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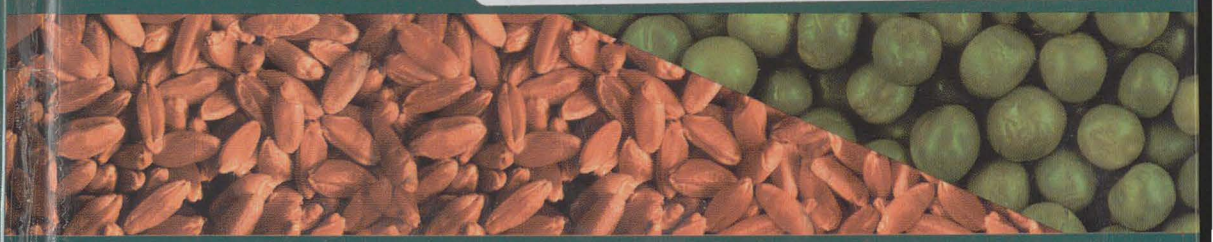

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Trade Liberalisation, Agricultural Prices and Net Social Welfare in India

Ramesh Chand

During the last decade India has undertaken several policy changes towards liberalisation of agricultural trade as a part of broad economic reforms programme initiated in the year 1991, and to meet its commitments as a WTO member – country. The changes involve removal of quantitative restrictions on imports and exports and gradual reduction in peak tariff rates. As a consequence of these changes, volume of agricultural exports and imports has risen sharply. Share of agricultural trade in agricultural GDP has increased from about 6 percent before liberalisation to about 9 percent in recent years. While domestic market is getting integrated with global market at a fast rate some important concerns are being raised about the impact of free trade in agriculture on different sections of society, different regions of the country, price stability, vulnerability of small and marginal farmers to price shocks, and long-term output growth. The present study is an attempt to address some of such concerns. It examines the trade flows and estimates the impact of freeing trade on domestic prices as well as on producers, consumers and net social welfare in the case of major crops grown in the country. It demonstrates the pitfalls in using international prices to indicate opportunity for import and export. The study examines the regional gains and losses from trade liberalisation. Global price trends and instability in international and domestic prices have been studied for the past fifty years. The findings have been used to suggest trade policy and strategy for specific commodities and for the agricultural sector as a whole.

The paper is organised into five sections. Trade flows, prices received for export and prices paid for imports, international and domestic prices during the last ten years are discussed in the first section. Impact of trade liberalisation on wholesale and farm level prices is presented in the second section. The third section quantifies the likely impact of changes in domestic prices induced by free trade on producer surplus, consumer surplus and net social gain. The benefits and losses that would accrue to different states from trade liberalisation are also discussed in this section.

Instability in domestic and global prices is examined in the fourth section. Main conclusions and policy implications are contained in the last section.

Trade Flows and Prices

In this section, trends in export and import, prices paid for imports and prices received for exports, and domestic and international prices have been examined using data for the last ten years beginning from 1988-89. The analysis covers rice, wheat, maize and sorghum among cereals; pigeonpea among pulses; rapeseed/mustard and soybean among oilseeds; and sugar among other crops.

Rice Trade and Prices

Rice trade during the last ten years has witnessed tremendous change in its composition, particularly after the year 1994-95, which happens to be the year when WTO came into being. Traditionally, India used to export basmati rice; however, since 1995-96, export of non-basmati rice dominated the rice trade. During the late eighties, non-basmati export constituted less than 2 percent of total rice export, and during the recent triennium its share has risen above 80 percent of total quantity of rice export. The second important development in rice trade is that during the late eighties, India was net importer of rice, whereas, since 1990-91 imports have dwindled almost to nil.

Table 1 *Trade flow and international and domestic prices of rice in India*

Year	*Export (000 tons)*			*International price (Rs/ton) 5% broken*	*FOB price (Rs/ton) excepting parboiled*	*Domestic price (Rs/ton) (Delhi)*	*NPC* (P_d/P_b)
	Basmati	*Non-basmati*	*Total*				
1988-89	314	36	350	4359	5480	3918	0.715
1989-90	384	38	422	5328	5737	4108	0.716
1990-91	232	273	505	5150	6018	4813	0.800
1991-92	267	411	678	7695	6232	5429	0.871
1992-93	325	255	580	8809	6704	6050	0.902
1993-94	527	240	767	7384	9460	6742	0.713
1994-95	442	449	891	8402	7390	6929	0.938
1995-96	373	4541	4914	10731	8241	7200	0.874
1996-97	523	1989	2512	12031	9872	8240	0.835
1997-98	593	1797	2389	11280	9712	8650	0.891
1998-99	597	4364	4961	12264	10254	9398	0.917

Sources: 1. Monthly Statistics of Foreign Trade of India, Volume I and II, Annual Number, DGCIS, Ministry of Commerce, various issues.
2. Agricultural Prices in India, Ministry of Agriculture.
3. Agricultural Situations in India, Ministry of Agriculture relevant issues.
4. Agricultural Statistics at a Glance, Ministry of Agriculture.
5. Reports of the Commission for Agricultural Costs and Prices.
6. Commodity Price Data, World Bank.

Export of non-basmati rice witnessed a boost in 1991-92, when India adjusted its exchange rate to reflect its real value, under the economic reform process initiated in June 1991. The big boost to the export of non-basmati rice was again witnessed in 1995-96 when it touched 4.5 million tonnes.

Rice, excepting parboiled, constituted major share in rice export. Accordingly, FOB price of this grade of rice was used to represent export price. The NPC under exportable hypothesis throughout remained below one, indicating that the country was getting higher price for export compared to the domestic price. The NPC varied between 0.71 and 0.93 (see Table 1). Though FOB export price was higher than domestic price in all the years, the country was not able to export rice at the price quoted in international market. A comparison of FOB price received by India with the FOB price at Bangkok port is presented in Table 1.

It is assumed that import from Indian ports and Bangkok port would involve same cost, and therefore, India should get the same price as Bangkok FOB price. However, since 1991-92, except one year, price received for Indian export was 14 to 23 percent lower than that in the international market. This is to show that for a country like India, actual export may not take place at the price prevailing in the international market.

Wheat Trade and Prices

Wheat trade and prices in domestic and international markets during the last decade are presented in Table 2. The trade in wheat shows year to year fluctuations. In some years the country exported huge quantity while in others it had to go for massive imports. Import of wheat till sometime back was canalised whereas export was allowed through private agencies subject to quantitative restrictions and minimum export price. Both export and import consist of durum wheat, wheat seed, other wheat (not for seed consumption) and wheat flour.

Table 2 *Trade flow and international and domestic prices of wheat in India*

Year	*Trade (000 ton)*		*International price (Rs/ton) US HRW*	*FOB price (Rs/ton)*	*CIF price Rs/ton*	*Domestic price (Rs./ton) (Hapur)*	*NPC (P_d/P_b)*
	Export	*Import*					
1987-88	254	21	1448	1328	4188	2010	1.514
1988-89	16	1792	2086	1840	2390	2383	1.295
1989-90	12	33	2758	1819		2120	1.165
1990-91	139	63	2391	1842	3557	2860	1.553
1991-92	658		3086	2190		3400	1.553
1992-93	37	1364	4444	2778	5203	3340	1.202
1993-94	0.39	242	4397	5293	5203	3740	0.707
1994-95	87	0.54	4700	4887	7102	4040	0.827
1995-96	1091	8	5920	5736	12611	4060	0.708
1996-97	1848	613	7369	6068	6590	5710	0.941
1997-98	22	1486	5927	-	6656	5230	
1998-99	1.75	1804	5090	-	6458	7270	

Source: Same as in Table 1.

The trend in export and import of wheat reveals a very interesting pattern. One or two years of good harvest resulted into piling up of wheat stock, which led the country to go for large exports. This was immediately followed by huge imports. For instance, India exported 2.5 lakh tonnes of wheat during 1987-88, and in the following year it had to resort to huge imports to the tune of 18 lakh tonnes. Again, the country exported 6.6 lakh tonnes of wheat during 1991-92 which was followed by import of 13.6 lakh tonnes during 1992-93. Similarly, for the third time during the last ten years, when the country exported 10 lakh tonnes of wheat during 1995-96 and 18 lakh tonnes during 1996-97 it had to go for import of 15 lakh tonnes during 1997-98.

It is inferred from the data on import and export presented in Table 2 that wheat exports exceeding half percent of domestic production led to massive imports in the immediate succeeding year. From this, it appears that export surpluses of wheat were of very transitory nature and their disposal (export) necessitated huge imports, presumably to stabilise domestic price as well as to meet domestic requirement.

We have further examined whether large imports of wheat in some years were necessitated by poor harvest or by the export in the previous year. In order to do so, following equation was estimated for the period 1988-89 to 1997-98:

$$\text{Wheat import in year } t = b_0 + b_1(\text{wheat export in year t-1}) + b_2(\text{wheat output in year t-1})$$

The estimated relationship turned out to be like this:

$$\text{Wheat import}_t = 4011.06 + 1.1782(\text{wheat export}_{t-1}) - 68.468(\text{wheat output}_{t-1})$$
$$t = (3.831) \qquad (2.524)$$

$R^2 = 0.6786$, $N = 10$

R^2 is statistically significant at 5 percent level while the coefficients of exports and output are significant at 1 and 5 percent level respectively.

