Chapter 6

Analysis Of Terms Of Trade: Prices & Income
An attempt has been made in this chapter to study the impact of the New Policy of Agriculture on price, income front (including per capita output and income), terms of trade between the manufacturing and the primary sector.

**Introduction:**

In countries where agriculture provide employment and income to the majority of the workforce, sustained and broad based agricultural development is of great significance. It raises standard of living, facilitates elimination of poverty, assures food security and generates buoyant market for the expansion of manufacturing and services. In India, notwithstanding a satisfactory growth rate of agricultural production, there is an intense need for the improvement in the food security scenario, growth of the economy and reduction in inter-state and inter-regional disparities in development. It is a known fact that in the initial phase of economic development, the scope for area expansion was substantial but the scope of area expansion now is limited, a faster agricultural growth would depend upon acceleration of yield per hectare, particularly in areas and regions where the unit yield persists to be lower than the potential.

The Indian experience regarding the trend and pattern of economic growth and development differs from the experiences of the economies across the globe and the vast availability of literature on the subject. The pattern of growth and development followed and experienced in the process of economic progress is generally as the economy moves forth the contribution of the primary sector in the GDP declines over the period, that of manufacturing and the service sector increases gradually. Initially the increase in the contribution of the agriculture & the allied sectors, manufacturing in the GDP is greater and latter on the contribution of the Tertiary sector surpasses it. But the Indian experience has been different from this acknowledged behaviour of
economic literature. In India the contribution of Primary sector in the GDP declined over the years but the contribution of Tertiary sector took over the manufacturing thereby by breaking the conventional experience. The development of the manufacturing and agriculture & the allied sectors is interwoven and the linkage between them is quite significant in a labour surplus economy like that of India. Any weakening of this connectivity between these two sectors leaves deeps imprints not only on the health of millions who are engaged in it but also the quality of growth and development which is expected to be forthcoming. With the disappearing relationship between the two sectors, a significant emergence of the tertiary sector even before the economy became highly industrialised is noted. This is in sharp contrast to the development experience visualized in the developed countries in the theoretical literature. Also, gap between sectoral rates of growth has not declined (Bhattacharya and Mitra, 1990). Further, agriculture continues to be an important sector in terms of absorbing two-third of the total work force and positively influencing development of manufacturing and overall economy despite a deceleration in its share in total income. This would again mean that the occupational structure as envisaged in the theory and experience in the developed countries has behaved differently in India. A paradigm shift towards higher growth and employment potential in the specialized services has been witnessed, particularly after the initiation of economic reforms in the early nineties. However, a mismatch in the growth of income and employment in the services, i.e. income rising faster than employment that was observed during the eighties continues to stay. And, this could be a major cause of concern.

Agricultural price and Terms of Trade (TOT) are closely netted with one another. Prices, which the agricultural commodities command in the market, are of great significance for the mass of the farming community in India, as about 63 % of the
land utilisation is under marginal farming community. An output price of the agricultural commodities determines the gross amount which the farming community in India would be able to reap from their marketed surplus. Not only this but intermingled is the issue of the prices of the non-agricultural inputs which are used as an input by the peasantry to produce the product. The relative prices received by the peasantry with reference to the price paid for the purchase of the various inputs so as to produce the final agricultural produce. So the relative price received by the farmers in relation to the payments made by the agricultural sector is called the Barter Terms of Trade (BTOT). The changes in these relative prices over time in some sense determine whether or not peasantry is getting a fair deal. The TOT has its origin in the international trade. It is an index of the price of a country's exports (X) in terms of its imports. It is said to improve if the index rises and decline when the income falls. An analogy is drawn while we compare the relative prices. If the price of agricultural goods in terms of industrial goods increases, one may infer that the TOT has moved in favour of agricultural sector or agricultural goods. For instance, if $P_x$ is the index of prices received by the agricultural sector and $P_m$ is the index of prices paid by the agricultural sector, then, Net Barter TOT is given by $-P_x*100/P_m$. Another term generally used explains Income Terms of Trade (ITOT). This is worked out to find out the relative position of one sector of the economy as against the other sectors of the economy. ITOT are NBTOT multiplied by the volume a commodity purchased or sold. In other words, it is the ratio, expressed in percentage terms, of the value of exports to the prices of imports. For instance, the ITOT is given by the expression $Q_x*P_x*100/P_m$. Here, $Q_x$ is the volume of exports. When discussed in Indian context one may find two opposite viewpoints on the subject. One section of the experts are of the view that the price mechanism in India favoured the agricultural
sector as over the years, agriculture commanded higher prices with reference to the non-agricultural sector. The other section of the experts is of the belief that the movement of relative prices for agriculture and non-agriculture sector was unfavourable to the agricultural sector.

**An Overview of the Situation:**

Since peasantry derives considerable fraction of their total income from cultivation of food production, fluctuation in the prices of food products have a significant bearing over the fate of farmers. As is well known, one of the important aims of the price policy of farm produce is to ensure stability in prices. Not only this but also it is to tread over knife edge of providing agricultural products to the consumers at a reasonable price and ensuring reasonable return to the cultivators. At the back drop of all this is also to maintain food security, as it deeply affects the price situation and may warrant to pay heavy import bill. In the decades of 1950’s agricultural prices recorded a very low rise. The bumper crop of the year 1953-54 lead to lower down of the whole sale prices of agricultural commodities in 1955. The import of the foodgrains in the subsequent years controlled the price hike. On an average, during the 1950’s, India imported 2.1 million tons a year. During the 1960’s serious occurred. In 1964-65 the crop production was good but again the subsequent years lead to serious droughts. Consequently, India had to import 10 million tons each for both the years. On an average during the 1960’s the import stood at around 5.2 million tons a year. The index of prices for the agricultural products rose sharply during this period to more than a double to 201 by 1970-71. The growth of prices was as high as 9.38% per annum compared with the overall price hike of 7.61% per annum. It must be kept in mind that the decade of 1960’s not only faced serious droughts but also had two wars-one with China and the other with Pakistan. The
decade of 1970's was peculiar in itself as India faced war in the very beginning, i.e. in the year 1971. Thereafter, there was a severe international crisis on oil front, as the prices of the oil and oil products increased substantially in the international market. It is a fact that despite the introduction of the HYV package and import of agricultural products, prices of agricultural products rose sharply than the overall prices. During the decade of 1970's the prices of agricultural products rose by 8.52% per annum and the overall prices showed an increase at 7.86% per annum. The Green Revolution spread to new regions in the decade of 1980's. The economic growth rate moved upward consequently there was pressure on the demand side, this lead to increase in the overall prices. This culminated into the agricultural price index rising to 174.4, the prices for overall commodities rose to 165.7. This was the decade which saw, initially, Iraq war and thereafter a serious foreign exchange crisis in India. Moreover, in other words, this decade ended, even though with difficult circumstances not only on the economy front but also initiating the era of collision politics in India, with by laying the foundation for the metamorphosis of the structure of Indian economy.

During the 1989-90 to 1993-94, the price index for agricultural commodities was 271.8, while that of the overall prices stood at 247.8 and the growth rate of agricultural prices stood at 8.72% per annum and the rate of growth of overall prices was 7.86%. This makes clear that there was high rate of inflation during the period under consideration. The post-reform period witnessed a gradual decline in the rate of inflation. During the aforesaid period the rate of growth on agricultural prices was quite at 5.55% per annum, while the growth rate of overall price were 5.14%. The reason behind the higher growth rate of prices in agricultural commodities was the larger hikes given to the administered prices of wheat and rice. After 2001-02 the government decided to offload large amount of foodgrains through Targeted Public
Distribution system at a highly subsidised rates, this lead to bring a change in the situation. This bought a decline the prices of agricultural products. Agricultural prices started rising after 2005. Before we move forward it may be appropriate to note that the rise in the agricultural prices may or may not increase the farm income, as the situation leading to it vary and the benefit of increase may not show spread effect. Year to year sharp fluctuation are also a matter of concern as it affects the realization of the objective of stabilization of agricultural prices.

Table Number: 6.1

Price Indices of All & Agriculture Commodities (Base: 1993-94)

<table>
<thead>
<tr>
<th>Index</th>
<th>All Commodities</th>
<th>Agriculture</th>
<th>% change in Price Indices</th>
<th>All Commodities</th>
<th>Agriculture</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994-95</td>
<td>112.6</td>
<td>116.1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1995-96</td>
<td>121.6</td>
<td>125.9</td>
<td>7.99</td>
<td>8.44</td>
<td></td>
</tr>
<tr>
<td>1996-97</td>
<td>127.2</td>
<td>136.4</td>
<td>4.61</td>
<td>8.34</td>
<td></td>
</tr>
<tr>
<td>1997-98</td>
<td>132.8</td>
<td>140.3</td>
<td>4.4</td>
<td>2.86</td>
<td></td>
</tr>
<tr>
<td>1998-99</td>
<td>140.7</td>
<td>157.2</td>
<td>5.95</td>
<td>12.05</td>
<td></td>
</tr>
<tr>
<td>1999-2000</td>
<td>145.3</td>
<td>159.1</td>
<td>3.27</td>
<td>1.21</td>
<td></td>
</tr>
<tr>
<td>2000-01</td>
<td>155.7</td>
<td>163.6</td>
<td>7.16</td>
<td>2.82</td>
<td></td>
</tr>
<tr>
<td>2001-02</td>
<td>161.3</td>
<td>169.6</td>
<td>3.6</td>
<td>3.65</td>
<td></td>
</tr>
<tr>
<td>2002-03</td>
<td>166.8</td>
<td>175.4</td>
<td>3.41</td>
<td>3.44</td>
<td></td>
</tr>
<tr>
<td>2003-04</td>
<td>175.9</td>
<td>182.8</td>
<td>5.46</td>
<td>4.2</td>
<td></td>
</tr>
<tr>
<td>2004-05</td>
<td>187.2</td>
<td>186.7</td>
<td>6.42</td>
<td>2.14</td>
<td></td>
</tr>
<tr>
<td>%Gr pa</td>
<td>4.95</td>
<td>4.69</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>CV</td>
<td>16</td>
<td>14.9</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Note: Figure number 1 & 2 is based on table number 6:1
For the aforesaid overall period 1994-05 the coefficient of variation for the price index of agricultural prices was lower than that for all the commodities. The extent of divergence between the two was much lower during the 1970’s subsequent to the oil crises but became very high afterwards during the 1990’s. Even the percentage change in price indices in case of agricultural commodities was lower than that of all commodities.

