costs solely to compensate shipowners for the slow loading rates for DOC cargoes.

2.55 **Low Quality Lowers Earnings.** The extent of the discounts suffered by Indian exporters of DOC on account of low meal quality – rather than transport deficiencies -- can be estimated from calculations of the Quality Discount Coefficients[14], which have generally been less than one over the period since 1984/85 on the leading oilseed meals, reflecting the disadvantage faced by India because of the inferior quality of its meal. (Table 1.3). Soybean is the meal with the NPC closest to 1, with a quality discount averaging 0.9 over the eleven years

[14] The oilseed meal NPCs estimated for the study differ from the true definition of NPCs because of quality differences in the products being compared. World market prices are not available for meals of comparable quality to exported Indian meals.

surveyed. For groundnut and rapeseed meal, the quality discounts have averaged 0.81 and 0.47, respectively, over the period surveyed. Sunflower seed meal, unlike other meals, is consumed mainly in the domestic market, where prices are typically at a sizable premium to the computed f.o.b. values. Therefore, its low average quality discount at 0.5 may be as much a reflection of an unrepresentative small volume of exports, as of grave quality defects.

2.56 Assuming that reported f.o.b. values of DOC exports and computations of world market border prices are correct, then the difference between 1.00 and the observed value of the Quality Discount Coefficient for individual oilseed meals amounts to the penalty suffered for low quality products. On this basis, the normal discount for soybean meal --59 percent of meal export volumes in 1993-- is very modest: 8 percent on average between 1984 and 1994 (Table 1.3). Allowing for the normal margins of error in such calculations, it appears that soybean meals suffer only a negligible penalty from poor quality but rapeseed-mustardseed and sunflower seed meal incur much larger discounts --23 percent and 6 percent of export volumes in 1993, respectively-- averaging close to 50 percent in both cases. For groundnut meal, accounting for 11 percent of export volumes in 1993, the corresponding quality discount has averaged approximately 20 percent.

2.57 **Export Incentives Partly Compensate for Quality Discounts.** The "export performance" premium associated with export contract sales by DOC exporters to trading houses, export houses, star trading houses or superstar trading houses create additional revenues. Largely a reflection of the difference between shadow and official exchange rates on account of the continuation of non-tariff barriers on consumer goods imports, the premium partly compensates for the quality discounts on meals sent abroad. These "export performance" premiums, now fairly modest, averaged around 3 percent to 4 percent of the official exchange rate in 1995. Additional export earnings also accrued from legal or illegal Rupee:Rouble escrow trading with Russia. The size of these bonuses from 3-5 percent for legal sales of export performance to 30 percent -- split between the local exporter and the Russian trading partner – on illegal Rupee:Rouble escrow trading.

2.58 **Small-Scale Processing and Domestic Market Failures Affect Export Quality.** Because the average India solvent plant is small in scale, it is necessary to combine the export sales of a large number of extractors --1,000 to 2,000 tons each-- in order to obtain a cargo large enough to fill a vessel --generally, around 10,000 tons. Because this requirement makes it extremely difficult to standardize quality, all exports tend to be tarnished by the reputation of Indian DOC for unacceptably high levels of aflatoxin (in groundnuts due to poor post-harvest handling) and glucosinolates (in rapeseed due to the variety cultivated). Rice bran extractions are also poorly received by many foreign buyers, since Indian shipments tend to have a high silica and sand content. This resistance abroad reflects, in turn, the failure of domestic markets to reward quality, as a result of Indian consumer preferences, of inadequate quality and health standards, regulations, and of poor enforcement of intellectual property rights.

3 Meeting Opportunities & Challenges: A Framework for Reform

A. Rationale for Reform: Opportunities & Challenges Ahead

3.1 **Introduction.** Over the last 15 years, India has doubled oilseed production demonstrating -- especially in rainfed areas where agricultural growth had been lagging -- growers' capacity to respond to favorable price incentives and market opportunities by rapidly adopting new crop technologies. Stabilizing oilseed production through diversification across oilseeds, seasons, regions and states, moreover, India appears to have developed the basis for comparative advantage in the production of oilseeds, largely because of the adoption of new crop technology adapted to a wide range of existing cropping systems and available resources. These achievements are noteworthy, but to maintain them will require the GOI to establish a price and market environment in the oilseed complex conducive to sustained technological change. To capitalize on the remarkable stability in production, moreover, will require the GOI to allow the creation of a truly common market.

3.2 **Competing in a Larger Context.** The scope for further improvements in oilseed production is large, notably in terms of yields, and oil and protein contents which remain below international standards. Yield improvements and increases in the oil and protein content of seeds will be particularly crucial for oilseeds to compete more effectively with other crops for the use of scarce resources such as land and labor, and other critical inputs such as fertilizer, electric power, and irrigation water, whose prices are likely to go up to better reflect their true economic costs. This competition for farm-level resources and inputs between oilseeds and other crops is likely to intensify in the future because of the agricultural policy changes which are underway. Oilseed crops are less protected now than they were before, and the relative prices of crops such as rice and wheat should improve as export liberalization takes hold —or, in the case of horticultural crops and cotton because of the phase-out of the Multi-Fiber Agreement, as demand increases significantly to satisfy rapidly expanding domestic and foreign markets.