The above equation shows that export was a significant factor in necessitating import of wheat. For every ton of wheat export, India had to import 1.17 tons of wheat in the following year, during the last decade. One can say that there is nothing wrong in exporting the produce when there is surplus production and to import when production is below normal. What matters in such cases is that benefits and costs are associated with this kind of trade. It would be observed from Table 3 that except for recent years when international wheat prices plummeted to a very low level, the country had to pay very high price differential for imports in the year succeeding large exports. Another disquieting aspect of India's wheat export has been the destabilising impact on domestic prices. This has been worked out by computing percent difference in wholesale price index (WPI) of wheat between farm harvest and subsequent pre-harvest period as under:

$$\text{Rate of price increase} = (\text{WPI January-March})_{t+1} - (\text{WPI April-June})_t)/(\text{WPI April-June})_t$$

Table 3 shows that wheat export during 1987-88 led to 36 percent price increase in nine months time. The rate of increase in 1988-89 and 1989-90 was 6.8 and (–)0.78 percent when export was below 16 thousand tons. Again, exporting wheat to the tune of 139 and 658 thousand tons during 1990-91 and 1991-92 caused more than 36 percent increase in wheat price. And, when India went for export in 1996-97 again

prices shot up by 35 percent. These results demonstrate that export led to strong inflationary pressure on domestic prices.

Table 3 *Price differential paid by India between successive export and import and impact of export on domestic prices of wheat*

Year	*Export (000 ton)*	*Import in next year (000 ton)*	*Price differential (Rs/ton)*	*Difference over FOB price (%)*	*Off season increase in price (%)*
1987-88	254	1792	1062	79.97	35.65
1988-89	16	33	NA	NA	6.80
1989-90	12	63	1738	95.54	-0.78
1990-91	139	0	NA	NA	36.95
1991-92	658	1364	3013	137.58	41.23
1992-93	37	242	2425	87.29	5.71
1993-94	0.39	0.54	1809	37.18	16.98
1994-95	87	8	7724	158.05	4.67
1995-96	1091	613	854	14.89	5.97
1996-97	1848	1486	588	9.69	35.29
1997-98	22	1804			8.62

Source: Same as in Table 1.

Domestic, International and Actual Trade Prices

The FOB and CIF prices referred in this paper allude to the price of "other wheat" (not seed consumption) while the international price speaks of USHRW–2 wheat at US gulf (FOB). This makes comparison of FOB India with FOB USA meaningful because most wheat-importing countries are located at about same distance from the two countries. Price received by India for wheat export was always lower than the price in international market whenever exports exceeded one lakh tons. Ratio of FOB price received to international price reveals that except for the years 1993-94 and 1994-95, which were not important from export volume point of view, India received 3 to 34 percent lower price than the international price. Till 1992-93 prices realised in export were 16 to 55 percent lower than the domestic price.

In the light of strong positive association between export and import of wheat, it would be worthwhile to look at the difference between prices received for exports and prices paid for imports with one year lag. While export exceeded half percent of domestic production during 1987-88, 1991-92, 1995-96 and 1996-97, the import price in the years following above years exceeded FOB price by about 80 percent during 1988-89, 138 percent during 1992-93, 15 percent during 1996-97 and 10 percent during 1997-98 (Table 3). The data also show that exporting in one year and importing in the following year cost the country Rs. 1,062 per ton during 1988-89, Rs. 3,013 during 1992-93 and Rs. 854 during 1996-97. The difference between export price of 1996-97 and import price of 1997-98 was Rs. 588, which is quite low because

wheat price in international market was quite low. There could be two approaches to dispose of surplus in one year and to meet the deficiency in the following year. One approach is through export and import and the other approach is to carry stock to the next year. The cost of the two needs to be weighed with each other to find the policy beneficial to the country. The figures for the latest two years reveal that in case carrying the stock to next year caused more than Rs. 721 per ton, it would be worthwhile to stabilise domestic supply through trade.

Nominal protection coefficient of wheat under exportable hypothesis exceeded one till 1992-93, after which it remained below one indicating that the border price was higher than domestic price during the recent years. Nominal protection coefficient under importable hypothesis was throughout less than one indicating that price paid for imports was higher than the domestic price. This also shows that imports were resorted to face a kind of distress rather than to take advantage of lower international prices.

Maize Trade and Price

Export of maize was almost negligible till 1992-93. During 1993-94 to 1996-97 maize export varied between 19 and 55 thousand tons (Table 4). India imported more than 80 thousand tons of maize between 1988-89 and 1989-90, after which the import of maize almost vanished. During the period from 1993-94 to 1996-97, when maize exports were significant, the country realised attractive price which was higher than the international price of maize.

Table 4 *Trade flow and international and domestic prices of sorghum and maize in India*

(Price: Rs/ton)

Year	*Export (000 ton)*		*Import (000 ton)*		*International price*		*FOB price*		*Domestic price*	
	Sorghum	*Maize*	*Sorghum*	*Maize*	*Sorghum*	*Maize*	*Sorghum*	*Maize*	*Sorghum (Nagpur)*	*Maize (Kanpur)*
1988-89	3.0	0.02	0.11	81.00	1433	1549	3287	1758	2017	2282
1989-90	2.0			95.00	1764	1864	3375		2183	1983
1990-91	4.0		0.21	0.01	1866	1955	3954		1760	2129
1991-92	7.0				2572	2628	4054		2771	3404
1992-93	5.0	0.42			3150	3193	6583	5484	3505	2425
1993-94	72.0	27.00			3105	3202	2312	3612	2274	2983
1994-95	58.0	19.00			3262	3378	2640	4302	3287	3964
1995-96	3.0	19.00		0.01	3980	4131	6165	5498	4283	3846
1996-97	7.0	55.00			5325	5885	6910	6281	4515	4692
1997-98	4.8	1.60			4073	4352	8011	7851	3783	4491
1998-99	1.2	2.04		1.44	3934	4102	9272	8125	5250	4800

Source: Same as in Table 1.

Sorghum Trade and Prices

Sorghum export varied between 2 and 7 thousand tons during the last ten years, except 1993-94 and 1994-95 when it reached the levels of 72 and 58 thousand tons, respectively (Table 4). As long as the country exported small quantity of sorghum, its FOB price was higher than the price in international market. However, during the period between 1993-94 and 1994-95, when India exported substantial quantity of sorghum, its FOB price realised by the country turned out to be 20 to 26 percent lower than the price quoted in international market.

Pigeonpea Trade and Prices

There is chronic shortage of pulses in India, which is met through imports. Imports of pigeonpea (*tur*) have sharply increased from a modest level of 2,000 tons in late eightees to 21,000 tons in the beginning of nineties. By mid-nineties the level of import exceeded 80,000 tons and peaked to 1.72 lakh tons during 1997-98 (Table 5). Stagnation in domestic production necessitated the increase in imports.

Table 5 *Trade flow and international and domestic prices of pigeonpea in India*

Year	*Import (000 tons)*		*CIF price (Rs/ton)*	*Domestic price (Rs/ton)*	*Production (000 ton)*	
	Pigeonpea	*All pulses*	*Pigeonpea*	*(Aurangabad)*	*Pigoenpea*	*All pulses*
1988-89	2	756	6659	6122	2720	13850
1989-90	2	470	5518	6599	2750	12860
1990-91	21	1273	6228	8497	2410	14260
1991-92	12	313	8706	10278	2130	12020
1992-93	69	383	9376	9350	2330	12820
1993-94	126	628	8060	9691	2690	13300
1994-95	80	554	10665	11542	2140	14040
1995-96	82	486	16035	16144	2310	12310
1996-97	139	692	14415	17075	2660	14250
1997-98	172	1084	10676	16580	1950	12980
1998-99	59	629	15395	16808	2800	14810

Source: Same as in Table 1.

Rapeseed/Mustard Oil Trade and Prices

India had launched several technological and price intervention initiatives since mid-eightes to attain self-sufficiency in edible oils. These efforts helped to contain import below half million tons from 1989-90 to 1994-95. Heavy dependence on imports has re-emerged after that which has raised level of edible oil imports to more than 2 million tons by 1998-99.

Palm oil and soyabean oil constitute substantial share of edible oil imports though in some years India imported huge quantity of rapeseed/mustard oil also.

India imported large amount of rapeseed/mustard oil in 1998-99 of the order of 2.27 lakh tons (Table 6). During 1988-89 when country had to go for large import of edible oils due to drought in the country, domestic price of rapeseed/mustard oil was two-and-half times the CIF price paid for its import. During the same year, CIF price paid by the country was 25 percent higher than the international. During 1998-99, when India again went for large import, CIF price paid for import turns out to be 17 percent higher than the international price. The normal difference between CIF price paid by India and the international price should be around 10 percent to take into account cost of freight, insurance and handling.[1] These results show that there is a decline in excess of price paid for import over international price which could be due to relatively higher efficiency of private sector, as the imports in 1988-89 were canalised through official agencies and during the latter year these were handled by private sector. However, the fact remains that India had to pay higher price for import than the price corresponding to international market.

