

ECONOMICS OF THE RAPESEED INDUSTRY IN INDIA

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INTRODUCTION

Edible oils are in short supply in India. Domestic production has not kept pace with the increase in domestic demand. The importation of edible oils increased sharply in the 1980's. The share of edible oil of India's total import bill is second only to crude oil imports. Given a rapidly growing population and a potential increase in per capita income and a positive income elasticity of demand, the demand for fats and oils could further outstrip domestic production.

Currently the per capita consumption of edible oils is approximately 6.6 kg. per annum against a minimum nutritional requirement of 14 kg. recommended by the Indian Council of Medical Research. Oilseeds production during past years has been disappointing. Production increases have come mainly from expanded acreage. The oilseed sector in general has not been part of the green revolution that has led to increased grain production through higher yields. During the period 1950-86, the area under oilseeds increased at a compound growth rate of about 4.0 percent while yield has increased at only 0.7 percent. On the other hand, area under food grains has increased at a rate of 0.69 per cent per annum while yield increased at a rate of 1.73 per cent, Ninan (1988).

In relation to the above problem and situation this paper attempts to describe the structure of the oilseed sector in terms of production and future demand. Taking into consideration the comparative performance of oilseeds and food grains, the paper examines the question of agricultural self sufficiency in all food crops versus specialisation and trade. The specific objectives of the paper are,

- (i) to study the growth trends of major oilseeds and food grain crops in terms of both production and consumption.
- (ii) to determine the degree of protection versus taxation for selected crops.
- (iii) to examine policy options for the oilseed sector.

METHODOLOGY

Linear trends were estimated based on time series data from 1951 to 1988 using the method of least squares, with slopes expressed as a percentage of the respective means. Trends were estimated for two periods, 1951 to 1965, the pre green revolution period and 1968 to 1988, the post green revolution period. The years 1966 and 1967 were omitted because they were felt not to be representative of typical Indian crop production. Since soybeans and sunflower are relatively new crops in India, data from 1975 to 1988 were used.

To determine the extent of policy intervention in the oilseed and food grain sectors the producer subsidy equivalent (PSE) and the consumer subsidy equivalent (CSE) were calculated. Nominal protection coefficients (NPC) defined as the ratio of domestic price to the reference price were estimated for selected commodities. The NPC estimates indicate which commodities are

protected and which ones are taxed. A NPC greater than 1 means the commodity in question is protected and an NPC less than 1 means it is taxed. These coefficients were calculated for rapeseed, groundnut, soybean, wheat and rice under the importable hypothesis for the years 1982 to 1987, a period during which large scale imports of edible oils took place, Gulati "et al"(1990). Under this hypothesis it is assumed that the commodity competes with imports. Thus, in order to determine the border or the reference price, the international shipping cost is added to the price at the foreign market. This allows for direct comparison of costs at the domestic market and to make judgements on whether domestic production is competitive with imports. The domestic price is approximated either by what the farmers receive or the support/procurement price. The reference price is obtained from the international price adjusted for the transportation cost.

GROWTH PERFORMANCE

Groundnut and rapeseed are the two most important oilseed crops. Together they constitute nearly 60 percent of both area and production. Groundnut production increased at a rate of 1.47 per cent per annum between 1951 and 1988, (Table 1).

Table 1. Growth trend and actual area, yield and production of selected crops. (area='000 ha, prod.='000 tonnes, yield= kg/ha).

