

Agricultural Policy Reform in India: Implications for Pulse Trade, Prices and Production, 1970-1999

Frank W. Agbola

School of Policy, The University of Newcastle, Callaghan, NSW 2308, Australia.
email: frank.agbola@newcastle.edu.au

Abstract

India is a major producer and consumer of pulses in the world. In the last two decades, India's pulse economy has undergone major policy and institutional reforms. These changes are likely to influence India's trade in pulses and consequently world pulse trade. This article examines the impact of these reforms on trade, prices and production in India. The article discusses the factors that instigated these policy reforms and their consequences. The results indicate that a number of key economic, political and technological factors are reshaping pulse industry in India. The policy implication of the findings is discussed.

1. Introduction

Indian agriculture has faced serious structural challenges in recent times. In response to the continuing demand for food, the Government of India embarked on a series of policy reforms, namely, the reduction in import tariffs, the liberalisation of agricultural trade and the removal of production controls in the agricultural sector. Because of these reforms, the market for pulses in India is opened to international trade. Trade prospects for pulses in India depend largely on sustained growth in demand for pulses, where pulses are a traditional component and integral part of the human diet (Kelley, 1999). Despite the reforms, pulse import to India has slowed down in the 1990s. The transition towards a fully liberalised pulse marketing system in India is still underway and this opens opportunities for pulse exporting countries to export to one of the most lucrative markets, the Indian pulse market.

The objective of this study is two-fold. First, is to provide an overview of recent developments in the Indian agricultural sector, in terms of policy and institutional reforms, and second, is to examine the impact of these reforms on pulse trade, prices and production.

The rest of this paper is organised as follows. Section 2 provides an overview of agricultural and trade policy reform in India. Section 3 describes the impact of policy reform on pulse imports and prices. Section 4 describes the impact of policy reform on area under cultivation, yield and production. Finally, Section 5 discusses the implications of the findings and presents some concluding remarks.

2. Agricultural and Trade Policy Reform in India

The principal question that this paper addresses is the impact of policy reforms on pulse trade, price and production in India. To provide an up to date historical perspective of developments in the Indian pulse industry, the investigation period extends across three decades from 1970 through to 1999. This section draws on the 2002 Trade Policy Review of India by the World Trade Organisation (WTO-I, 2002). The discussion focuses on the major characteristics of Indian agriculture and trade policy reforms, outlining some challenges that the pulse industry has faced during the period of dramatic policy change.

India is the second most populated country in the world with an estimated population of over 1.0 billion. In Purchasing Power Parity terms, the World Bank rates India as the fifth largest economy in the world and projects that by 2020 it will be fourth behind China, US and Japan. In the last decade, India achieved spectacular economic performance with the growth rate sustained at an average of 6 percent per annum due to continued structural reform, including trade liberalisation. In the last decade, about 31 percent of the GDP growth originated in the primary sector, around 28 percent in the manufacturing sector and the balance, 41 percent, in the services sector. More than two thirds of the working population is employed in the primary sector (mainly agriculture), while the secondary sector (mainly manufacturing) and the tertiary sector (mainly services, trade and commerce) employ around 14.5 percent and 20.5 percent, respectively, of the workforce (WTO-I, 2002).

India is an agricultural country and the agriculture and allied activities sector is the second largest sectoral contributor to India's Gross Domestic Product (GDP). Since 1991, there has been a considerable increase in the integration of the Indian economy with the global

economy. Share of agricultural trade in the country's GDP has increased from 16% in the early 1990s to about 20% by the end of the decade. Share of agricultural trade in agricultural GDP has also increased from about 6% before liberalisation (1991) to about 9% by the end of the decade (Chaudhri et al. 1998). The contribution of agricultural products to total export earnings is substantial, even though it has decreased in recent years. Agricultural imports constitute a small proportion of the country's total merchandise imports, ranging between 4% and 7% (WTO-I, 2002).

In the early 1970s, the touchy area in India's agricultural trade policy related to the importation of food commodities. The government intervened in the agricultural sector in an effort to eradicate hunger and ensure domestic supplies and to protect the domestic agricultural sector from international competition. Specifically, the Government regulated the quantity, quality and price of agricultural products using a series of rules and regulations, and quantitative restrictions, including tariffs, quotas, price controls, import licensing and marketing restrictions such as state trading, export restrictions and import restrictions.

The Indian government pursued its protectionist policies throughout the 1970s and 1980s. Beginning in 1990, recognising the important linkages between trade and economic growth, and faced with a balance of payments crisis, the Indian Government undertook significant reforms. The reform process included reductions in tariffs and quotas, reductions in import and export restrictions, abolishment of industrial licensing and the floating of the exchange rate (WTO-I, 2002). These reforms are intended to foster higher sustainable economic growth and reduce reliance on multilateral assistance for financing external imbalances. These reforms opened the Indian economy more to international trade and investment and increased domestic and foreign private participation in financial markets (DFAT, 2001).