Table 6 *Trade flow and international and domestic prices of rapeseed/mustard oil in India*

Year	*Import 000 tons*		*CIF price (Rs/ton)*	*International price (Rs/ton)*	*Domestic price (Kanpur)*	*Domestic production*	
	Rapeseed/ mustard oil	*All edible oils*				*Rapeseed/ mustard oil*	*All edible oils*
1988-89	186.00	1083	7479	5961	19280	1456	4980
1989-90	2.00	324	15090	6915	17029	1370	4811
1990-91	3.00	525	10117	7589	23671	1600	4877
1991-92	3.30	226	22701	10022	29461	1793	5022
1992-93	0.48	103	27153	11277	25773	1470	5247
1993-94	1.10	114	17542	15570	27000	1630	5397
1994-95	2.00	347	29231	18226	28221	1761	5531
1995-96	22.24	1062	22611	20504	32178	1835	5611
1996-97	0.79	1416	38658	19702	30660	2037	6170
1997-98	5.69	1265	24467	20998	31987	1441	5280
1998-99	227.65	2378	29146	24813	51146		

Source: Same as in Table 1.

Soybean Oil Trade and Prices

After palm oil, import of soybean oil constitutes highest share in the total import of edible oils. Import reached a level of 101 thousand tons in 1995-96 and 439 million tons in 1998-99. In the following years import varied between 22 and 62 thousand tons (Table 7).

Domestic prices of soybean oil consistently remained higher than international prices indicating the attractiveness for imports. As has been the case with rapeseed/mustard oil, India paid much higher price for import of soybean oil than that corresponding to international price. In some years, it was as high as two times the CIF price corresponding to international price. The excess price paid for import has declined to 5 percent in 1998-99.

Table 7 *Trade flow and international and domestic prices of soybean oil in India*

Year	Import (000 tons)		CIF price (Rs/ton)	International price	CIF price paid in excess of international price and 10 % CIF cost on international price	Domestic price (Rs/ton) (Madhya Pradesh)	Domestic production of soybean oil
	Soybean oil	All edible oils					
1988-89	32.12	1083	13255	6705	88		139
1989-90	29.45	324	13241	7192	74		162
1990-91	21.61	525	23085	8021	178		234
1991-92	22.00	226	23060	10874	102	36067	305
1992-93	62.00	103	18302	12330	38	30386	427
1993-94	29.00	114	21788	14172	44	29909	354
1994-95	39.00	347	23826	17534	26	29432	459
1995-96	101.00	1062	22905	17538	21	34739	468
1996-97	21.00	1416	23830	17175	29	31480	538
1997-98	46.00	1265	27381	19398	31	30700	6530
1998-99	438.90	2378	28453	24813	5		

Source: Same as in Table 1.

Sugar Trade and Prices

Sugar used to be an important export commodity from India. However, its domestic demand has risen at a very sharp rate and its production has been following violent fluctuations. Consequently, export of sugar also follows a sort of cyclical pattern. Due to stagnant production in the recent years and mismanagement of supply, India had to go for huge imports in four out of the five recent years (Table 8).

Table 8 *Trade flow and international and domestic prices of sugar in India*

Year	Trade (000 tons)		International price (Rs/ton)	FOB price (Rs/ton)	CIF Price (Rs/ton)	Domestic price (Rs/ton) (Hapur)
	Export	Import				
1988-89	7.00	0.32	3258	6928		6574
1989-90	31.00	134.00	4695	8477	4642	8285
1990-91	27.00	12.00	4970	8497		8856
1991-92	176.00	3.00	4846	7218	2079	9211
1992-93	394.00		6130	8378		11437
1993-94	167.00	0.45	6932	8338	16975	12257
1994-95	49.00	1781.00	8383	10506	12751	13121
1995-96	278.00	151.00	9801	12897	14346	13129
1996-97	653.00	2.00	9336	12944	14945	14556
1997-98	171.71	346.89	7359	12810	13551	15904
1998-99	4.83	900.07		13370	12516	14948

Source: Same as in Table 1.

Due to wide variation in its grades it is difficult to have a meaningful comparison of sugar prices. Some important inferences that emerge from the data on quantity and prices of import and export of sugar are: (1) during the recent years, when India had to go for import of sugar, it had to pay 31 to 84 percent higher price than the annual price reported in international market; and (2) price paid for imported sugar in some years was higher and in some years lower than the domestic price.

Impact of Trade Liberalisation on Prices

The impact of trade liberalisation has been studied under two scenarios. In the first scenario, domestic prices are equated to actual FOB prices received for export for exportables and to CIF prices paid for import under importables. This implies that domestic market is integrated with the global market and domestic prices would be same as the prices for country's produce in the international market. Similarly, for importables, domestic prices are expected to be same as those at which the produce is purchased from other countries. In the second scenario, domestic prices are adjusted to appropriate international prices. For instance, domestic producers are paid international prices and the consumers are also supposed to pay the international prices suitably adjusted to border price.

Trade liberalisation was assumed to first affect domestic wholesale prices, and then to farm level prices. The change induced in farm level price by the change in wholesale price, resulting out of trade liberalisation, has been estimated using price linkage equation.

Table 9 *Impact of free trade on domestic wholesale prices of cereals under exportable hypothesis*

	Particulars	*Rice*		*Wheat*		*Maize*		*Sorghum*	
		Sc. I	*Sc. II*	*Sc. I*	*Sc. II*	*Sc. I*	*Sc. II*	*Sc. I*	*Sc. II*
1.	Domestic price in representative market#	8030	8030	5000	5000	4343	4343	4194	4194
2.	Handling/marketing charges @ 5% of domestic price	402	402	250	250	217	217	210	210
3.	Transportation cost to port	649	649	649	649	649	649	325	325
4.	Reference price (1+2+3)	9081	9081	5899	5899	5209	5209	4728	4729
5.	FOB price at port	9275	11344	5902	6405	6543	4789	7029	4459
6.	NPC (4/5)	0.979	0.801	0.999	0.921	0.796	1.088	0.673	1.060
7.	Domestic price under free trade (5-2-3)	8224	10293	5003	5506	5677	4343	6494	4194
8.	Change in domestic price under free trade % [(7-1)/1*100]	2.42	28.18	0.06	10.13	30.71	0.00	54.86	0.00
9.	Farm level price of paddy	4427	4427	4278	4278	3859	3859	3913	3913
10.	Farm price under free trade [9+9*(8/100)*ET]	4539	5732	4280	4713	5080	3859	6024	3913
11.	Change in farm price % [(10-9)/9*100]	2.53	29.47	0.06	10.16	31.63	0.00	53.93	0.00

Notes: # Representative markets are Delhi for rice, Hapur for wheat, Kanpur for maize and Nagpur for sorghum.
Scenario I assumes free trade in which domestic prices are equaliberated to actual FOB price.
Scenario II assumes free trade in which domestic prices are equaliberated to prices in international market.

The impact of free trade would depend upon the level of domestic and international prices. Since the ratio of domestic to international prices keeps varying, the impact of free trade would also vary accordingly. In this section, we present the impact of free trade based on price scenario of triennium ending 1997-98.

The impact of free trade on prices of exportables like rice/paddy, wheat, maize and sorghum is presented in Table 9. When domestic cost of taking produce from surplus area to port is reckoned, the NPC turns out to be 0.975. However, if Indian rice export fetches same price as Thai rice, the NPC becomes 0.801. When rice trade is liberalised, the domestic price of rice is increased by 2.42 percent at existing FOB price. If country export at international price, the domestic price would increase by 29 percent. Corresponding to these changes the farm level price is increased by 2.5 percent and 29.5 percent under the two scenarios respectively.

Price fetched by wheat export was marginally higher than the reference price of exportable wheat; the NPC was 0.999. However, in the second scenario, if the country could sell its produce at the international price, then it could get about 9 percent higher price over domestic reference price. As almost entire difference between the price realised for export and the domestic price is covered by the internal cost to take wheat from market in producing area to port, liberalisation as such is not found to have noticeable impact on domestic prices. In case the country gets international prices for its wheat exports, the trade liberalisation would raise domestic prices by about one-tenth of their existing level.

Table 10 *Impact of free trade on domestic wholesale prices of edible oil/oilseed and pigeonpea under importable scenario*

	Particulars	*Pigeonpea*	*Rapesseed/mustard*		*Soybean*	
		Sc. I	*Sc. I*	*Sc. II*	*Sc. I*	*Sc. II*
1.	CIF price at port	13709	23418	21587	24705	19841
2.	Handling/marketing charges @ 5% of domestic price	685	1171	1171	1235	932
3.	Transportation cost to domestic market	325	783	783	392	392
4.	Reference price (1+2+3)	14719	25372	23541	26332	21165
5.	Price in domestic market	16600	31608	31608	32306	32306
6.	NPC (5/4)	1.128	1.246	1.343	1.227	1.526
7.	Domestic price under free trade	14719	25372	23541	26332	21165
8.	Change in domestic price under free trade % [(7-5)/5*100]	-12.78	-19.73	-25.52	-18.49	-34.49
9.	Farm level price	16535	11193	11193	8976	8976
10.	Farm price under free trade [9+9*(8/100)*ET]	13979	9250	8679	8345	7800
11.	Change in farm price % [(10 - 9)/9*100]	-15.46	-17.36	-22.46	-7.03	-13.10

In the case of maize and sorghum, the domestic reference prices after adding domestic cost to move produce to port, turn out to be higher than the international

prices. However, India was able to export small quantity of maize and sorghum at a price much higher than at the international level. Pushing export further and free trade would push India's export price close to international market which would not leave much room for export. Thus, free trade would not have much impact on domestic prices of coarse cereals.