CROPS	Trend				Actual				
	1951 -1988	1951 -1965	1968 -1988	1975 -1988	1985	1986	1987	1988	
Groundnut	A	0.86	3.61	0.26	*	7120	6982	6844	8430
	Y	0.59	-0.07	0.98	*	719	842	774	1068
	P	1.47	3.41	1.30	*	5120	5876	5300	9000
Rapeseed	A	1.75	2.81	1.81	*	3980	3719	4619	4865
	Y	1.73	0.72	2.18	*	673	700	671	863
	P	3.59	3.65	4.23	*	2680	2605	3100	4200
Safflower	A	2.46	1.08	2.87	*	910	892	1052	782
	Y	4.51	0.62	5.45	*	385	396	439	549
	P	6.62	1.73	7.80	*	350	353	462	429
Sesame	A	-0.12	0.03	-0.27	*	2220	2164	2153	2433
	Y	0.65	-1.32	1.65	*	225	207	271	274
	P	0.49	-1.35	1.36	*	500	448	583	667
Soybean	A	*	*	*	16.55	1340	1529	1543	1655
	Y	*	*	*	-0.92	761	583	582	907
	P	*	*	*	15.81	1020	891	898	1501
Sunflower	A	*	*	*	20.14	750	1023	1651	1052
	Y	*	*	*	-2.29	373	411	385	377
	P	*	*	*	18.17	280	420	635	397
Wheat	A	2.74	2.47	2.48	*	23564	22997	23131	22604
	Y	3.20	1.53	2.92	*	1870	2050	1920	2000
	P	5.64	4.02	5.33	*	44069	47052	44323	45096
Rice	A	0.93	1.46	0.67	*	41137	40774	38319	41500
	Y	1.68	1.92	1.87	*	2330	2220	2210	2530
	P	2.32	3.32	2.56	*	95747	90633	84608	105011

Source: trends estimated, area, yield and production from World Crop and Livestock Statistics(1948-1985), FAO. and USDA publications (various issues).

However, a disaggregated analysis shows that during the period prior to the green revolution, the growth rate was 3.41 per cent compared to 1.30 per cent for the period 1968-1988. Increased groundnut production has been achieved through acreage increases. Rapeseed is grown in India during the Rabi (winter) season. Approximately 25 percent is grown under irrigation. This results from the fact that rapeseed is grown as a mixed crop with wheat and thus benefits from irrigation and other inputs applied to wheat. The growth rate shows that production during 1951-1988 increased at 3.59 per cent per annum. This was achieved because of increases in both area and yield at 1.73 and 1.75 per cent per annum respectively. Production increased at 4.23 per cent per annum for the 1968-88 period. The yield growth rate at 2.18 per cent was up sharply from the earlier period.

Safflower, though not an important crop has had a production growth rate of 6.62 per cent per annum. It's growth has been much greater in the post green revolution period. Sesame seed production has registered an overall growth rate of only 0.49 per cent per annum. Production actually declined by -1.35 per cent in 1951-65; it increased by 1.36 per cent in the 1968-88 period. Soybeans and sunflowers are new oilseed crops in India. Soybeans which tend to dominate the world oilseed market has yet to make a significant impact on the Indian oilseed economy. Both these crops have registered significant increases in production, however yields have actually declined over the 1975-88 period, therefore the production increases of 15.81 percent for soybeans and 18.17 per cent for sunflower has come mainly from increased acreage.

Wheat and rice the two major food grain crops, registered a positive growth especially during the post green revolution period. As a result India has become self sufficient in cereal grains. Compared to wheat, the growth rate of rice has been slow. In the edible oil/oilseed sector it is seen that India has become a major net importer of edible oils, (Table 2). It is thus important to estimate future demand and supply of oilseeds and edible oils.

Table 2. Production, consumption and trade in edible oils.
('000 tonnes)

Year	1975	1980	1985	1990
Production	3575	3620	4466	5909
Consumption	3746	5003	5639	6776
Imports	260	1413	1206	957

The domestic consumption is expected to increase because of increasing population and a potential increase in per capita income. With an estimated income elasticity of 1.73 and income projected to increase at 1.70 per cent per year, the per capita consumption of fats and oils is estimated to increase to over 9.80 kg. per annum by 1995, Furtan "et al"(1989). This is based on the 1985 per capita per annum consumption of edible fats and oils of 6.62 kg. Total consumption is projected to increase to 10.3 million tonnes by 2000 and 12.9 million tonnes by 2005. The per capita per annum consumption for the two years is projected at 10.23 kg. and 11.82 kg., (Table 3).

Table 3. Future demand of edible fats and oils in India.