In 1994, following the commitment to the Uruguay Round Agreement on Agriculture (URAA), India essentially lowered tariffs on agricultural imports and replaced most of the quantitative restrictions and non-tariff border measures by tariffs that provided the same level of protection. For example, the Indian government reduced tariffs on agricultural products from 71.0 percent in 1993 to 35.0 percent in 1998. Although tariffs on agricultural products decreased from the early 1990s, the overall protection of agriculture actually increased. Other measures used to regulate agricultural products imports under the URAA were agreements on sanitary and phytosanitary measures. This measure recognises the right of the Indian government to implement policies to protect human, animal or plant life or health, but emphasises the need to ensure that the policy does not arbitrarily or unjustifiably discriminate between members where identical or similar conditions prevail (WTO-I, 2002). For India, the combination of the introduction of sanitary and phytosanitary measures from time to time, the licensing requirements and the lack of transparency and consistency in regulations made the trade in agricultural products, including pulses, very complex.

By removing import restrictions on agricultural goods, tariffs on several agricultural products rose. Although the most-favoured nation (MFN) tariff rate fell from 35.3 percent in 1997/98 to 32.3 percent in 2001/02, and is expected to fall further to 29 percent in 2002/03, the overall MFN tariff on agriculture has risen from 35 percent in 1997/98 to 41 per cent in 2001/02. The overall MFN tariff is however expected to fall to around 37.5 percent in 2002/03. Despite these reforms, the Indian government continues to maintain some custom tariffs and with the numerous exceptions based on end use, the tariff system in India remains complex (WTO-I, 2002). Tariffs on pulses were reduced gradually and by 1996, all tariffs on pulses were abolished. Beginning in 2000, tariffs for many agricultural and allied products, such as rice, wheat, millet, sugar, milk powder, apple chicken, edible oils, etc, were increased. For pulses, import duties were increased from 5% to 10% in the Indian Union Budget of 2002-2003 (MANAGE, 2002).

As noted by Gulati (1998), with the exception of Basmati rice and durum wheat, external trade in all major crops is regulated. Imports of most crops, with almost the single exception of pulses, are canalised, i.e. imported only through government agencies. Crops are also subject to restrictions on domestic trade that are regulated under the Essential Commodities Act of 1955. These include compulsory levies on millers, stocking limits for private traders, milling reserved for only small sector industries, occasional restrictions of interstate movement and, for most crops, prohibition of trading futures (Kelley, 1999).

Table 1 illustrates import tariffs and trade policy status of some selected food commodities in India. Table 1 shows that in 1991 the Indian government restricted the export of pulses although the importation of pulses was free. Trade in other agricultural products was generally restricted or canalised, i.e. traded under the Public Distribution System. However, during this time, the Indian government retained custom duties and levies on pulse imports and the imposition of levies on pulse imports continued until 1999 when the practice was abolished. Despite the export quotas that the Indian government imposed on pulse exports, it permitted the exportation of branded pulses in consumer packs not exceeding 5 kilograms in weight. The challenge facing pulse exporters in India is the cost incurred in exporting branded pulse products. The findings of a focus group study by Agbola et al. (2002) point to some interesting results about the impact of liberalisation reforms. Pulse traders have indicated the desire to export pulses but expressed frustration with the obstacles whereby pulse exports are restricted. The survey revealed that the removal of restrictions on pulse exports could stimulate increased demand for imported pulses into India.

Table 1: Import tariffs and trade policy status of selected food commodities in India

Commodity	Existing Tariff April 1996	Uruguay Round Binding	Trade Policy Status	
			1991	1997

			Exports	Imports	Exports	Imports
Animals	0	100	Mostly restricted	Mostly restricted	Mostly restricted	Mostly restricted
Fresh, chilled and frozen meat	10	150	Mostly restricted	Restricted	Mostly restricted	Restricted
Milk/Cream	40	100	Restricted	Restricted	Restricted	Restricted
Yoghurt	40	100	Canalised	Restricted	Free	Restricted
Rice	0	0	Mostly restricted	Canalised	Free	Canalised
Wheat/Flour	0	100	Restricted	Canalised	Free	Canalised
Pulses	5	100	Restricted	Free	Restricted	Free
Vegetables	10	100	Mostly free	Restricted	Mostly free	Restricted
Fruits	50	100	Mostly free	Restricted	Mostly free	Restricted
Oilseeds	40/50	100	Restricted	Canalised	Mostly restricted	Canalised

Notes: 'Mostly restricted' means that most products or product varieties in the category are subject to licensing or other non-tariff controls.