The impact of liberalised trade on prices of importables, namely, pigeonpea, rapeseed/mustard oil and soybean oil is presented in Table 10. Free trade in pigeonpea results in 13 percent decrease in wholesale prices and 15.5 percent decrease in farm level prices. The impact on price of rapeseed/mustard refers to price of its oil at wholesale level and to price of rapeseed/mustard seed at farm level. When transport and the other costs involved in taking produce from port to reference market (Kanpur) are added, the price of imported oil turns out to be about 20 percent lower than the domestic market. In the second scenario, if country freely imports rapeseed/mustard oil at the prices prevailing in international market, the domestic prices of oil would be brought down by 25.5 percent and prices of rapeseed/mustard seed go down by 22.5 percent.

The impact of liberalisation on soybean seed price is quite small compared to the impact on its oil due to low elasticity of transmission from wholesale oil price to farm level seed price.

Trade Liberalisation and Social Welfare

Simple welfare analysis was employed to analyse the effect of trade liberalisation on selected commodities. The analysis required the elasticity of demand and supply of the selected commodities along with their elasticity of price transmission between wholesale and farm level prices. The demand and supply elasticities used in the analysis are presented in Table 11.

Table 11 *Estimates of own price elasticity of demand and supply used in the study*

Crop	*Demand Elasticity*	*Supply Elasticity*
Rice	-0.481	0.32
Wheat	-0.607	0.43
Maize	-0.582	0.12
Sorghum	-0.582	0.12
Rapeseed-mustard	-0.499	0.33
Soybean	-0.499	0.33
Pigeonpea	-1.104	0.24

Notes: 1. Demand elasticity are taken from Radhakrishan and Ravi(1992) for rural and urban population. Elasicity for pooled population was taken as weighted average using population weight.

2. Supply elasicities are chosen from the set of elasticities prepared by Gulati and Kelly (1994: 148) based on survey of the literature. The study has grouped elasticity estimates in low, medium and high categories. We have used estimates in medium category are used.

The impact of free trade on producer surplus, consumer surplus and net social gain is exhibited in Table 12. When domestic commodity gets the same price at

which it is sold (exports) in the international market, producer surplus from rice/paddy production is increased by Rs. 13.5 billion. This causes consumer surplus to decline by Rs. 14.5 billion, leaving negative net social gain. The net social gain turns positive when the country gets international price for its export, which is about 22 percent higher than the price actually got.

Table 12 *Impact of free trade on consumer, producer and net social welfare*

(Unit: Rs. million)

Particulars	*Rice*	*Wheat*	*Mustard oil*	*Soybean oil*	*Pigeonpea*
Impact on producer surplus					
Scenario I	13552	132	-10928	-8627	-5795
Scenario II	164683	29240	-14017	-16085	
Impact on consumer surplus					
Scenario I	-14548	180	11771	3425	6803
Scenario II	-159122	29374	15437	6631	
Net social gain					
Scenario I	-996	-48	843	-5202	1009
Scenario II	5561	-134	1420	-9455	

Notes: Scenario I: Domestic prices equated to actual FOB/CIF prices.
Scenario II: Domestic prices equated to international prices.

The sensitivity analysis was performed to find out the breakeven level of FOB export price which would exactly balance the gain in producer surplus and loss in consumer surplus. It was found that if India could get 16 percent higher price than existing FOB price, the negative social gain from trade liberalisation would change to positive gain.

Free trade in wheat at the FOB export price of triennium ending 1997-98, would have very small impact on domestic prices and hence on producer and consumer surpluses. If trade liberalisation enables the country to get a higher net price for export, equivalent to the price in international market, there is very strong impact on producer surplus as well as consumer surplus resulting in small net social loss. The sensitivity analysis also shows that if India gets 9.6 percent higher price for its wheat export as compared to the FOB price of TE 1997-98, the net social gain would turn positive. However, the price is even higher than international price by 1 percent.

The impact of trade liberalisation on rapeseed/mustard is studied under importable hypothesis. In the first scenario, when domestic prices are depressed by import liberalisation to come in equilibrium with the actual CIF price, rapeseed/mustard producers suffer a loss of Rs. 10.93 billion due to decline in the price of rapeseed/mustard seed. On the other hand, decline in the price of rapeseed/mustard oil due to liberalisation increases consumer surplus by Rs.11.77 billion. This way, liberalisation of rapeseed/mustard oil import results in net social gain of Rs. 843 million. India has been importing rapeseed/mustard oil at a price which is about 8.5 percent higher compared to what would be the CIF price corresponding to international price. When domestic prices are adjusted downward

in accordance with the international price, the net social gain increases to Rs. 1.42 billion.

India imports soybean oil in sizeable quantity at a price which is about 80 percent of the domestic price. When the trade is liberalised and consumers pay CIF price plus cost of taking produce from port to central market, it increases consumer surplus by Rs. 3.42 billion. When the impact of decline in soybean oil price is linked to farm level price of soybean seed, the producer surplus declines by Rs. 3.68 billion. Thus, the liberalisation of import of soybean oil reduces net social welfare by Rs. 260 million. Further, if the import takes place at international prices of soybean, it would raise consumer surplus by Rs. 6.63 billion and reduce producer surplus by Rs. 6.80 billion. This scenario would decrease net social welfare by Rs. 170 million.

Domestic price of pigeonpea during triennium ending 1997-98 was about 13 percent higher than the CIF import price. When the import is totally freed and domestic wholesale market price is determined by CIF import price, the consumer pays less and the producer also gets lower price for their produce. This process results in decline in producer surplus by Rs. 5.8 billion and increase in consumer surplus by Rs. 6.8 billion. The net gain to society is Rs. 1 billion.

Statewise Impact of Trade Liberalisation

India is a big country and its agricultural production pattern as well as level of economic development varies considerably across states. Similarly, the consumption pattern also varies, for example, in some states rice is the main staple food while in others wheat is prominent food. Inview of varied crop pattern different states specialise in production of different crops. Therefore, the impact of trade liberalisation is bound to affect different states in different ways; for example, for crop groups like cereals, pulses and oilseeds, it has been estimated to have an idea of the impact on consumers, producers and net social welfare across states.

Rice and wheat are the most important cereals produced and consumed in India. Food security of the country is invariably equated to availability of these two cereals. The combined impact of trade liberalisation of rice and wheat, which brings domestic prices in equilibrium with international prices, is presented in Table 13 for the usual two scenarios and is estimated on per capita basis.

The analysis of the data reveals that punjab remains as the top beneficiary, followed by Haryana, while small positive gains also accrue to the states like Uttar Pradeh, West Bengal and Madhya Pradesh. All the remaining states, which constitute about 63 percent population of the country, would be net losers. Among the 12 loser states, 10 have per capita income lower than the national average.

The overall relationship between per capita income of a state during the recent triennium and net social gain was positive; it was 0.5306 under scenario I and 0.5464 in the second scenario. The correlation between impact of trade and NSDP agriculture per rural person was above 0.84 in both the scenarios. This shows that higher the per capita income of a state more is the gain from liberalisation of trade in wheat and rice. On the contrary, lower the per capita income of a state, higher is the loss due to liberalisation of rice and wheat trade.

Table 13 *Combined per person net social gain from liberalisation of rice and wheat*

State	Scenario I			Scenario II			Per capita income
	Producer surplus	Consumer surplus	Net gain	Producer surplus	Consumer surplus	Net gain	
Andhra Pradesh	21.54	-28.03	-6.48	261.85	-310.05	-48.21	8901
Assam	22.13	-29.58	-7.45	270.64	-330.79	-60.15	6461
Bihar	11.73	-19.03	-7.30	161.30	-243.50	-82.20	3819
Gujarat	3.37	-5.92	-2.55	54.37	-101.24	-46.87	12980
Haryana	20.08	-4.67	15.40	408.52	-105.52	303.00	13754
Himachal Pradesh	3.43	-10.94	-7.51	82.08	-159.38	-77.30	8332
J&K	9.63	-13.50	-3.87	135.08	-187.61	-52.53	6092
Karnataka	10.53	-17.56	-7.04	129.36	-198.48	-69.12	9109
Kerala	4.95	-23.86	-18.91	60.10	-265.64	-205.54	8970
Madhya Pradesh	13.82	-10.28	3.54	208.35	-155.72	52.63	6680
Maharashtra	4.74	-8.73	-3.99	62.52	-118.15	-55.63	15250
Orissa	27.21	-30.52	-3.31	330.74	-344.53	-13.79	5802
Punjab	55.28	-2.90	52.37	916.91	-80.29	836.62	16099
Rajasthan	0.75	-2.02	-1.28	58.21	-83.82	-25.61	7095
Tamilnadu	17.31	-25.87	-8.56	210.39	-287.29	-76.89	10180
Uttar Pradesh	11.77	-7.63	4.14	203.18	-134.33	68.85	5784
West Bengal	26.72	-23.17	3.55	328.87	-270.68	58.18	8248
All India	14.16	-15.54	-1.38	201.21	-199.16	2.05	10607

The state-wise impact of liberalisation of imports of edible oils and pulses has been estimated by taking rapeseed/mustard and pigeonpea as the representative crops of the respective crop group. That is by extending the impact on consumer and producer surpluses of these two crops to the output and consumption of total oilseeds/oils and pulses as complete information on the impact of trade liberalisation for each commodity in the group was not available.

Import liberalisation of edible oils is found to have worst impact on the producers in Gujarat, closely followed by Madhya Pradesh and Rajasthan. The impact would be high on the farmers of Haryana and moderate in Maharashtra, Karnataka, Tamil Nadu and Andhra Pradesh. Other states would be affected mildly (Table 14).

