

## PAKISTAN'S AGRICULTURAL TERMS OF TRADE: 1973-74 to 1983-84

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The main concern of this paper is the effect of relative price changes on the agricultural sector during 1973-84. Various terms of trade indices have been calculated. The first is the ratio of the prices received by agriculture for its produce to the prices paid by agriculture for consumer goods. The second is the ratio of the prices received for agricultural output to prices paid for agricultural inputs. Both these indices have been calculated using domestic and international prices. Adjustments have also been made to account for changes in per capita incomes over time. To analyse regional differences in the terms of trade, indices have been calculated at both the national and provincial levels. Two important conclusions have emerged from the results. First, there is not much difference between the terms of trade under regulated (pre-1977) and de-regulated (post-1977) price regimes. Second, regional inequalities in the agricultural sector have not reduced significantly over the period under consideration.

### I. Introduction

The impact of government policies in changing the relative price structure immediately raises the question: changing them from what and to what end? In the context of agricultural pricing policy, the reasons for altering relative prices can be manifold. For example, it could be used as a means for altering income distribution both within agriculture and also between the agricultural sector<sup>1</sup> and the non-agricultural sectors. Relative price changes

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<sup>1</sup> The agricultural sector must be distinguished from the rural sector. The latter would include rural industries, services, infrastructure, etc.

could also be used to influence the allocation of resources, i.e., production, cropping patterns and input use.

The terms of trade for agriculture can best be represented by two separate indices. The first should reflect the relative price changes between prices received by agriculture for its produce, and the prices paid by agriculture for consumer goods and services. This index illustrates changes in the standard of living in the agricultural sector, i.e., whether the agricultural sector is able to consume more or less, over time, with the income it has received.<sup>2</sup> The second index for the terms of trade should include relative price changes between prices for agricultural output and prices for agricultural inputs. This index would deal with issues related to the profitability of production.

Most studies relevant to these issues have been concerned with relative prices between the agricultural sector and the manufacturing sector. The main concern of this paper is not inter-sectoral terms of trade but the effect of relative price changes on the agricultural sector.

Previous studies have used various approaches. Lewis (1968) has used implicit exchange rates<sup>3</sup> for tradable goods to examine the effects of economic policy on the difference between domestic and "free trade" relative price structures. His study was mainly related to the terms of trade between agriculture and manufacturing, and the extent to which these terms of trade are turned against agriculture. The basic aim was to measure the extent to which domestic prices were prevented from reaching the relative prices that existed in international trade. The time period under study was 1951-64.

In another study, Lewis and Hussain (1967) used relative price changes for the same period (1951-64) to determine the direction and size of movements in the terms of trade between agriculture and the manufacturing sector in Pakistan and within each sector. Their results show that the manufacturing sector in both the provinces (East and West Pakistan) faced worse terms of trade in the mid-1960's. The terms of trade were turned against the manufacturing sector during the 1950's.

<sup>2</sup> The commodity terms of trade may not fully reflect changes in the standard of living for a couple of reasons. First, commodity terms of trade do not reflect changes in productivity. Since a farmer's productivity may have increased by more than a drop in the price of his output one would need to know the income terms of trade. This has been done by calculating what have been termed "the real per capita income" terms of trade and are explained later in the text. Second, a worsening of the commodity terms of trade may be accompanied by a larger increase in output sold, so that in spite of smaller margins, gains are increased. However, in this paper the commodity terms of trade are considered a reasonable reflection of the standard of living in the agricultural sector, despite these limitations.

<sup>3</sup> An implicit exchange rate is the ratio between the domestic wholesale price of commodity in local currency and the foreign price of the same commodity in some international currency.

Afzal (1977) using the structure of domestic prices in the agricultural sector in the base year of 1959-60, was concerned exclusively with movements in the terms of trade in agriculture (in domestic prices) during the period 1966-76. He does address the effects of relative price changes on the agriculture sector but there are certain deficiencies in his paper. His analysis is aggregated for all of Pakistan and is confined strictly to parity pricing.

Gotsch and Brown (1980) are primarily concerned with the overall taxes and subsidies in Pakistan's agriculture. Terms of trade have been computed only to explain the government's policy towards the agricultural sector. The period under study is 1960 to 1976. The methodology and the weights used by the authors are the same as those used by Lewis and Hussain. Apart from inter-sectoral terms of trade, the authors have calculated the indices of the real cost of acquiring inputs using the prices of selected commodities and inputs individually. The study also attempts to fit a distributed lag model to explain the links between these terms of trade and value added in agriculture. However, as the authors themselves point out the results of their regression analysis are unsatisfactory.

Cheong and D'Silva (1984) have calculated four terms of trade indices, namely, net barter terms of trade, income terms of trade, single factorial terms of trade, and the wholesale price ratios. All of these are intersectoral terms of trade. The main purpose of the study, however, is to assess the performance of the agricultural sector in the light of government policy. The terms of trade indices have been computed by taking the ratio of the G.D.P. deflator for the agricultural sector to the G.D.P. deflator for the manufacturing sector. The weighting scheme is constructed on the basis of production of different commodities. The terms of trade are calculated for the whole of Pakistan. The time period under study is 1960-82. The study also computes the ratio of fertilizer prices to prices of major crops individually, for the period 1970-83. Besides this, the ratios, of domestic to international prices of major crops have also been calculated.

Qureshi (1985) has used Lewis and Hussain's methodology and weighting structure to calculate the terms of trade for the agricultural sector for the period 1951-64. In this study the following three types of terms of trade have been computed: (a) net barter terms of trade, (b) income terms of trade and (c) single factorial terms of trade. These terms of trade are aggregated for all of Pakistan. Using the weights constructed by Lewis and Hussain may not be proper because there have been significant changes in the economy over the period of the study. An attempt has also been made to explain the impact of the terms of trade on farm output using a single equation system. Such a system may be too simplistic to explain the variation in farm output given the complex inter-relationships that exist in the

agricultural sector.

The present paper differs from earlier studies on agricultural terms of trade in a number of ways. First, as mentioned earlier, the main concern is with the effect of relative price changes on the agricultural sector. Second, the terms of trade for agriculture have been calculated at both the national and provincial levels, thus allowing the analysis of various issues on an inter-regional basis. Third, separate indices are calculated using both domestic and international prices for agricultural commodities. The indices using international prices give some idea about the degree of protection that the agricultural sector has been given and what the real income of the agricultural sector would have been if it were allowed to trade freely in the world markets. Fourth, various terms of trade indices have been adjusted for changes in agricultural production and population changes over time to derive what have been termed the 'real per capita income' terms of trade. These have been discussed in detail later.

The paper is divided into four sections. The next section describes the data and the methodology. The third discusses various indices in detail, analysing major movements and pointing out the key factors responsible for these movements. Conclusions are given in the final section. Details regarding various prices that have been used and the construction of the weights used are given in the appendix.

## II. Methodology

### 1. *Various Methods for Calculating the Terms of Trade*

The terms of trade for any sector are defined as the ratio of the index of prices received by that sector to the index of prices paid by that sector. The data for this purpose are from secondary sources. The period under consideration for this study is 1973-84. Initially, four different indices of the terms of trade for agriculture have been calculated. These are as follows:

- (a) Terms of trade using domestic prices for agricultural commodities. This includes two indices:
  - (i) Ratio of the prices received for agricultural commodities by farmers to the prices of consumer goods they buy domestically.
  - (ii) Ratio of the prices received for agricultural commodities by farmers to the prices of major agricultural inputs they purchase in the domestic market.
- (b) Terms of trade using international prices for agricultural commodities. This includes two indices:

- (i) Ratio of the prices of agricultural commodities that farmers would be paid in the international market (assuming no trade restrictions) to the prices of consumer goods they buy domestically.
- (ii) Ratio of the prices of agricultural commodities that farmers would be paid in the international market (assuming no trade restrictions) to the prices of major agricultural inputs they purchase in the domestic market.

Indices [(a)(i)] and [(b)(i)] indicate movements in the standard of living of the farmers – under domestic and international price regimes, respectively.

Indices [(a)(ii)] and [(b)(ii)] show profitability in agriculture domestically and internationally, respectively.

In addition to these indices, another index is calculated to account for changes in per capita income over time. This involves adjusting the forementioned indices for changes in agricultural production and population in the four provinces and also for Pakistan over the period under consideration.

During the year 1972 there were heavy floods in the country and a major portion of the crop was destroyed. The data for this period was not considered and the period 1973-74 to 1983-84 was selected for the study. The economy of the country, by 1973-74 to some extent, had also been stabilized, after the creation of Bangladesh.

## 2. Description of Various Indices

The first step in computing the terms of trade is to calculate separate indices for prices received and prices paid by the farmers.

- (a) *Prices Received by Farmers:* First, a simple index of prices for each commodity was derived. Then, by multiplying the prices with the quantity of commodity produced in the base year, the amount received by all farmers for that commodity was obtained. Repeating the same exercise for each commodity and summing the amount received the total sale proceeds accruing to the farmers was calculated. Finally, to derive the weighted index, each commodity was assigned weights equal to the ratio of the amount received for that commodity to that received for all the commodities. Estimates are related to average annual wholesale prices that farmers receive for their products.<sup>4</sup> However, for some

<sup>4</sup> It was considered expedient to use average annual wholesale prices as opposed to post-harvest prices. First, since we are concerned with relative price changes, it is the direction of change, as opposed to absolute prices, that is of relevance. Second, average annual wholesale prices were more reliable and readily available.

crops like wheat, sugar-cane and rice, which are major crops in Pakistan, government procurement prices have been used for computing the index of domestic prices received by farmers. Nineteen crops were selected for computing the index of prices received in the domestic markets.<sup>5</sup> For the index of prices received using international prices, only seven crops could be selected due to the lack of data on international prices for the rest of the commodities. However, it was observed that the crops, namely, wheat, rice, cotton, maize, jowar, citrus fruits and banana, covered a major portion of Pakistan's crop production.<sup>6</sup>

- (b) *Price Paid by Farmers*: Estimates of prices paid by farmers are divided into two categories. The first relates to prices of consumer goods and services that farmers buy, and the second relates to the prices of inputs that farmers buy for crop production. Twenty-eight items were selected for computing the index of prices paid by farmers for consumer goods and services. Prices prevailing in the rural areas would have been the appropriate choice for computing this index, but no such data were available. The only available data were on the prices prevailing in urban areas. The prices prevailing in urban areas were used on the basis of the observations made by Ginneken (1976) about five developing countries including Pakistan. Ginneken demonstrates that the difference between urban and rural prices are too small to result in any significant difference between urban and rural areas.<sup>7</sup>

Five major inputs i.e., seed, fertilizer, water, pesticides and low diesel oil (used for tractors) were selected for computing the index of prices for inputs. The weighted price index was calculated by using the value of each input consumed in the base year 1973-74.<sup>8</sup>

The index of prices received and paid by farmers were calculated with the following Laspeyres formula using 1973-74 as the base year.

$$IP = \sum_{j=1}^n W_{0j} (P_{ij} / P_{0j}) 100$$

<sup>5</sup> The list of crops used is given in Appendix-1.

<sup>6</sup> The sources of data used were "Pakistan Economic Survey", "Agricultural Statistics of Pakistan", and "Markets and Prices", for domestic prices, while international prices taken from the World Bank's statistical handbook "Commodity Trade and Price Trends", for all relevant years.

<sup>7</sup> The data sources for computing the consumer price index for the rural sector were the "Household Income and Expenditure Survey", "Consumer Prices in Urban Centres", "Monthly Statistical Bulletin", and the "Statistical Year Book", for all relevant years.

<sup>8</sup> The data for calculating the input price index were taken from "Agriculture Statistics of Pakistan", "National Accounts of Pakistan", "Pakistan Economic Survey", and the "Energy Year Book", for all relevant years.

Where  $W_{oj} = q_{oj} P_{oj} / \sum_{j=1}^n q_{oj} P_{oj}$ ;  $i = 1973-74$  to  $1983-84$ ;  $j = 1$  to  $n$  commodities;  $IP =$  index of prices for a particular group;  $P_{ij} =$  current year price of commodity  $j$ ;  $P_{oj} =$  base year price of commodity  $j$ ;  $q_{oj} =$  base year quantity of commodity  $j$ .

The four indices discussed so far do not take into account any changes in real per capita income over time. If, for example, the terms of trade improve, this means that the relative prices received by farmers have increased. At the same time, if the quantum index relative to the population index falls, this implies a fall in per capita production. With higher relative prices but a lower per capita production, the real per capita income would be less than that with a higher or at least the same level of per capita production as in the previous period. To adjust for such changes, it is considered necessary to alter the terms of trade indices and to construct what we have termed the 'real per capita income' terms of trade for agriculture. The adjustment formula used is: Terms of Trade  $\times$  Adjustment Factor.

The adjustment factor used is:

(Index of agricultural production / Index of rural population).

This involves the construction of two further indices: (1) a quantum index of agricultural production; and (2) an index of rural population.<sup>9</sup> The ratio of these two indices was taken as a proxy for changes in real per capita income. The Quantum index was computed by using the same Laspeyres formula as follow:

$$IQ = W_{oj} [(q_{ij} / q_{oj}) \times 100]$$

Where  $W_{oj} = q_{oj} \times P_{oj} / \sum_{j=1}^n q_{oj} \times P_{oj}$ ;  $i = 1973-74$  to  $1983-84$ ;  $j =$  crop  $1$  to  $n$ ;  $q_{ij} =$  current output of commodity  $j$ ;  $q_{oj} =$  base year quantity of commodity  $j$ ;  $P_{oj} =$  base year price of commodity  $j$ .

### III. Results and Discussion

#### 1. Terms of Trade Using Domestic Prices

- (a) *Parity between domestic prices received for farm products and domestic prices paid for consumer goods.*

<sup>9</sup> Population Index was calculated as follows:  $I_{pop} = (Pop_i / Pop_0) \times 100$ ,  $i = 0, 1, 2, \dots$  years where population was computed on the basis of intercensal growth rate between the 1972 and the 1981 Census.

The results are given in Table 1. The terms of trade for all of Pakistan improved to some extent in the years 1975-76, 1976-77 and 1978-79, but for rest of the period they declined over the base year. If we look at each province separately we find that in the case of both Punjab and Sindh the terms of trade remained above the base year level, for four years. The index of prices received increased more than the index of prices paid for consumer goods. In the case of N.W.F.P. and Baluchistan there was no improvement in the terms of trade throughout the period under study because the price index for agricultural products was increasing less than the price index increase for goods consumed by the rural sector (see Table 2 and Table 3).

It must be mentioned that for N.W.F.P. the terms of trade improved only in the year 1974-75 while in the remaining years the index of prices paid was more than the index of prices received. Looking at Figure 1(a) and Figure 2, it appears that, for all the provinces and for all of Pakistan prices received and prices paid increased in the same direction mainly due to the impact of price inflation.