Source: Adapted from Kelley (1999).

It is interesting to note that in 1991, export of cereals, mostly rice and wheat/flour, was either restricted or mostly restricted. By 1997, cereal exports were free. This result is evidence of India achieving self-sufficiency in cereal production, a consequence of policies implemented by the Indian government. As Kelley (1999) observed, the technological advancement and biotechnology investment appeared to have stimulated increased growth in productivity of cereals such as wheat and rice. This is because the productivity gains continue to favour crops like wheat and rice, where biotechnology investments are considerably higher and where potential is perceived to be greatest. This technological bias has exerted a distorting effect on crop competitiveness, with comparative advantage shifting away from pulses towards other crops such as cereals and to a lesser extent oilseeds.

Over the years, the Indian government's policy has been to protect consumers, especially those on low incomes, by ensuring that prices of most agricultural products are affordable. This was achieved through the setting of a Minimum Support Price (MSP) for most agricultural products, including pulses. As the WTO-I (2002) states the Indian government announces the MSP for agricultural goods after taking into account recommendations made by the Commission for Agricultural Costs and Prices. Price support for rice and wheat is derived using the cost of production and the accounting principles of farm management, while price support for pulses and oilseeds are under the responsibility of the National Agricultural Federation (NAFED). The MSP is determined based on a number of factors including input/output price parity, trends in market prices, demand and supply, inter-crop price parity, effect on industrial cost structure, effect on general prices, cost of living, international market prices, and the terms of trade. Table 2 shows the MSP of selected agricultural commodities in India. Interestingly, Table 2 indicates that the MSP for Gram (chickpeas) is about twice the MSP of other agricultural commodities. Although the Indian government continues to provide MSP for cereals and pulses, these pricing policies appear to have had no significant effect on the domestic market price of pulses because the MSP for pulses is generally less than the market price.

Table 2: Minimum Support Prices of various Agricultural Commodities (according to crop year, in Rs. per Quintal) in India, 1998-2002

Commodity	Variety	1997-98	1998-99	1999-2000	2000-01	2001-02
Paddy Rice	Common	415	440	490	510	530

	Grade "A"	445	470	520	540	560
Maize		360	390	415	445	485
Wheat		510 ^a	550	580	610	620
Barley		350	385	430	500	500
Gram		815	895	1015	1100	1200

^a Includes a Central Bonus of Rs.55.00 per quintal payable from April to June of 1998.

Source: Adapted from MoA (2003).

To stimulate growth in domestic production of agricultural products, governments in developed and developing countries often use production subsidies (Table 3). In India, the government's goal has been to overcome supply and production constraints, due to seasonality and imports, in order to ensure an adequate price to farmers, and to promote agricultural diversification to meet the government's target of self-sufficiency. This goal was achieved through the provision of subsidies for fertiliser and water to encourage production of grains and oilseeds rather than through increasing investment in irrigation, power and rural infrastructure (WTO-I, 2002). Further, as the WTO-I (2002) notes, the Indian government also reduced import duties on capital goods used in agriculture and made credit available for exports. The assistance led to an expansion of the area of land under irrigation and actively encouraged research to improve yields of cereals and oilseeds varieties. Research on pulses received little attention. Against this background, subsidies and price controls in the agricultural sector created distortions. The effect has been to bias resource allocation towards cereals and oilseeds and away from pulses. A persistent problem however is the continuing lack of adequate infrastructure for exports, including post harvest infrastructure such as storage and packaging facilities (WTO-I, 2002).

Table 3: Agricultural Subsidies (PSE) in Selected OECD Countries and India (in US\$)

Country ^a	(1986-88) Base Year		1997		1998		1999 (Provisional)	
	Per Farmer	Per Hectare	Per Farmer	Per Hectare	Per Farmer	Per Hectare	Per Farmer	Per Hectare
Canada	12000	75	7000	42	8000	48	9000	52
EC	11000	707	16000	815	18000	890	17000	831
Japan	15000	10048	21000	10211	22000	10005	26000	11792
USA	17000	98	12000	73	19000	116	21000	129
OECD	11000	187	10000	189	11000	209	11000	218
India	11	8	55	43	61	46	66	53

Notes:

a: 1. Exact comparison of subsidies between India & OECD countries is not possible on account of difference in composition of PSE and subsidies as computed in India.

2. In case of India, Values in Rupees have been converted into US dollars at exchange rate prevailing in 1999, viz. Rs. 43.3 per US dollar.

3. For developed countries- *Agricultural Policies in OECD Countries – Monitoring & Evaluation 2000- OECD Producers Support Estimate (PSE)*.