Table Number: 6:2

Index Numbers and Percentage change in Price Indices of All & Agricultural Commodities (Base: 1952-53=100)

<table>
<thead>
<tr>
<th>Index</th>
<th>All Commodities</th>
<th>Agriculture</th>
<th>% Change in Price Indices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Price Indices</td>
<td></td>
<td>All Commodities</td>
</tr>
<tr>
<td>1955-56</td>
<td>92.5</td>
<td>88</td>
<td>13.84</td>
</tr>
<tr>
<td>1956-57</td>
<td>105.3</td>
<td>104.5</td>
<td>2.94</td>
</tr>
<tr>
<td>1957-58</td>
<td>108.4</td>
<td>107.4</td>
<td>4.15</td>
</tr>
<tr>
<td>1958-59</td>
<td>112.9</td>
<td>114</td>
<td>3.72</td>
</tr>
<tr>
<td>1959-60</td>
<td>117.1</td>
<td>116.5</td>
<td>6.66</td>
</tr>
<tr>
<td>1960-61</td>
<td>124.9</td>
<td>123.8</td>
<td>0.16</td>
</tr>
<tr>
<td>1961-62</td>
<td>125.1</td>
<td>115.5</td>
<td>89.66</td>
</tr>
</tbody>
</table>

% Gr pa | 4.17            | 2.94        |

CV      | 10.3            | 10.5        |

Table Number: 6:3

Index Numbers and Percentage change in Price Indices of All & Agricultural Commodities (Base: 1952-53=100)

<table>
<thead>
<tr>
<th>Index</th>
<th>All Commodities</th>
<th>Agriculture</th>
<th>% Change in Price Indices</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Price Indices</td>
<td></td>
<td>All Commodities</td>
</tr>
<tr>
<td>1962-63</td>
<td>103.8</td>
<td>102.3</td>
<td>6.17</td>
</tr>
<tr>
<td>1963-64</td>
<td>110.2</td>
<td>108.4</td>
<td>10.98</td>
</tr>
<tr>
<td>1964-65</td>
<td>122.3</td>
<td>130.9</td>
<td>7.6</td>
</tr>
<tr>
<td>1965-66</td>
<td>131.6</td>
<td>141.7</td>
<td>13.91</td>
</tr>
<tr>
<td>1966-67</td>
<td>149.9</td>
<td>166.6</td>
<td>11.61</td>
</tr>
<tr>
<td>1967-68</td>
<td>167.3</td>
<td>188.2</td>
<td>-1.14</td>
</tr>
<tr>
<td>1968-69</td>
<td>165.4</td>
<td>179.4</td>
<td>5.75</td>
</tr>
<tr>
<td>1969-70</td>
<td>171.6</td>
<td>194.8</td>
<td>5.54</td>
</tr>
<tr>
<td>% Gr pa</td>
<td>7.61</td>
<td>9.38</td>
<td></td>
</tr>
<tr>
<td>CV</td>
<td>19.8</td>
<td>23.9</td>
<td></td>
</tr>
</tbody>
</table>


294
Terms of Trade-A Debate:

A greater interdependence of each sector towards higher economic growth is the most likely outcome of this change despite the fact agriculture share in the total value added is decelerating, industrial share is not expanding and services share is perpetually increasing. It may be noted that a fall in the relative share of agriculture in structural transformation is not considered to be unforeseen as it is bound to take place due to low-income elasticity. What is surprising is that in Indian agriculture only Engle’s Law holds as income elasticity of food has fallen over time (Kumar, 1998). Contrary to expectations, a deceleration in crop productivity, improvement in agricultural terms of trade due to increase in food prices and not so impressive industrial expansion have been observed. With the result, from 1980 onwards both agriculture and manufacturing have shown a marginal change in annual rates of growth and have failed to show any casual linkage. There are greater chances to believe that absence of demand-pull factors such as technology, productivity, and not so impressive increase in public investment impeded growth of agriculture and hence manufacturing. These in turn can be attributed to lower public investment as well as greater concentration of liberalized reforms on industry, trade and other sectors related to agriculture. The net outcome has been an increasing trend towards growth of tertiary sector, probably at the expense of agriculture and industrial growth that too before the economy could reach advanced stages of industrialization.

The agriculture-industry terms of trade, (TOT) question has been extensively studied in both the academic and policymaking circles in India. The issue emerging out of this literature can be classified into two categories. While one set deals with the methodological and data related aspects regarding empirical estimation of TOT, the other set analyzes the variable in relation to specific policy considerations.
The theoretical basis of the Ashok Mitra's study Terms of Trade and Class Relations, 1977 (London) was that it was necessary for the developing countries to extract surplus from agriculture for rapid industrialisation. According to Mitra, perverse situation prevailed in India. Instead of extracting surplus from agriculture sector government followed the policies that favoured the agricultural sector relative to the non-agricultural sector, opines Mitra. According to him, during the 1960s, the TOT was highly favourable to agriculture. Thus, with 1960-61=100, the official price index for the food articles was 363.6 in 1973-74 and for the foodgrains it was 400.7. On the other hand the price index for industrial raw materials was 327.4 and for the manufacturing it was 254.5 and for the finished products the figure stood at 238.6. It was on this basis he concluded that the weighted terms of trade between industry and agriculture have over the periods moved close to 50% in favour of agriculture. This, according to him, reflected a class bias in favour of the rich farmers and the rich north-western region of the country. Ashok Mitra in 'Terms of Trade and Class Relations (London, 1977)' concludes that "the weighted terms of trade between agriculture and industry have over the period thus moved close to 50 percent in favour of the former." As a result of this policy, the rich farmer lobby has benefited extensively while the industrial sector has to face recession.

The inter-sectoral terms of trade between agricultural and non-agricultural sectors, defined in ordinary parlance as the ratio of total prices received by the agricultural sector to the total prices paid by it to non-agricultural sectors, is one of the important economic indicators to get a perception as to how agricultural sector as a whole has either gained or lost in the process of economic growth. The Commission has been regularly monitoring the changes in the inter-sectoral terms of trade, (the base 1971-72) since 1980-81 using its own methodology and data base. However, from 2001-02 kharif report, the
Commission has been using the new index of terms of trade as compiled by the Directorate of Economics and Statistics following the methodology evolved in 1995 (base year 1988-91= 100) by a Task Force headed by Prof. A.S. Kahlon, former Chairman, CACP. The Commission’s series of the Index of Terms of Trade showed unfavourable terms to agriculture during both 1980’s and 1990’s. But the new series of the Index of Terms of Trade of agriculture sector (ITT) indicates that it remained adverse during the decade of eighties, but was making steady recovery before turning favourable in 1990-91. However, the ITT deteriorated steadily from 105.6 in 1997-98 to 102.8 in 2000-01 and recovering to 104.5 for the year 2001-02. The provisional estimates of ITT for the year 2002-03 is 106.8, reflecting further improvement in the terms of trade in favour of agriculture. However, this improvement needs to be viewed in the context of severe drought faced in the country in 2002 and the resultant crunch in production supply as reflected in relatively higher escalation in the index of prices received by the farmers. The index of input output price parity (IIOP) is derived by the Commission based on the components of new series of ITT. This is done by deriving the index of prices paid for agricultural inputs using the elements of index of prices paid viz. the indices of intermediate consumption and of capital formation, and comparing it with index of prices received, available from ITT. Akin to ITT, which remained unfavourable to agriculture during the eighties and then turned favourable to agriculture in the nineties, the price parity also remained unfavourable to agriculture in eighties and subsequently recovered in early 1990’s. However, the index of input-output price parity remained lower than hundred since 1994-95.

R. Thamarajakshi in her article, “Intersectoral Terms of Trade and Marketed Surplus of Agricultural Produce, 1951-52 - 1965-66”, was the first to ever attempt to apply

the concept of TOT to intersectoral transactions. Making departure from the usual approach to measurement of intersectoral TOT as a ratio of agriculture to non-agricultural prices, she in her article defined them as a ratio of exports to imports. She identified the commodities which are traded between the sectors, estimated the value of the intersectoral transactions in the base year for using them as weights for the composite prices of these transactions and derived the NBTOT. She also estimated marketed surplus and worked out the ITOT. Her study indicates that the terms of trade moved in favour of agriculture over the period of first three five year plans (1951-52 to 1965-66). Whereas, NBTOT moved in favour of agriculture by 0.51 percent per annum the ITOT rose by 3.4 percent per annum. Thus where, NBTOT improved marginally for the agricultural sector, the ITOT rose significantly. Thamarajaakshi’s conclusion is that the agricultural sector benefited from economic development by experiencing improving TOT in respect of non-agriculture. At the same time it contributed by raising marketed surplus as well as its own absolute demand for non-agricultural products. In 1990 she in her article, “Intersectoral Terms of Trade Revisited”, EPW, March 31, 1990, updated her series of NBTOT upto 1987-88 using the value if intersectoral transaction for current consumption in 1978-79 as weights. The total period covered in the study is 1951-52 to 1987-88, divided into two sub-periods: sub-period I from 1951-52 to 1973-74 and sub-period II from 1974-75 to 1987-88. Thamarajakshi concludes that, “aggregate terms of trade do not seem to enter as such in the calculus of farmers” production decisions. On the other hand, real factors which promote growth of crop yields and which part relative stability to agriculture have a declining influence on profitability of agriculture.”