There is not much difference between the prices of the crops between provinces. One reason is that procurement prices of wheat, rice and sugar-

TABLE 1

Domestic terms of trade  
(consumer goods prices index in denominator)

YEARS	PUNJAB	SINDH	N.W.F.P.	BALU- CHISTAN	PAKISTAN
1973-74	100.00	100.00	100.00	100.00	100.00
1974-75	98.90	97.78	103.78	95.84	96.74
1975-76	103.15	104.35	98.65	89.82	102.04
1976-77	105.68	108.00	87.21	95.55	102.83
1977-78	96.86	97.68	82.50	84.78	94.40
1978-79	104.11	106.00	91.07	93.35	101.24
1979-80	93.67	92.79	89.64	86.37	91.40
1980-81	104.65	98.52	98.65	93.38	98.30
1981-82	98.36	95.82	97.82	97.69	96.66
1982-83	95.04	95.00	90.70	94.10	93.50
1983-84	99.87	100.50	90.10	92.70	97.83



TABLE 2

Prices (index) received by farmers  
(domestic)

YEARS	PUNJAB	SINDH	N.W.F.P.	BALU- CHISTAN	PAKISTAN
1973-74	100.00	100.00	100.00	100.00	100.00
1974-75	123.08	118.24	132.85	116.42	120.79
1975-76	138.05	141.15	140.62	124.67	138.77
1976-77	152.28	160.04	137.06	141.20	150.78
1977-78	149.91	151.18	146.08	136.28	148.67
1978-79	173.30	178.35	169.95	160.41	169.23
1979-80	176.09	173.50	182.11	171.41	174.00
1980-81	219.03	207.63	217.73	213.87	213.75
1981-82	228.45	223.71	237.73	248.86	227.17
1982-83	233.02	229.19	251.00	249.85	229.52
1983-84	272.24	265.78	262.01	272.00	260.74

TABLE 3

Prices (index) paid by farmers for consumer goods  
(domestic)

YEARS	PUNJAB	SINDH	N.W.F.P.	BALU- CHISTAN	PAKISTAN
1973-74	100.00	100.00	100.00	100.00	100.00
1974-75	124.44	120.92	128.00	121.47	124.86
1975-76	133.78	135.26	142.53	138.80	135.99
1976-77	144.06	148.14	157.16	147.77	146.62
1977-78	154.76	154.76	177.06	160.73	157.50
1978-79	166.45	168.24	186.61	171.82	167.15
1979-80	187.98	186.98	194.29	198.46	190.41
1980-81	209.28	210.74	220.69	229.01	217.46
1981-82	232.25	233.46	243.01	254.73	234.96
1982-83	241.90	241.31	259.39	265.43	245.46
1983-84	264.08	264.39	278.96	293.42	266.52

Figure 1

Domestic Terms of Trade for Pakistan

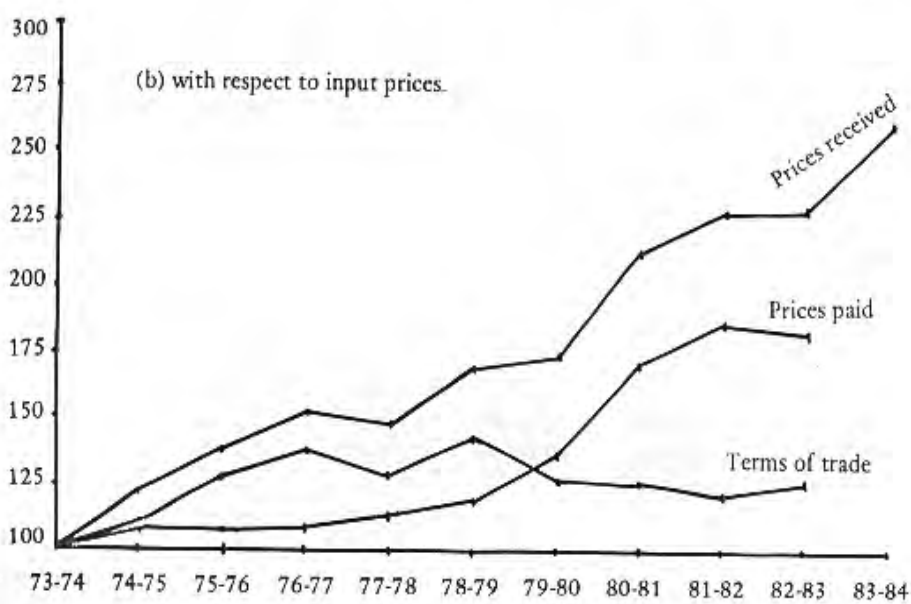
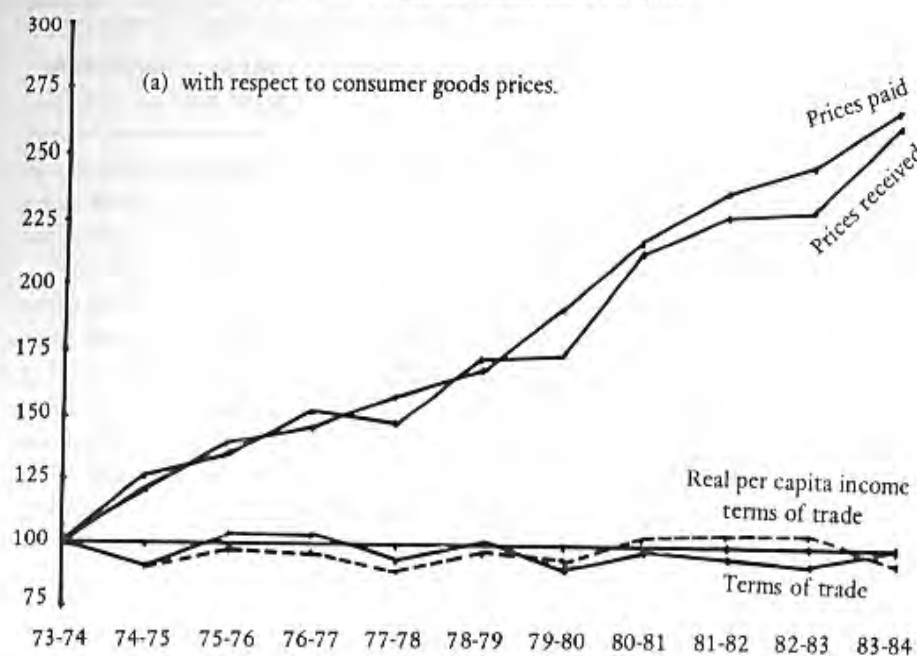
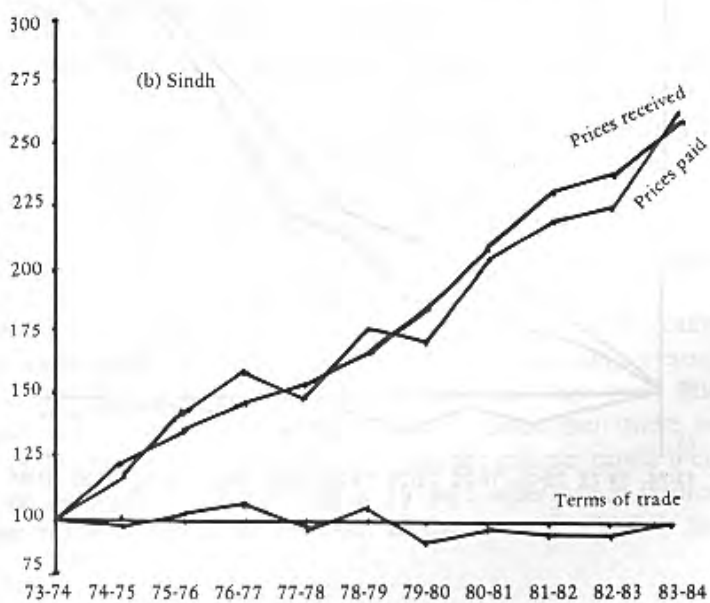
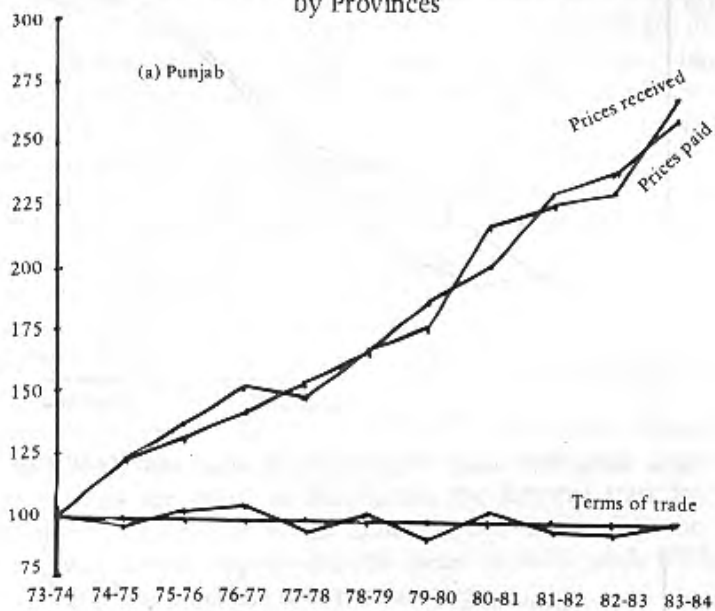
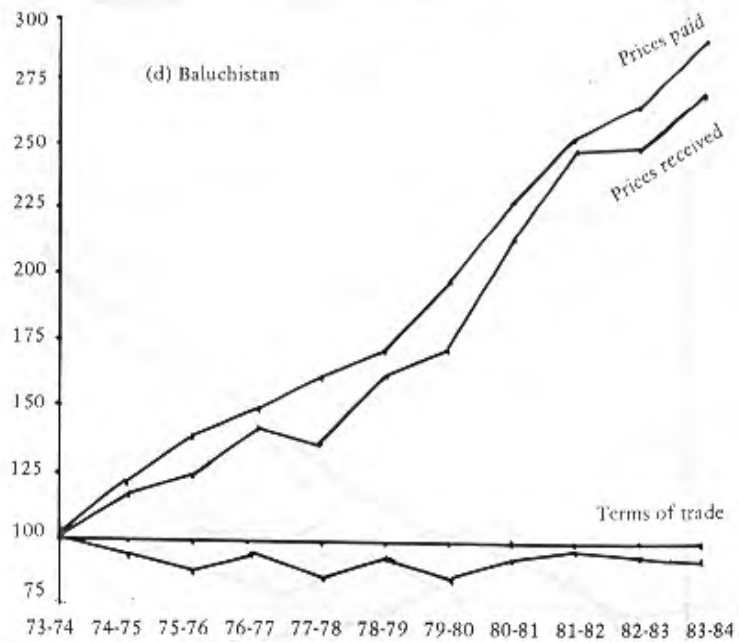
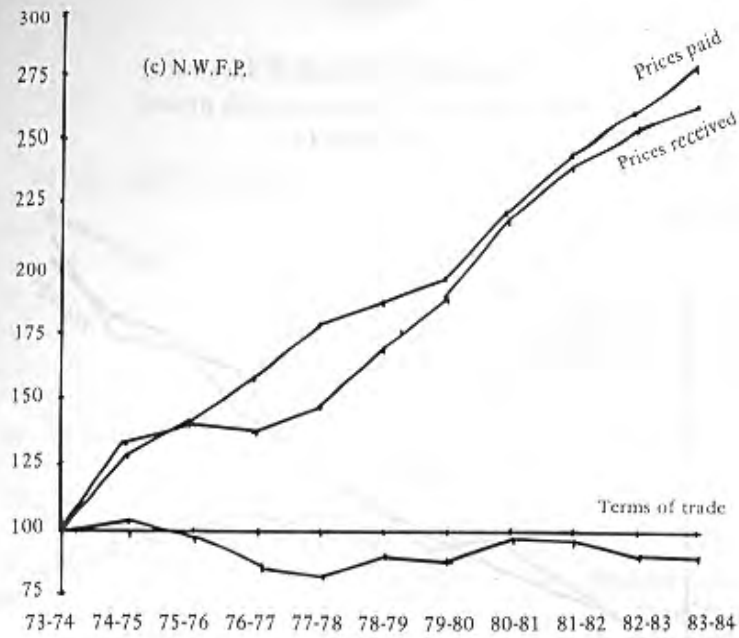


Figure 2

Domestic Terms of Trade  
(with respect to consumer goods prices)  
by Provinces





cane have been taken for the calculation of the index of prices received. For cotton, Karachi spot prices have been taken. In the case of other crops also, prices moved at a similar rate in the four provinces. The only difference is in the crop mix which explains the variation in the index of prices received between provinces. For example, in Baluchistan, fruits have a weight as high as 0.54 (54 per cent) and the fluctuation in prices received are due to the fluctuation in fruit prices. In N.W.F.P., fruits account for only 11 per cent of the total value of agricultural production and the variation in the index of prices received is mainly due to the variation in the prices of wheat, maize and sugarcane which have a weight equal to 0.28, 0.19 and 0.25 respectively.

Since the measure of the terms trade tells us whether the agricultural sector can buy a larger or smaller bundle of consumer goods, the terms of trade index provides a measure for the standard of living in the agricultural sector. In other words, it shows whether the farmers are becoming better off or worse off over time. From our calculations it can be observed that in Pakistan, as a whole, the standard of living of the farmers improved a little in 1975-76, 1976-77 and 1978-79. It declined over the base year in the remaining period. Province-wise, however, there is a fair amount of variation. In Punjab and Sindh the standard of living of the farmers was above the base year for four of the years. In Baluchistan the farmer's standard of living declined over the base year for the entire period. In N.W.F.P. the standard of living of the farmers improved in the years 1974-75, while for the rest of the period there was a decline over the base year.

#### (b) *Real per Capita Income Terms of Trade*

The main findings are given in Table 4 and Figure 1(a) and Figure (3). For the period upto 1979-80 the real per capita income terms of trade remained below the base year for all of Pakistan. After 1980-81 the real per capita income terms of trade improved. It would appear that during the 70's any growth in agricultural production was negated by population growth. But in the early 80's a significant rise in agricultural production outpaced the growth in rural population, thereby improving the real per capita income of the farmers.

Province-wise the results show that in the Punjab the real per capita income terms of trade display an erratic pattern with some years showing a decline and others showing an increase over the base year. The greatest increase was between 1979-80 and 1980-81. Since then there has been a fairly rapid decline until 1983-84. In Sindh the real per capita income terms of trade declined by 15 per cent in 1974-75 after which it showed some increase reaching a peak in 1981-82. In the case of N.W.F.P. the real per

capita income terms of trade remained above the base year level in more years than in the other provinces. Since 1981-82 there has been a rapid decline even in the N.W.F.P. The real per capita income terms of trade for Baluchistan remained below the base year upto 1978-79. After 1978-79 the real per capita income improved considerably over the base reaching a peak in 1982-83. It is necessary to mention that in Baluchistan the real per capita income in the years 1980-81, 1981-82 and 1982-83 increased at a high rate (see Table 4), due to a very high rate of growth in agricultural production. There has been some decline in 1983-84.