4. For India - *Central Statistical Organisation, New Delhi*.

Source: Adapted from MoA (2003).

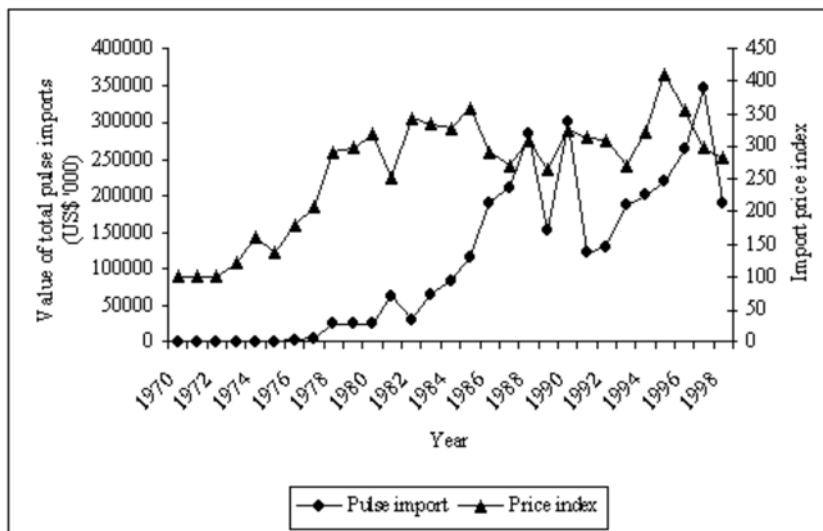
The most disturbing aspect of past agricultural performance in India has been the decline in labour productivity. Agricultural labour productivity is a little more than one third of the national average. This has been driven by the decline in levels of capital per unit of labour, a consequence of the failure on the part of the government to invest in infrastructure and total factor productivity. The WTO-I (2002) attributes the low productivity in the agricultural sector was due in part to the high degree of protection from competition, the lack of scale economies and the inefficient use of new technologies.

Since 1991, export controls on agricultural products have been gradually phased out. However, the marketing of cereals such as wheat, rice, edible oils and sugars continues to be controlled by the Indian government. The marketing of these products were operated under the Public Distribution System (PDS) and under the joint responsibility of the Central and State governments (WTO-I, 2002). The Central government however bears the responsibility of procurement, storage, transportation and bulk allocation of food grains, rice and wheat, at subsidised prices, while the responsibility for distribution to consumers through the Fair Price Shops (FPS) rests with the state government. Export quotas are also maintained on pulses except when the product is exported as branded product in consumer packs not exceeding 5 kg in weight (MoC, 1999).

3. Impact of Reform on Pulse Imports and Prices

This section focuses on the impact of the reform on value of imports and import price of pulses in India. Since the 1970s, total pulse imports to India have fluctuated quite considerably (Figure 1), although there appears to be an upward trend in the 1970s and 1980s, and a downward trend in the 1990s. Plotting imports in constant units emphasises the fact there has been an increased import demand for total pulses in the 1970s and 1980s. The value of total pulses increased in early and mid 1990s, but decline in the late 1990s. Figure 1 also depicts the import price index of total pulses. This index trended import value, which highlights the importance of import price in influencing import demand for total pulses. The decline in the value of total imports in the late 1990s was due in part to the Asian crisis and the growth in domestic production of pulses, especially chickpea. Following a recovery of domestic production in the late 1990s, the value of imports of total pulses declined presumably due to the fall in domestic price causing import volumes to decline pushing down the import price of total pulses in the late 1990s.

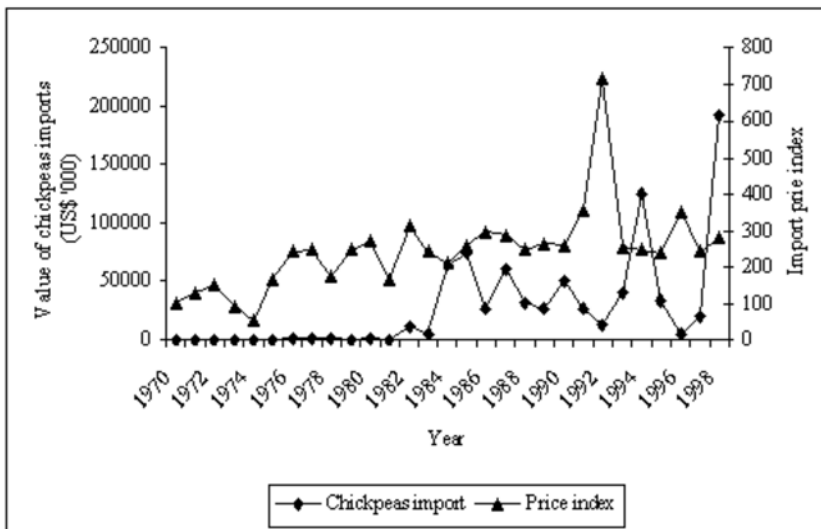
Figure 1: Total pulse imports (constant values) and price index, 1970-99



Source: FAOSTAT Trade Data (FAO, 2002).