3.3 **Accelerating Domestic Demand Will Spur Market-Led Growth.** Demand projections to the year 2020 indicate the magnitude of domestic demand for oil and oilseed meals in India is likely to accelerate substantially. Demand for oils is likely to double under a 3 percent per capita income growth scenario, to treble under a more sustained economic growth (5.5 percent per capita income growth), and to grow even faster if poverty reduction accelerates. Among oils, the demand for packaged, refined oils is likely to expand rapidly with rising consumer incomes and changing preferences, notably due to health concerns over free fatty acids and aflatoxin in groundnut, and erucic acid in rapeseed-mustardseed. The demand for oilseed meals – a function of rapid demand expansion for livestock products -- is likely to grow even faster if the livestock industry is allowed to intensify and modernize, in which case quality concerns – over glucosinolates in rapeseed meals and aflatoxin in groundnut meals will also rise. These shifts will have important repercussions on the need to introduce quality management in the Indian oilseed complex. The failure to enforce intellectual property rights in the past has prevented India from taking advantage of the yield and quality improvements which can be secured by using commercially developed new varieties of seeds.

3.4 **Foreign Competition Encourages Efficiency Gains.** Already exposed to foreign competition in the export of large quantities of oilseed meals and the import of edible oils, the oilseed complex has to improve significantly its marketing and processing efficiency to counter the attraction of imports. The incentives for oilseed meal exports, somewhat distorted by the various schemes which increase export earnings, are dwarfed by the costs imposed upon the industry by the inefficiencies of the transport and port infrastructure, and by the large losses of revenue which the entire Indian oilseed industry suffers because of the poor quality of much of the exported meal.

3.5 **Improving Marketing and Processing Essential to Preserve Gains.** The continuing rigidities of domestic policies prevent the oilseed complex from gaining the maximum benefit of exposure to foreign competition. So far, GOI policies in the oilseed complex have been determined as much in order to achieve social objectives as to promote efficiency and competitiveness. These social objectives have focused on the protection of hundreds of thousands of people with jobs in the small-scale processing of oilseeds, to the disadvantage of the much larger constituency of oilseed farmers and even larger constituency of Indian consumers. Unless rigidities in current domestic polices are lifted, and infrastructure improved, however, it is farmers – 60 percent of whom live in opportunity-poor rainfed areas -- who will continue to bear the high marketing costs and crushing margins in the form of lower producer prices. With 20 percent tariffs, and world prices of oils bound to fall back to trend levels --a process already begun -- domestic oilseed prices will continue to decline even further below import parity levels. While farmers will increasingly push the government hard to change policies, raising tariffs on oil imports would only shift the burden onto recalcitrant consumers without addressing the large inefficiencies in oilseed marketing and processing. Allowing oilseed imports will benefit a few processors, possibly consumers, but hurt growers and the large majority of processors. It is an unattractive proposition on two counts. First, our calculations indicate that it will be profitable for processors to import oilseeds only if oils continue to be protected. Consumers are therefore unlikely to benefit from such a policy. Second, unrestricted oilseed imports will in fact provide fewer incentives to develop domestic markets for their raw material and overcome the observed inefficiencies in domestic marketing and processing. Such a policy instead would provide strong incentives to processors to re-locate and establish large-scale solvent extraction plants at or near the port, where they could import large quantities of seeds in bulk and re-export the meals, selling the processed oil locally, and so avoid the infrastructure bottlenecks and observed inefficiencies in domestic marketing and processing. It does not, therefore, provide much incentive for the crushing industry to improve existing processing and marketing, rather it would drive down the price of domestic oilseeds and hurt growers. Allowing free oilseed imports will also reduce competition; only processors large enough to finance imports and cover their risks abroad, or to invest in large-scale plants at the port, will be in a position to import. Such an import strategy, besides crowding out domestic production and reducing domestic competition, would create only limited incentives for the modernization of domestic marketing and processing activities, the industry's current priority.

3.6 The SSI Reservation, one of the main government tools to achieve its social objectives -- and a major cause of poor marketing and processing performance -- is being undermined by the adoption of expander technology for the processing of groundnuts and rapeseed-mustardseed, as well as by the rapid diversification of production away from those two oilseeds. Expanders-cum-solvent extractors, a process outside the scope of the SSI Reservation rules permit larger factories to compete with small-scale expellers steadily displacing them, if nothing changes, from the market. Expanders, however, are not the best technology for soft-seed processing, since they are less efficient than conventional expellers. It seems inevitable that the days of SSI Reservation for

groundnut and mustardseed expellers are numbered. The end will come, however, at the cost of an inefficient industry.

3.7 **Modern Risk Management Essential to Modernization.** The vulnerability of Indian oilseed processors to movements on the world market comes with the opening of India to imported edible oils and the exposure of Indian meal exports to competition. In other countries, standard risk management techniques as well as technological and sourcing flexibility give processors tools – denied to Indians – against such risks. If GOI is unwilling to permit the use of hedging techniques, and is reluctant to repeal controls on storage, movement, access to credit, and processing technology, then farm prices will be forced down whenever processors feel a squeeze on their margins. Processors will be denied the resources to modernize, but it will be millions of small farmers who bear the social cost of the technical, economic, infrastructural and institutional failings and who are more than likely to claim that they are being deprived of the benefits of trade liberalization. In the long run, it is politically unrealistic to expect either farmers --and/or consumers if tariffs on oil imports are raised-- to carry the responsibility for maintaining a profitable, but inefficient, processing sector. If processors are protected, and consumers penalized, it will be increasingly hard to defend a system which restricts the foreign trade in oilseeds, and forces domestic seed prices below border prices.