An interesting result to be noted is that for several years the real per capita income improved over the base year even though the growth in population was more than the growth in agricultural production. This was due to a significant increase in relative prices received by farmers in those years. The opposite is the case for some other years where the real per capita income declined over the base, although the increase in the quantum index was more than the increase in the population index. The reason for this was the rise in relative prices paid for consumer goods by farmers.

TABLE 4

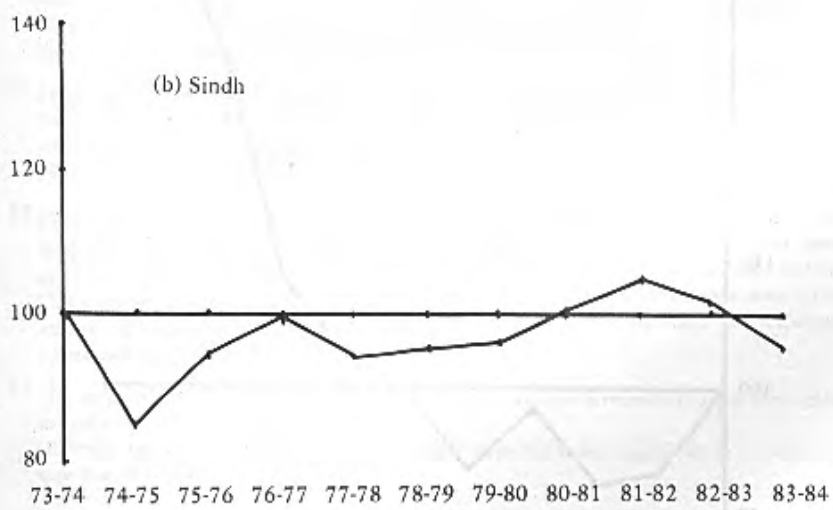
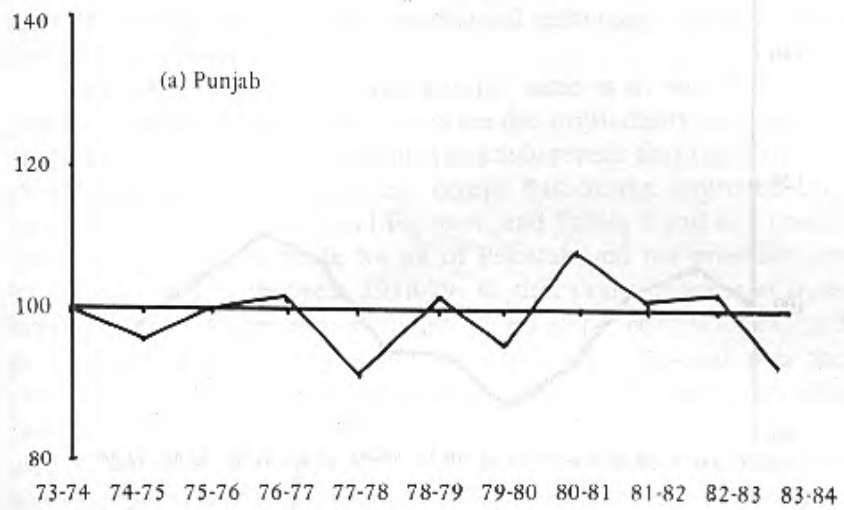
Real per capita income terms of trade\*

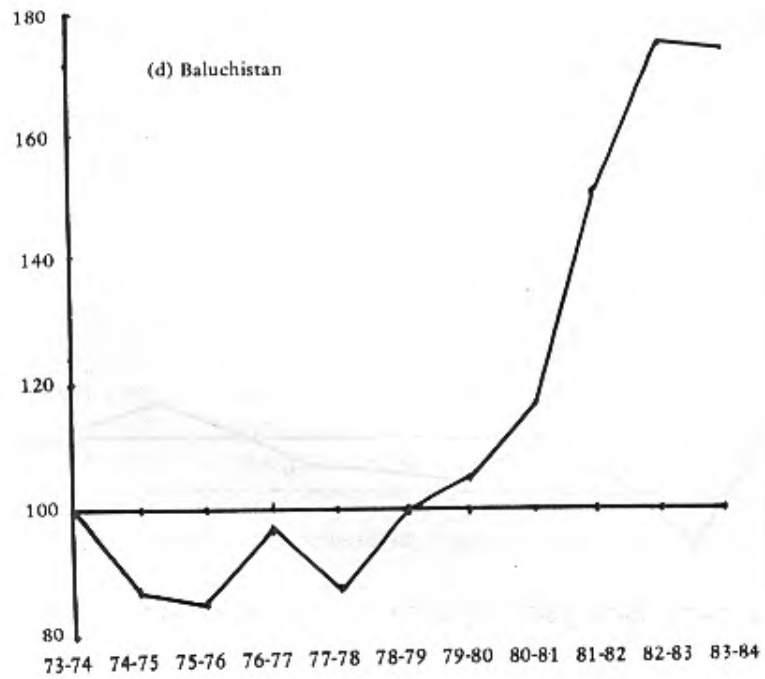
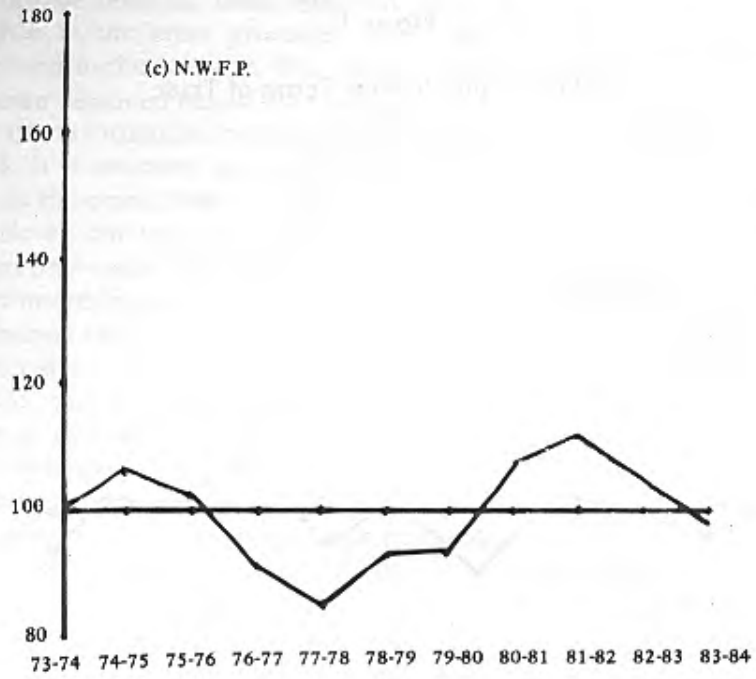
YEARS	PUNJAB	SINDH	N.W.F.P.	BALU- CHISTAN	PAKISTAN
1973-74	100.00	100.00	100.00	100.00	100.00
1974-75	95.72	85.16	106.31	87.54	91.70
1975-76	100.35	94.40	102.26	84.80	98.02
1976-77	101.06	99.08	91.46	97.34	98.43
1977-78	91.61	94.12	85.42	87.14	90.43
1978-79	100.77	95.65	93.24	99.73	97.10
1979-80	95.67	96.32	93.16	104.40	94.30
1980-81	108.18	100.43	106.44	117.50	102.23
1981-82	101.70	104.85	111.30	150.00	103.06
1982-83	102.07	101.44	104.53	174.54	103.81
1983-84	90.52	95.85	98.14	173.00	93.58

\* (i)  $RPCI_D = \frac{IQ_t}{IPOP} \times \text{Domestic terms of trade}$ ; (ii)  $IQ_t = \text{Quantum index}$ .

(iii)  $IPOP = \text{Population index}$

Figure 3  
Real per Capita Income Terms of Trade  
(domestic)  
by Provinces







(c) *Parity between Domestic Prices Paid for Selected Agricultural Inputs and Domestic Prices Received for Farm Products*

Five major inputs were used for calculating the index of domestic prices paid for agricultural inputs.<sup>10</sup> These were fertilizer,<sup>11</sup> seeds,<sup>12</sup> water,<sup>13</sup> (irrigation), diesel oil (used for tractors) and pesticides. The first four of these inputs are used directly for crop production, while diesel oil covers most of the operational cost of mechanical technology (tractors, tubewells and other machines).

The index of prices received was the same as in section II 2(a). The purpose of these terms of trade was to see the profitability in each province in the period under consideration. The study reveals that terms of trade for all of Pakistan and the provinces except Baluchistan improved over the base year [see Figure 1(b) and Figure 4, and Tables 5 and 6]. The highest value of the terms of trade for all of Pakistan and the provinces, except Baluchistan, was in the year 1978-79. In that year the terms of trade had improved by 44.29 per cent in Punjab, by 66.30 per cent in Sindh, by 25.88 per cent in N.W.F.P. and by 43.82 per cent in all of Pakistan over the base year. This was due to significant increases in the procurement price of wheat and rice. Price of cotton also rose sharply in 1978-79. On the input side the price of fertilizer, the input with the highest weight in the three provinces and Pakistan, was at its lowest during 1978-79. In 1977-78 there was a sharp drop in the prices of cotton and rice which is clearly reflected in the terms of trade.

<sup>10</sup> Price indices for fertilizer, water and L.D.O. were calculated by the authors. Data on seeds and pesticides prices were not available. The price indices for these two inputs were taken from Cheong (1984). Also, prices of the five inputs for the year 1983-84 were not available, therefore, the index of inputs prices is computed for the period 1973-74 to 1982-83.

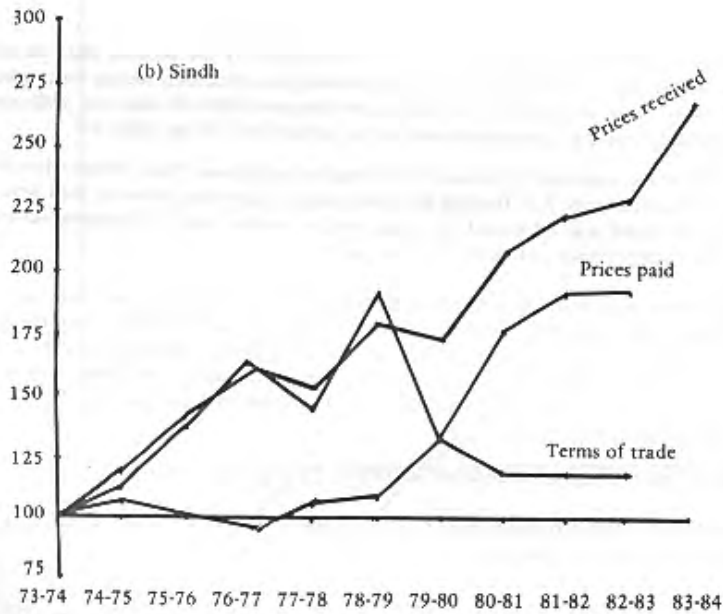
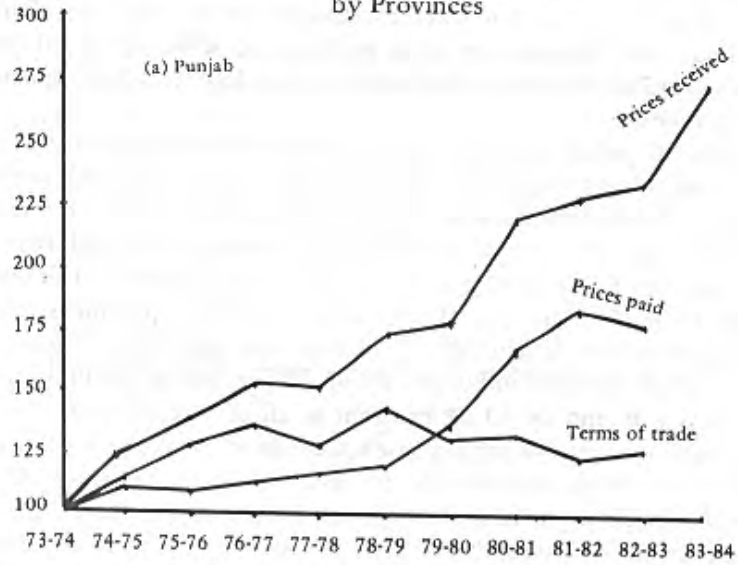
<sup>11</sup> Fertilizer prices are calculated in terms of each nutrient as follows: From variety-wise prices, the prices are separated for N, P, K through the percentage of nutrients present in each type. Then a weighted price index was calculated by giving weights to the value of nutrients consumed in 1973-74 for each province and for Pakistan as a whole.

<sup>12</sup> Seed requirement was calculated in the following manner: By multiplying seed rate/acre with the total area sown, the quantity of seeds used in the base year was obtained. Then the base year price of the seed was multiplied with the quantity used to calculate the value of seeds in 1973-74. This exercise was repeated for each selected crop. Wheat, rice and cotton were selected in the case of both Punjab and Sindh province. In N.W.F.P., wheat, rice and maize and in Baluchistan, wheat, rice and jawar were taken.

<sup>13</sup> The index of water charges was obtained as follows: First, per acre water charges were calculated as under: (Revenue from Irrigation/Irrigated Area Sown). Then the index was computed using these per acre charges taking 1973-74 as base.