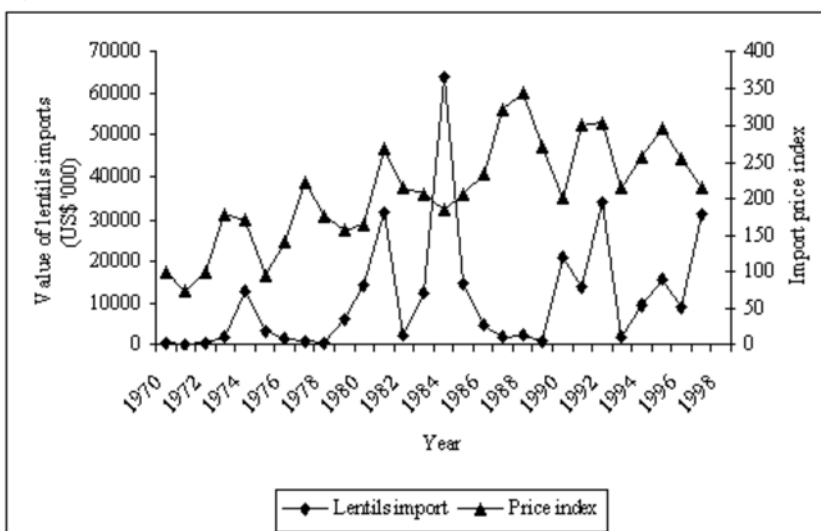
Figure 2 shows the value of chickpeas imports and the import price index over the study period. Although imports of chickpeas in constant values had remained stable in the 1970s, the import price fluctuated quite dramatically. In the 1980s the value of imports of chickpeas fluctuated, but appears to have trended downwards until the mid 1990s. It rose in the mid 1990s, and again, quite dramatically, in the late 1990s due in part to the drought experienced by India. The chickpeas import price index moves in such a way as to suggest that the import price of chickpeas is independent of the value of chickpea imports. The rise in the value of imports in 1998 was not due to the price deterioration but to the decline in domestic production, which stimulated increased importation of chickpeas in value terms. Figure 3 shows trends in the value of lentils imports and their price index. Clearly, the import price of lentils appears to move in opposite direction to the lentils imports over the last three decades. Again, the result suggests that the import price of lentils is independent of the value of lentils imports.

Figure 2: Chickpeas imports (constant values) and price index, 1970-99



Source: FAOSTAT Trade Data (FAO, 2002).

Figure 3: Lentils imports (constant values) and price index, 1970-99



Source: FAOSTAT Trade Data (FAO, 2002).

Table 4 shows annual growth rates of value of imports and price index of chickpeas, lentils and total pulses. An examination of the structural changes in the importation of pulses reveals that the value of imports of lentils and total pulses declined from a growth rate of 240% and 87% per annum, respectively, in the 1970s to 74% and 34% per annum, respectively, in the 1980s. For chickpeas, the value of imports rose from 273% per annum in the 1970s to 284% per annum in the 1980s, declining to 129% per annum in the 1990s. The declining trend in the value of imports of pulses in the 1990s may probably be due to two factors. The first is the shift in consumption patterns away from pulses towards value-added products such as meat products, processed cereals and milk products (Kelley, 1999), and the second is the high minimum support price (MSP) of pulses relative to cereals; the MSP for pulses is about twice the MSP for cereals (see, Table 2). Given that the MSP influences the domestic price of pulses, it seems that the relatively high MSP for pulses may have caused consumers to demand food products other than pulses.

Table 4: Growth rates in pulse imports and import price

Period	Import price			Pulse import		
	Chickpeas	Lentils	Total pulses	Chickpeas	Lentils	Total pulses
1970-79	28	14	13	273	240	87
1980-89	5	8	0	284	74	34