Year	Population (in millions)*	per capita projected consumption (kg.)	consumption (in million tonnes)
1995	930	9.82	9.161
2000	1010	10.23	10.332
2005	1091	11.82	12.895

* Source: Asia Region Population Projection 1989-90 edition, World Bank.

The future production based on the estimated linear trend coefficients suggest a widening gap between demand and supply, (Table 4). The estimates, are based on the fact that there will be no significant changes in current policies.

Table 4. Actual and projected production, consumption and trade of oilseeds, fats and oils and oilseed meal ('000 tonnes).

	Actual				Forecast		
	1975	1980	1985	1990	1995	2000	2005
<u>Production</u>							
Major oilseeds	12993	11943	14552	17976	20279	22582	24884
Major veg.oils	3007	2985	3731	4741	5438	6135	6832
Fats and oils	3575	3620	4466	5909	6539	7385	8231
Major oil meal	4502	4105	4825	5067	5310	5554	5797
Rapeseed	1936	2002	2680	3698	4474	5251	6028
Rapeseed oil	598	601	870	1143	1381	1619	1857
<u>Consumption</u>							
Edible veg.oil	2904	3865	4450	5713	6558	7404	8250
Fats and oils	3746	5003	5639	6776	9161	10332	12895
Rapeseed oil	634	745	1020	1370	1644	1918	2192
Oil meal	4502	4105	4264	4805	5346	5887	6428
<u>Imports</u>							
Veg.oils	232	1293	1204	972	1120	1269	1418
Fats and oils	260	1413	1206	957	2622	2947	4664
Rapeseed oil	36	124	150	227	263	299	335

However, adjustment in the production estimates are needed for the fact that production will not increase as it did in the past. This is noticeable, especially in the food grain sector where total production has levelled off at the peak in recent years. The consumption forecasts are based on per capita income and consumption, used on the population projections. The difference between demand and supply is assumed to be met with imports.

OILSEED SECTOR POLICY

Government intervention in agriculture takes place in the form of various policies and programs that affect producers and consumers. One form of policies are subsidy measures undertaken by the government to help producers include direct payments to producers of a commodity. Indirectly producers are subsidised through lower prices for fertilizer, irrigation water and credit. All these measures cause the short run supply curve, *S*, to shift

to the right at each output price combination. This results because subsidised prices lower the marginal cost of the inputs to producers. The new supply curve is shown as S' , (Figure 1). Both domestic and international markets have been shown assuming a small importing nation. The shift of the supply curve denotes the amount of the subsidy, (s). This causes India's excess demand curve to shift inward from ED to ED' shown in the international market panel. As a result imports decline from AC to BC at the international price P_1 . The per unit return to domestic producers including the subsidy, increases from p_1 to p_2 . These higher returns could create a diversion of variable inputs to the subsidised sector increasing its output while reducing output in the non subsidised sector.

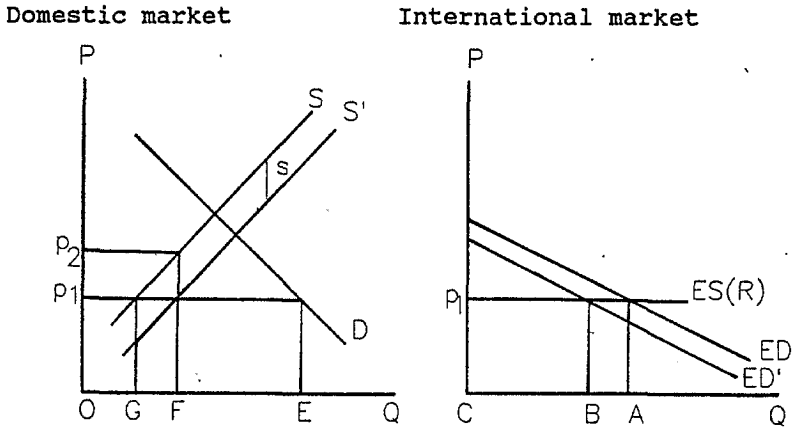


Fig 1. Illustration of the effect of a production subsidy

The extent of the intervention in the oilseed sector is determined, using empirical estimates of the PSE and the CSE. This measurement methodology has been a major step in understanding how policies and programs affect agriculture. These measures allow direct comparison of a broad range of policies (OECD, 1987). PSE and CSE measure the level of subsidy that would be necessary for the removal of government programs affecting a particular commodity. Figure 2, shows the PSE and CSE levels for selected commodities for the year 1987.