Figure 4

Domestic Terms of Trade  
(with respect to input prices)  
by Provinces



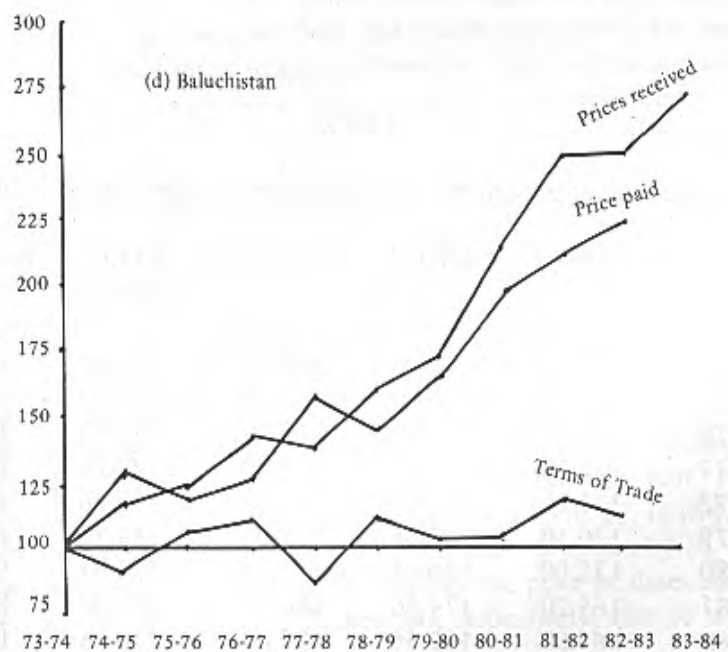
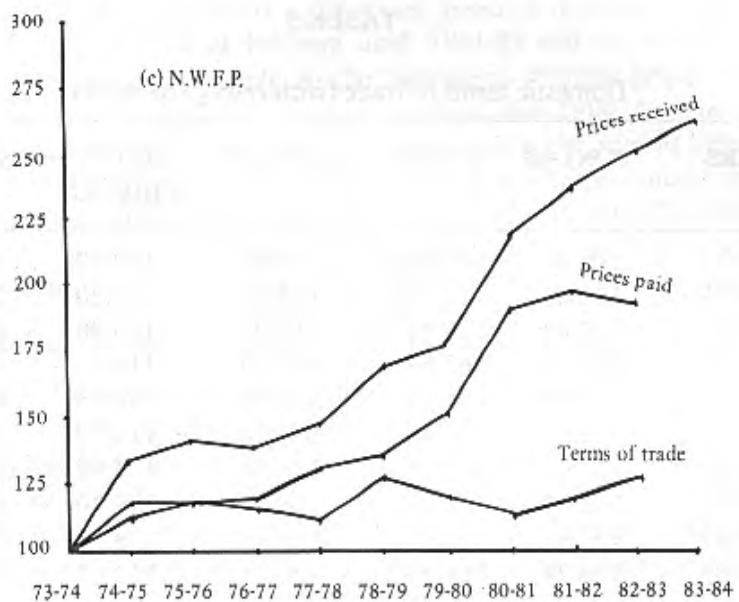


TABLE 5

Domestic terms of trade (with respect to inputs)

YEARS	PUNJAB	SINDH	N.W.F.P.	BALU- CHISTAN	PAKISTAN
1973-74	100.00	100.00	100.00	100.00	100.00
1974-75	112.61	111.54	113.74	91.20	110.72
1975-76	127.82	139.54	118.76	106.08	129.69
1976-77	135.60	162.94	115.76	110.91	138.60
1977-78	128.45	144.53	112.11	86.88	129.57
1978-79	144.29	166.30	125.88	112.00	143.82
1979-80	130.43	133.04	120.84	104.00	128.54
1980-81	132.72	118.88	114.30	104.30	125.45
1981-82	124.83	117.39	119.46	118.30	121.80
1982-83	128.74	119.99	128.71	111.47	124.68

TABLE 6

Domestic prices (index) paid by farmers for agricultural inputs

YEARS	PUNJAB	SINDH	N.W.F.P.	BALU- CHISTAN	PAKISTAN
1973-74	100.00	100.00	100.00	100.00	100.00
1974-75	109.30	106.60	116.80	127.65	109.09
1975-76	108.00	101.00	118.40	117.52	107.00
1976-77	112.30	98.22	118.40	127.21	108.79
1977-78	116.70	104.60	130.30	156.86	114.74
1978-79	120.10	107.24	135.00	143.24	117.67
1979-80	135.00	130.41	150.70	164.81	135.36
1980-81	165.70	174.56	190.50	195.67	170.38
1981-82	183.00	190.56	199.00	210.36	186.47
1982-83	181.00	191.00	195.00	224.14	184.08

After 1978-79 there was a decreasing trend in the terms of trade for Sindh, Punjab, and all of Pakistan until 1981-82 and for N.W.F.P. until 1980-81. This was due mainly to the increase in fertilizer prices because of the reduction in fertilizer subsidies after fiscal year 1980. Another contributory factor to this effect is the precipitous rise in the price of light diesel oil in 1979-80 and thereafter. The per acre water charges paid by farmers also increased substantially in Punjab, Sind, N.W.F.P. and all of Pakistan after 1979-80. It must be mentioned that the procurement price of wheat was raised further in fiscal year 1980, 1981 and 1983, and the procurement price of rice in fiscal years 1981 to 1984. But the effect of the increase in input prices was strong enough to cause a decline in the terms of trade upto 1981-82 in Punjab, Sindh and all of Pakistan, and upto 1980-81 in N.W.F.P. In the year 1982-83, however, the terms of trade for Punjab, Sindh and all of Pakistan improved over the previous year, especially due to a significant rise in the price of cotton. In the case of N.W.F.P. a considerable rise in the price of maize and rice, a sudden jump in the price of gram, onion and potato, and a substantial rise in the price of wheat resulted in the improvement of the terms of trade.

Before discussing the terms of trade for Baluchistan, it might be useful to mention that, in Baluchistan, in contrast to other provinces, seed is the input with the highest weight (0.60), while fertilizer (0.16), L.D.O. (0.13) and water (0.13) rank second, third and fourth respectively. On the output side, dates have the highest weight, followed by apples, wheat and jawar. It is this difference in the weights of agricultural inputs and outputs between Baluchistan and other provinces that results in the terms of trade for Baluchistan having a different trend compared to the other provinces.

The terms of trade for Baluchistan declined over the base in 1974-75 and in 1977-78, while in the remaining years they improved over the base year. In 1974-75 and 1977-78 the index of prices paid for inputs increased more than the index of prices received for farm products. In both these years prices of dates decreased over the base while the price of apples declined by 26 per cent in 1977-78 over the preceeding year. Seed prices increased by 35 per cent and 15 per cent over the previous years in 1974-75 and 1977-78 respectively. Also, in 1977-78, the per acre water charges paid by farmers increased by 181 per cent over the preceeding year. The most significant improvement in the terms of trade is in 1981-82. In this year the price of dates rose by 106 per cent and the price of apples by 91 per cent over the previous year. However in 1982-83 the price of dates and apples declined by 73 per cent and 71 per cent respectively, due to which the terms of trade decreased.

## 2. Terms of Trade Using International Prices<sup>14</sup>

These include two types of indices:

- (a) *Parity between international prices received for farm products and domestic prices paid for consumer goods.*

This index was calculated to determine how the farmer's standard of living would have altered had they been given an opportunity to trade their farm products in international markets under free trade conditions.

Terms of trade in this case for all of Pakistan had a steep declining trend throughout the period under study [see Figure 5(a) and Figure 6 and Table 7]. During 1977-78 to 1979-80 the terms of trade did not decline due to some recovery in the international prices of farm products (see Table 8). In the four provinces separately the terms of trade index also showed the same trend.

In the year 1982-83 the terms of trade for Pakistan, as a whole, had declined by 59 per cent over the base year. In the same year it declined by 58 per cent in the Punjab, by 59 per cent in Sindh, by 63 per cent in N.W.F.P. and by 64 per cent in Baluchistan. If the farmers had been allowed free trade during the period under study the standard of living of the farmers in all the four provinces would have declined continuously. The index of prices received by farmers in the international market shows that the prices improved in 1974-75 over the base year but after that they declined. The index of prices received started increasing after 1977-78 and declined again after 1980-81. On the other hand, the index of prices paid for consumer goods increased continuously over the base. As a result, the difference between prices paid and prices received increased continuously over the whole period, except during the years 1977-78 to 1979-80.

### (b) *The Real per Capita Income Terms of Trade*

The real per capita income terms of trade index using international prices have also been constructed in the same way as was done for domestic prices. The index will show the effect of changes in production and population on the standard of living of farmers if they had faced world prices. The trend remained the same as in the case of the terms of trade index. The real per capita income terms of trade declined over the base year [see Figure 5(a) and Figure 7 and Table 9].

<sup>14</sup> The index of international prices received for farm products is computed for the period 1973-74 to 1982-83, since international prices for 1983-84 were not available.

Figure 5

Terms of Trade using International Prices for Pakistan

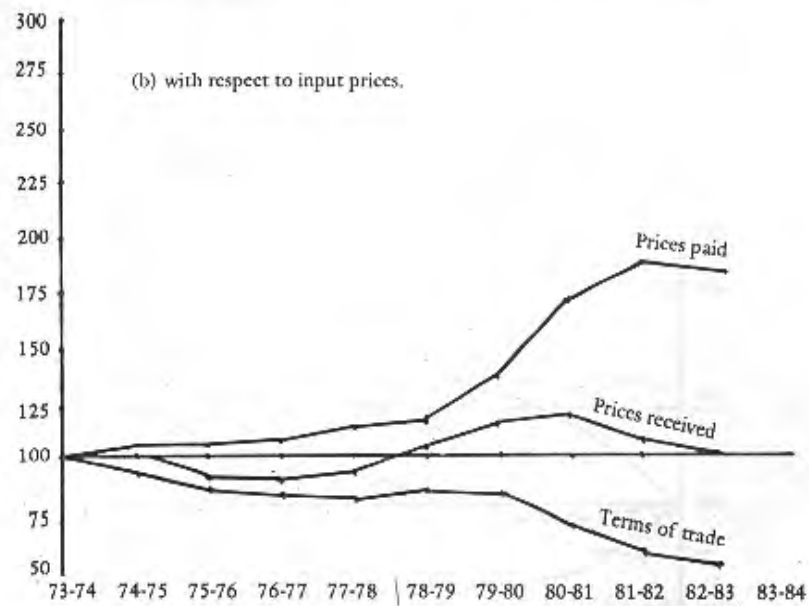
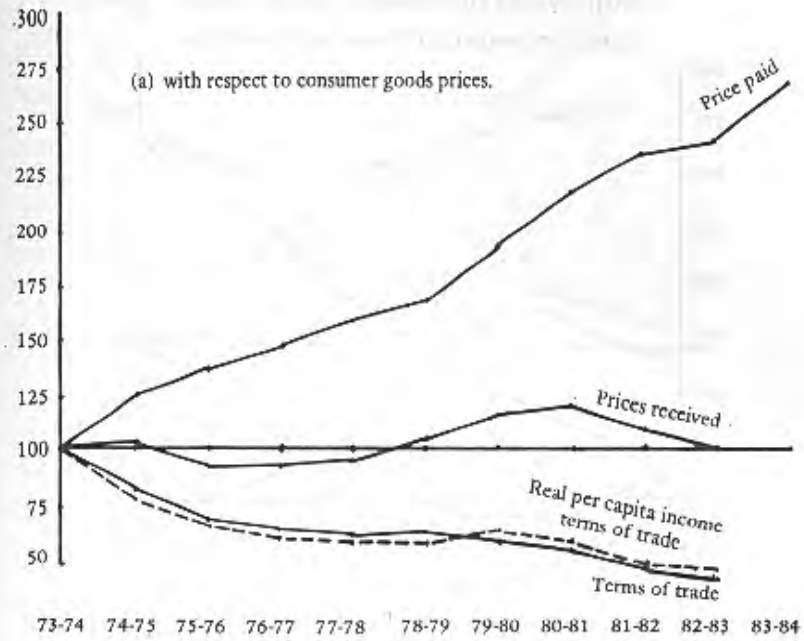
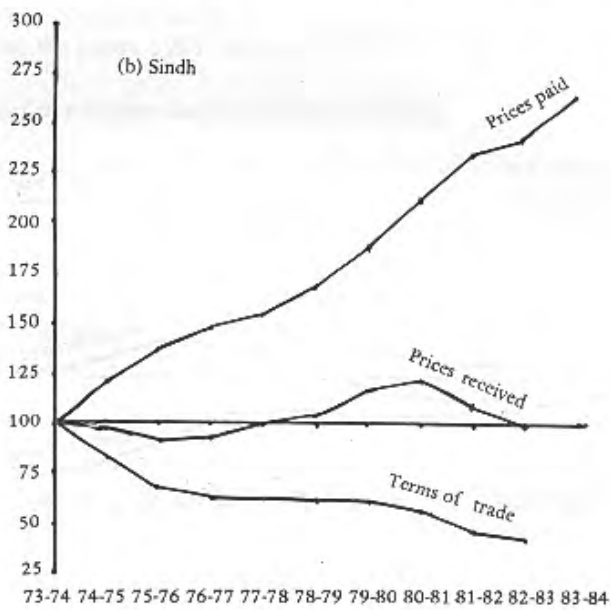
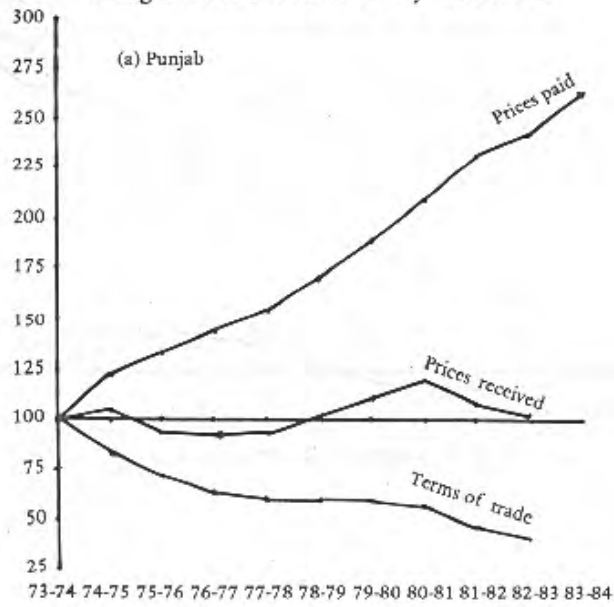


Figure 6

Terms of Trade  
(with respect to consumer goods prices)  
using International Prices by Provinces