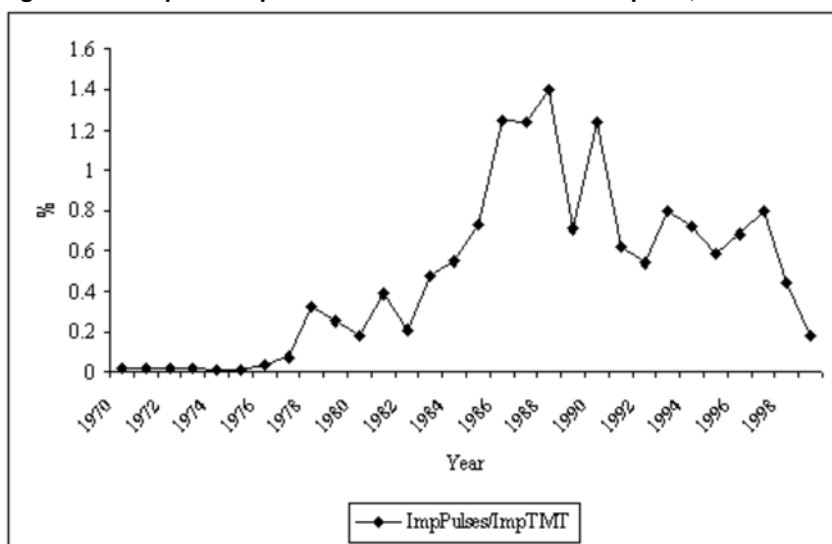
1990-99	0	-11*	3	129	270*	6
1970-99	11	4*	5	229	192*	42

*Data is for the period up to 1998.

Source: FAOSTAT Trade Data (FAO, 2002).

One of the main issues investigated in this paper is whether policy reforms in India enhanced trade in pulses. Figure 4 shows the ratio of total pulse imports to total merchandise trade imports for the period 1970 through to 1999. Three distinct features are observable. Over the 1970s, the ratio of pulse imports to total imports was virtually static. Beginning in 1978, the ratio increases rapidly from barely positive to 1.40% in 1988. The 1990s and especially the latter period indicate a trend decline in the import ratio. The importance of total pulse imports in total merchandise trade in the 1970s grew at a rate of 68.67% per annum. Again, in the 1980s, the importance of total pulse imports in total merchandise trade has grown though at a slower pace of 25.56% per annum. However in the 1990s, when the domestic pulse market was liberalised, the importance of total pulse imports in total merchandise trade declined by 3.77% per annum. While pulse imports are important in India as an offset to domestic shortfalls, these results reveal that imports have become less important in terms of total merchandise trade. This is a paradox given the generally held view that liberalisation would increase pulse imports.

Figure 4: Total pulse imports/Total Merchandise Trade Imports, 1970-99



Source: FAOSTAT Trade Data (FAO, 2002).

4. Impact of Reform on Pulse Acreage, Yield and Production

This section focuses on the impact of reform on area under cultivation, yield and production of pulses in India. Since 1970, the Indian government has actively pursued policy aimed at improving wheat and rice yields with little attention to pulse production. Given that pulses are grown on marginal lands, the assistance provided in the form of subsidies for fertiliser and water and for the development of high yielding cereal varieties biased the allocation of resources in favour of cereals and oilseed production and against pulse production. Consequently, India achieved near self-sufficiency in cereal production while pulse production generally stalled or declined in some years.

Between 1970 and 1999, the pattern of domestic production of total pulses has been more or less stagnant, fluctuating between 9.1 and 15 million metric tonnes (MT) (Figure 5). Figure 5 indicates that, in 1970, domestic production of total pulses was 12.1 million MT, declining to about 9.5 million MT in 1974 before recovering to peak at 15.0 million MT in 1999. Table 5 shows that, between 1970-79, domestic production of total pulses grew by 1.36% per annum, rose further to 2.41% per annum in the 1980s but has since declined to 1.39% per annum in the 1990s. The growth in domestic production in the 1980s was due primarily to productivity in the pulse industry; yield rose by 2.20% per annum in the 1980s. The fall in domestic production in the 1990s was a result of key factors, namely, the decline in productivity and area under cultivation, a consequence of drought experienced in the mid and late 1990s in India.

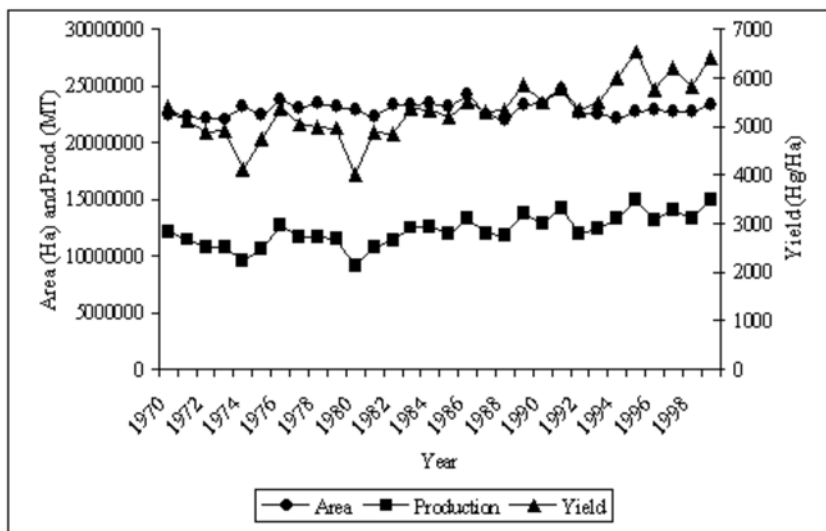
Table 5: Growth Rates in Area under Cultivation, Yield and Domestic Production, of Pulses in India, 1970-99