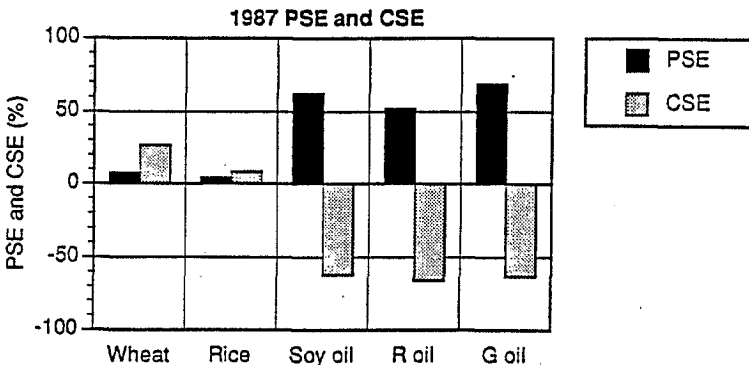


Fig.2 PSE and CSE levels of selected commodities in 1987.

All three edible oils show a positive rate of government assistance to producers. The assistance is highest for groundnut, being nearly 63 per cent. Consumers of edible oils on the other hand are taxed. The figure shows negative rates of assistance for edible oils. The two major food grains, however, enjoy positive rates of assistance for both producers and consumers. However, the level of assistance to cereal grain producers is lower than that for producers of edible oils.

The estimated NPC's indicate that oilseeds, in general have been protected, while wheat and rice crops have been taxed (Table 5). The NPC's for selected commodities show that edible oils have a higher degree of protection than oilseeds and food grains. It thus seems that over the years, the policy has been to tax the food grain sector and thus divert the resources which could have been more efficiently used.

Table 5. NPC's of major oilseeds, oils and food grains

Commodity	1982	1983	1984	1985	1986	1987	Mean
Rapeseed	1.25	1.33	1.19	0.91	1.17	2.04	1.31
Rapeseed oil	2.78	2.66	2.33	1.64	1.62	3.17	2.46
Soybean	0.98	1.01	0.78	0.84	0.90	1.34	0.97
Soybean oil	1.91	2.03	1.24	1.22	2.40	2.68	1.91
Groundnut	1.14	1.47	1.46	1.27	0.98	0.80	1.19
Groundnut oil	2.12	2.63	1.48	1.38	2.24	3.26	2.18
Wheat	0.72	0.78	0.70	0.61	0.69	0.82	0.72
Rice	0.74	0.86	0.93	0.77	0.89	0.93	0.85

Source: Estimated.

With an already existing infrastructure and success of the green revolution in cereal grains, increased cereal production could be used to earn foreign exchange for the imports of oilseeds and oils and be better off on the basis of comparative advantage. The use of the NPC alone however is not sufficient to determine the appropriate policy. However, the coefficients are indicators as to where the incentives lie. An earlier study using NPC, Effective Protection Coefficient (EPC) and Effective Subsidy Coefficients (ESC) for groundnut, wheat, rice and cotton has concluded that in general oilseeds have been protected, Gulati "et al" (1990).

CONCLUSION

Oilseed and edible oil production has not kept pace with demand resulting in increasing imports. Government policy has been to provide protection for producers and tax consumers in an attempt to become self sufficient. However oilseed productivity has not kept pace with grains. The increase in oilseed production has been through acreage increases. Unless oilseed productivity can be increased it would mean that India might be better off to focus on cereal grain production, exporting grains and importing oilseeds and vegetable oils. This however requires further investigation.

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