The impact on consumption side showed less variation. In terms of net social welfare, the highest loss would accrue to the states of Rajasthan and Madhya Pradesh and moderate loss to the states of Haryana and Gujarat. The impact would be quite small on Tamil Nadu and Andhra Pradesh. All other states would benefit from liberalisation of edible oil import. The state-wise net social welfare did not show significant association with per capita income of a state as the simple correlation was (-) 0.14 in both the scenarios.

Table 14 *Net social gain from liberalisation of trade in edible oils*

(Rs. per capita)

State	Scenario I			Scenario II			Per capita income TE 96/97
	Producer surplus	Consumer surplus	Net gain	Producer surplus	Consumer surplus	Net gain	
Andhra Pradesh	-59.66	58.43	-1.23	-76.53	76.62	0.10	8901
Assam	-11.82	54.54	42.71	-15.16	71.52	56.36	6461
Bihar	-2.91	51.76	48.85	-3.74	67.88	64.15	3819
Gujarat	-155.42	111.72	-43.70	-199.34	146.51	-52.83	12980
Haryana	-99.33	53.74	-45.59	-127.40	70.47	-56.93	13754
Himachal Pradesh	-2.93	73.23	70.29	-3.76	96.03	92.27	8332
J&K	-10.06	73.35	63.29	-12.90	96.20	83.29	6092
Karnataka	-65.81	50.36	-15.45	-84.41	66.04	-18.37	9109
Kerala	-0.72	40.63	39.91	-0.92	53.28	52.36	8970
Madhya Pradesh	-127.44	63.79	-63.66	-163.47	83.65	-79.82	6680
Maharashtra	-49.97	87.35	37.38	-64.10	114.56	50.46	15250
Orissa	-10.23	44.52	34.29	-13.12	58.39	45.27	5802
Punjab	-18.20	72.49	54.29	-23.34	95.07	71.72	16099
Rajasthan	-122.02	59.61	-62.42	-156.52	78.17	-78.34	7095
Tamilnadu	-45.90	50.20	4.30	-58.88	65.83	6.95	10180
Uttar Pradesh	-11.91	50.36	38.45	-15.27	66.04	50.77	5784
West Bengal	-9.44	56.83	47.39	-12.11	74.53	62.43	8248
All India							10607

Free import of pulses would cause per capita loss of Rs. 109 to producers in Madhya Pradesh and Rs. 84 in Rajasthan (Table 15). Per capita gain in consumer surplus ranged between Rs. 14.54 in Kerala and Rs. 36.66 in Himachal Pradesh. In terms of net social welfare Rajasthan and Madhya Pradesh would loose heavily and Haryana and Maharashtra would suffer moderate loss. All other states except Uttar Pradesh and Gujarat would be gainer. Like edible oils, net social gain across states did not show any significant impact with per capita income as the correlation between the two scenarios was found to be 0.009.

Global Price Trends and Instability

Most of the studies relating to the trends and instability in international agricultural prices are based on the behaviour of real prices, i.e., price in US $ deflated by some like the US consumer price index or US GNP deflator or price index of manufacturing sector. We have analysed the price behaviour (trends and instability) of selected agricultural commodities during the last 50 years beginning from 1950, using nominal price series expressed in US $. One reason for choosing nominal price, instead of real price, has been that in developing countries like India the price in US $ is treated as real price in trade.

Table 15 *Net social gain from liberalisation of trade in pulses*

(Rs. per capita)

State	*Producer Surplus*	*Consumer Surplus*	*Net Gain*	*Per capita income Rs. TE 1996-97*
Andhra Pradesh	-25.65	25.75	0.11	8901
Assam	-6.18	21.82	15.64	6461
Bihar	-17.66	23.94	6.28	3819
Gujarat	-33.30	28.48	-4.82	12980
Haryana	-41.91	21.51	-20.40	13754
Himachal Pradesh	-4.41	36.66	32.26	8332
J&K	-4.38	33.33	28.95	6092
Karnataka	-33.26	26.66	-6.59	9109
Kerala	-1.11	14.54	13.44	8970
Madhya Pradesh	-109.00	31.21	-77.79	6680
Maharashtra	-52.22	28.18	-24.04	15250
Orissa	-14.88	22.12	7.24	5802
Punjab	-8.17	28.18	20.01	16099
Rajasthan	-83.81	21.51	-62.30	7095
Tamilnadu	-8.90	25.75	16.85	10180
Uttar Pradesh	-38.18	28.48	-9.70	5784
West Bengal	-5.11	17.88	12.76	8248
All India				10607

Nominal Price Trends

Annual series on nominal international prices of wheat, rice, sorghum, maize, soybean oil and sugar are exhibited in Figures 8.1 to 8.6 and in Appendix Table I. A cursory glance at the plotted series points out a sharp upward jump in international prices of agricultural commodities during 1973 and 1974, which can be called as the beginning years of world food crisis of 1970s. In a single shot, prices of wheat jumped up by 100 percent, rice price by 138 percent, sorghum price by 66 percent, maize price by 75 percent, soybean oil price by 89 percent and sugar price by 30 percent. This way there has been perceptible upward shift in the intercept of these prices, characterising two distinct phases of the trend representing the periods before and after early 1970s. When we look at the two sub-periods separately, it is observed that between 1950 to early 1970s, prices of wheat, rice, sorghum, maize and sugar moved around the line parallel to horizontal axis without showing any upward or downward trend. In contrast to this, prices of soybean oil moved on a downward trend. In the years 1973 and 1974, prices of all these commodities witnessed large upward spurt. This proved to be only a one-time spurt as agricultural prices of all the commodities, except rice, started treading on a higher line parallel to horizontal axis. In the case of rice the trend appears to be moving downward. One distinguishing

feature of the price trends in two periods is that annual price movements were relatively gentle before 1973-74 and they became violent in the subsequent period.

Recent Price Trends

International prices of cereals since 1996 and those of sugar and edible oils since 1995 have been constantly declining. It is difficult to predict whether this decline would continue for some more years or it would be reversed as has been witnessed from the cyclical behaviour of these prices in the past. In fact, the recent trends have significantly altered comparative advantage in export that India enjoyed a few years back particularly, in the case of wheat and rice. International prices of wheat have gone so low that situation has become quite attractive for import. What should be the trade and production strategy in this kind of situation? Can farmers in developing countries be subjected to price shock due to short-term price fluctuations? Should country change its strategy every 3-4 years according to international price pattern, or, the strategy should be based on medium- and long-term price prospects? These are the pertinent issues that India has to address in the liberalised trade environment in the beginning of 21st century.

Price Instability

A comprehensive study on evolving nature of international price instability in cereal markets for the period 1971-1996 undertaken by Alexender Sarris (1998), has following conclusions: First, any temporary shock to the international cereal markets does not leave permanent effects. Second, there was no evidence of an increasing trend in inter-year variability in world cereal prices. Third, there was no rising trend in intra-year price variability. The period chosen for the study was rather short.

It has been shown by some studies in India that international prices of agricultural commodities during the 1980s were more unstable compared to the domestic prices (Nayyar and Sen, 1994). Based on this it is apprehended that the trade liberalisation would impart instability to domestic prices detrimental to small and marginal farmers and vulnerable consumers.

We have examined inter-year price instability in a longer period covering five decades from 1951 to 1999. As mentioned earlier, trend in international agricultural prices witnessed a break during early 1970s, with a sharp upward shift in these prices. Accordingly, price instability during the 1970s was estimated for 1973 to 1980, excluding years 1971 and 1972 which formed part of different trend.

The instability in prices has been estimated using following measure of instability:

Instability index = Standard deviation of $\ln(Y_t/Y_{t-1})*100$

This is unit free measure of instability and it represents deviations from trend growth line.

International prices of wheat show very small inter-year instability during 1950s as well as 1960s. The instability rose to a very high level, beginning with 1973, when