	Area	Yield	Production

	Ha	Hg/Ha	MT
	Total Pulses		
1970-79	0.90	0.44	1.36
1980-89	0.15	2.20	2.41
1990-99	0.03	1.24	1.39
1970-99	0.36	1.29	1.72
	Chickpeas		
1970-79	1.20	2.76	4.23
1980-89	-0.52	2.11	2.11
1990-99	3.13	1.25	4.56
1970-99	1.27	2.04	3.63
	Lentils		
1970-79	2.96	-1.39	1.61
1980-89	0.92	5.10	6.56
1990-99	2.65	0.59	3.50
1970-99	2.18	1.43	3.89

Source: FAOSTAT Trade Data (FAO, 2002).

Figure 5: Area, Yield and Production of Total Pulses in India, 1970-99

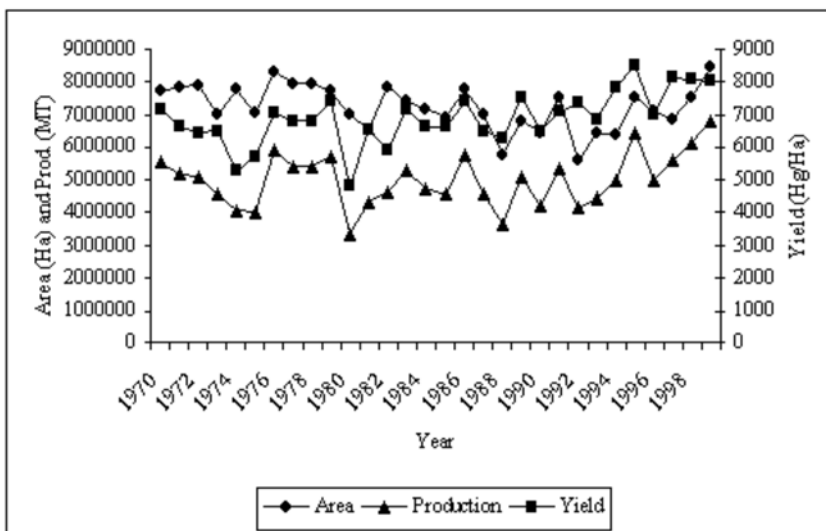


Source: FAOSTAT Trade Data (FAO, 2002).

In the 1970s growth in area under cultivation of total pulses was 0.90% per annum, declining to 0.15% per annum in the 1980s, and declining further to 0.03% per annum in the 1990s. It is evident from the above analysis that the policies of the Indian government is one of the factors that led to the decline in domestic production, acreage and yield of total pulses in the last three decades, shifting comparative advantage away from pulses towards other crops, such as cereals (compounded by earlier mentioned biotechnology advantages). The solid output performance in the cereals sector compared to the pulse sector in the last three decades was due largely to the differential performance in productivity. In fact, productivity growth in the pulse sector grew at a slower pace than in the cereals sector (1.29% per annum for pulses vs. 2.84% per annum for cereals for the period 1970-1999). It is evident that production subsidies on fertiliser and water (though associated with negative externalities to the environment), agricultural credits and to a lesser extent government investment in infrastructure played a critical role in sustaining a stable path of growth for achieving self-sufficiency in cereal production in India.