B. TOWARDS A STRATEGY FOR REFORM

Elements of Reform

3.8 **Reform Begins at Home to Upgrade Marketing and Processing.** To remedy India's deficiencies in marketing and distributing oilseeds and derived products, in the technical competitiveness of processors, and in their exposure to the volatility of a liberalized domestic and foreign trade environment, improved incentives should be put in place to:

- Adjust the regulatory framework, including the taxation regime, on domestic trade and agro-processing;
- Develop improved market, transport and port infrastructure, and processing and crop technologies;
- Facilitate the development of support services to market participants in the areas of market and technology information, exchange of risks, and exchange of products;
- Adjust the role of government agencies from an interventionist and punitive approach, toward a new supportive role in the following priority areas:
  - product quality,
  - standardization of products and contracts by the private sector,
  - training;
- Fine-tune the external trade regime, consistent with WTO rules, with the view to:
  - protect farmers from having to bear the brunt of any squeezes on Indian processors' margins,
  - protect consumers by providing a ceiling on domestic prices of oils, and
  - protect the oilseed complex from extreme price spikes.

What Makes It a Win-Win Strategy?

3.9 **Gains from Reform Substantial.** Measured in terms of higher oilseed prices[1] and assuming 20 percent tariff[2] on imported oils, improved marketing and processing performance made possible by the removal of various domestic restrictions could bring substantial economic benefits, of as much as 30 percent higher farmgate oilseed prices (see column (4) in Table 3.1). The poor marketing and processing performance of the oilseed complex is therefore imposing a large efficiency tax, equivalent to an estimated 30 percent of the average farmgate price received by oilseed growers. On average, the highest return (14%; column (3) in Table 3.1) could come from higher meal realization rates in the oilseed complex, which could be achieved by raising meal quality and to a lesser extent through reduced transport and port handling costs. On average, the lowest return (7.5%; column (2) in Table 3.1) could come from simply reducing oilseed processing costs,[3] for example through higher utilization rates and scale economies but without simultaneously raising oil recovery ratios and the quality of meals. In between, technical efficiency gains -- i.e., the capacity of the oilseed industry to raise its oil recovery ratio to international standards through less fragmentation in processing, improved processing technology and marketing of seeds -- could have the potential to raise the prices of the four major oilseeds by 10 percent (column (1) in Table 3.1).

Table 3.1
Potential Producer Price Gains - Alternative Scenarios of Improved Marketing & Processing Performance
Expressed in US$/ton (and as a percent of producer prices implied by 20 percent import tariff on oils)
Average 1990-1995

	Technical Efficiency (1)	Economic Efficiency (2)	Improved Meal Realization (3)	Full Marketing & Processing Performance (4)
Groundnut	31 (11%)	19 (7%)	19 (7%)	69 (25%)
Rapeseed	25 (12%)	19 (10%)	48 (25%)	112 (57%)
Soybean	9 (4%)	15 (5%)	30 (13%)	54 (22%)
Sunflower	46 (21%)	19 (9%)	52 (14%)	117 (44%)
Average of Four Oilseeds	25 (10%)	18 (7.5%)	31 (14%)	74 (31.5%)

Source: computed (see Annex 5 for details)

3.10 **Reform Can Aid Consumers and Growers Without Harm to Processors.** The substantial gains that domestic reforms can bring arise entirely from greater efficiency in oil processing and marketing and in moving the finished products to domestic and foreign consumers. Without reform, the large apparent rents of the protected processing sector are being dissipated in poor processing and marketing performance, and poor meal realization. A reform strategy that

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[1] This is equivalent to saying that all efficiency gains will be passed onto growers by way of higher oilseed prices.

[2] The current 20 percent import tariff is assumed to be maintained since it is consistent with India's commitments to GATT, and in line with recommendations of the Chelliah Commission on the tariff protection level for consumer goods.

[3] Specifically, it is assumed that the industry is characterized by 1,200 ton per day factories, each operating at 90 percent of their rated capacity, and that the profitability of crushing remains unaltered

aims directly at alleviating the root causes of these losses can benefit the large constituencies of consumers and oilseed growers by keeping oil prices low without forcing oilseed prices to fall below parity levels. Free and cheap oil imports do not need to come at the expense of farmers concentrated in India's rainfed areas. In addition, such a strategy would enable the oilseed industry to act to improve its profitability and raise the necessary resources for modernization and restructuring. Minimizing the inherent conflicts between growers, consumers and processors, domestic reforms would both avoid the pitfalls of a strategy limited to changes in the external trade environment and bring Government added bonuses in strengthening food security objectives, promoting sustained agricultural growth and rural development in rainfed areas, and tackling health and environmental concerns --erucic acid, glucosinolates, aflatoxin in oilseeds, and reduced hexane effluents from oilseed processing.