Subsequently, Kahlon and Tyagi( 1980), Tyagi (1987), Mungekar(1992) and Palanivel(1999) provided estimates of agriculture TOT using alternate prices data and
different trading baskets. A.S.Kahl and D.S.Tyagi in their article, "Inter-Sectorial Terms of Trade," 2 criticised the methodology adopted by R.Thamarajash and developed an alternative methodology. According to Kahl and Tyagi, "most of the studies cited on the subject suffered from serious limitations on account of limited coverage, use of improper weights, inappropriate prices indicators, adaptation of incorrect method for estimating volume of exports and the use of a method for constructing price indices which on a prior reasoning would underestimate the rise in the price of non-agricultural goods and inflate the rise in the prices of agricultural commodities." With the help of the methodology developed by them, they have shown that the terms of trade moved against agriculture. In a paper presented to the World Economic Congress at New Delhi in December 1986, D.S.Tyagi presented a study of the TOT for a period of 31 years (1952-53 to 1983-84). On the basis of his study, he divided the entire period of 31 years into three sub-periods. Tyagi notes that though the TOT remained against the agricultural sector in this period yet these were less adverse than in the earlier period viz., 1952-53 to 1963-64. The assertion by Kholon and Tyagi (1980, 1983) that TOT have moved against agriculture, contrary to Thamarajash's conclusion, generated considerable debate in the literature. Vittal (1986), Tyagi (1988), Vittal (1988), and Mungekar (1993). It also generated some amount of doubt on the direction of Indian agriculture TOT movement for the period between mid-60's to mid-70's. It may further be noted that since agricultural TOT is often used to charter policies in India, the Government of India provides two different series that are individually estimated by the Commission for Agricultural Costs and Prices (CACP), and Directorate of Economics and Statistics (DES). Agricultural price policy analysis has pointed out various implications of a TOT change in the economy.

2 Economic and Political Weekly, December 27, 1980, p.177-188
Studies such as Bhagwati and Chakravarty (1974, 1979), Krishna (1982), Rangarajan (1982a), Ahluwalia and Rangarajan (1989), Sen (1996), Fan and Hazell (2000), Desai and Namboodiri (2001), Desai (2002) and others have discussed the impact of TOT on specific development policy issues, such as the interaction of agriculture-industry growth; rural wages and poverty; technology (HYV) adoption, spread of irrigation, private investment, government expenditure and total factor productivity growth in agriculture.

This issue of debate and discussion among the renowned experts still continue to prolong. As a matter of fact the trend that has emerged from the facts on ground suggests that the benefit the favourable TOT is restricted to certain section of the farming community. The problems of the small and the marginal farmers is where it was. That is the proportion of money they receive as their income is still quite small and highly inadequate to maintain the nominal well being. As has been stated by Dr. Rangrajan that even there may be instances when the prices of agricultural commodities, tomato, are as high as rupees fifteen but what actually the tiller receives as his income is a nominal amount of fifty paise. So this fact may seems to be too small an instance to be cited but when seen in the context of the substantial farming community engaged in agriculture for subsistence the impact and the gravity of the situation itself becomes important. In this context it becomes important to have a glance over the trends, prospects and challenges in this regard.

---

### TABLE 6:4
Wholesale Price Index of Agriculture Products and Manufactured Products

<table>
<thead>
<tr>
<th>Year</th>
<th>GI*</th>
<th>% Change</th>
<th>IAP**</th>
<th>% Change</th>
<th>MP***</th>
<th>% Change</th>
<th>A as %of M****</th>
</tr>
</thead>
<tbody>
<tr>
<td>1982-83</td>
<td>104.9</td>
<td>107.3</td>
<td>103.5</td>
<td>103.7</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>1983-84</td>
<td>112.8</td>
<td>121.4</td>
<td>13.14</td>
<td>109.8</td>
<td>6.09</td>
<td>110.7</td>
<td></td>
</tr>
<tr>
<td>1984-85</td>
<td>120.1</td>
<td>129.2</td>
<td>6.43</td>
<td>117.5</td>
<td>7.01</td>
<td>110.7</td>
<td></td>
</tr>
<tr>
<td>1985-86</td>
<td>125.4</td>
<td>129.1</td>
<td>-0.08</td>
<td>124.4</td>
<td>5.87</td>
<td>103.8</td>
<td></td>
</tr>
<tr>
<td>1986-87</td>
<td>132.7</td>
<td>142.8</td>
<td>10.61</td>
<td>129.2</td>
<td>3.86</td>
<td>110.5</td>
<td></td>
</tr>
<tr>
<td>1987-88</td>
<td>143.5</td>
<td>161.8</td>
<td>13.31</td>
<td>138.5</td>
<td>7.2</td>
<td>116.8</td>
<td></td>
</tr>
<tr>
<td>1988-89</td>
<td>154.2</td>
<td>170.9</td>
<td>5.62</td>
<td>151.6</td>
<td>9.46</td>
<td>112.7</td>
<td></td>
</tr>
<tr>
<td>1989-90</td>
<td>165.7</td>
<td>174.4</td>
<td>2.05</td>
<td>168.6</td>
<td>11.21</td>
<td>103.4</td>
<td></td>
</tr>
<tr>
<td>1990-91</td>
<td>182.7</td>
<td>198.3</td>
<td>13.7</td>
<td>182.8</td>
<td>8.42</td>
<td>108.5</td>
<td></td>
</tr>
<tr>
<td>1991-92</td>
<td>207.8</td>
<td>236.8</td>
<td>19.42</td>
<td>203.4</td>
<td>11.27</td>
<td>116.4</td>
<td></td>
</tr>
<tr>
<td>1992-93</td>
<td>228.7</td>
<td>255.5</td>
<td>7.9</td>
<td>225.6</td>
<td>10.91</td>
<td>113.3</td>
<td></td>
</tr>
<tr>
<td>1993-94</td>
<td>247.8</td>
<td>271.4</td>
<td>6.22</td>
<td>243.2</td>
<td>7.8</td>
<td>111.6</td>
<td></td>
</tr>
</tbody>
</table>

**Weights**

<table>
<thead>
<tr>
<th>Year</th>
<th>GI*</th>
<th>% Change</th>
<th>IAP**</th>
<th>% Change</th>
<th>MP***</th>
<th>% Change</th>
<th>A as %of M****</th>
</tr>
</thead>
<tbody>
<tr>
<td>1994-95</td>
<td>112.6</td>
<td>-54.56</td>
<td>116.1</td>
<td>-57.22</td>
<td>112.3</td>
<td>-53.82</td>
<td>103.3</td>
</tr>
<tr>
<td>1995-96</td>
<td>121.6</td>
<td>7.99</td>
<td>126</td>
<td>8.53</td>
<td>121.9</td>
<td>8.55</td>
<td>103.3</td>
</tr>
<tr>
<td>1996-97</td>
<td>127.2</td>
<td>4.61</td>
<td>136.4</td>
<td>8.25</td>
<td>124.4</td>
<td>2.05</td>
<td>109.7</td>
</tr>
<tr>
<td>1997-98</td>
<td>132.8</td>
<td>4.4</td>
<td>140.3</td>
<td>2.86</td>
<td>128</td>
<td>2.89</td>
<td>109.6</td>
</tr>
<tr>
<td>1998-99</td>
<td>140.7</td>
<td>5.95</td>
<td>157.2</td>
<td>12.05</td>
<td>133.6</td>
<td>4.38</td>
<td>117.7</td>
</tr>
<tr>
<td>1999-2000</td>
<td>145.3</td>
<td>3.27</td>
<td>159.1</td>
<td>1.21</td>
<td>137.2</td>
<td>2.69</td>
<td>116</td>
</tr>
<tr>
<td>2000-01</td>
<td>155.7</td>
<td>7.16</td>
<td>163.7</td>
<td>2.89</td>
<td>141.7</td>
<td>3.28</td>
<td>115.5</td>
</tr>
<tr>
<td>2001-02</td>
<td>161.3</td>
<td>3.6</td>
<td>169.6</td>
<td>3.6</td>
<td>144.3</td>
<td>1.83</td>
<td>117.5</td>
</tr>
</tbody>
</table>

**AARC#**

<table>
<thead>
<tr>
<th>Year</th>
<th>GI*</th>
<th>% Change</th>
<th>IAP**</th>
<th>% Change</th>
<th>MP***</th>
<th>% Change</th>
<th>A as %of M****</th>
</tr>
</thead>
<tbody>
<tr>
<td>1984-85</td>
<td>146.33</td>
<td>7.15</td>
<td>158.07</td>
<td>7.38</td>
<td>144.66</td>
<td>7.58</td>
<td>109.39</td>
</tr>
<tr>
<td>1995-96</td>
<td>140.66</td>
<td>5.28</td>
<td>150.33</td>
<td>5.63</td>
<td>133.01</td>
<td>3.67</td>
<td>112.76</td>
</tr>
</tbody>
</table>

1. Composite index of the sub-groups-Food Articles & Non-Food Articles.
2. *General Index,** Index of Agricultural Products,***Manufactured Products,****Agriculture as % of Manufacturing
Figure Number 6.3

Wholesale Price Index of Agriculture Products and Manufactured Products

[Graph showing changes in wholesale price index over years with various labels and symbols indicating different data points and trends.]
Figure Number 6: 4

Wholesale Price Index of Agriculture Products and Manufactured Products

![Graph showing percentage change in wholesale prices over years.]

Figure Number 6: 5

Average Annual Growth Rates for 1993 to 2004-05

![Graph showing average annual growth rates over years.]