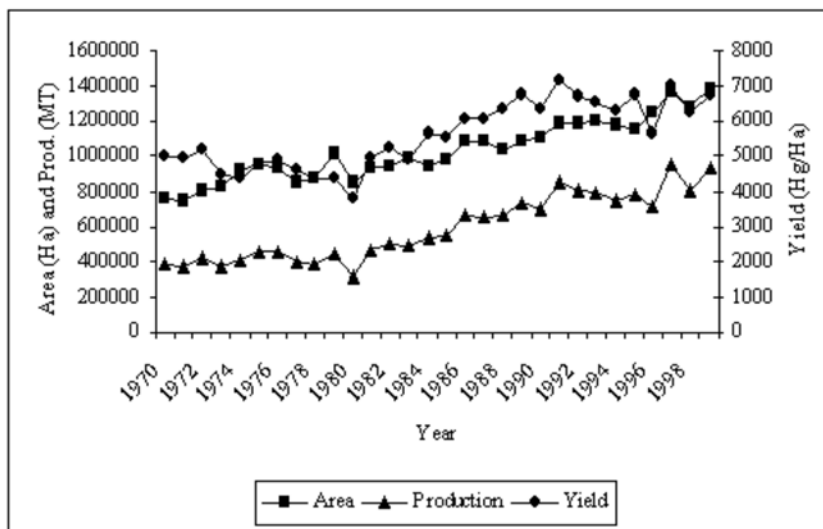
Over the same period, domestic production of one of the major pulses, chickpeas, appears to have shifted (Figure 6). In the 1970s, domestic production of chickpeas grew at a rate of 4.23% per annum. It declined to 2.11% in the 1980s, but rose quite dramatically to 4.56% per annum in the 1990s. Corresponding to trends in domestic production, the yield of chickpeas was 2.76% per annum in the 1970s. It grew at a slower pace of 2.11% per annum in the 1980s, and declined further to 1.25% per annum in the 1990s. The rise in domestic production of chickpeas can be attributed to the dramatic increase in area under cultivation, which rose from -0.52% per annum in the 1980s to 3.13 in the 1990s. For lentils (Figure 7), another major pulse in India, despite a rapid growth in area under cultivation in the 1970s (2.96% per annum), domestic production grew at a slow pace due partly to the negative growth in productivity. The lentils industry however achieved a remarkable growth of 6.56% per annum in domestic production in the 1980s due to dramatic increase in productivity of 5.10% per annum due possibly to the increased demand for lentils in the 1980s. In the 1990s, domestic production of lentils grew at a slower pace of 3.5% per annum, despite the increase in area under cultivation of lentils, due largely to the low productivity (0.59% per annum) in the lentils industry.

Figure 6: Area, Yield and Production of Chickpeas in India, 1970-99



Source: FAOSTAT Trade Data (FAO, 2002).

Figure 7: Area, Yield and Production of Lentils in India, 1970-99



Source: FAOSTAT Trade Data (FAO, 2002).

5. Concluding Remarks

The Indian government's interventionist policies have created a number of problems in the agricultural sector. The distorted price signals have led to environmental problems such as land degradation, water logging and depletion of groundwater resources. The water and fertiliser subsidies encouraged inefficient allocation of resources, creating an incentive to allocate resources to the development of new cereal varieties and thereby increasing cereal production. This in turn has shifted comparative advantage away from marginal crops such as pulses towards cereals and, to a lesser extent, oilseeds. The distortions have recently been evident, with subsidies to farmers considered financially unsustainable. Despite these negative effects of government policy, the expansion in subsidies to producers has stimulated growth in domestic production of crops resulting in India achieving self-sufficiency in cereal production in the 1990s. As the Indian government continues to pursue the policy of fully liberalising the agricultural sector, the new reforms might lead to efficient use of resources and this could eliminate the unsustainable substitution between cereals, oilseeds and pulses.

To improve efficiency at the marketing level, it is pertinent that the Indian government abandons the minimum support price program, which causes distortions. An alternative policy could be for the government to target the poor within society through the provision of a subsidy at the consumption level. This will reduce the subsidy expenditure of the government and the fluctuations in the price of pulses because less intervention in the market could reduce distortions in price. These proposals however present two interesting issues. On the one hand, the cut in production subsidies may push some farmers into the marginally solvent or vulnerable category, and for the Indian government, this will mean failure to achieve self-sufficiency in cereal production. The political pressure for stabilising agricultural production has meant that the Indian government may have to continue to intervene in the agricultural sector. On the other hand, the cut in subsidies and the abolishment of the MSP may reduce the budgetary difficulties and distortions in agricultural prices.

For exporting countries, much concern exists regarding whether liberalisation could lead to increased importation of pulses into India. The results of this study do not provide a clear answer. The findings of this study on policy reforms in India have added yet another dimension to the policy debate. This study has shown that the removal of production subsidies may yet shift resource allocation towards pulses and this could lead to an increase in domestic pulse production, and consequently reduce the importation of pulses. Experience has revealed that there are production constraints, which tend to limit the extent to which India can increase domestic pulse production. The uncertainty surrounding Indian agricultural policy, for example, a recent introduction of levies on pulses, may suggest that one needs to be cautious about how lucrative the India pulse economy is. For exporting countries, developing marketing policies that strategically position them is perhaps the only way forward.

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Authorised By: Assoc. Prof. Bill Malcolm, Agriculture and Food Systems

Maintainer: Nanette Esparon, Agriculture and Food Systems

Email: webmaster@landfood.unimelb.edu.au