Figure 1 *Annual Series on International Price of US HRW Wheat*

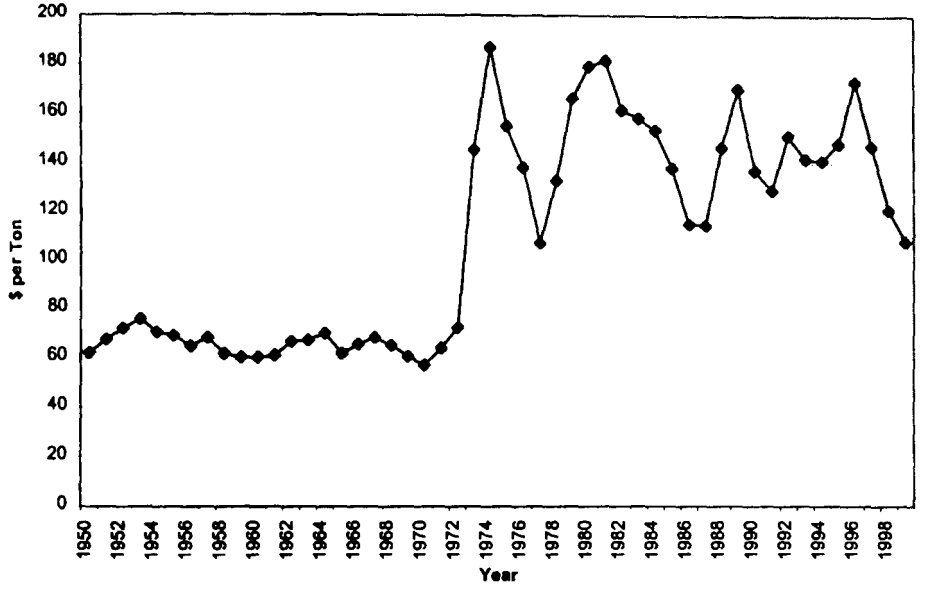


Figure 2 *Annual Series on International Price of Rice FOB Thai*

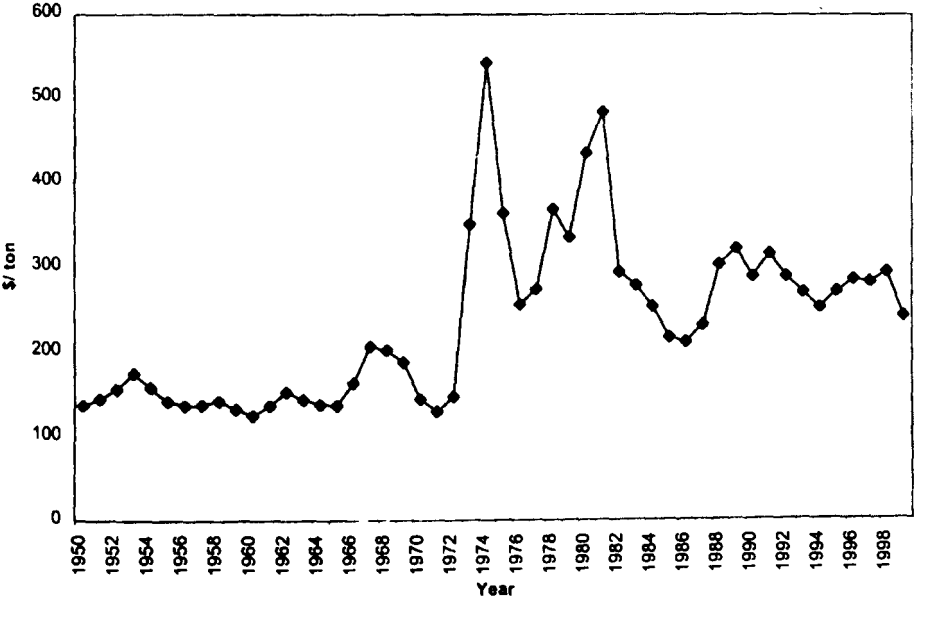


Figure 3 *Annual Series on International Price of Sorghum US Yellow FOB*

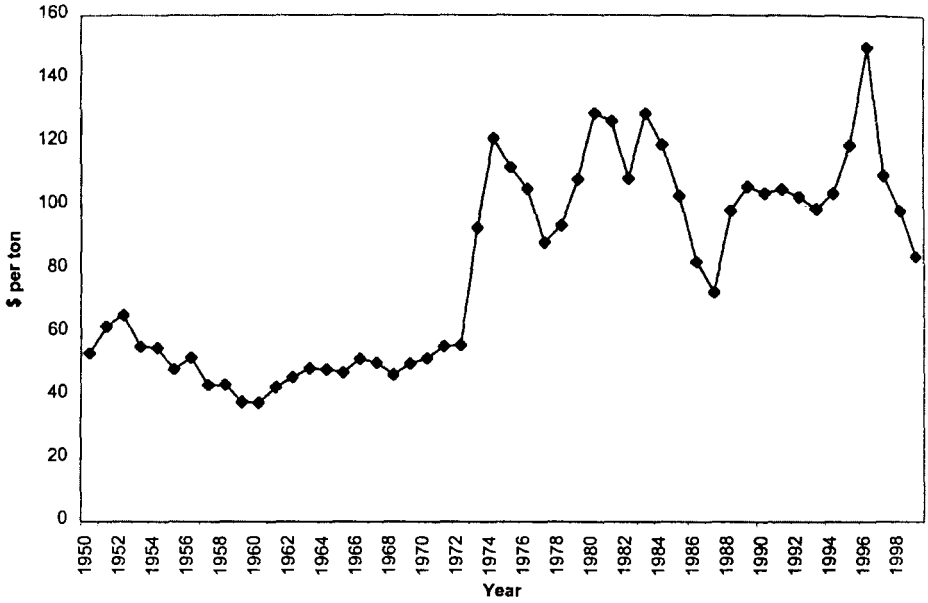


Figure 4 *Annual Series on International Price of Maize US 2 Yellow FOB*

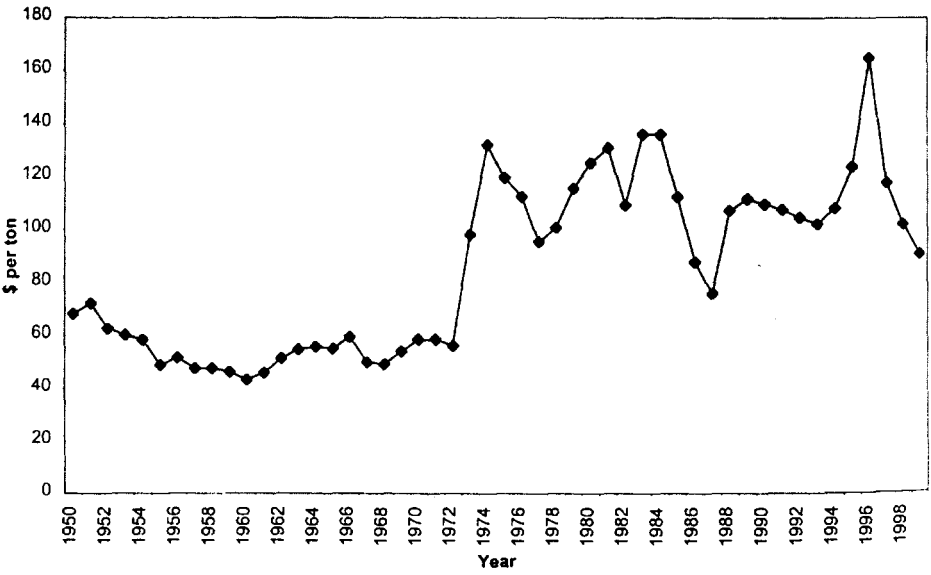


Figure 5 *Annual Series on International Price of Soybean Oil FOB Dutch*

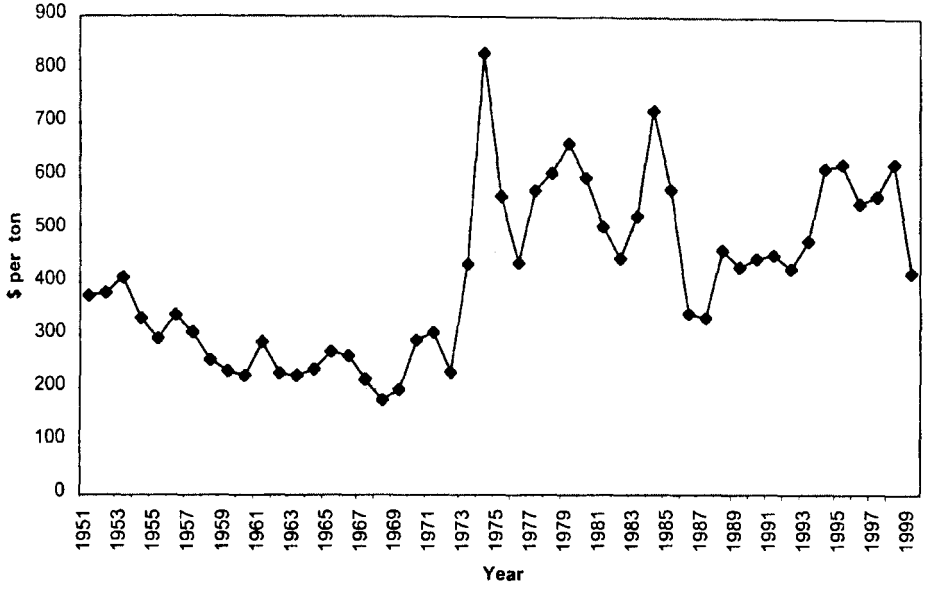


Figure 6 *Annual Series on International Price of Sugar, FOB Caribbbean Port*

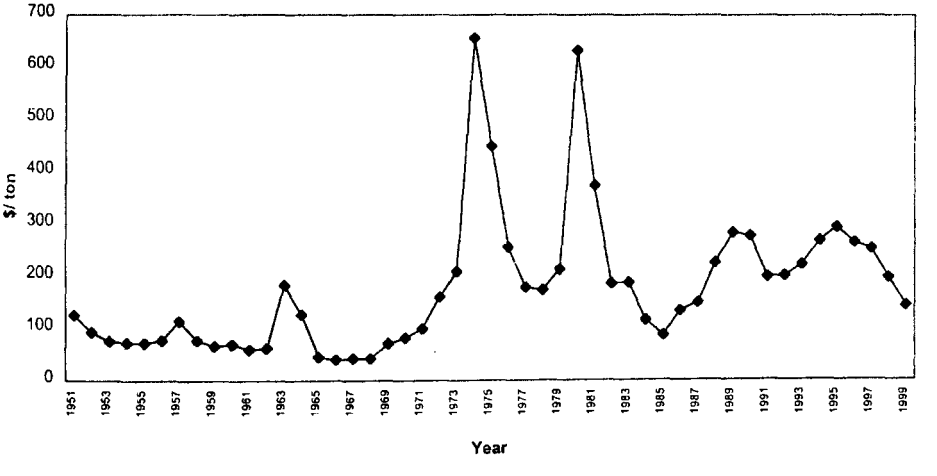
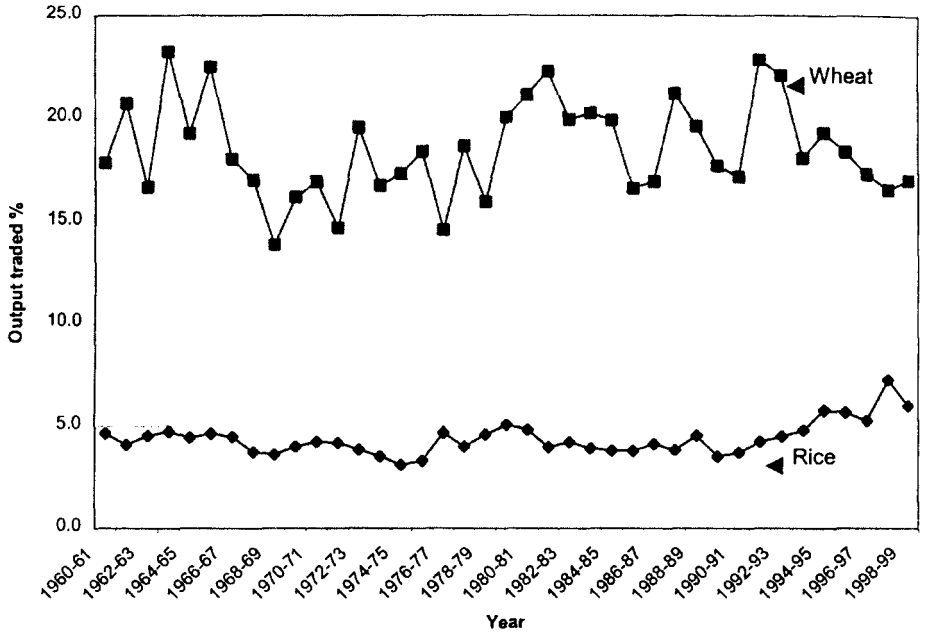


Figure 7 *Trend in Percent of Global Output of Rice and Wheat Traded*



international prices of agricultural commodities shifted upward. The instability during 1980s declined to about half the level of the 1970s. The 1990s witnessed further, albeit small, decline in price instability.

Instability in international price of rice almost doubled during 1960s compared to 1950s. Between 1973 and 1980, the price instability increased almost three times compared to the previous decade. The phenomenon of rising instability in rice prices got reversed after 1980s (Table 16). Instability index declined to 19.4 percent in 1980s and to 8.85 percent in 1990s. International prices of rice remained more unstable, compared to wheat prices till 1990 after which wheat prices became more unstable than rice prices. Trade liberalisation during 1990s led to significant decline in price instability in the case of rice but there is no perceptible decline in the case of wheat.

In the context of trade liberalisation it is important from a policy perspective to see how instability in domestic prices can be compared with international prices. During 1950s when there was little government intervention in the grain markets, instability index for both wheat and rice stood at 11 percent. Compared to this, instability in world prices was about 7 percent in the case of rice and 6 percent in the case of wheat. The government started intervention in wheat and rice markets in a big way during late 1960s through support price, procurement and buffer stocking. As a consequence, during the following four decades, domestic prices witnessed much lower volatility than international prices. For instance, international prices of wheat and rice showed about 30 and 40 percent deviation from trend during 1980s, compared to only 14 and 13 percent in the case of domestic prices. This shows that the government intervention has been quite effective in insulating domestic prices

from effect of instability in international prices. Since there is a clear indication that throughout domestic prices remained less volatile than international prices, liberalisation of trade would impart instability to domestic prices of rice and wheat.

Table 16 *Instability in domestic and international prices of selected commodities, 1951-1999*

Particulars	*1951 to 1960*	*1961 to 1970*	*1973 to 1980*	*1981 to 1990*	*1991 to 1999*
Wheat					
International price ($)	5.63	6.49	28.72	13.50	12.05
International price (Rs.)	5.63	11.11	29.98	16.14	16.71
Domestic price (Rs.)	11.16	10.98	14.44	5.83	6.25
Rice					
International price ($)	7.44	13.60	39.62	19.42	8.85
International price (Rs.)	7.44	19.19	40.52	20.82	15.60
Domestic price (Rs.)	11.10	8.21	13.19	5.27	4.15
Sorghum					
International price ($)	9.32	6.01	20.45	15.43	15.11
International price (Rs.)	9.32	13.32	22.29	17.83	18.56
Domestic price (Rs.)	29.64	16.43	12.79	12.62	20.57
Maize					
International price ($)	6.63	7.96	22.08	17.95	16.69
International price (Rs.)	6.63	14.47	24.05	20.59	19.1
Domestic price (Rs.)	17.87	20.43	23.97	10.45	20.43
Soyabean					
International price ($)	11.03	19.1	35.71	24.51	17.09
International price (Rs.)	11.03	25.16	37.56	26.74	19.55
Domestic price# (Rs.)	22.25	13.95	20.79	11.84	8.12
Sugar					
International price ($)	22.01	52.24	60.76	37.29	17.96
International price (Rs.)	22.01	44.19	62.90	36.72	15.85
Domestic price (Rs.)	7.11	4.51	13.87	7.11	8.56
Exchange rate instability	0	13.76	3.97	4.28	9.85

Notes: 1. International prices refer to: wheat US HRW FOB Gulf, rice 5% broken FOB Bangkok, sorghum US 2 Yellow FOB Gulf, maize US 2 yellow FOB Gulf, soyabean FOB Dutch, and sugar ISA price FOB Carribean port.

2. Instability during 1970s is estimated for 1973 to 1980 as first three years witnessed sharp break in the price series.

The instability in domestic prices of maize and sorghum in most of the sub-periods was higher than international prices. One reason for this could be that there is no effective government intervention in domestic prices of coarse grains.

International price of soybean oil exhibits 11 and 19 percent deviation from trend during 1950s and 1960s. As is the case with other commodities, the instability peaked during 1970s and then declined to around 24 percent during 1980s and 17 percent during 1990s. When measured in domestic currency, the instability was found to be a slightly higher.