3.11 Restructuring and rationalization, however, are not entirely cost free. Some oilseed processors are bound to be hurt by reforms, in particular the small-scale processors without the financial means and wherewithal to adjust. However, the process of modernization in the industry is likely to be gradual enough to give time for alternative economic opportunities to arise. Furthermore, small-scale expellers who cater to special markets, such as the pungent mustard-oil, are likely to be unaffected by competition and would not need special protection to operate. Restructuring and rationalization in the oilseed industry are unlikely to result in lower rural employment opportunities for several reasons. First, more rural employment opportunities will be created by domestic reforms that encourage agricultural growth through higher farmgate (oilseeds) prices without raising consumer (edible oil) prices. Second, employment opportunities and better paying jobs in oilseed processing and trading will be achieved by reforms that make the industry competitive with imports, raise its profitability, and at the same time encourage greater domestic production of oilseeds.

3.12 **Domestic Reforms Would Mostly Pay for Themselves.** Large reform-induced efficiency gains will generate most of the resources and activate the financial and institutional incentives needed for its implementation, especially enhanced access by financially sound processors to formal credit sources to underwrite restructuring and modernization. Oilseed processors will also have the financial capacity and incentives to raise producer prices, introduce and develop standardized product-grading payment systems reflecting quality premiums for characteristics so far ignored, such as oil content and health criteria for erucic acid, glucosinolate, and aflatoxin. They will also be encouraged to pay for improved services in the regulated markets, such as bulk and grading facilities. Higher market prices, in turn, will also encourage growers to adopt new, improved varieties of seeds as well as improve post-harvest practices, reducing the need for costly government interventions to promote technological progress among farmers. Additionally, by allowing Indian oilseed processors and other market participants to use modern, market-based risk management techniques, government will be able to shift scarce fiscal resources from costly market intervention operations and administratively expensive domestic regulations with large attendant economic costs to other areas of public concern.

3.13 Cooperatives – now overly dependent on the public sector for management and finance -- would have the potential to play an important role in the modernization of the oilseed marketing chain, and in providing market support services to growers in the exchange of market and technology information, in the improved exchange and storage of products, and in intermediating price risks for their members. Finally, the financial benefits to meal exporters from lower domestic transport and port costs will make it worthwhile for them to finance and/or contribute to private investments in modern bulk transportation and port facilities.

C. MAKING HASTE SLOWLY

3.14 **A Sequential Approach to a Complex Transition Process.** The list of policy reforms needed to allow the Indian oilseed complex to realize its full potential is long. Since full and simultaneous implementation is impossible, priorities must be established that also recognize the way many government policies and regulations are interrelated, often overlapping and complementing one another. Adjusting only one policy or regulation without adjusting its companions will inevitably generate a range of responses that fall short of the best solutions. In many instances, no single reform can be counted crucial in enabling the industry to reach its full potential. Since piecemeal approaches will not release untapped potential, a comprehensive strategy characterized by a sequence of packages of internally consistent reforms is essential to lay the foundations for the sustained growth in the Indian oilseed economy, including the creation of a true common domestic market and the removal of the multiple anachronistic restrictions on private-sector activities which now serve as incentives to profit from cheating.

A Possible Sequence of Individual Packages of Sectoral Reforms

3.15 A five-stage approach to improving the marketing and processing performance in the oilseed complex could begin with **fine-tuning the external trade regime,** consistent with WTO rules, by:

- Extending the export liberalization to all oilseeds (*GOI*);
- Legislating IPR's (*GOI*);
- Extending import liberalization to *all* edible oils and maintaining current and homogenous tariffs across all edible oils;[4] establishing the external trade rules and institutions, consistent with WTO rules, to deal with international price spikes (*GOI*);
- Rationalizing food labeling regulations, reinforcing monitoring capacity to raise awareness of health issues by distinguishing product labeling between the traditional pungent mustard-seed oil and healthier rapeseed oil, manufactured from "double zero" varieties of seeds (*GOI*).

3.16 The first set of reforms to be undertaken is also the easiest to implement since its only departure from current policies is the liberalization of oilseed exports, which will not affect the high natural barriers blocking any sudden wave of exports. Rather, it would provide a badly needed floor to the local market, protecting farmers from having to bear the brunt of any squeezes on Indian processors' margins. At the same time, the intellectual property rights would give seed companies the needed incentives to sell improved varieties of seeds. Simultaneously encouraging the cultivation of healthier and more valuable crops (e.g., double-zero rapeseed varieties), this policy would bolster the export liberalization of all oilseeds by raising their market value on the world market or providing strong incentives for attention to quality by growers and traders. Along with this preliminary step toward improved grading practices and a quality-payment system in oilseed marketing, distinctions in product labeling between the traditional pungent mustard seed oil and healthier rapeseed oil manufactured from "double zero" varieties of seeds should reinforce health awareness. Maintaining 20 percent tariff on edible oil imports will help secure a ceiling on the level of domestic vegetable oil prices.

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[4] Large-scale investments in the palm oil sub-sector that are being contemplated by private and cooperative firms would benefit from more certainty about the future tariff protection level of the oilseed complex.

3.17 This initial set of reforms can also serve as the spur to a publicly articulated GOI strategy for trade reforms in agriculture, the now missing foundation for a stable policy environment. The oilseed complex --and agriculture in general-- would greatly benefit from a clear statement about the trade and tariff regime under which it will operate. India's tariff bindings commitments to the URA are extremely high, and much higher than current tariff levels, providing GOI with plenty of room in setting actual tariffs. If India decides to vary its tariffs, tariff rates could be highly dispersed --e.g., from 0 to 300 percent in the case of palm oil and groundnut oil-- imparting great price instability and uncertainty detrimental to long term, efficient investment decision-making in the sector.