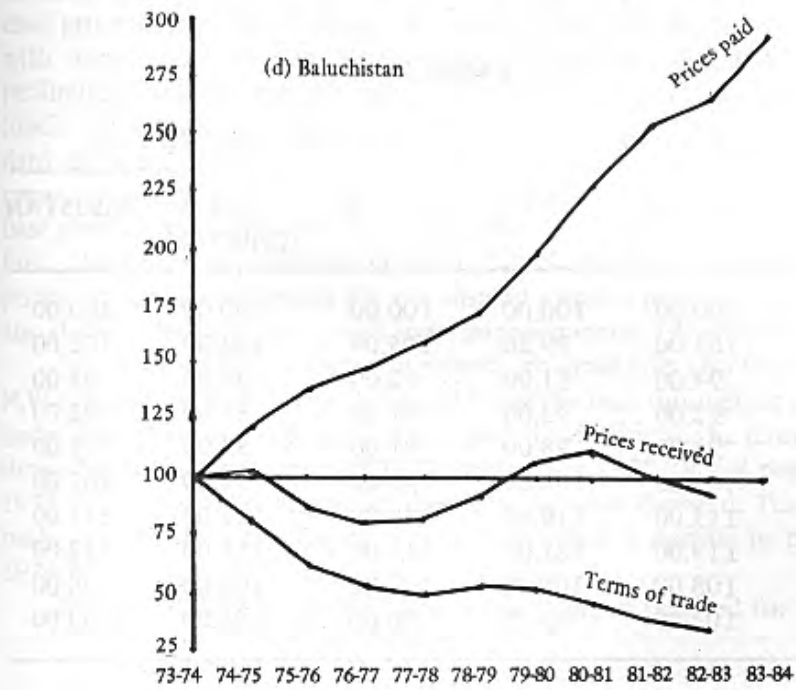
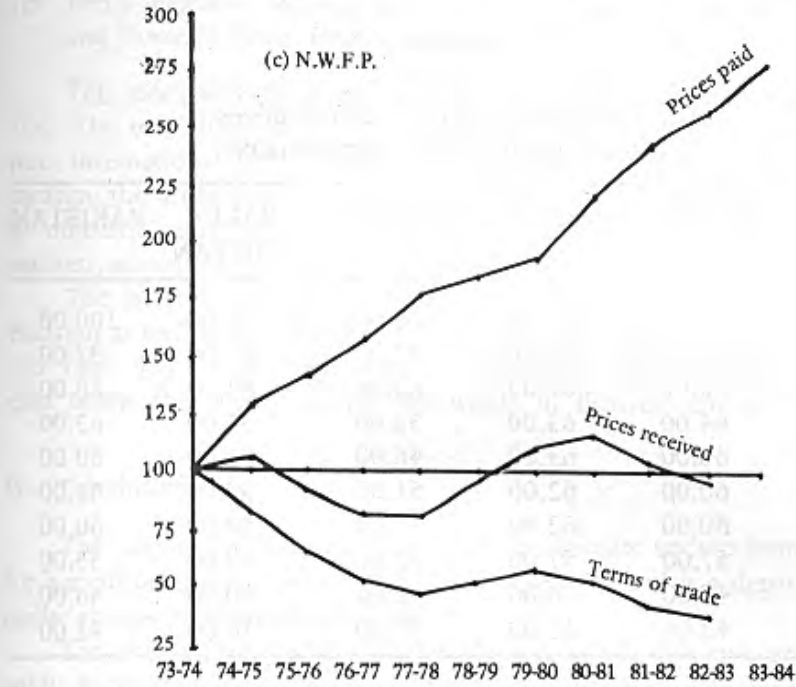


TABLE 7

Terms of trade using international prices  
(consumer goods prices in denominator)

YEARS	PUNJAB	SINDH	N.W.F.P.	BALU- CHISTAN	PAKISTAN
1973-74	100.00	100.00	100.00	100.00	100.00
1974-75	83.00	82.00	82.00	84.00	82.00
1975-76	70.00	67.00	65.00	64.00	68.00
1976-77	64.00	63.00	52.00	55.00	63.00
1977-78	60.00	63.00	46.00	51.00	60.00
1978-79	60.00	62.00	51.00	55.00	61.00
1979-80	60.00	62.00	57.00	54.00	60.00
1980-81	57.00	57.00	52.00	49.00	55.00
1981-82	47.00	46.00	42.00	40.00	46.00
1982-83	42.00	41.00	37.00	36.00	41.00

TABLE 8

Price (index) received by farmers (international)

YEARS	PUNJAB	SINDH	N.W.F.P.	BALU- CHISTAN	PAKISTAN
1973-74	100.00	100.00	100.00	100.00	100.00
1974-75	103.00	99.20	105.09	102.00	102.00
1975-76	94.00	91.00	92.00	89.00	93.00
1976-77	92.00	93.00	81.00	81.00	92.00
1977-78	93.00	98.00	81.00	83.00	94.00
1978-79	101.00	104.00	95.00	94.00	102.00
1979-80	113.00	116.00	110.00	107.00	115.00
1980-81	119.00	121.00	115.00	113.00	119.00
1981-82	108.00	108.00	103.00	102.00	108.00
1982-83	101.00	99.00	96.00	95.00	100.00

(c) *Parity between International Prices Received for the Farm Products and Domestic Prices Paid for Major Agricultural Inputs*

This index was calculated along the same lines as discussed in section II 1(a). The only difference is in the prices received by farmers for their output. International prices rather than domestic prices have been used to measure the profitability of farm output. If farmers buy agricultural inputs in domestic markets and sell their agricultural products in international markets, would there have been an additional gain or loss?

The index in most of the years declined over the base year for all of Pakistan as well as for all the four provinces [see Figures 5(b) and Figure 8 and Table 10]. In the year 1982-83 the index was approximately 50 per cent below the base year, for the whole of Pakistan and the provinces.

#### IV. Conclusion

The purpose of this paper has been to estimate various terms of trade for agriculture for the period 1973-74 to 1983-84, and is a departure from earlier studies in a number of ways.

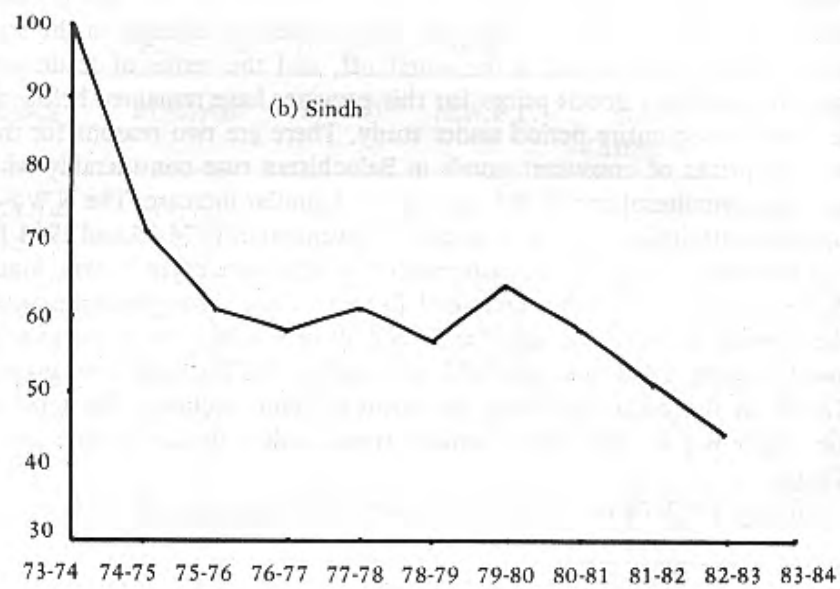
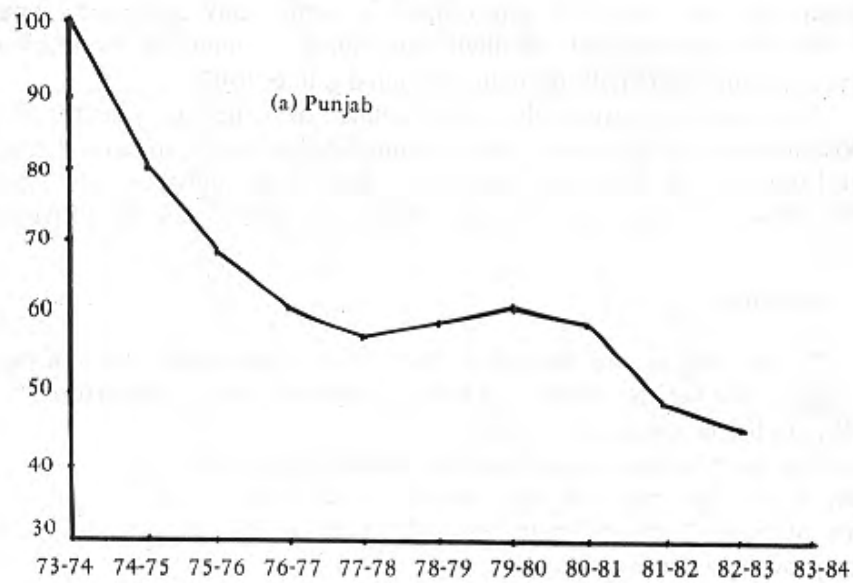
The most interesting and perhaps topical aspect that emerges from the study is the light that has been thrown on the regional differences in the terms of trade. Terms of trade were calculated for the agricultural sector in each province separately. Punjab appears to have been at an advantage both with regard to changes in the standard of living and also with respect to profitability and returns to inputs. Sindh follows with the gap between Sindh and the Punjab almost negligible with respect to changes in the standard of living. Baluchistan is the worst off, and the terms of trade with respect to consumer goods prices for this province have remained below the base year for the entire period under study. There are two reasons for this. First, the prices of consumer goods in Baluchistan rose considerably while prices for agricultural goods did not display a similar increase. The N.W.F.P. also shows a declining trend with some improvement in 1974-75 and 1981-82.

The terms of trade index with respect to input prices for Punjab, Sindh, N.W.F.P. and all of Pakistan remained above the base throughout the period under consideration. In Punjab, Sindh and all of Pakistan the terms of trade showed a rising trend upto 1976-77, declined in 1977-78 and rose again in 1978-79. In the following years the terms of trade declined. The terms of trade for N.W.F.P. also have a similar trend with a decline in the period 1976-78.

During 1973-74 to 1976-77 the index of prices received for farm pro-

Figure 7

Real per Capita Income Terms of Trade  
(international)  
by Provinces



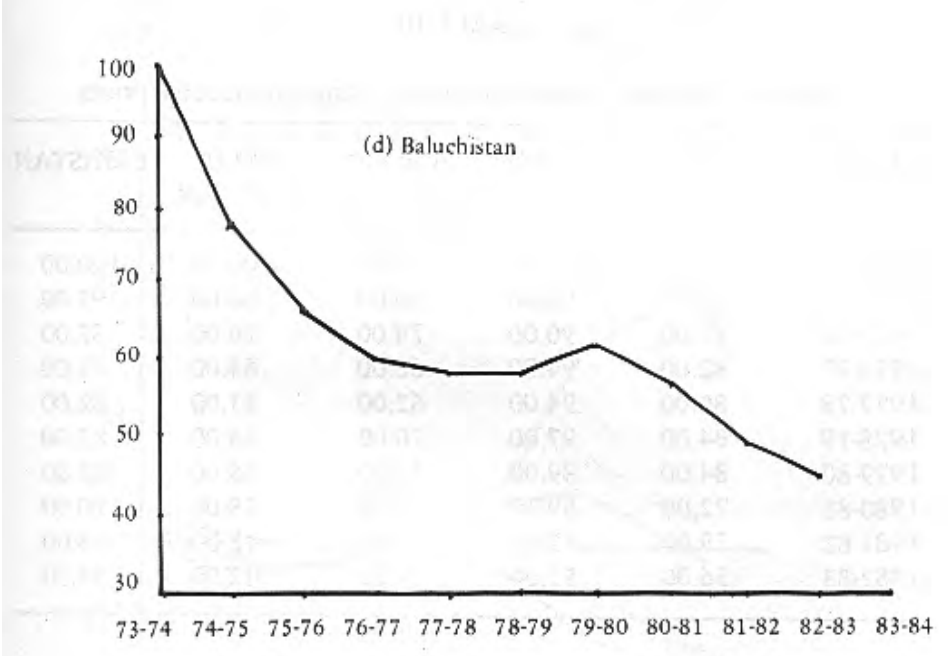
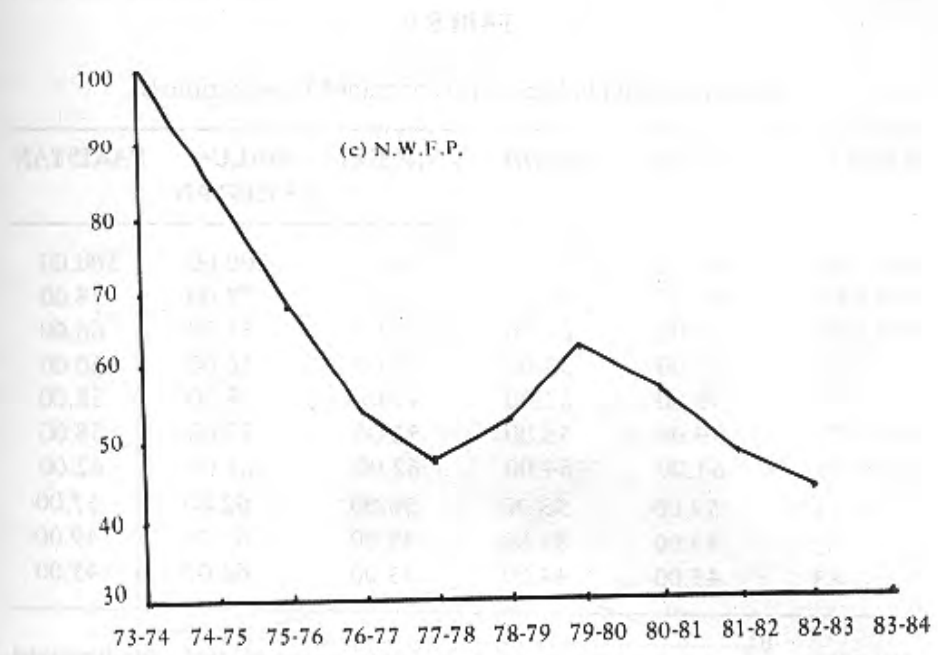


TABLE 9

Real per capita income terms of trade\* (international)

YEARS	PUNJAB	SINDH	N.W.F.P.	BALU- CHISTAN	PAKISTAN
1973-74	100.00	100.00	100.00	100.00	100.00
1974-75	80.00	71.00	84.00	77.00	78.00
1975-76	69.00	61.00	68.00	61.00	66.00
1976-77	61.00	58.00	54.00	56.00	60.00
1977-78	57.00	61.00	47.00	53.00	58.00
1978-79	59.00	56.00	52.00	58.00	58.00
1979-80	61.00	64.00	62.00	65.00	62.00
1980-81	59.00	58.00	56.00	62.00	57.00
1981-82	49.00	51.00	48.00	61.00	49.00
1982-83	45.00	44.00	43.00	66.00	45.00

\* (i)  $RPCI_t = \frac{IQ_t}{IPOP} \times \text{International terms of trade}$ . (ii)  $IQ_t$  = Quantum index,  $IPOP$  = Population index.