Note: Figure number 6:3;6:4 & 6:5 is based on table number 6:4.
The table 6.4, shows the changes in the Wholesale Price Index of Agricultural Products (WPI AP) vis-à-vis General Index and the Index of Manufacturing Products. The Index of Agricultural Products has moved more or less in tandem with the General Index during two comparable periods 1984-85 to 1990-91 and 1995-96 to 2001-02. The AAGR of the General Index during 1984-85 to 1990-91 was 7.15% and that of Index of Agricultural Products 7.38%, the corresponding figures for the period 1995-96 to 2001-02 being 5.28% and 5.63%, respectively. These movements reveal that during these two periods those deriving income from sale of agricultural products have not suffered on account of having to sell at prices increasing at substantially lower rate than the prices of other commodities or General Index of prices. This table further shows that the Agricultural Price Index as percentage of Manufacturing Price Index has been more than 100 in all the years 1982-83 to 2001-02, which means that the former has all along been higher than the latter indicating that those producing agricultural products have benefited more due to price changes as compared to those producing manufactures goods, or the terms of trade have been in favour of agriculture. The same conclusion emerges from another Index prepared by the Government of India on the basis of the methodology recommended by a Task Force set up by the Government in March 1993 under the Chairmanship of Prof. A.S.Kahlon, former Chairman of Commission for Agricultural Costs and Prices (CACP). After considering the various indices of TOT being constructed by several countries as reported by the Food and Agricultural Organisation (FAO), the Task Force presented a suitable methodology to compute an index of terms of trade for India. The recommended index is expressed as a percentage of the ratio of index of price received for agricultural products to index of price paid by the farm sector for final consumption, farms inputs and capital investment in agriculture. The TOT
between agriculture and non-agriculture sectors is now being computed by the government on the basis of the methodology recommended by the Task Force. The TOT has been favourable for agriculture all along 1991 but there are reasons because of which agricultural growth was hindered. Capital formation in agriculture inspite of favourable TOT in agriculture and deceleration in agricultural growth can be attributed to factors like absence of technological breakthrough for rainfed agriculture, uneconomic size of landholdings, inadequate availability of agricultural inputs and agricultural credit, Government's procurement and price support operations which act as a disincentive for the diversification of agriculture production and lack of rural infrastructure because of which price incentives hardly work in Indian agriculture.

It must be mentioned here that the importance of monitoring the TOT was explicitly recognized by the Government of India and consequently, in 1980, the terms of reference of the Commission for Agricultural Costs and Prices (CACP) were modified to include this aspect. Since then the CACP has been constructing the series and monitoring the TOT at the all India level. For such a series, the base period and methodology are of considerable importance. The base period being used by the Commission for constructing the series of index of terms of trade is the triennium ending (TE) 1971-72. The inter-sectoral terms of trade between agricultural and non-agricultural sectors, defined in ordinary parlance as the ratio of total prices received by the agricultural sector to the total prices paid by it to non-agricultural sectors, is one of the important economic indicators to get a perception as to how agricultural sector as a whole has either gained or lost in the process of economic growth. The Commission has been regularly monitoring the changes in the inter-sectoral terms of trade, (the base 1971-72) since 1980-81 using its own methodology and data base. However, from 2001-02 kharif report, the
Commission has been using the new index of terms of trade as compiled by the Directorate of Economics and Statistics following the methodology evolved in 1995 (base year 1988-91= 100). In 1995 the Task Force in its report submitted to the Government (Ministry of Agriculture), recognizing the importance of monitoring the TOT at the State level, had inter-alia recommended the TOT indices to be build at the State level also. The need of the State level TOT indices also arouse because such estimates of the TOT at the all India level conceal a great deal of variation across States. Larger variations in the growth of the agriculture sector, and capital formation and changes in the poverty levels across the States may partly be attributed to regional variations in the TOT. This is the function of changing consumption and production patterns, as well as, the efficacy of the government policies on technologies and incentives.

As the spread of technology and consequent growth pattern has considerably varied across regions and sub-sectors within agriculture, it is extremely important to monitor the TOT for the agricultural sector in different regions of the country. This has become even more important in the context of several measures being taken by the government to liberalise the economy including trade in farm products, which are bound to affect the profitability of agriculture differently in the different regions of the country.

It may not be inappropriate to think that because of the different agro-climatic conditions of our diverse nation in the cropping pattern, the TOT for the agriculture sector have moved differently at the regional levels and freeing of trade in agricultural commodities would increase these differences.

Five distinct phases in the behaviour of TOT for agriculture during the forty years period (1951-52 to 1991-92) may be put as follows.
a. Almost no change : 1951-52 to 1963-64
b. Improvement or Increasing phase : 1963-64 to 1973-74
c. Detoriating or decreasing phase : 1973-74 to 1980-81

Mishra and Hazell (1996) have prepared and reported the series of GTOT as well as the index of income changes for the agriculture. The GTOT series was constructed as the ratio of index of implicit of prices for the agricultural and the non-agricultural sectors. It was derived from the GDP from these sectors at current and at the constant prices. The index of income change was constructed by multiplying the BTOT with the all-crop productivity index. The purchasing capacity of the agricultural sector was assessed from the index of income change. There are three important observations from these estimates.

i. GTOT follows the trend of BTOT but there is no point of correspondence.

ii. The GTOT show fluctuations without a distinct trend during the fifties, an increasing trend up to early seventies, and a phase of recovery thereafter.

iii. The Index of income change which reveals the capacity of agricultural sector to purchase non-agricultural goods, has been, by and large, improving since early 1980's.

The Commission's series of the Index of Terms of Trade showed unfavourable terms to agriculture during both 1980's and 1990's. But the new series of the Index of Terms of Trade of agriculture sector (ITT) indicates that it remained adverse during the decade of eighties, but was making steady recovery before turning favourable in 1990-91. However, the ITT deteriorated steadily from 105.6 in 1997-98 to 102.8 in 2000-01 and
recovering to 104.5 for the year 2001-02. The provisional estimates of ITT for the year 2002-03 is 106.8, reflecting further improvement in the terms of trade in favour of agriculture. However, this improvement needs to be viewed in the context of severe drought faced in the country in 2002 and the resultant crunch in production supply as reflected in relatively higher escalation in the index of prices received by the farmers.

The Government of India adopted the policy of deliberately keeping the TOT against agricultural sector. From the beginning of the Planning era in India till 1963 TOT was against agriculture. One of the reasons for this has been the success of the First Five Year Plan. The assistance in the form of PL-480 also contributed to this by keeping the prices within reasonable level. After 1965 the prices of the agricultural products increased. The studies conducted concluded that between 1963-64 to 1973-74 the TOT was in favour of agriculture. The index prepared by the Ministry of Agriculture on the recommendation of the Task Force constituted by the ministry is presented in the table 6.5

| TABLE: 6.5 |

Index of Terms of Trade between Agricultural and Non-Agricultural Sector

(Base: Triennium ending 1990-91 = 100)

<table>
<thead>
<tr>
<th>Year</th>
<th>IPR*</th>
<th>Index of Prices Paid (IPP) for:</th>
<th>Combined Index (IPP)</th>
<th>(\text{ITT}^*\times\text{IPR/IPP} \times 100)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>FC+</td>
<td>IC#</td>
<td>CF</td>
</tr>
<tr>
<td>1981-82</td>
<td>54.9</td>
<td>54.4</td>
<td>88.5</td>
<td>56.9</td>
</tr>
<tr>
<td>1985-86</td>
<td>70.4</td>
<td>69.5</td>
<td>94.3</td>
<td>76.4</td>
</tr>
<tr>
<td>1990-90</td>
<td>97.5</td>
<td>97.6</td>
<td>99.2</td>
<td>100.6</td>
</tr>
<tr>
<td>1990-91</td>
<td>112.3</td>
<td>112.1</td>
<td>104</td>
<td>108.5</td>
</tr>
<tr>
<td>1991-92</td>
<td>130.8</td>
<td>124.9</td>
<td>119.4</td>
<td>127.2</td>
</tr>
<tr>
<td>1992-93</td>
<td>138.7</td>
<td>131.5</td>
<td>139.5</td>
<td>137.5</td>
</tr>
<tr>
<td>1993-94</td>
<td>151.4</td>
<td>143.9</td>
<td>152.9</td>
<td>147.3</td>
</tr>
<tr>
<td>1994-95</td>
<td>171.1</td>
<td>159</td>
<td>166.1</td>
<td>158.4</td>
</tr>
<tr>
<td>1995-96</td>
<td>182.9</td>
<td>173.7</td>
<td>174.2</td>
<td>176.1</td>
</tr>
<tr>
<td>1996-97</td>
<td>190.6</td>
<td>185.6</td>
<td>181.5</td>
<td>188.8</td>
</tr>
<tr>
<td>1997-98</td>
<td>205.9</td>
<td>195.7</td>
<td>192</td>
<td>196.7</td>
</tr>
<tr>
<td>1998-99</td>
<td>220.8</td>
<td>213.8</td>
<td>197.1</td>
<td>206.8</td>
</tr>
<tr>
<td>1999-2000</td>
<td>219.8</td>
<td>217.1</td>
<td>203.9</td>
<td>212.6</td>
</tr>
<tr>
<td>2000-01</td>
<td>225</td>
<td>220.1</td>
<td>211.9</td>
<td>227</td>
</tr>
<tr>
<td>2001-02(P)</td>
<td>229.4</td>
<td>225.6</td>
<td>216.2</td>
<td>240.4</td>
</tr>
</tbody>
</table>

1. P (Provisional), *Index of Prices Received, **Index of Terms of Trade, + Final Consumption, #Intermediate Consumption, Capital Formation

2. Source: Government of India, Agricultural Statistics At a Glance, 2003, (Delhi, 2003), Table 6.8

308
The TOT, as is clear from the Table 6.5, were against agriculture throughout the 1980’s as the index in the last column of the table was less than 100 all through the years 1981-82 to 1989-90. After that, there was a distinct turnaround and TOT moved in favour of agriculture, the index being more than 100 from 1990-91 onwards. During the 1990’s, the index of the TOT ranged between a high of 106.6 in 1994-95 and low of 101.9 in 1990-91. In contrast, the index of the TOT averaged around 95.0 during 1980’s. The rising index of prices received by the farmers has been supported by the public policy of annual hikes in the Minimum Support Prices (MSP) of 22 major crops over the years. In the light of the trends in terms of trade noted above, the following observations made in Reserve Bank of India’s Report on Currency and Finance is important. It stated:
a. Over the long-term, the improvement in the gross TOT has been associated with higher output. It has also been associated with increased private investments. However, these gains have been at the cost of impoverishing the rural poor, though farmers with significant surpluses apparently gained.

b. There has been a deceleration in the agricultural growth during 1990’s vis-à-vis 1980’s. The Table above shows TOT moving in favour of agriculture during 1990’s. Thus a paradoxical situation emerges. According to the Report, “It is possible that this may be the outcome of aggregate supply response being price-inelastic because of fixity of land and resource specificity in which agro-climatic conditions, inter alia, are crucial determinants of cropping pattern. It is also possible that the overall impact of TOT on aggregate supply is small, as the favourable TOT may induce marketed supply through a decline in self-consumption among farmers but is offset by the positive income effect that triggers self-consumption.”

c. It is also necessary to examine the relationship between the deceleration in agricultural output in 1990’s and the Aggregate Measure of Support (AMS) which has been estimated to be negative. An estimate of AMS computed by Ashok Gulati and Sudha Narayanan in accordance with the specifications set out in the Uruguay Round Agreement on Agriculture shows that Indian agriculture has been net taxed throughout the 1990’s. Negative AMS for agriculture indicates a negative protection and provides the justification for policy measures aimed to move TOT in favour of agriculture.