3.18 The management of price instability through external trade instruments consistent with WTO rules and India's commitments to the URA, and its relation with risk management tools on the domestic market, would also need to be addressed. In view of their policy significance, stable and transparent external trade rules should be established from the outset, to be gradually improved over time as the institutional capacity of the private sector and government agencies to manage price risks improve. In view of its importance, detailed recommendations are elaborated further in the next section.

3.19 The primary objective of the first set of reforms is to provide a consistent and stable external trade regime that protect growers and consumers from domestic inefficiencies in marketing and processing of oilseed products, along with initial incentives for the modernization of the oilseed marketing chain and processing industry. The industry's performance, however, will not improve until traders and processors also gain flexibility from a set of reforms which should accompany the changes in external trade.

3.20 **That second set of actions would modernize domestic trade and processing policy** by:

- Removing the oilseed complex from the scope of the EC Act (*GOI*);
- Removing the oilseed complex permanently from the scope of the RBI's Selective Credit Control Policy (*GOI*), and promoting the use of warehouse receipts (*GOI*);
- Lifting the Small-Scale Industry Reservation from --its application to crushing equipment; groundnut, rapeseed-mustardseed and safflower expelling (*GOI*);
- Allowing forward and futures trading (hedge contracts) in oilseeds and its derived products (*GOI*); promoting the establishment, in coordination with the private sector, of standard quality norms and contracts, and improving contract arbitration procedures[5] (*GOI*);
- Harmonizing and standardizing the taxation of oilseeds and their products, at a rate consistent with processing margins, such as replacing the sales taxes with an excise tax (*GOI - state governments)*;
- Phasing out government interventions in operations of cooperatives (*state governments*); and
- Establishing an agricultural price-and-trade surveillance unit (*GOI*).

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[5] Standard quality norms and standard exchange contracts for the oilseed complex could be established under the aegis of an industry-wide body, with official standing, which would bring together producer, processor (private and cooperative), trader, and government interests. Also, arbitration procedures should be established, possibly under the control of the same industry-wide body, which would ensure easy, prompt, and cheap resolution of contractual disputes. Quality norms, standard contracts, and arbitration procedures would be coordinated with the establishment of forward and futures trading.

3.21 This second round of reforms requires the simultaneous introduction of six new policies, the first four of which constitute the package's vital core. Although the regulatory changes can be rapid, their gestation period is likely to be prolonged. With vegetable oils freely importable, oilseeds and oilseed meals freely exported, there will be little further need to continue EC Act restrictions on the oilseed complex, since any form of hoarding and price squeezes can be overcome by appropriate foreign trade.[6] With oilseeds free of EC Act limits, the credit controls that can be re-applied by the RBI should be eliminated and the use of warehouse receipts as collateral promoted so as to facilitate access and reduce the costs of financing of larger inventories than those currently permitted under EC Act/RBI rules. Allowing futures contracts in oilseeds and derived products would largely amount to the normalization of the already widespread, but illegal, futures trading, while improving its transparency, efficiency, and reliability. At the same time, the supervision of futures markets should be improved and, subject to such oversight, the use of such markets and forward sales should be permitted. This topic, further developed in the next section, has been analyzed in even greater detail in a companion World Bank - UNCTAD study.[7] The impossibility of protecting SSI Reservation from the advances of new technologies should be recognized, and SSI Reservation should be eliminated in the oilseed expeller sector and expelling equipment. The distortions caused by different rates of taxation in different states should also be eliminated and, if possible, state sales taxes should either be standardized at a rate of no more than 2 percent, a level sufficiently modest in relation to processing margins not to encourage tax avoidance. Alternatively, state sales taxes could be replaced by a single nation-wide central government excise tax, similar to the earlier practice in the *vanaspati* sector.

3.22 To oversee price and trade deregulation (domestic and external) and the performance of agricultural markets and agro-industry, the surveillance unit would assess the impact and progress of the reforms on consumers, farmers, and agro-industry by monitoring and analyzing price formation on agricultural markets, such as oilseeds, oils and meals. Its assignment would be to identify and avoid the development of unfair trade practices and dominant positions which can easily develop in an agro-industry characterized by scale economies in processing and (edible oils) imports, and prominence of risk and financial management expertise. The role of a surveillance unit in informing and advising policy-makers, as well as the general public, about the progress of reforms and their impact would be essential in keeping abreast of a complex and difficult reform process and avoiding slippages and back-tracking. The role of such a surveillance unit needs not be limited to the oilseed sector alone; it would also be useful in other agro-industries and agricultural markets.

3.23 The third set of changes would seek to **modernize the market, post-harvest, transport, and port infrastructure**, by:

- Decentralizing the financial and management authority of regulated markets (*state governments*);

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[6] In this context, it is significant to note that the EC Act does not apply to the trade in DOC, since it is recognized that DOC is a product which is already governed by the world market, so that hoarding is not a concern.