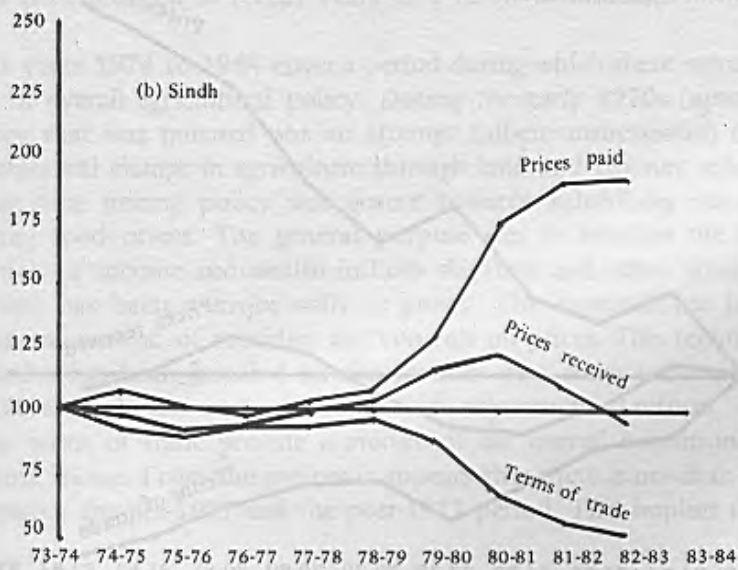
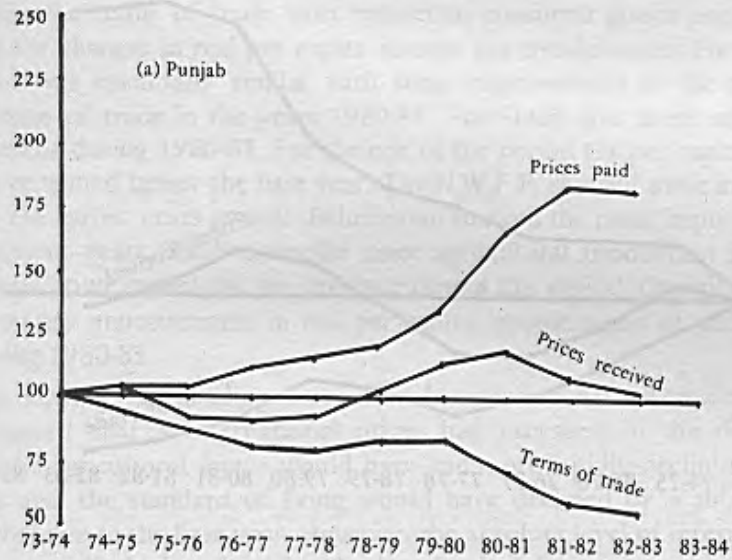
TABLE 10

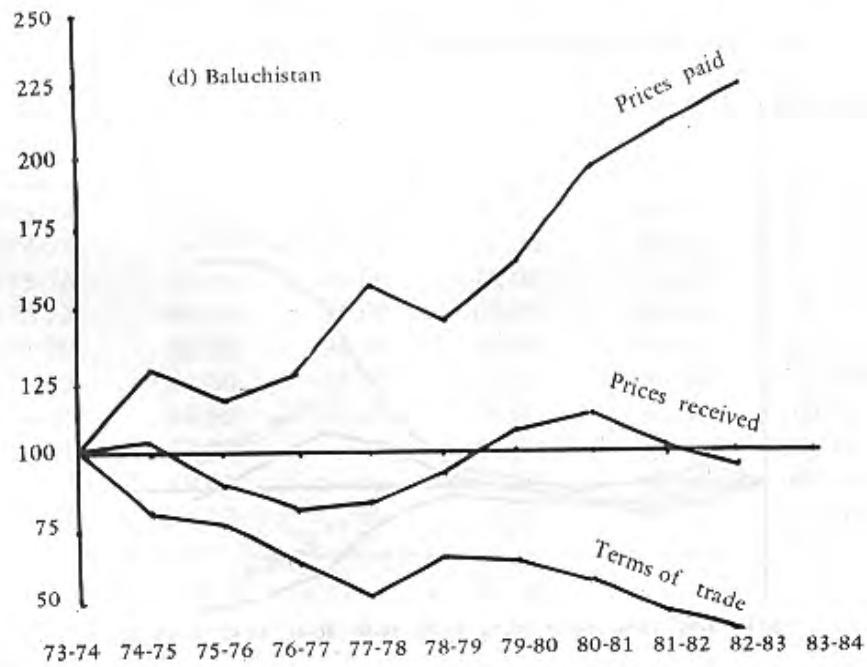
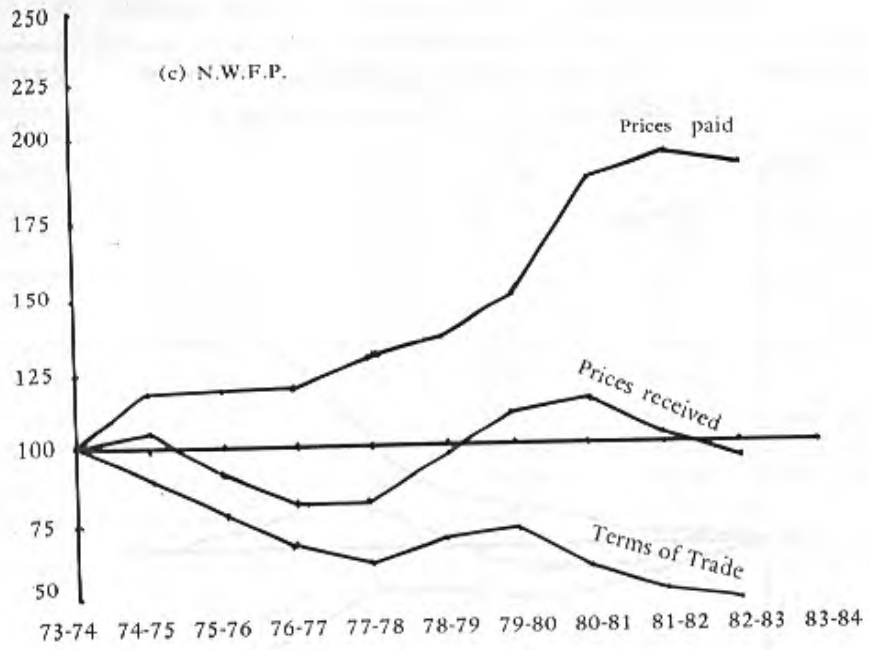
Terms of trade (with respect to inputs) using international prices

YEARS	PUNJAB	SINDH	N.W.F.P.	BALU- CHISTAN	PAKISTAN
1973-74	100.00	100.00	100.00	100.00	100.00
1974-75	94.00	94.00	90.00	80.00	93.00
1975-76	87.00	90.00	78.00	76.00	87.00
1976-77	82.00	94.00	68.00	64.00	85.00
1977-78	80.00	94.00	62.00	53.00	82.00
1978-79	84.00	97.00	70.00	66.00	87.00
1979-80	84.00	89.00	73.00	65.00	85.00
1980-81	72.00	69.00	60.00	58.00	70.00
1981-82	59.00	57.00	52.00	48.00	58.00
1982-83	56.00	52.00	49.00	42.00	54.00

Figure 8

Terms of Trade  
(with respect to input prices)  
using International Prices by Provinces







ducts increased more than the index of prices paid for inputs. After 1978-79 the input prices index increased at a faster rate than the price index for farm products. The terms of trade for Baluchistan have a different trend from other provinces. In Baluchistan the terms of trade index declined over the base in 1974-75 and 1977-78 mainly due to a fall in fruit prices. In the rest of the period under study the index improved over the base.

When the terms of trade with respect to consumer goods prices were adjusted for changes in real per capita income the trends varied. For Punjab the trend was essentially similar with some improvement in the real per capita terms of trade in the years 1980-83. For Sindh also there was some improvement during 1980-83. For the rest of the period the per capita terms of trade remained below the base year. The N.W.F.P. showed some improvement in the earlier years as well. Baluchistan showed the most improvement in subsequent years (1979 onwards) since agricultural production far outpaced population growth in this province during this period. Overall, for the whole country improvements in real per capita income terms of trade were only during 1980-83.

The terms of trade using international prices for agricultural commodities showed that if international prices had prevailed in the domestic market, the agricultural sector would have had more rapidly declining terms of trade and the standard of living would have declined by a substantial amount relative to the base year. However, the absolute level of international prices is generally higher than the absolute level of domestic prices and thus the agricultural sector is being indirectly taxed by a substantial amount. This has been reduced in recent years as a result of increases in domestic prices.

The years 1973 to 1984 cover a period during which there were several changes in overall agricultural policy. During the early 1970s (upto 1977) the policy that was pursued was an attempt (albeit unsuccessful) to bring about structural change in agriculture through land and tenancy reform. At the same time pricing policy was geared towards subsidising inputs and controlling food prices. The general purpose was to improve the relative distribution of income and wealth in both the rural and urban areas. After 1977 there has been a major shift in policy. The approach has been an emphasis on removal of subsidies and controls on prices. This technocratic deregulation has been justified on the grounds of a more rational pricing policy. There has been no attempt to institute any structural reform.

The terms of trade provide a picture of the overall condition of the agricultural sector. From the indices it appears that there is no clear distinction between the pre-1977 and the post-1977 period. This implies that the

overall effect on agriculture of very different policies has not been very effective. Both under regulated and deregulated price regimes the agricultural sector has had some good and some bad years. Quite clearly, pricing policy alone is not sufficient to bring about improvements in the agricultural sector.

With regard to regional inequalities in the agricultural sector the terms of trade show that these inequalities have remained fairly consistent. Once again, during the pre-1977 period it would appear that any attempt at reducing these inequalities was not very successful. Post-1977, regional inequalities have not been a major concern of policy makers. In any event, the agricultural sector in all provinces appears to have become relatively worse off during the period under study.

It must be borne in mind that the aggregated approach implicit in such terms of trade indices does not in any way reflect intra-sectoral inequalities or differences. Perhaps policies geared specifically to these intra-sectoral differences would have a more beneficial effect on the overall performance of the sector assuming that any such policy can be effectively implemented. In any case, further exploration along these lines could be very useful.

Further work that is possible in this area, is the updating of the various indices continually (year after year). It might also be useful to construct a more sophisticated weighting structure for the consumption weights for each province and between rural and urban areas. The present study has used consumption weights that have been based upon certain simplifying assumptions. Greater refinement of these weights would improve the results of the study. Further work is also recommended in the area of terms of trade using international prices for both agricultural goods and traded consumer goods.

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Index of prices received by farmers (Pakistan) using domestic prices

Commodity	$q_{0j} P_{0j}$ (value in Rs. '000)	$W_{0j}$ (Weight)	$P_t$											
			1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84	
Wheat	5212114.00	0.2648	100.00	145.05	145.05	145.05	145.05	176.47	182.94	212.19	212.19	234.15	234.15	
Rice	2178796.03	0.1107	100.00	148.20	149.80	176.08	159.92	167.88	167.94	214.58	243.82	264.37	274.38	
Cotton	4469791.60	0.2271	100.00	80.06	129.82	160.03	142.63	176.59	154.58	172.56	165.83	182.20	274.22	
Sugar-cane	2709828.20	0.1376	100.00	123.75	135.63	135.63	135.63	135.63	165.32	213.06	213.06	213.06	213.06	
Maize	528461.27	0.0268	100.00	178.93	166.42	166.95	190.72	224.33	227.08	222.52	299.17	317.35	284.08	
Jawar	246522.45	0.0125	100.00	174.93	187.67	186.60	183.62	193.46	211.66	292.76	317.62	354.25	302.11	
Bajra	247554.26	0.0125	100.00	198.72	199.58	175.58	206.44	221.37	305.31	367.73	317.07	429.55	406.31	
Mash	65939.02	0.0033	100.00	99.55	88.87	99.96	125.58	141.25	142.43	163.85	204.99	184.24	206.38	
Moong	68489.70	0.0034	100.00	88.26	95.21	132.94	163.62	169.93	168.63	203.64	304.76	276.63	299.57	
Gram	663735.48	0.0337	100.00	117.15	114.32	118.96	188.44	161.60	173.49	401.65	602.37	491.66	356.95	
Masoor	48615.57	0.0025	100.00	93.88	138.38	172.55	192.94	177.92	151.92	267.22	466.37	310.73	245.55	
Barley	101505.31	0.0052	100.00	107.15	107.77	109.88	170.11	184.86	211.23	231.47	210.46	211.51	243.71	
Onion	330406.95	0.0168	100.00	51.67	83.16	118.34	105.71	93.81	137.35	90.19	152.67	98.83	200.00	
Potato	314542.23	0.0160	100.00	89.68	67.15	102.43	105.70	106.19	75.46	136.44	145.23	100.44	152.13	
Citrus fruits	334522.00	0.0177	100.00	102.64	179.98	145.25	132.96	166.30	166.00	227.44	264.47	227.22	257.98	
Mango	1370988.20	0.0696	100.00	121.56	138.08	163.29	163.55	210.54	228.00	261.61	257.57	167.74	333.78	
Apple	218723.93	0.0111	100.00	112.51	126.59	124.06	151.03	224.90	220.97	253.98	280.81	235.59	287.92	
Dates	386949.49	0.0196	100.00	97.07	133.67	142.12	94.04	101.02	147.21	204.48	213.26	268.26	275.83	
Banana	183228.00	0.0093	100.00	115.74	141.70	145.53	152.34	120.00	120.00	145.95	146.38	158.29	182.97	
$\Sigma q_{0j} P_{0j}$	19680715.00													
$\Sigma W_{0j} \left[ \frac{P_{ij}}{P_{0j}} \times 100 \right]$		1.0000	100.00	120.79	138.77	150.78	148.67	169.23	174.00	213.75	227.17	229.52	260.74	

Appendix I(b)  
Index of prices received by farmers (Punjab) using domestic prices