---

<table>
<thead>
<tr>
<th>Year</th>
<th>CIPP*</th>
<th>IPR#</th>
<th>ITOT(DEC)AS</th>
<th>ITOTeB</th>
<th>V AQ±(Rs crores)</th>
<th>YTOTE¥</th>
</tr>
</thead>
<tbody>
<tr>
<td>1981-82</td>
<td>61.9</td>
<td>54.9</td>
<td>88.7</td>
<td>97.3</td>
<td>188657</td>
<td>65.2</td>
</tr>
<tr>
<td>1982-83</td>
<td>66</td>
<td>60.3</td>
<td>91.4</td>
<td>96.9</td>
<td>188398</td>
<td>67.09</td>
</tr>
<tr>
<td>1983-84</td>
<td>70.1</td>
<td>64.2</td>
<td>91.6</td>
<td>97.1</td>
<td>204854</td>
<td>73.11</td>
</tr>
<tr>
<td>1984-85</td>
<td>72.4</td>
<td>68</td>
<td>93.9</td>
<td>95.3</td>
<td>208496</td>
<td>76.28</td>
</tr>
<tr>
<td>1985-86</td>
<td>75.2</td>
<td>70.4</td>
<td>93.6</td>
<td>94.7</td>
<td>210496</td>
<td>76.76</td>
</tr>
<tr>
<td>1986-87</td>
<td>80.2</td>
<td>76.7</td>
<td>95.6</td>
<td>96.9</td>
<td>210339</td>
<td>78.43</td>
</tr>
<tr>
<td>1987-88</td>
<td>88.3</td>
<td>86</td>
<td>97.4</td>
<td>101.5</td>
<td>206983</td>
<td>78.54</td>
</tr>
<tr>
<td>1988-89</td>
<td>91.8</td>
<td>90.3</td>
<td>98.4</td>
<td>98.7</td>
<td>239351</td>
<td>91.67</td>
</tr>
<tr>
<td>1989-90</td>
<td>98.1</td>
<td>97.5</td>
<td>99.4</td>
<td>99.5</td>
<td>241787</td>
<td>93.64</td>
</tr>
<tr>
<td>1990-91</td>
<td>110.2</td>
<td>112.3</td>
<td>101.9</td>
<td>101.6</td>
<td>251885</td>
<td>100</td>
</tr>
<tr>
<td>1991-92</td>
<td>123.8</td>
<td>130.8</td>
<td>105.6</td>
<td>107.2</td>
<td>249050</td>
<td>102.46</td>
</tr>
<tr>
<td>1992-93</td>
<td>133.5</td>
<td>138.7</td>
<td>103.9</td>
<td>103.3</td>
<td>261901</td>
<td>106.02</td>
</tr>
<tr>
<td>1993-94</td>
<td>146.1</td>
<td>151.4</td>
<td>103.6</td>
<td>106.1</td>
<td>271839</td>
<td>109.72</td>
</tr>
<tr>
<td>1994-95</td>
<td>160.5</td>
<td>171.1</td>
<td>106.6</td>
<td>106.5</td>
<td>284975</td>
<td>118.36</td>
</tr>
<tr>
<td>1995-96</td>
<td>173.7</td>
<td>182.9</td>
<td>105.3</td>
<td>107.4</td>
<td>284273</td>
<td>116.62</td>
</tr>
<tr>
<td>1996-97</td>
<td>184.8</td>
<td>190.6</td>
<td>103.1</td>
<td>109.8</td>
<td>307393</td>
<td>123.47</td>
</tr>
<tr>
<td>1997-98</td>
<td>194.9</td>
<td>205.9</td>
<td>105.6</td>
<td>113.5</td>
<td>302399</td>
<td>124.41</td>
</tr>
<tr>
<td>1998-99</td>
<td>209.9</td>
<td>220.8</td>
<td>105.2</td>
<td>113.1</td>
<td>323017</td>
<td>132.39</td>
</tr>
<tr>
<td>1999-2000</td>
<td>214</td>
<td>223.1</td>
<td>104.2</td>
<td>111.8</td>
<td>324298</td>
<td>129.76</td>
</tr>
<tr>
<td>2000-01</td>
<td>218.9</td>
<td>225</td>
<td>102.8</td>
<td>110</td>
<td>320920</td>
<td>128.53</td>
</tr>
<tr>
<td>2001-02</td>
<td>225.3</td>
<td>235.5</td>
<td>104.5</td>
<td>109</td>
<td>338976</td>
<td>138.01</td>
</tr>
<tr>
<td>2002-03</td>
<td>231.8</td>
<td>247.5</td>
<td>106.8</td>
<td>112.6</td>
<td>315921</td>
<td>131.45</td>
</tr>
</tbody>
</table>

Source Compiled on the basis of data DE&S, Ministry of Agriculture
* Combined Index of Prices, Prices Paid
# Index of Prices Received
$ Index of Terms of Trade(DES)
ε Index of Terms of Trade derived from National Income & NAS
± Value of Agricultural Output at (1993-94 prices)
¥ Income Terms of Trade
Figure Number 6:9
Index of Terms of Trade between Agriculture and Non-Agriculture (Triennium ending 1990-91=100)

Figure Number 6:10
Index of Terms of Trade between Agriculture and Non-Agriculture (Triennium ending 1990-91=100)
Figure Number 6:11
Index of Terms of Trade between Agriculture and Non-Agriculture (Triennium ending 1990-91=100)

VAQ±(Rs crores)

Figure Number 6:12
Index of Terms of Trade between Agriculture and Non-Agriculture (Triennium ending 1990-91=100)

YTOT¥

Note: Figure number 7, 8, 9, 10, 11 & 12 is based on table number 6:6.
The table 6:6, above shows that the income TOT showed an improvement upto 1981-82 upto 1997-98 either stagnated or slightly declined since 1997-98. The income TOT was much lower during the 1990s as compared with the 1980s. This phenomenon brings to the surface certain serious questions to be answered.

Provision of food for the economy whose population is ballooning at the rate of about 2 percent annually is not an easy task. The provision of food for the expanding population is a matter of concern, as it is not confined to production and productivity but also the problems of distribution and ensuring that it reaches the needy – the poorest among the poor. The existing level of food consumption in labour surplus economies, like that of ours, is very low and with very little increase in the per capita income, the demand for food increases steeply. For instance, population growth rate lies between 1.5 percent and 3 percent in most of the developing economies. This shows that the demand for food grows significantly on account of this factor alone.

The income elasticity of demand for food in developing countries is 0.6 percent or even higher, meaning thereby that 60 percent or more of the per capita income goes to buy food alone. While in the developed countries it is only 0.2 percent or 0.3 percent of the per capita income that goes for the aforesaid purpose. This brings to the surface the fact that unless agriculture is able to continuously increase its production, productivity and more importantly marketable and marketed surplus of foodgrains; a crisis is likely to emerge. If we intend to remain unfazed with the challenges of population increase we must ensure that the foodgrains production will have to be increased at an annual rate of 4.5 percent during the next ten years.\(^5\)

---

It is significant via media to establish a strong forward-backward linkage between agriculture and industry in the economy. There is a circular flow of goods, services and income between these two sectors, in particular and the tertiary sector in general. Many of the industrial inputs come from agriculture and industries to facilitate a good number of agriculture inputs, needed to enhance production and productivity as well. Agricultural production and productivity leave a serious impact on the economy. Any downfall leads to the rise in the general prices of edible items are affected but also the prices of the inputs to the industry are hiked. And if the opposite happens then the reduced purchasing power of the rural segment affects the manufacturing sector and the economy as well. It is established fact that a strong forward-backward linkage works as a multiplier and boosts the economy in the right direction. This can be ensured only if the health of the primary sector improves, becomes robust and stable day by day so that it deepens the magnitude of the market for the semi-finished and finished goods of the manufacturing. The challenges posed before us by the whirlwind of the policy of Laissez-Faire is a matter of serious concern, as the Multinational Companies (MNCs) are targeting this sector as their primary concern for enlarging their revenues and minimizing the cost. Agriculture provides basic inputs to various industries of national significance—sugar industry, cotton-textile industry, vanaspati industry are a few examples of some such industries, which depend upon agriculture for their development. The entire range of food processing industries is dependent on agriculture. Therefore, unless agriculture leaps forward these industries won’t make any significant headway. It is not a one-way traffic, as we know, it is both ways. Not only does this sector facilitate the other sectors, their basic needs but also furnishes for them a very huge market to exploit. With still two third of its population residing in the rural areas, it works as a stimulus for the manufacturing.
As pointed out by Professor Ragnar Nurkse,

"The trouble is this: there is not a significant market for manufactured goods in a country where peasants, farm labourers, and their families, comprising typically two third to fourth – fifth of the population are too poor to buy any factory products, or any thing in addition to the little they already buy. There is a lack of real purchasing power, reflecting low productivity in agriculture". [Ragnar Nurkse, Pattern of Trade and Development, Stockholm, (1959), p 41-42]

So if the level of agricultural production and productivity is enhanced it will facilitate increased income at the disposal of farm families to go for the purchase of the industrial products. The corporate is very well aware with this aspect and is reorienting their marketing strategies and production pattern to tap this large segment of the market. The Fast Moving Consumer Goods (FMCG) giant Hindustan Liver Limited (HLL) has success in its bag. Its A1 tea and Lipton Tiger tea have registered good progress in rural areas.