Decadal pattern of sugar prices was similar to soybean oil but the spike during 1970s was more peaked (see Fig. 6). Among all the six commodities international prices of sugar were most volatile during all the five decades for which estimation was made. During the decade of food crisis, sugar prices deviated from trend by 61 percent. The lowest instability is observed during the recent decade which shows 18 percent instability in dollar prices and 16 percent instability in rupee prices.

Compared to international prices, domestic prices of sugar show remarkable stability during all the decades. Sugar prices in India deviated from the trend by 4.5 to 8.6 percent during different decades except the decade of food crisis when deviation increased to 14 percent. Sugar has been an important item of public distribution in India and the government has been playing an active role in sugar trade through domestic policy intervention as well as through export-import policy and tariffs on imports.

One reason for selecting soybean oil for the study has been that it is the second most important edible oil after palm oil imported by India. However, long data series on its domestic price are not available. To represent price scenario of domestic edible oils, we have used price index for all edible oils in the country. Domestic edible oil prices showed higher instability compared to international prices during 1950s, whereas, in all the subsequent decades international prices were more volatile than domestic prices. If we keep aside the decade of food crisis, the domestic prices of edible oils during rest of the four decades would show a progressive decline in instability.

Trend in Global Output and Trade

During the four decades encompassing period 1960-61 to 1998-99, output of wheat as well rice has increased about two-and-a-half times. Global rice output during the recent triennium was 384 million tons, and wheat production has reached around 594 million tons. Out of this, about 24 million tons rice and 101 million tons wheat are traded internationally. While both output as well as trade have grown over time it would be interesting to see in which direction the proportion of trade and output has moved. Since there are large year-to-year fluctuations in percentage of output traded, the trend has been examined by looking at the decadal movement, as presented in Table 17. The analysis shows that proportion of wheat sold in the international market moved in a narrow range of 17.3 to 19.5 percent and did not show any trend over time. Rice trade accounted for 4 to 4.3 percent of total output during the three decades following 1960-61. However, during the recent decade, proportion of global rice output traded in international markets increased to 5.3 percent. Recent data show that since 1991-92, share of trade in rice output has been moving upward whereas that of wheat has been moving downward.

During 1960s about 13 percent of global output of rice and wheat was traded globally. This percentage has increased only marginally to reach 13.4 percent during 1990s. This has happened despite the decline in real prices of the grains. One reason for no increase in share of trade in output seems to be that different countries do not want to increase their dependence for food security on trade. Another reason seems

to be the volatility in international grain prices. It would be seen from Table 17 that except a few cases instability is higher in volume of trade, compared to instability in output and instability in prices, is higher than the instability in volume of trade.

Table 17 *Instability in global output, trade volume and prices, and share of trade in output of rice and wheat, 1960-61 to 1998-99*

Particulars	*1961 to 1970*	*1971 to 1980*	*1981 to 1990*	*1991to 1999*
Instability in rice:				
Global output	4.0	4.3	2.4	1.1
Trade volume	10.5	13.8	12.1	14.4
International prices	13.6	39.6	19.4	8.9
Instability in wheat:				
Global output	7.9	8.6	3.7	5.7
Trade volume	13.7	10.7	10.1	9.9
International price	6.5	28.7	13.5	12.1
Percent output traded:				
Rice	4.3	4.1	4.0	5.3
Wheat	18.3	17.3	19.5	18.7
Total rice and wheat	12.9	12.2	13.6	13.4

Inter-year instability in global output of rice ranged between 1 and 4.3 percent during the last four decades whereas instability in trade volume showed 10 to 14 percent deviation from the trend. Similarly, in the case of wheat, output instability ranged between 3.7 and 8.6 percent whereas globally traded quantity varied between 10 and 13.7 percent. Such huge difference in instability of output and trade indicates that international grain trade has been treated as a residue by most of the countries, as a source to meet deficit or avenue for disposing surplus output. This, again, stemmed from concern for food security.