Commodity	$q_{oj}^P$ (value in Rs. '000)	$W_{oj}$ (Weight)	$P_i$													
			1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84			
Wheat	3870228	0.3032	100.00	145.05	145.05	145.05	145.05	145.05	176.47	182.94	212.19	212.19	212.19	234.15	234.15	
Rice	1235575	0.0968	100.00	148.20	149.80	176.08	159.92	159.92	167.88	167.94	214.58	214.58	214.58	243.82	264.37	274.38
Cotton	3095160	0.2425	100.00	80.06	129.82	160.03	142.63	142.63	176.59	154.58	172.46	172.46	172.46	165.83	182.20	274.22
Sugar-cane	1887575	0.1479	100.00	123.82	135.37	135.37	135.37	135.37	135.37	164.86	212.26	212.26	212.26	212.26	212.26	212.26
Maize	241157	0.0189	100.00	185.91	168.11	170.41	194.41	194.41	239.20	223.35	214.47	214.47	214.47	316.04	309.68	281.31
Jawar	90612	0.0071	100.00	179.03	189.93	186.95	172.94	172.94	203.11	279.82	291.96	291.96	291.96	337.98	381.84	308.79
Bajra	166041	0.0130	100.00	200.95	204.45	165.31	204.49	204.49	224.72	304.37	374.01	374.01	374.01	311.17	414.08	426.79
Mash	56577	0.0044	100.00	96.57	81.48	96.25	123.21	140.86	133.98	133.98	159.76	159.76	159.76	191.23	170.89	204.90
Moong	41312	0.0032	100.00	90.40	92.88	133.75	164.50	173.31	166.06	166.06	201.77	201.77	201.77	302.70	269.55	299.95
Gram	466704	0.0365	100.00	131.35	120.36	130.68	221.65	169.19	192.90	192.90	447.19	447.19	447.19	612.29	538.47	386.94
Masoor	38631	0.0030	100.00	95.53	141.19	178.29	197.11	181.34	166.62	166.62	290.00	290.00	290.00	497.73	338.03	241.35
Barley	55382	0.0043	100.00	105.17	111.11	108.73	172.09	179.46	179.46	213.16	240.96	240.96	240.96	196.18	212.76	242.90
Onion	148786	0.0116	100.00	53.11	80.14	118.51	103.73	98.76	142.53	97.28	165.36	165.36	165.36	105.15	206.49	206.49
Citrus fruits	299067	0.0234	100.00	132.18	171.65	216.83	150.66	286.06	286.06	226.37	321.88	321.88	321.88	355.66	297.75	333.39
Apple	12210	0.0009	100.00	115.56	137.46	170.04	160.31	205.02	235.74	235.74	269.17	269.17	269.17	275.82	248.06	247.18
Mango	785355	0.0615	100.00	125.27	135.60	164.53	171.03	208.86	220.60	220.60	290.15	290.15	290.15	261.84	153.42	374.14
Date	72416	0.0056	100.00	97.07	133.67	142.12	94.04	101.02	147.21	147.21	204.48	204.48	204.48	213.26	243.58	278.63
Banana	9996	0.0008	100.00	113.86	136.97	139.50	151.26	164.28	155.88	155.88	181.93	181.93	181.93	173.53	184.87	224.37
Potato	189081	0.0148	100.00	83.45	56.84	100.76	109.40	108.03	73.19	73.19	142.27	142.27	142.27	179.60	100.32	156.70
$\Sigma q_{oj}^P$	12761866															
$\Sigma W_{oj} \left[ \frac{P_{ij}}{P_{oj}} \times 100 \right]$		1.0000	100.00	143.08	138.05	152.28	149.91	173.30	176.09	219.03	228.45	233.02	233.02	272.24	272.24	272.24

Appendix I(c) Index of prices received by farmers (Sindh) using domestic prices

Commodity	$q_{oj}^P$ (value in Rs.'000)	$W_{oj}$ (Weight)	$P_i$										
			1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84
Wheat	851275.22	0.1740	100.00	145.05	145.05	145.05	145.05	176.47	182.94	212.19	212.19	234.15	234.15
Rice	860304.36	0.1758	100.00	148.14	148.14	200.00	170.37	180.22	180.22	217.70	250.51	276.44	286.81
Cotton	1374631.62	0.2809	100.00	80.06	129.82	160.03	142.63	176.59	194.58	172.46	165.83	182.20	274.22
Sugar-cane	447379.50	0.0914	100.00	122.72	133.86	133.86	133.86	133.86	162.27	207.95	207.95	207.95	207.95
Maize	9293.75	0.0020	100.00	175.09	166.16	179.81	205.23	214.87	227.19	217.26	304.83	322.06	282.76
Jawar	72581.58	0.0148	100.00	167.46	179.67	190.10	196.59	171.60	232.94	263.73	306.21	323.81	284.14
Bajra	73068.26	0.0149	100.00	187.00	175.56	177.61	208.03	210.07	292.32	348.67	305.85	417.89	373.92
Mash	3491.02	0.0007	100.00	103.92	101.07	110.58	131.30	155.72	142.73	170.41	195.71	164.64	201.06
Moong	10649.58	0.0022	100.00	90.56	113.32	145.42	177.29	174.62	165.81	208.15	311.52	272.87	297.59
Gram	158463.13	0.0323	100.00	122.22	125.51	120.57	174.13	165.76	176.17	417.95	554.25	472.81	365.18
Masoor	7437.57	0.0015	100.00	101.01	141.19	184.47	197.37	166.84	139.49	273.11	460.77	284.67	218.96
Barley	8870.11	0.0018	100.00	98.21	103.01	108.83	155.73	155.84	199.03	199.34	166.24	173.53	207.32
Onion	102343.21	0.0209	110.00	56.63	98.40	145.95	127.48	96.07	149.12	89.82	153.42	105.50	199.51
Potato	16390.45	0.0033	100.00	93.19	84.00	96.74	78.96	83.04	77.10	121.67	92.42	84.73	141.04
Banana	162658.00	0.0332	100.00	135.92	169.46	159.88	177.24	154.49	134.43	150.89	164.67	181.73	192.81
Mango	578851.39	0.1183	100.00	116.52	141.21	155.67	155.25	259.19	203.31	225.35	232.12	185.90	282.53
Dates	131029.00	0.0267	100.00	97.07	133.67	142.12	94.04	101.02	147.21	204.48	213.26	340.65	318.81
Citrus fruits	24636.00	0.0050	100.00	141.56	512.82	193.76	183.37	175.37	181.11	242.51	254.51	333.25	395.96
$\Sigma q_{oj} P_{oj}$	4893353.10												
$\Sigma W_{oj} \left[ \frac{P_{ij}}{P_{oj}} \times 100 \right]$		1.0000	100.00	118.24	141.15	160.04	151.18	178.35	173.50	207.63	223.71	229.19	265.78

Index of prices received by farmers (N.W.F.P.) using domestic prices

Commodity	$Q_{0j} P_{0j}$ (value in Rs. '000)	$W_{0j}$ (Weight)	$P_t$											
			1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84	
Wheat	414638.0	0.2810	100.00	145.05	145.05	145.05	145.05	176.47	182.94	212.19	212.19	234.15	234.15	
Rice	59651.0	0.0400	100.00	149.37	150.41	165.28	154.89	160.20	158.50	213.90	242.26	261.91	271.85	
Sugar cane	374793.5	0.2538	100.00	125.25	137.25	137.25	137.25	137.25	168.50	218.75	218.75	218.75	218.75	
Maize	275666.0	0.1866	100.00	163.57	171.75	150.19	171.44	204.27	229.66	219.42	254.66	297.86	285.92	
Jawar	11824.0	0.0080	100.00	182.78	200.13	160.47	197.38	229.07	232.76	354.13	319.65	423.08	332.97	
Rajra	8445.0	0.0080	100.00	174.93	243.03	185.68	228.81	257.13	354.64	427.14	368.30	498.94	467.86	
Mash	5871.0	0.0040	100.00	102.06	91.32	104.14	131.84	127.98	155.68	166.44	254.56	232.16	221.79	
Moong	12915.0	0.0087	100.00	81.27	85.44	119.73	151.23	156.59	172.50	204.39	314.37	287.49	299.19	
Gram	36167.0	0.0245	100.00	104.88	118.78	120.06	161.23	173.48	164.86	387.31	602.22	508.78	502.07	
Masoor	2637.0	0.0018	100.00	78.26	121.19	140.20	186.58	161.71	117.11	225.55	425.12	359.05	282.64	
Barley	29652.0	0.0200	100.00	137.70	144.11	141.24	170.78	208.85	218.82	268.81	290.11	261.14	325.99	
Onion	46298.0	0.0313	100.00	44.70	81.41	90.19	92.54	104.20	143.44	97.62	169.27	109.31	241.54	
Potato	80941.0	0.0548	100.00	97.69	65.18	125.72	126.94	146.83	79.57	157.79	213.50	147.02	184.32	
Banana	10574.0	0.0071	100.00	104.50	114.79	154.34	154.01	90.67	90.67	110.29	110.61	119.61	138.26	
Apple	86676.0	0.0586	100.00	103.31	143.22	76.17	129.06	231.20	217.00	255.56	255.79	211.91	269.74	
Dates	9097.0	0.0061	100.00	97.07	133.67	142.12	94.04	101.02	147.21	204.48	213.26	253.07	260.21	
Citrus fruit	10819.0	0.0073	100.00	81.33	115.71	110.34	101.00	126.66	122.75	172.77	201.12	172.61	195.97	
$\Sigma Q_{0j} P_{0j}$	1476663.5													
$\Sigma W_{0j} \left[ \frac{P_{ij}}{P_{0j}} \times 100 \right]$		1.00000	100.00	132.85	140.62	137.06	146.08	169.95	182.11	217.73	237.73	251.00	262.01	



Index of prices received by farmers (Baluchistan) using domestic prices

Commodity	$q_{0j}^P$ (value in Rs. '000)	$W_{0j}$ (Weight)	$P_i$										
			1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84
Wheat	75972.56	0.1384	100.00	145.06	145.06	145.06	145.06	176.47	182.94	212.19	212.19	234.15	235.71
Rice	23266.33	0.0423	100.00	149.98	152.88	171.63	158.65	164.90	163.92	217.70	250.51	276.44	286.81
Sugar-cane	90.21	0.0016	100.00	123.75	135.63	135.63	135.63	135.63	165.32	213.06	213.06	213.06	213.06
Maize	2344.52	0.0042	100.00	164.67	143.66	-	180.03	187.19	209.13	239.49	266.46	322.92	261.43
Jawar	71504.87	0.1302	100.00	158.59	176.31	188.26	188.05	191.40	209.41	289.64	314.24	350.49	298.89
Moong	3613.12	0.0065	100.00	92.90	99.05	146.34	172.93	188.89	190.74	212.14	292.67	311.06	327.44
Gram	2401.35	0.0043	100.00	127.43	199.16	137.23	194.63	185.85	189.64	393.51	622.86	508.48	369.16
Barley	7601.20	0.0138	100.00	89.97	100.06	109.35	180.22	196.28	202.91	208.73	210.42	200.90	208.64
Onion	32979.74	0.0600	100.00	51.80	73.30	112.91	101.75	87.27	128.17	85.61	136.44	81.55	178.38
Potato	28129.78	0.0512	100.00	92.66	70.55	90.88	96.23	101.41	81.55	126.26	189.31	84.56	145.98
Mango	6781.83	0.0123	100.00	105.86	128.31	171.85	168.20	221.59	191.77	275.03	271.08	176.54	351.28
Apple	119837.93	0.2183	100.00	120.59	88.98	125.50	167.75	243.29	205.70	230.37	321.03	251.12	321.37
Dates	174407.49	0.3177	100.00	97.07	133.67	142.12	94.04	101.02	147.21	204.48	213.26	268.26	275.83
$\Sigma q_{0j}^P$	548931.31												
$\Sigma W_{0j} \left[ \frac{P_{ij}}{P_{0j}} \times 100 \right]$		1.0000	100.00	116.62	124.29	141.03	136.28	160.28	171.41	213.87	248.86	249.85	272.00

## Appendix III(a)

Index of consumer goods prices paid by farmers - Pakistan

Article	weight	1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84
Wheat	0.1908	100.00	147.00	150.00	155.00	168.00	169.00	177.00	194.00	209.00	223.00	234.00
Rice	0.0375	100.00	103.00	117.00	137.00	162.00	171.00	167.00	194.00	246.00	259.00	260.00
Masoor	0.0078	100.00	99.00	136.00	174.00	185.00	189.00	171.00	251.00	443.00	351.00	274.00
Mash	0.0063	100.00	100.00	87.00	85.00	110.00	129.00	124.00	139.00	184.00	158.00	180.00
Moong	0.0047	100.00	99.00	99.00	132.00	158.00	159.00	163.00	193.00	287.00	260.00	287.00
Sugar	0.0236	100.00	118.00	131.00	131.00	131.00	131.00	141.00	183.00	213.00	213.00	234.00
Gur	0.0395	100.00	98.00	139.00	133.00	113.00	158.00	268.00	242.00	185.00	247.00	243.00
Vegetable ghee	0.0488	100.00	128.00	146.00	147.00	146.00	148.00	163.00	164.00	165.00	165.00	190.00
Desi ghee	0.0488	100.00	109.00	122.00	141.00	148.00	158.00	176.00	191.00	203.00	211.00	241.00
Tea	0.0200	100.00	106.00	100.00	127.00	200.00	200.00	200.00	200.00	200.00	207.00	262.00
Salt	0.0030	100.00	123.00	136.00	137.00	170.00	205.00	189.00	200.00	209.00	221.00	240.00
Potato	0.0142	100.00	109.00	93.00	112.00	112.00	110.00	90.00	128.00	174.00	112.00	162.00
Onion	0.0157	100.00	65.00	105.00	140.00	125.00	119.00	168.00	125.00	195.00	138.00	243.00
Milk	0.1480	100.00	137.00	137.00	151.00	162.00	173.00	193.00	211.00	233.00	238.00	276.00
Beef	0.0267	100.00	142.00	160.00	161.00	169.00	183.00	201.00	241.00	269.00	284.00	305.00
Mutton	0.0173	100.00	128.00	147.00	147.00	179.00	197.00	215.00	253.00	286.00	294.00	320.00
Cotton cloth	0.1055	100.00	105.00	108.00	121.00	124.00	125.00	130.00	163.00	165.00	146.00	161.00
Cigarette	0.0204	100.00	122.00	156.00	165.00	183.00	212.00	244.00	307.00	324.00	349.00	395.00
Match	0.0030	100.00	119.00	119.00	131.00	144.00	144.00	144.00	150.00	156.00	156.00	156.00
Fire wood	0.0504	100.00	121.00	138.00	153.00	165.00	170.00	188.00	235.00	275.00	280.00	302.00
Kerosene	0.0126	100.00	145.00	176.00	184.00	161.00	182.00	266.00	408.00	426.00	426.00	429.00
Electricity	0.0047	100.00	100.00	100.00	104.00	100.00	117.00	138.00	150.00	154.00	154.00	154.00
Gram	0.0015	100.00	124.00	125.00	132.00	202.00	175.00	184.00	439.00	618.00	558.00	424.00
Bus fare	0.0620	100.00	136.00	173.00	182.00	200.00	245.00	345.00	455.00	482.00	527.00	573.00
Washing soap	0.0236	100.00	127.00	122.00	158.00	158.00	153.00	176.00	194.00	194.00	185.00	186.00
Medicine	0.0221	100.00	105.00	106.00	105.00	110.00	114.00	120.00	123.00	126.00	126.00	127.00
Aluminium utensils	0.0078	100.00	100.00	104.00	104.00	112.00	119.00	138.00	162.00	169.00	162.00	165.00
Foot-wear	0.0315	100.00	141.00	164.00	186.00	225.00	229.00	276.00	280.00	285.00	337.00	424.00
Weighted Index	1.0000	100.00	124.86	135.99	146.62	157.50	167.15	190.41	217.46	234.96	245.46	266.52