The enhanced production in agriculture not only reduced our dependence on the externally aided imports but also enabled us to support the secondary sector’s import bill, thereby reducing the burden on the state exchequer. Still during this period there was stability in the level of agricultural production of agriculture sector. Consequently, farm incomes kept on fluctuating and the survival of the substantial fraction of the population remained in doldrums. For a number of years the agriculture based upon exports in India – cotton-textile, jute tea, accounted for more than 50 percent of export earnings of the country. If one adds the exports to other agricultural commodities like cashew kernel, tobacco, coffee, tea, vanaspati oil, sugar etc. the share of exports in the total exports rose to around 70 percent to 75 percent. The share

---

of agriculture in the total exports was 44.2 percent in 1960-61. This fell consistently to 30.7 percent in 1980-81 and further to 17.6 percent in 1992-93. But because of the positive shift in the government policy there has been a rise in the contribution to 18.7 percent in 1993-94 and 18.5 percent in 1998-99.

As we know that the growing surplus is needed in the country to –

a. increase the surplus of foodgrains and agricultural raw material at non-inflationary prices;

b. widen the domestic market for the industrial goods through increase in the purchasing power within the rural sector;

c. facilitate inter-sectoral transfer of capital needed for industrial development, including infrastructure; and

d. increase the foreign exchange through agricultural exports.

The underdeveloped countries often buy capital goods and technical know-how from the advance countries. To be able to trade with advanced nations the poor nations must develop in the production of the products in which they have a comparative advantage, typically the natural resources based industries like agriculture rather than the skill based industries. As agriculture expands its exports the revenue gained can be used both to purchase imports necessary for the development process- namely capital goods but also some consumer goods, pay off loans from foreign institutions. The concentration on the sector such as agriculture in which the country has the comparative advantage will not only enlarge exports, but may also contribute to economic growth via raising the nation’s productive efficiency. However, expansion in the primary products supplies may lead to a reduction in the prices, thereby, turning the terms of trade against primary producers. Agricultural exports provided the necessary support and stimulus for India’s export development right from the early
stage: the emphasis got shifted as they embarked upon the massive industrialization programmes. In the process, the focus on agricultural exports development got diffused and lacked the requisite sharpness. The potential of agricultural exports has also remained largely untapped due to excessive reliance on low-farm technology, lack of the desired level of intensive research efforts on crops other than cereals, stagnant output, lack of full co-operation and involvement by the state governments in the farm output and generating export surpluses, inadequate deployment of marketing techniques, inability to stand up to organized trading houses that dominated world commodity market trade and lack of cohesive and pragmatic approach.

Agricultural support surpluses result from stable and sizeable agricultural production, which in turn stabilizes the prices of farm output by preventing sharp downward movements in them and thereby protects the incomes of the agriculturists. Exports, by reducing excessively large buffer stocks would also lower the storage requirements and avoid the associated waste other costs. It will, to a great extent, facilitate import-substitution. Agriculture, for such economies, may be a source of foreign exchange. It is clear that agricultural exports dominate in the early phases of economic development. But also important in relaxing the foreign exchange constraints is the possibility in several developing countries to save foreign exchange by replacing the import of foodstuffs with home production. Export promotion and import-substitution are the activities not only for the industrial sector but also for the agriculture.

Barter TOT, as is known, only refers to the higher or lower prices received by agriculture. It does not, in any way, reveal the income which agriculture receives relative to the other sectors of the economy. ITOT enables to know this aspect, as it is the ratio, expressed in percentage terms, of the values of exports to the prices of
imports. ITOT has been calculated by using the value of agricultural output sold by agriculture to the prices of the commodities purchased by it, as calculated by the DI & S, Ministry of Agriculture. It comes out that ITOT for agriculture which showed an improvement from 1981-82 to 1997-98 have either stagnated or slightly declined since 1997-98. The increase in the ITOT was much lower during the 1990s as compared with 1980s. This brings to the surface certain very relevant and serious question. When economic reforms were initiated it was claimed that it would bring to an end discrimination against agriculture and consequently turn the TOT in favour of agriculture. Quite obvious the question then what is the reason behind the fact that even though macro-economic reforms including the devaluation, exchange rate reforms, have already taken place agriculture under performed. This indicated towards the fact that there is something wrong down the line. According to the Reserve Bank of India Currency and Finance Report for 1998-99, "It is possible that this may be the outcome of aggregate supply response being price inelastic because of fixity of land and resources specificity in which agro-economic conditions, inter alia, are the crucial determinants of cropping pattern. It is also possible that the overall impact of TOT on aggregate supply is small as the favourable TOT may induce marketed supply through a decline in self-consumption but is offset by the positive income effect that triggers self-consumption. Interestingly, TOT improvement is evident at a time when following Engle's law, the proportion of consumption expenditure on food items, and within food items on cereals is appears to be on decline."

The rise in the prices in fact introduced serious distortions in the food economy having resulted in reduced consumption by the poor as well as building of large stocks of foodgrains.
It is quite evident from the available data that the percentage of agricultural exports declined from 13.5 percent to 11.7 percent for the year 2001-02 and 2003-04 (April-February) respectively. But the other aspect of it is that the value of exports has increased but was not stable. The agricultural imports have been stable at around 4.6 percent of the total imports.

Capital in agriculture is generally used to increase output per worker. Many studies could be quotes in support of the contention that the introduction of the additional capital resulted in a remarkable improvement in the farm labour. ‘The index of output per man-hour in the United States of America went up from 21 in 1940 to 129 in response to the increase of index of average value of productive assets per farm worker from $3,300 to $70,700 during the same period.’17 The use of capital in agriculture has been stimulated by the adoption of the New Technology leading to a fall in the per unit cost of production, though, the overall cost per farm tends to increase. The use of capital becomes more intensive in the case of new agricultural technology as compared to the use of labour.

There are three ways in which the farm sector contributes to industrial capital formation –

Firstly, increased agricultural production benefits the non-agricultural sector through lower food prices, enlarging its real income and so providing the means for increased saving and capital accumulation in the urban sector.

Secondly, these savings may be utilized in financing the growth of non-agricultural sectors. This contribution becomes less important in the latter stages.

Thirdly, contribution to capital formation occurs if the government imposes a compulsory transfer of funds from agriculture for the other sectors, deriving more tax.

revenue from agriculture than the cost of public services, the difference being spent
by the government for the benefit of the industrial sector or used to finance
government services.

One of the major problem facing the under developed countries is to use agriculture to
provide a basis for industrial capital accumulation without simultaneously hindering
agricultural development\(^8\). [Metcalf, David, 1969, The Economics of Agriculture,
p.76-77] Investment in agriculture is a very crucial factor. Both the public and the
private investment are significant forces, which works as a solid bedrock for
exchanging agricultural productivity and production and paves way for its sustainable
progress and development. In a economy like India public investment is of immense
value, as a majority of farming community depends upon the support from the State.
It does not imply that the private investment is something unwanted and undesirable.
It is an integral and desired thing to happen but not at the cost of public investment
and it will be a desirable thing and a healthy symptom if those investing in it represent
the majority of farming community.

The contribution of the public investment in the total investment in agriculture has in
overall assessment declined. Another important fact about the private investment is its
concentration in the Northern region – Punjab, Haryana, and Western Uttar Pradesh.
It clearly reflects the stark reality about the increasing disparities among different
regions and between strata of the farming community. It may not be out of place to
note that in India of about 81 million farm households 6% are big farmers accounting
for 40 percent of the land. This section of the peasantry largely invests in the
installation of tube wells, pumping sets, fertilizers and agricultural machinery required
for this purpose. Furthermore, it has given vent to capitalistic farming, which is not a

\(^8\) David, Metcalf, The Economics of Agriculture, 1969 p.76-77
healthy sign, as majority of them still yearn for the basic inputs and rely solely upon the primitive techniques of cultivation. Total investment in agriculture has not increased much during the last decade and a half. It was 4,636 crores in 1996-97 (at 1980-81 prices). In fact, total gross capital formation (GCF) in agriculture as percent of GDP from agriculture was 9.6% in the year 1980-81 and this declined to 8.5% in the year 1996-97 (in the intervening period it was still lower). At 1993-94 prices, GCF in agriculture as percent of GDP from agriculture was just 5.2 percent in 1998-99. This does not augur well for the future growth of the agriculture sector. A stepping up of the GFC in agriculture is necessary to keep up the agricultural growth in future.

"It is useful that the impact of technology changes in agriculture, like new seeds and crops as well as application of fertilizers, is dependent on acts of investment in irrigation and land development. The nature of investment is another matter that may lead to poorer income generation with the help of assets. While decline in Public investment was made good by increased investment on private account the instances relating to tractors, pump sets, minor irrigation and IRDP suggest that the growing proportion of this was either for replacement of assets or wasted in idle capacity or on investment along lines with very low income generating capacity. The net effect is the lowering of effective investment in agriculture. Unfortunately, however, this direct attack on rural poverty whether through NREP, EGS and RLEG or IRDP, appears to have substituted planned investment in agriculture, instead of being a supplement to the best possible efforts in agricultural investment. It is possible that the large buffer stock of food grains created a feeling of complacency; it appears to have given rise to a feeling that agriculture is no longer a pressing priority in the development effort. If
true, it is dangerous. Rath, Nilkantha: Agricultural Growth and Development in India, 1987.