Conclusions and Policy Implications

Among cereals, Indian rice is export-competitive but the margin is thin. The net social welfare impact from rice export is also negative. However, it can turn positive if export fetches same price as for the Thai rice of comparable quality. The present policy of no restriction on rice export appears justified as long as market conditions permit export of small surplus available in the country. However, any concession or incentive to rice export does not seem desirable, because promoting rice export would be beneficial to rice-surplus states, most of which are relatively better economically, but detrimental to most of the poor states.

Price advantage for wheat export in recent years has been completely eroded owing of two reasons: first, international prices have touched rock bottom; and second, the practice of raising support-cum-procurement price in the country, every year, irrespective of demand and supply situation, raised open market prices making it attractive to wheat import. This has put the country in a paradoxical situation;

wheat procured by the government during 1999 rot in its stocks, while, due to removal of QRs, wheat imports have flowed heavily into the domestic market. This further depressed the domestic prices creating conditions for higher loss to the government when it sells wheat in the open market. At the beginning of 21st century India is facing a piquant situation which favours import amidst plenty of domestic production, because of badly mingled price policy.

Past experience shows that even when international prices were favourable, wheat export of sizeable quantity destabilised domestic market, necessitating imports which caused huge losses through trade, as exports fetched much lower whereas imports were paid much higher price than the average international price. We thus find that there is neither much scope nor benefit in promoting wheat export. Wheat exports also caused a decrease in net social welfare.

International prices for export of coarse grains have become highly unattractive in recent years. There is scope for export of small quantity to neighbouring countries, which find export from international market relatively costly due to cost of shipment etc.

There are more serious challenges on import front. Among grains, in some years when international prices go very low, imports to India can become attractive causing abrupt fall in domestic prices. If such shocks are transmitted to farm level prices, it would destabilise crop pattern and supply. Such volatility would cause uncertainty in crop income and can result in cobweb-like situation. Since vast majority of Indian farmers are either small or marginal, they do not have resources and capability to quickly move from one kind of crop pattern to another year after year. The cost of such shifts in terms of crop-specific farm investments, arranging seeds and other inputs, production and marketing skill would be prohibitive for such farmers. Since under WTO obligations such temporary imports and shocks cannot be checked through QRs, there is need for alertness to impose appropriate tariffs to regulate unwanted imports. As long as international market prices of grain, particularly of wheat, follows long-term trend, which is around US $ 140 for wheat, the trade should be kept free. However, sharp fall from the trend needs to be checked through tariff to keep import reference prices around the long-term average.

During the last 10-15 years the government implemented several programmes and schemes to raise output of edible oils and also to attain self-sufficiency in the edible oils. Farmers responded positively to various incentives and there has been significant increase in the output resulting from expansion in oilseed area and yield. The growth in oilseed crops has occurred largely in agriculturally backward areas where the Green Revolution could not have much impact and where there was not much potential for other alternatives. The new trade regime involving removal of physical restrictions on imports has thrown serious challenges to these oilseed-growing areas. International prices of edible oils are considerably lower than domestic prices. Even at moderate tariffs, imports are giving tough time to domestic producers. One reason for domestic prices being considerably higher than international prices seems to be the high level of subsidy to producers in the oil-exporting countries in Europe. Though some input subsidy is there in India also but it is very small in the case of oilseeds; according to one study oilseed production

in India receives less than one-fourth of the input subsidy for rice (Chand, 1999). Till the level of farm subsidy in the exporting countries is brought down to comparable standards, India should impose moderate tariff on import of edible oils. There is also need to look into R&D aspect for reducing cost of production of oilseeds in the long run.

India continues to face shortage of pulses and there does not appear to be any likelihood of a major breakthrough in the production of pulses in the country in near future. Imports of pulses have been taking place at competitive price and this does not pose any serious challenge to the producers. It is suggested that import of pulses should be permitted without imposing tariffs.

In recent years international prices of sugar have gone very low; price in 1999 was $143 per ton which is less than half the price in 1996. Consequently, imported sugar turns out be very cheap compared to domestic sugar. Even at a tariff rate of 100 percent, the price of imported sugar in such situation turns out to be lower than the domestic price. Special countervailing duties are needed when in a particular year international price crashes to very low level. The domestic sugar industry often puts the blame on the government control and regulations for preventing a level playing field to domestic industry. The levy on domestic sugar, statutory minimum price for sugarcane, stock limits and high cost of power to sugar mills are said to be some of the disadvantages faced by the domestic industry compared to international players. Besides, there is also need to improve efficiency of sugar mills and make productive use of by-products to reduce the cost of sugar production.

Coming to general strategy and policy on trade, there are two serious issues: first, what kind of policy would protect domestic markets, and producers in particular, from high volatility in international prices and; second, where lies the comparative advantage in trade. Given the nature of volatility in international prices, domestic markets must be insulated from temporary shocks from international markets. The shock due to low prices in particular year(s) can be checked through appropriate tariffs. A cell should be created in the Ministry of Commerce/Agriculture to constantly monitor international prices and to suggest timely intervention to check adverse impact of international volatility destabilising domestic market. Recent experience shows that such measures are taken when enough damage is already done. In the emerging era of free trade the need to monitor and forecast global prices and output is as great as is being done for domestic prices and output of some crops in the country.

Frequent sharp spikes in grain prices indicate that international market can turn out to be very costly to meet year-to-year fluctuations in domestic supplies. Import at such price during the years of domestic shortfall in supply would hit the large section of consumers comprising poor households very badly. Therefore, reasonable level of buffer stock would be required to meet year-to-year fluctuations in domestic output.

The best protection against unwanted imports is not only to improve efficiency of production but also reduce cost of production and domestic trade. These would require effective R&D to evolve cost-saving technology, better infrastructure, efficient markets and several other bold initiatives to improve competitive edge of Indian agriculture.

Appendix Table I *Nominal international prices of selected agricultural commodities, 1950-99*

(in US $)

Year	*Wheat US HRW Export Price Gulf*	*Rice Thai 5% Fob Bangkok*	*Sorghum US2 Yellow FOB Gulf*	*Maize US2 Yellow FOB Gulf*	*Soybean Oil FOB Dutch*	*Sugar Carribean Port*
1950	62	137	53	68		
1951	67	144	62	72	375	125
1952	72	156	65	63	380	92
1953	76	175	55	60	410	75
1954	71	158	55	58	333	72
1955	69	142	48	49	294	71
1956	65	137	52	52	339	77
1957	68	137	43	48	306	114
1958	62	142	43	48	254	77
1959	60	132	38	46	232	65
1960	60	125	38	43	224	69
1961	61	137	43	46	287	60
1962	67	153	46	51	228	62
1963	67	143	49	55	224	183
1964	70	138	48	56	235	126
1965	62	136	47	55	270	45
1966	66	163	52	59	262	40
1967	68	206	50	50	217	42
1968	65	202	47	49	178	42
1969	61	187	50	54	198	71
1970	57	144	52	58	291	81
1971	64	129	56	58	306	99
1972	72	147	56	56	231	160
1973	145	350	93	98	436	209
1974	187	542	121	132	832	655
1975	155	363	112	120	563	447
1976	138	255	105	112	438	255
1977	107	272	88	95	574	178
1978	133	368	94	101	607	173
1979	166	334	108	116	663	213
1980	179	434	129	125	598	630
1981	182	483	126	131	507	372
1982	162	293	109	109	447	185
1983	158	277	129	136	527	187
1984	153	252	119	136	725	115
1985	138	216	103	112	576	86
1986	115	211	82	88	342	133

Contd...

Contd...

1987	115	230	73	76	334	149
1988	146	302	98	107	463	225
1989	170	320	106	112	432	282
1990	137	287	104	110	448	276
1991	129	314	105	108	454	198
1992	151	287	103	104	429	200
1993	142	268	99	102	480	221
1994	141	250	104	108	616	267
1995	148	269	119	124	625	293
1996	173	283	150	165	552	264
1997	147	280	110	117	565	251
1998	121	292	99	102	626	197
1999	108	240	84	90	421	143

Source: IMF Financial Statistics, Yearbook, various issues.

NOTES

1. Based on World Bank (1997) study on India's oilseed sector.
2. The price linkage equations linking central market price to farm harvest prices were estimated using data for the period 1976-77 to 1996-97 except for soybean for which data for the period 1986-87 to 1996-97 has been used. Two types of linkage equations have been used. One, linking the impact of trade liberalisation with wholesale price in the central market, calculated as: $PC_i = PB_i$+transfer cost: where Pci is price of 'i' the commodity in central wholesale market of the country and PB_i is border (international reference price) of ith commodity. Two, impact of changes in PC_i due to trade liberalisation on farm or producer's price (PF) is estimated using following equations: $\ln PF_i = a+b \ln PC_i$ where 'b' directly gives elasticity of price transmission. The elasticity of transmission is found to be 1.04 for rice, 1.00 for wheat, 1.03 for maize, 0.98 for sorghum, 0.88 for rapeseed mustard, 0.38 for soybean, and 1.21 for pigeonpea.

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