[7] See *Managing Price Risks in India's Liberalized Agriculture: Can Futures Market Help?* World Bank - UNCTAD Report No. 15453-IN, November 1996

- Developing grading facilities, facilities for the bulk transportation and handling of oilseeds in markets which should lead to the promotion of quality incentives in payment schedules by seed purchasers[8] (*state governments)*;
- Legalizing direct sales of oilseeds to processors (*state governments*);
- Disseminating price information (*state governments, GOI*);
- Establishing the policy framework necessary to promote private investment in market, storage, transport, and port infrastructure (*GOI; state governments*);
- Improving port infrastructure, in collaboration with the private sector (*GOI; state governments)*.

3.24 This package of reforms is the one most likely to require a long gestation period since it primarily involves infrastructure investments along with institutional changes. Since progress will come slowly and in tandem with advances under the second set of reforms, this package should be initiated early in the reform process. Unlike other reforms, state governments will have primary implementation responsibility and will require committed central government support. Legalizing direct sales of oilseeds to processors will help promote contract-farming between processors and growers and therefore the spread of new technologies, as well as level the field between cooperatives and non-ccoperatives.

3.25 The fourth and most prolonged reform measure would **improve the regulatory and institutional framework on health and quality issues**, by:

- Tightening national food safety standards (GOI);
- Improving monitoring and enforcement capacity of food safety institutions (GOI & state governments);
- Strengthening and directing pollution controls and enforcement towards the better treatment of effluents and the reduction of hexane losses in oilseed processing (GOI & state governments);
- Raising consumers' awareness about health and quality concerns and oilseed processors' appreciation of appropriate technologies and labeling.

3.26 Even in the most developed economies, quality regulations and standards keep evolving as health safety issues continue to arise, technology and scientific knowledge improve, and consumer preferences adjust. In India's oilseed complex, strict controls of the kind developed in other countries over the erucic acid content of mustard seed/rapeseed oil and the Free Fatty Acid (FFA) content of the edible oils sold to the general public have yet to be applied. Nor does India impose other countries' controls over the impurity levels permitted in oilseed meals. Aflatoxin and glucosinolate levels are well above the levels accepted in many foreign markets, causing Indian exports to trade at discounts to meals from many other origins. Widespread adulteration of edible oils arises from the practice of selling them in a loose form from drums and of unlabelled oil in *telia* tins. The adulteration of *vanaspati* also occurs. As noted in the previous chapter, oilseed processing effluents are poorly treated, and losses of solvent to the atmosphere are unacceptably high. Existing food labeling regulations require solvent-extraction refined oil to be labeled separately from expeller refined oil, even though the end products are indistinguishable. The *vanaspati* regulations permit solvent-extraction mustardseed oil to be used, but not expeller

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[8] When the distribution of improved varieties of seeds has been improved (see first package of reforms), grading infrastructure in *mandis* and quality incentives in payment should be promoted. Cooperatives could have a particularly important role to play in the promotion and diffusion of quality management in the oilseed marketing chain.

mustardseed oil; yet refiners are permitted to use either of these oils, and refining is an intermediate stage in the manufacture of *vanaspati*.

3.27 Strong financial, market-based incentives for the oilseed complex to improve its performance on health and quality issues would be the moving force of the recommended strategy. The improved management and enforcement of health concerns and consumer safety would give processors and the entire marketing chain valid reasons to invest and to differentiate products, complementing and strengthening other regulatory reforms. Government has a critical role to play in making this strategy possible by establishing the regulatory framework and institutions needed to shape market forces, and by raising --in coordination with, or in the support of an industry-wide body -- the awareness of consumers about product quality and health. This implies government role evolving from the current interventionist and punitive approach to a new mix of supportive role and surveillance. Specifically, this would imply adapting food safety regulations and institutions to:

- *Tighten and modernize national food safety standards on edible and hydrogenated oils*. Jointly with respected university laboratories and representatives from the processing industry, the agencies involved should prepare an up-to-date assessment of health hazards resulting from the consumption of edible oils --raw, refined or hydrogenated—as the basis for a revised joint regulation. (*GOI*);
- *Update the labeling of edible oils*. For example, all refined edible oils could be labeled in the same way, whether or not manufactured from solvent extraction oil; there is no reason to forbid the *vanaspati* industry to use particular edible crude oils, such as mustardseed expeller oil; the application of food safety regulations could be adapted to permit the continued use of pungent mustard oil as a premium niche market for small-scale expellers, notably in the North East.
- *Improve the enforcement of food laws*, by concentrating on the conformity of products with respect to food safety standards and labeling regulations -- instead of meeting administrative standards with respect to processes. Enforcement would initially (1-2 years) be accompanied by training, and information about processing and post-harvest technology to meet standards and labeling regulations by processors, as well as by food safety information campaigns (and services, e.g., testing) to consumers. This initial phase would be followed by strict imposition of financial and legal penalties --e.g., fines and/or removal of the right to produce and/or distribute.
- *Industrial pollution* controls should be directed towards the better treatment of effluents and to reduce hexane losses.
- *Intellectual Property Rights*. As required under the WTO, protecting intellectual property rights of seed companies will be an essential complement to the above policies, since it will greatly facilitate and accelerate improvements in the genetic material of seeds available locally. For example, seed varieties which meet the health requirements of other countries, such as the double-zero low erucic acid/low glucosinolates varieties of rapeseed, need to be promoted in India.

3.28 The final step in reform would be to **complete external trade liberalization**, by:

- liberalizing *exports* of vegetable oils and the *importation* of edible oils (*GOI*).