It is an acknowledged fact that the affluent farmers appropriate the major fraction of support provided by the government and the needy section of the peasantry is left out of its ambit. Not because of any prejudice in policy formulation but because of the manipulations at the ground level. Even after the nationalization of the banks in the 1969 and 1980 the flow of institutional credit has increased leaps and bound but here again it has been subject to the maneuvering by the dominance of the dominant section of the rural social fabric. After the mid-sixties, apart from the introduction of the High Yielding Varieties (HYV) seeds for Wheat and Rice, public investment in agriculture was stepped up significantly. The new technology raised the profitability of investment for the farmers. Besides, in agriculture, there is high complementarity between public and private investment. As a result, the annual GCF in agriculture, public and private combined, at constant prices, rose much faster than in the pre-green revolution period. This was reflected in the accelerated increase in the gross irrigated area. It increased from less than one million hectares per annum during the pre-green revolution period to about 2.5 million hectares per annum during the seventies. However, owing to the land constraints, the growth of the net sown area slowed down considerably. This explains why despite of the increase in the capital formation and introduction of the new techniques, the growth rate of the agricultural output in the post green revolution period as a whole was broadly the same in the pre-green revolution period. However, the picture is not encouraging regarding capital formation in agriculture in the country during eighties. After showing a steep rise in seventies, the gross capital formation in agriculture at the constant prices, both by the

public and the private sector showed a significant decline in the eighties. The decline the Fixed Capital Formation (FCF) could be even steeper. While the gross irrigated area increased at a rate of nearly 2.5 million hectares per annum during the seventies, the increase in the eighties came down to less than a million hectare per annum.

The need for the steep in the investment in agriculture is underlined by the recent trend of a declined in the real investment in this sector. Also there is a need to cope with some of the adverse consequences of the economic reforms in the short run as inflation and slow growth in output and employment. Agriculture can work as the biggest safety net in the process of adjustment by softening the rogours of inflation as well as by the raising of the income and employment for the vulnerable sections of the population. Stepping up of the public and private investment in the infrastructure, i.e. irrigation, research extension and in social development, i.e. rural health, education and skills is the key to the realization of the potential for the private investment and effort\textsuperscript{10}

Both GFC in agriculture and public investment in agriculture have declined considerably during the period of nineties as would be clear from the following facts\textsuperscript{11}[Data are at the 1993-94 prices-computed from the Government of India, Agricultural Statistics At a Glance, 2003(Delhi), Table 3.6(b)].

1. GCF in agriculture was 15.4 percent of the total GCF in the country in 1980-81 declined to 9.8 percent in 1990-91 and further to 7.1 percent in 2000-01 and in 2001-02 it around 8.6%.


\textsuperscript{11} Data are at the 1993-94 prices-computed from the Government of India, Agricultural Statistics At a Glance, 2003(Delhi), Table 3.6(b).
2. Public investment in agriculture was Rs. 7,301 crores in 1980-81. It declined to Rs. 4,992 crores in 1990-91 and it stood at Rs. 4,417 crores in 2000-01. In the year 2001-02 it was Rs. 5,260.

3. The share of public investment in agriculture of total was 51.3 percent in 1980-81, it declined to 30.4% in 1990-91 and further to 22.6% in 2000-01. In the year 2001-02 it was 24.9%.

4. The share of GCF in agriculture in public sector in the total GCF was 17.7% in 1980-81. This fell to 7.9% in 1990-91 and further to 5.3% in 2000-01, it was 5.5% in 2001-02.

This decline in the public investment in agriculture is a serious concern because of the potential negative impact on agriculture in the long run. Gulati and Bathla have recently estimated that a 10% decrease in the public investment (including irrigation and power) leads to a 2.4% annual reduction in the agricultural GDP growth\(^2\). The country is facing a real challenge of accelerating the pace of agricultural growth for poverty alleviation in rural areas. The widespread poverty among marginal and small farmers and landless agricultural labourers can be largely attributed to slow growth of agricultural income vis a vis the growth of population. During the first three years of the Tenth Five Plan, the average GDP growth in agriculture and allied sectors worked out only 1 percent per annum and as the Mid Term Appraisal of the Tenth Plan by the Planning Commission indicates, per capita agricultural GDP shows no significant upward trend after 1996-97. Deceleration in the growth of crop yields which are already at low levels, low output prices, rising costs of crop production and frequent occurrence of natural calamities like drought, flood, hailstorm etc. The question that arises in this context is whether the pace of agricultural growth can be accelerated.

\(^{12}\) Ahok Gulati and Seema Bathla, Capital Formation in Indian Agriculture: Trends, Composition and Implications for Growth,(NABARD, Occasional Paper 24, Mumbai, 2002.)
without substantial improvement in technology, infrastructure and policies of the Government. There are not only supply side problems like declining public investment and weakened support system, but also there is evidence of major structural weakening of demand impulses for agricultural commodities on both domestic and external fronts. While the slow growth in domestic demand has been partly caused by stagnant/declining real agricultural income partly due to change in the consumption behaviour of the people, the external demand through exports has also not grown much in recent years. What is therefore, needed is a comprehensive examination of the existing policies and strategies and preparation of a road map of agricultural development clearly indicating short term, medium term and long term strategies for accelerated growth of crop production, animal husbandry horticulture, agro-processing etc.

Early analysis has also suggested that escalation of agricultural prices reduce the public investment in investment in agriculture, because as agricultural prices rise, the tax revenue to the government, which is mainly derived from industrial income, would go down (Chakravarty 1974, Raj 1976, Vaidyanathan 1977). Subsequently, Mohan Rao (1994) and Mohan Rao and Strom(1998) have claimed that an increase in agricultural TOT will actually shrink the public investment in large irrigation projects, transport, storage, agricultural research and extension due to a fiscal squeeze in the government budget. A number of recent studies have been concerned about the impact of changing TOT on the private component of agricultural investment level (Misra and Hazell 1996, 1997, Alagh 1997, Hanumantha Rao 1997, Misra 198, Chand 2001, Gulati and Bathla (2001). Results by Misra and Hazell(1996), Misra(1998) and Gulati and Bathla (2001) indicate that a favourable agricultural TOT helped to raise the private investment in Indian agriculture. Recently, Fan and Hazell (2000)
examined the impacts of TOT on the technology (HYV) adoption as well as the spread of canal and private irrigation, and noticed a significant and positive influence of the TOT variable. On the contrary, the respective results by Desai and Namboodiri(1997b and 1998a) indicate that an increase in the TOT lowers the total factor productivity growth and government expenditure in agriculture. They used the series prepared by R.Thamarajakshi.

A number of studies such as Ahluwalia (1986), Ghose(1989), Gaiha(1989), Bhattacharya et al (1991), Ghose(1996) have examined the role of agricultural NBOT on the growth-poverty relationship in India. White Ahluwalia (1986) found a weak and statistically insignificant, though positive influence, both Ghose (1989) and Gaiha(1989) identified a strong and statistically significant direct impact of prices on rural poverty levels. Subsequently, other analysts ( Ravallion and Datt 1996, Sen 1996, Desai and Namboodiri 1998b and World Bank 2000) have claimed that the rise in rural poverty in India noticed during the first half of 1990’s is due to the high agricultural price inflation.

Bhattacharya et al (1991), ILO (1996) and Fan and Hazell (2000) analyze the impact of changes in NBOT on rural wage levels. The evidence suggests an inverse relationship between NBOT and the rural wage earnings. This is also consistent with the hypothesis by Bhaduri(1993), suggesting that a rise in TOT leads to higher out-migration by pushing out the rural population who are the net buyers of foodgrains.

Rath.(1985) estimated the index of terms of trade for major crops at the State level for a period of 22-23 year period ending in the 1980s. He worked out and presented two types of index numbers, viz.

a. ratio of index of farm harvest prices (FHP) to composite index of the prices of inputs purchased by the farmers from the non-farm sector, and
b. ratio of index of FHP to the index of prices paid by rural households for goods of household consumption purchased from the non-agricultural sector.

For both of these index numbers estimated by Rath, the base period is 1961-62. He worked out the State level index numbers of the 14 important crops. The crop-wise TOT with respect to input prices revealed the following:

1. The index for almost all crops (except jute) in all States was at high level till 1974-74. The index reached peaks around 1967-69, declined somewhat around 1970-72 and then increased till 1974-75 from 1974-76 till 1982-83, there was a visible decline in the TOT index.

2. The index for wheat, since 1975-76, fluctuated around 100 but became distinctly unfavourable in the 1980s. The index for rice became generally unfavourable since 1976-77. For coarse cereals also, the terms of trade during 1980 turned unfavourable compared to the early sixties.

3. The pulses, oilseeds, sugarcane and cotton did not generally exhibit unfavourable terms of trade.

4. Jute crop exhibited very distinctly unfavourable TOT during this period.

Results for the TOT with respect to the prices of consumption goods revealed the following:

a. the TOT moved up significantly for most crops till about 1968-69. But, thereafter, the index for most cereal crops declined at the beginning of the seventies, almost to the level of the beginning of the sixties. Subsequently, there was a fresh spurt in 1974-75. But after that, for many cereals, and after 1977-78 for all cereals in all States, the index declined sharply to the level of the early sixties or even lower than that.
b. With regard to pulses, oilseeds and sugarcane, the TOT remained consistently higher than in the beginning of the sixties, despite considerable fluctuations from year to year.

c. The index for cotton shows sharp fluctuations over the two decades and cannot be said to have remained consistently higher than in 1961-62, though it did not show persistent unfavourable trend either. Jute, on the other hand, not only showed great fluctuations, but also an unfavourable trend in more recent years.

**Crop Cultivation: State wise Analysis:**

The area and production of important crops of each States were compiled for the base period, that is, 1988-89 to 1990-90, to identify the major crops.

The state-wise level of crop wise index numbers of TOT derived as ratio of index of farm harvest prices to the index of purchased farm inputs. The index number of the TOT is derived by using the indices of normalized FHP are given in the table 15A. The inter-state comparison of TOT for the various crops was done on the basis of index numbers of TOT worked out from normalized indices of farm harvest prices. The TOT for all crops in almost all the states revealed wide inter-year fluctuations. The TOT for paddy at the state-level reveals the following:

a. there were large inter-year fluctuations in the TOT in all the states;

b. there has been an increasing trend in the quinquennial averages of indices of TOT (except Tamil Nadu where the reverse holds good);

c. the TOT during the 1990s in Haryana - a state where Baamati variety occupies considerable area under Paddy, where higher than that in other State; and

d. the indices of the TOT during 1990s in Bihar were considerably lower than that in other states.
The TOT for wheat at the State level reveals that

(a) there have been larger inter-year fluctuations in TOT in all the states;

(b) there was an increasing trend in quinquennial averages of indices of TOT in all the states;

(c) the indices for the TOT for Punjab and Haryana have remained lower than that for the other states during the last 15 years; and

(d) the indices of TOT for Gujarat have remained higher than that for other states during the study period. The Punjab and Haryana are surplus wheat producing states and the cost of production of wheat in these states is lower than in other states. Gujarat is, by and large, a deficient state in wheat production.