3.29 Although the least critical reforms in improving marketing and processing performance, import liberalization of oilseeds at least could come earlier in the reform process depending on the degree of progress in deregulating the domestic crushing industry and trade. Without free imports of oilseeds, the profitability and viability of the crushing industry can be jeopardized if domestic oilseed prices rise above international levels. Domestic oilseed prices will rise if domestic reforms are successful in improving the performance of marketing and processing in the oilseed complex; in this instance, oilseed imports would need to be liberalized. Domestic oilseed prices will also rise in the event of production shortfalls, in which case the import of oilseeds should be allowed to provide the needed relief to the crushing industry. This was attempted for soybean in 1995, although no imports actually took place, in part because of phyto-sanitary restrictions imposed by the Ministry of Agriculture.

D. MANAGING PRICE INSTABILITY: FURTHER RECOMMENDATIONS

3.30 Managing price instability will be critical to the overall success and political acceptability of any reform strategy in the oilseed sector. To keep price volatility under control will require two distinct sets of actions. First are measures to legalize market-based instruments to manage price risks such as forward and futures markets deal with for oilseeds and their derivatives. Second, together with the liberalization of oilseed exports,[9] the GOI can establish instruments capable of blunting price spikes --sudden, and generally short-lived, rapid price increases or declines-- originating either from the domestic or the world market.

3.31 Agricultural forward and futures markets are market-based instruments well adapted to deal with short term or seasonal price fluctuations within a cropping season or year that would form part and contribute to the orderly establishment of a more competitive and efficient oilseed complex. They represent a viable alternative to the risk-management instruments Indian policy-makers have used but are now largely relinquishing to cope with price volatility. In place of a virtually closed external trade regime, market intervention operations, and pervasive government controls on private sector activities, futures and forward markets can cushion processors and traders against most price fluctuations though not, by themselves, against sharp, brief price spikes. The latter impose large --and politically costly-- economic and social costs on either consumers or growers and interfere with the efficient working of futures and forward markets. Quite a common phenomenon on the world edible oil market,[10] price spikes also arise in India, often caused by the failure of monsoons, although the diversification in oilseed production has imparted a much higher degree of production stability than ever before.

Managing Price & Crushing Margin Risks

3.32 The recently (September 1994) submitted Kabra Committee report GOI recommended the introduction of futures contracts in a number of agricultural commodities, including most oilseeds and their oils, major oilseed meals, and linseed --a non-edible oil. The Indian vegetable oil industry appears to be the most eager to reintroduce futures trade. The oilseed industry, with support from groups of producers, traders, processors, and end-users, is asking for permission to reintroduce futures contracts in a wide range of oilseeds, oils and oil meals. To achieve the

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[9] Free oilseed exports will provide a (fiscal cost free) floor price support to oilseed growers.

[10] See Annex 6 on GATT for evidence on the incidence of world price volatility.

objectives and recommendations of the Kabra Committee in the oilseed complex, the following six proposals summarize, in part, the analysis of a companion and more detailed study on agricultural futures markets in India.[11]

- *The establishment of a stable, transparent and predictable foreign trade environment*; would involve among other things the set of measures recommended under the first package of sectoral reforms designed to fine-tune the external trade. Sudden foreign policy changes would create unhedgeable risks, making futures markets a non-viable proposition.
- *The removal of physical and financial constraints to the storage and movement* of oilseeds and its derived products is a pre-condition to the viable establishment of forward and futures markets.
- *Support price policy* could possibly be re-introduced by GOI (see below), but support prices should be set at a level that does not "crowd-out" the private --including cooperative-- sector in managing price risks. GOI should limit its interventions to providing "safety net" prices to oilseed growers with the view to prevent producer prices from going below a floor, while leaving sufficient price volatility in the market to be covered through risk management techniques. Truncating the price distribution at too high a level would shift all the burden of price stabilization onto the government, at tremendous financial costs.
- *Standard quality norms* along with arbitration procedures should be established under the aegis of an industry-wide body with official standing. Arbitration procedures, possibly under the control of the same entity, could facilitate the easy, prompt, and cheap resolution of contractual disputes.
- *The regulatory and institutional environment governing the operations of forward and futures markets needs to be improved to ensure their orderly development once the ban on oilseeds, oils and oilseed meals is lifted.* Among the steps involved:
  - The Forward Market Commission (FMC) should curb its discretionary interventions –giving associations permanent recognition, automatically renewing contracts, standardizing regulatory measures, and withdrawing price ceilings -- and revert to the original intent of the three-tier regulation model provided by the FC(R) Act. Under such a model, the government would still approve exchanges, and set the general legal and regulatory framework.
  - The FMC would play a monitoring role, approve requests for the introduction of new futures contracts emanating from the commodity exchange associations, and intervene when the situation warrants it. The FMC would need to be strengthened to fulfill its new responsibilities;
  - GOI should introduce a two-tier national brokerage regulation for the specific purpose of consumer protection, and prudential rules for the use of risk management instruments by companies;
  - The participation of commercial hedgers, including cooperatives, and large institutional investors should be promoted through changes in income-tax rules, tax registration requirements, and bans on participation;
  - Commodity exchanges would need to upgrade their rules and regulations -- trading procedures, delivery system, trade supervision -- clearing operations, promotional and development capacity, and their implementation and monitoring capacity.

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[11] See footnote 7.