The TOT for coarse cereals – maize, bajra, jowar, ragi and barley, improved during the 1980s as the average of index numbers of TOT for the second half of the 1980s was considerably higher than that for the first half of 1980s. Rajasthan which is the largest producer of Bajra, has been the exception, as the TOT of Bajra in this state during the second half of the 1980s was lower. During the subsequent period, that is, the first half of 1990s, the TOT for the coarse cereals revealed an improved, with the quinquennial average going up further in a majority of the states.

In case of Bajra, the TOT continued to remain relatively better for Gujarat and Rajasthan than other states through out the relative study period. For Jowar, the TOT for Gujarat have consistently remained relatively better than other states. As regards Maize, the TOT for the first half of 1990s have remained relatively better in Rajasthan and Bihar than that in other states.

In case of Pulses, the general trend is that the TOT in all the states, which have shown improvement during the second half of the 1980s, did not improve further during the
first half of 1990s. For Grams, there was even some deterioration in the TOT in Rajasthan and Haryana during the first of the 1990s. Contrarily, in Arhar, there was some improvement in TOT in Uttar Pradesh and Madhya Pradesh. However, in all the states, the average indices of TOT for the first half of the 1990s were higher than that of 1980s. The state with relatively better TOT was Haryana for gram and arhar for Gujarat.

The TOT for the Groundnut, an important kharif oilseed crop, which improved further during the second half of the 1980s in all the states, did not improve any further during the first of the 1990s, except Maharashtra. In fact, the TOT during the first half of the 1990s deteriorated in all the states during the first half of the 1990s except Maharashtra. However, the average of indices of TOT for the first half of 1990s was higher than that of the first half of the 1980s. The TOT for groundnut were relatively better for Gujarat than that for other groundnut producing states included in the study. The behaviour of TOT for sesamum, another kharif oilseed crop, was similar to that for groundnut.

The TOT for mustard at the state-level reveals that:

i. there have been large inter-year fluctuations in the TOT for mustard in all the states for which the analysis was done;

ii. the TOT for the mustard in all the states as revealed through quinquennial averages of indices, improved during the second half of 1980s and show a sharp decline during the first half of the 1990s; and

iii. the TOT during the 1990s were lower in Punjab and higher in Haryana than that in other mustard growing states for which analysis has been done.
The estimates of the TOT for cotton at the state level presented an increasing trend in all the major cotton growing states except Maharashtra. The average indices of TOT for the first half of the 1990s were higher than that for the second half of the 1980s. In the case of Maharashtra where a Monopoly cotton purchase scheme has been in operation, though the inter-year fluctuations in TOT have been lower than many other states, the TOT for cotton growers, by and large did not improve during the second half of the 1980s and in fact deteriorated during the first half of the 1990s. Further, this is the state, where the relative TOT for cotton growers have remained the worst compared to that for the cotton growers of other states.

The situation of Jute, another fibre crop, is worse than all the other crops as far as the behaviour of the TOT is concerned. The TOT in West Bengal did not reveal any significant improvement during the second half of the 1980s and revealed deterioration during the first half of the 1990s. However, the results should be used with caution, as there was an unusual spurt in jute prices during 1984-85 that increased the average of indices of TOT for the first half of the 1980s.

The TOT for sugarcane in Uttar Pradesh revealed a consistent increasing trend with the average of indices of TOT going up from the first half of the 1980s and further during the first half of the 1990s.

**Terms Of Trade: An Evaluation:**

There are three aspects of behaviour of TOT which need to be examined in the context of changes in the trade and marketing policy strategies. First is the change in the divergence of TOT for the agricultural sector across the states during the last 15 years. Second is the impact of further liberalization of trade and marketing policies on the TOT for agriculture in the different regions/states of the country. Third is the
impact of the changes in the TOT on the growth of the agricultural sector, and in turn on the food security and poverty.

For analyzing the changes in the divergence of TOT across the states, we estimated the coefficient of variation (CV) in the indices of TOT at the three point in time. The results reveal that the divergence in the TOT for the agricultural sector at the state level, which has been increasing during the 1980s, has gone up further during the 1990s. The CV in TOT across states, which was 7.44 per cent during 1981-84, increased to 9.04 per cent during 1988-91 and further to 10.40 per cent during 1995-98. The factors which influence the difference in the TOT for agriculture among states could be agro-climatic differences and consequent cropping pattern changes, or rigidities and infrastructural deficiencies and consequent marketing inefficiencies. A pooled time series cross section regression model incorporating these factors needs to be estimated to explain temporal and spatial variation in the TOT for agriculture.

With regard to the impact of trade liberalization on domestic price levels of important commodities, the results (Chand 2000a) reveal that the prices realized by the farmers are likely to increase in some crops and decline for the others. Under the assumption that India is able to realize the world market prices for its exports and pay the prices which it is now paying for its imports, freeing trade in agricultural products would result in increases in prices of rice and wheat and decline in that of oilseeds and pulses. The prices at the farm level are likely to go up by 29.5% for paddy/rice and 10.2% for wheat, whereas that of oilseeds (rapeseeds-mustard) would decline by 17.4% and pulses by 15.5% (pigeon pea). These coefficients reveal that TOT for oilseeds and pulses growing farmers and regions will deteriorate and of those growing rice and wheat will improve. The impact of these changes in prices at the regional
level can be analyzed by superimposing these price changes on the share of different crops in total output from crop product.

Terms Of Trade: Regional Analysis:

Across regions, the TOT for agriculture of central and some southern states are likely to worsen. The weightage of oilseeds in the central region (Gujarat, Madhya Pradesh, Maharashtra and Rajasthan) is 26.4% and in the southern region is 16.7%. The TOT for the central region would also worsen owing to the likely decline in the prices of pulses as a consequence of trade liberalization. Given the fact that the TOT of all the regions would somewhat improve owing to the rise in the price levels of rice and wheat, the negative impact of trade liberalization on the TOT can be mitigated by imposing import duties on oilseeds and pulses, and also by improving the efficiency of domestic markets.

In context of the different studies conducted with this view, it may be pointed out that the role of TOT has remained central in the debate on the role of price and non-price factors in agricultural growth. Some studies have found that TOT do not cause significant impact on output (Thamarakshin, 1994) while others concur through the favourable impact on private investment, TOT exert favourable impact on growth of agricultural output (Mishra and Hazell, 1996). The impact of TOT on private investment at the state level has also been confirmed by another study (Chand 2000b). Most of these studies are based on all-India data, as adequate data on TOT, public investment and private investments at state level were not available. They do not take into account interacting influences of different variables operating in different states. The results of these studies which constructs and uses state level series on TOT to examine how TOT affect output in different states representing different stages of
growth and different levels of infrastructural and institutional settings assumes considerable significance. It was found that in 10 out of the 17 states, for which the study was conducted, TOT shows a significant positive impact on agricultural output. The results reveal few interesting patterns. In the two states, namely west Bengal and Rajasthan, which topped in terms of growth of output, TOT did not have significant influence on the State Domestic Product (SDP) from agriculture. Similarly, the state of Bihar, which recorded the highest growth rate of TOT did not witness any influence of TOT on SDP from agriculture. This raises a pertinent question as to why in 40% cases TOT did not show any impact on output. The reasons could be several and some of those could be explained by looking at individual cases. For instance, in the case of West Bengal, institutional reforms like operation bajra seems to have played an important role in agricultural growth and in Rajasthan spread of irrigation and improved agricultural technology for some crops are main contributors to SDP growth. In the case of Bihar, supply squeeze seems to have played in influencing the agricultural prices that lead to higher growth of TOT in Bihar than on other states. These cases point to the need for undertaking the relationship between agricultural growth and relevant factors using state level time series data. As the series on state level TOT for agriculture is now available and statewise series of public investment has been prepared, it is now possible to undertake a detail state level study on the impact of various policies on agricultural growth. The inferences of the policy interest from the available study of the TOT are -

1. TOT do play a favourable role in agricultural growth if other factors for growth are conducive.
2. Availability of yielding-raising technologies and institutional and infrastructural conditions can negate the impact that barter TOT would have on agricultural output; and

3. Recognising that in some cases the impact of one kind of factor can be shadowed by other kind of factor, there is a need to isolate the impact of different factors on agricultural growth and development.

The crop wise result further reveals that-

a. the compound rates of increase in farm harvest prices have higher than that in prices of farm inputs and consumption goods separately for almost all crops in all states.

b. the rates of the increase in prices of purchased inputs have been generally lower than that of consumption goods; and

c. the rates of increase in the TOT for almost all the crops and states have been positive.

The results of different studies indicate that with the liberalization of trade in agricultural commodities, the TOT for pulses and oilseeds growing farmers and regions will deteriorate, and those growing rice and wheat, trade will improve. This will increase disparities in farm incomes between irrigated/ high rainfall regions and dry land areas, as well as between resources rich and resource poor farmers. Further, the net purchasers of the staple cereals would lose, as they will have to pay higher prices for these basic food items.

The results also reveal that owing to the diversity in agro-climatic conditions, consequent differences in production patterns, the TOT for the agricultural sector have move differently at regional levels and liberalizations of trade in agricultural commodities would increase these differences further. However, if complimentary
policies are in place, the gains from the trade can be maximized losses can be
minimized.

It is also surfaced through different studies that TOT do play a favourable role in
agricultural growth, if other factors for growth are conducive, particularly the
availability of better technology and institutional and infrastructural factors, absence
of which can negate the impact of favourable BTOT.

Conclusion:

One may conclude that –

1. there remained inconsistency in TOT for the agricultural sector since
   independence;
2. there were instances when in spite of initiatives by the Government to increase
   the prices of commodities produced by the agricultural sector the TOT for the
   agriculture sector remained unfavourable.
3. favourable TOT for agricultural sector could not check the low income
generation in this sector.