  * Recognized Exchange Associations, in which cooperatives would be invited to participate, would be left free to design their own futures contracts on the basis of in-depth analysis of market potential, and to experiment.
- Foreign exchange hedging in conjunction with oilseed processing and trading activities –vegetable- and edible-oil imports, and oilseed meals exports -- should be permitted.

3.33 Evidence on the current marketing performance in the oilseed complex suggests that groundnut oil and rapeseed oil futures contracts complemented with corresponding oilseeds and oilseed meals futures contracts in a few regional exchanges are likely to be successful. Groundnut and rapeseed-mustardseed futures contracts would stand a greater chance of success than soybean contracts which are likely to try to compete with the Chicago Board of Trade contracts. The absence of a common, domestic, physical market for the oilseed complex and the existence of better-integrated regional physical markets strongly suggest that a few regional exchanges will be better suited to the needs of an initially imperfect physical market situation.

3.34 Cooperatives could play an important role in providing risk intermediation services to their members, providing an attraction and cause for loyalty that has so far been lacking. In practice, cooperatives could offer attractive first initial payment for sale to the cooperative by hedging on the futures markets; similarly, cooperatives could offer attractive storage services to its members through hedging on their behalf by pooling risks from many farmers.

Managing Price Spikes

3.35 **Price Support Operations to Manage Domestic Price Spikes.** In the recent past and without much success, GOI has attempted two price support operations for oilseeds. MIO, in particular, was bound to be financially non-sustainable since its implementation rules -- absence of transparency in intervention mechanisms, combining price support at a high level with price stabilization -- compelled the NDDB as the implementing agency to assume extremely speculative positions. Under the proposed strategy, the liberalization of oilseed exports would provide an automatic floor price to oilseed growers, hence reducing the need for price support operations. As indicated above, in case GOI contemplates reintroducing a support price policy program, it would be essential for support prices to be set at a level that does not "crowd-out" either private or cooperative enterprises from undertaking storage operations and managing price risks on the futures markets. GOI should limit itself to providing "safety net" prices to oilseed growers to prevent producer prices from going below a floor, while leaving sufficient price volatility in the market to retain financial incentives for storage and for risks to be covered through risk management techniques. Setting price levels too high would shift all the burden of price stabilization and storage onto the government, at tremendous financial costs. It would also make futures markets non-viable.

3.36 **External Trade, WTO Consistent, Instruments to Manage World Price Spikes.** Initial analysis of India's commitments to WTO suggests that India has plenty of room to maneuver consistent with WTO rules in managing external price instability. In particular, the following conclusions emerge out of the more detailed analysis for managing edible oil price instability presented in Annex 6.

3.37 India's tariffication commitments --in particular, the high level of tariff binding commitments-- allow a wide discretion in setting actual, applied tariffs and provide plenty of room to manage world oil price spikes in the context of tariff-based price stabilization schemes.

3.38 The results of price stabilization simulations suggest the following policy conclusions. First, stabilizing import parity prices beyond price spikes through variable tariffs and/or price bands mechanisms would be quite costly yet bring only limited benefits to the economy in terms of greater price stability. The high costs in terms of additional taxation of Indian consumers and extremely unstable foreign trade policy and tariff rates in practice make such a policy unnecessarily complex and non-viable. Furthermore, price band mechanisms are likely to be challenged under WTO rules, primarily due to their possible discrimination against different sources of imports. The experience in Latin America with price band mechanisms confirms their administrative challenge and complexity in implementation as well as their tendency to rapidly become instruments of protection rather than stabilization. In the case of edible oils, the multiplicity of sources and qualities traded on the world market makes the implementation of price bands mechanisms virtually impossible, as suggested by the experience in Chile, the only country where price bands for edible oils were ever attempted.[12]

3.39 A more practical and less distorting way to deal with world price spikes would be for India to resort to the safeguard measures provided under WTO, as and when world price spikes do happen. These safeguard provisions allow India to impose tariffs or quantitative restrictions on imports for a limited period if those imports are growing in such fashion as to cause serious injury to the domestic oilseed and edible oil industry. Implementation would require two actions by GOI. First, a surveillance institution to monitor competition and openness in external trade either directly or through institutional contacts with the Ministry of Commerce and take the lead in the application of safeguard and contingency measures in coordination with WTO. Similar agencies in Latin America (Chile, Argentina, Peru) could provide useful examples. Second, the definition and public announcement of the triggers at which safeguard measures would be invoked by the surveillance institution, a transparency in operation that will be important for providing stability and predictability in the foreign trade regime and for making futures markets viable.

3.40 **Conclusion.** Taken in sequence but taken together and effectively enforced, these various reforms can enable India to build a modern, internationally competitive oilseed industry on the foundation successfully laid since the early 1980s. What the introduction of new crop technologies has done to diversify, expand and stabilize production, a functioning, integrated market can do to promote significantly higher levels of efficiency in the technical and economic aspects of processing and marketing. Change will probably accelerate the trend already underway toward larger enterprises in the oilseed-crushing and refining fields, but change that pays for itself should disrupt few participants in the industry and should assure farmers and consumers especially a fairer share of the progress that has been achieved and can be expected.

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[12] Agricultural Price Stabilization Policies in Latin America. Proceedings of the Round Table organized by FAO and the World Bank, Santiago, Chile, October 1993. FAO & The World Bank, 1995, p. 34.