## Appendix II(b)

## Index of consumer goods prices paid by farmers — Punjab

Article	Weight	1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84
Wheat	0.2096	100.00	143.00	142.00	149.00	161.00	178.00	186.00	186.00	224.00	239.00	256.00
Rice	0.0338	100.00	105.00	119.00	139.00	171.00	172.00	167.00	198.00	254.00	269.00	272.00
Masoor	0.0080	100.00	99.00	136.00	174.00	185.00	189.00	170.00	251.00	443.00	351.00	274.00
Mash	0.0080	100.00	100.00	87.00	86.00	110.00	129.00	124.00	130.00	184.00	158.00	180.00
Moong	0.0048	100.00	100.00	97.00	127.00	157.00	168.00	161.00	192.00	280.00	254.00	277.00
Sugar	0.0177	100.00	122.00	135.00	136.00	136.00	136.00	146.00	189.00	221.00	221.00	243.00
Gur	0.0371	100.00	100.00	123.00	126.00	103.00	144.00	279.00	223.00	177.00	224.00	215.00
Vegetable ghee	0.0371	100.00	140.00	160.00	160.00	160.00	162.00	177.00	177.00	177.00	177.00	202.00
Desi ghee	0.0645	100.00	110.00	125.00	147.00	153.00	158.00	175.00	190.00	211.00	217.00	240.00
Tea	0.0145	100.00	108.00	100.00	125.00	200.00	200.00	200.00	200.00	200.00	206.00	249.00
Salt	0.0030	100.00	125.00	128.00	135.00	167.00	188.00	152.00	182.00	213.00	235.00	263.00
Potato	0.0129	100.00	122.00	117.00	113.00	109.00	116.00	83.00	141.00	181.00	118.00	157.00
Onion	0.0145	100.00	63.00	106.00	138.00	122.00	120.00	160.00	124.00	190.00	140.00	243.00
Milk	0.1532	100.00	134.00	146.00	157.00	166.00	182.00	201.00	228.00	254.00	279.00	296.00
Beef	0.0241	100.00	138.00	152.00	158.00	162.00	180.00	201.00	236.00	268.00	278.00	304.00
Mutton	0.0161	100.00	140.00	149.00	161.00	184.00	210.00	236.00	283.00	299.00	315.00	340.00
Cotton cloth	0.1145	100.00	106.00	109.00	118.00	123.00	117.00	121.00	150.00	151.00	135.00	165.00
Cigarette	0.0161	100.00	122.00	156.00	163.00	183.00	212.00	244.00	309.00	324.00	249.00	395.00
Match	0.0030	100.00	127.00	133.00	147.00	167.00	167.00	167.00	167.00	167.00	167.00	167.00
Fire wood	0.0483	100.00	118.00	122.00	140.00	152.00	160.00	186.00	230.00	275.00	280.00	305.00
Kerosene	0.0113	100.00	142.00	156.00	165.00	133.00	156.00	235.00	358.00	354.00	356.00	358.00
Electricity	0.0030	100.00	100.00	100.00	104.00	100.00	117.00	138.00	150.00	154.00	154.00	154.00
Gram	0.0016	100.00	126.00	129.00	139.00	208.00	174.00	184.00	452.00	622.00	570.00	431.00
Bus fare	0.0387	100.00	136.00	173.00	182.00	200.00	245.00	345.00	455.00	482.00	527.00	573.00
Washing soap	0.0322	100.00	123.00	121.00	124.00	156.00	153.00	174.00	194.00	191.00	187.00	195.00
Medicine	0.0306	100.00	105.00	106.00	105.00	110.00	114.00	120.00	123.00	126.00	126.00	127.00
Aluminium utensils	0.0080	100.00	100.00	100.00	104.00	112.00	119.00	138.00	162.00	169.00	162.00	165.00
Foot-wear	0.0322	100.00	141.00	164.00	186.00	225.00	229.00	276.00	280.00	285.00	337.00	424.00
Weighted Index	1.0000	100.00	124.44	133.78	144.06	154.76	166.45	187.98	209.28	232.25	241.90	264.08

## Appendix II(c)

## Index of consumer goods prices paid by farmers - Sindh

Article	weight	1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84
Wheat	0.1263	100.00	154.00	157.00	167.00	177.00	199.00	215.00	227.00	249.00	253.00	269.00
Rice	0.0796	100.00	110.00	118.00	145.00	172.00	195.00	180.00	199.00	244.00	267.00	266.00
Masoor	0.0075	100.00	98.00	140.00	178.00	177.00	166.00	151.00	253.00	404.00	267.00	222.00
Mash	0.0015	100.00	91.00	76.00	89.00	116.00	141.00	126.00	148.00	152.00	135.00	176.00
Moong	0.0090	100.00	106.00	103.00	143.00	175.00	182.00	179.00	206.00	302.00	275.00	302.00
Sugar	0.0300	100.00	122.00	135.00	136.00	136.00	136.00	146.00	189.00	221.00	221.00	241.00
Gur	0.0165	100.00	107.00	131.00	112.00	102.00	147.00	267.00	214.00	183.00	240.00	228.00
Vegetable ghee	0.0600	100.00	129.00	147.00	147.00	147.00	148.00	162.00	162.00	162.00	162.00	184.00
Desi ghee	0.0300	100.00	114.00	119.00	128.00	147.00	179.00	201.00	200.00	200.00	211.00	266.00
Tea	0.0210	100.00	108.00	100.00	128.00	200.00	200.00	200.00	200.00	200.00	207.00	267.00
Salt	0.0030	100.00	120.00	135.00	156.00	230.00	230.00	239.00	250.00	250.00	250.00	248.00
Potato	0.0165	100.00	89.00	81.00	122.00	104.00	120.00	104.00	153.00	176.00	109.00	168.00
Onion	0.0211	100.00	66.00	105.00	141.00	123.00	124.00	170.00	132.00	215.00	151.00	233.00
Milk	0.1654	100.00	129.00	156.00	168.00	158.00	162.00	172.00	197.00	219.00	232.00	265.00
Beef	0.0225	100.00	154.00	169.00	196.00	167.00	189.00	192.00	266.00	289.00	292.00	320.00
Mutton	0.0210	100.00	127.00	141.00	164.00	137.00	178.00	193.00	235.00	265.00	268.00	290.00
Cotton cloth	0.0960	100.00	106.00	111.00	121.00	127.00	131.00	136.00	136.00	149.00	156.00	157.00
Cigarette	0.0466	100.00	122.00	156.00	163.00	183.00	212.00	244.00	307.00	324.00	349.00	395.00
Match	0.0030	100.00	100.00	100.00	100.00	133.00	133.00	167.00	167.00	167.00	167.00	167.00
Fire wood	0.0450	100.00	130.00	146.00	171.00	170.00	172.00	203.00	272.00	308.00	310.00	328.00
Kerosene	0.0110	100.00	136.00	167.00	175.00	153.00	181.00	264.00	278.00	458.00	458.00	461.00
Electricity	0.0015	100.00	100.00	100.00	104.00	100.00	117.00	138.00	150.00	154.00	154.00	154.00
Gram	0.0000	—	—	—	—	—	—	—	—	—	—	—
Bus fare	0.0526	100.00	136.00	173.00	182.00	200.00	246.00	346.00	455.00	482.00	527.00	573.00
Washing soap	0.0285	100.00	126.00	121.00	127.00	152.00	153.00	175.00	185.00	177.00	177.00	177.00
Medicine	0.0270	100.00	105.00	106.00	105.00	109.00	115.00	120.00	123.00	126.00	126.00	127.00
Aluminium utensils	0.0090	100.00	100.00	100.00	104.00	112.00	119.00	139.00	162.00	169.00	162.00	165.00
Foot-wear	0.0225	100.00	141.00	164.00	187.00	225.00	229.00	276.00	280.00	285.00	338.00	424.00
Weighted Index	1.0000	100.00	120.92	135.26	148.14	154.76	168.24	186.98	210.74	233.46	241.31	264.39

## Appendix II(d)

Index of consumer goods prices paid by farmers - N.W. F. P.

Article	Weight	1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84
Wheat	0.1942	100.00	165.00	162.00	146.00	175.00	208.00	204.00	202.00	242.00	267.00	275.00
Rice	0.0168	100.00	109.00	115.00	134.00	150.00	170.00	150.00	188.00	220.00	207.00	203.00
Masoor	0.0030	100.00	99.00	136.00	174.00	185.00	189.00	171.00	251.00	443.00	351.00	274.00
Mash	0.0076	100.00	100.00	88.00	86.00	110.00	129.00	124.00	139.00	184.00	158.00	180.00
Moong	0.0030	100.00	103.00	101.00	132.00	160.00	176.00	160.00	195.00	291.00	274.00	303.00
Sugar	0.0305	100.00	119.00	131.00	132.00	132.00	132.00	142.00	184.00	214.00	214.00	235.00
Gur	0.0688	100.00	92.00	120.00	136.00	122.00	142.00	259.00	259.00	224.00	232.00	255.00
Vegetable ghee	0.0733	100.00	131.00	160.00	160.00	160.00	164.00	177.00	177.00	177.00	177.00	204.00
Desi ghee	0.0229	100.00	111.00	126.00	145.00	148.00	168.00	180.00	199.00	215.00	227.00	246.00
Tea	0.0413	100.00	100.00	100.00	125.00	200.00	200.00	200.00	200.00	200.00	207.00	240.00
Salt	0.0030	100.00	122.00	124.00	126.00	158.00	204.00	203.00	176.00	187.00	172.00	200.00
Potato	0.0153	100.00	103.00	41.00	113.00	123.00	125.00	81.00	141.00	215.00	125.00	179.00
Onion	0.0122	100.00	70.00	114.00	144.00	141.00	134.00	186.00	136.00	213.00	158.00	271.00
Milk	0.1238	100.00	140.00	170.00	240.00	297.00	270.00	257.00	268.00	297.00	346.00	366.00
Beef	0.0458	100.00	139.00	159.00	164.00	166.00	174.00	196.00	234.00	289.00	314.00	340.00
Mutton	0.0031	100.00	139.00	151.00	165.00	187.00	206.00	214.00	255.00	311.00	322.00	362.00
Cotton cloth	0.0840	100.00	102.00	103.00	117.00	119.00	119.00	129.00	143.00	143.00	149.00	136.00
Cigarette	0.0046	100.00	122.00	156.00	163.00	183.00	212.00	244.00	307.00	324.00	349.00	395.00
Match	0.0020	100.00	111.00	117.00	139.00	139.00	139.00	139.00	144.00	139.00	139.00	139.00
Fire wood	0.0688	100.00	127.00	176.00	201.00	214.00	222.00	239.00	268.00	321.00	336.00	368.00
Kerosene	0.0137	100.00	133.00	147.00	143.00	117.00	124.00	286.00	286.00	294.00	294.00	298.00
Electricity	0.0107	100.00	100.00	100.00	104.00	100.00	117.00	138.00	150.00	154.00	154.00	154.00
Gram	0.0030	100.00	121.00	119.00	126.00	204.00	200.00	180.00	438.00	639.00	577.00	447.00
Bus fare	0.0428	100.00	137.00	173.00	182.00	200.00	245.00	345.00	455.00	482.00	527.00	573.00
Washing soap	0.0214	100.00	133.00	129.00	137.00	171.00	174.00	186.00	200.00	203.00	203.00	203.00
Medicine	0.0397	100.00	105.00	106.00	105.00	110.00	114.00	120.00	123.00	126.00	126.00	127.00
Aluminium utensils	0.0073	100.00	100.00	100.00	104.00	112.00	119.00	138.00	162.00	169.00	162.00	165.00
Foot-wear	0.0300	100.00	141.00	164.00	186.00	225.00	229.00	276.00	280.00	285.00	337.00	424.00
Weighted Index	1.0000	100.00	128.00	142.53	157.16	177.06	186.61	194.29	220.69	243.01	259.39	278.96

## Appendix II(c)

## Index of consumer goods prices paid by farmers - Baluchistan

Article	Weight	1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83	83-84
Wheat	0.1416	100.00	133.00	158.00	164.00	174.00	175.00	178.00	192.00	231.00	235.00	269.00
Rice	0.0228	100.00	96.00	109.00	125.00	143.00	168.00	164.00	190.00	242.00	270.00	264.00
Masoor	0.0085	100.00	99.00	131.00	171.00	-	182.00	154.00	190.00	338.00	323.00	-
Mash	0.0037	100.00	100.00	110.00	105.00	129.00	154.00	163.00	180.00	201.00	209.00	227.00
Moong	0.0128	100.00	95.00	95.00	122.00	156.00	166.00	170.00	191.00	298.00	281.00	292.00
Sugar	0.0520	100.00	122.00	135.00	136.00	136.00	136.00	146.00	189.00	221.00	221.00	243.00
Cur	0.0128	100.00	88.00	108.00	125.00	92.00	113.00	266.00	203.00	173.00	196.00	209.00
Vegetable ghee	0.0727	100.00	128.00	153.00	153.00	153.00	154.00	169.00	169.00	169.00	169.00	193.00
Desi ghee	0.0085	100.00	107.00	118.00	126.00	132.00	138.00	145.00	179.00	192.00	197.00	227.00
Tea	0.0313	100.00	109.00	100.00	127.00	200.00	200.00	200.00	200.00	200.00	207.00	262.00
Salt	0.0028	100.00	109.00	118.00	127.00	148.00	180.00	225.00	209.00	212.00	223.00	232.00
Potato	0.0171	100.00	106.00	80.00	120.00	115.00	115.00	108.00	148.00	168.00	117.00	167.00
Onion	0.0228	100.00	68.00	101.00	156.00	126.00	130.00	188.00	126.00	189.00	143.00	265.00
Milk	0.0813	100.00	121.00	142.00	121.00	158.00	158.00	189.00	203.00	224.00	246.00	277.00
Beef	0.0242	100.00	142.00	155.00	174.00	188.00	187.00	208.00	231.00	264.00	269.00	307.00
Mutton	0.0442	100.00	130.00	139.00	161.00	168.00	173.00	194.00	223.00	259.00	272.00	291.00
Cotton cloth	0.0984	100.00	103.00	110.00	115.00	131.00	131.00	124.00	123.00	138.00	131.00	141.00
Cigarette	0.0185	100.00	122.00	156.00	163.00	183.00	212.00	244.00	307.00	324.00	349.00	395.00
Match	0.0040	100.00	105.00	105.00	100.00	100.00	100.00	125.00	125.00	125.00	125.00	125.00
Fire wood	0.0613	100.00	122.00	124.00	148.00	156.00	155.00	158.00	213.00	258.00	264.00	284.00
Kerosene	0.0157	100.00	149.00	157.00	159.00	122.00	131.00	173.00	288.00	306.00	316.00	318.00
Electricity	0.0028	100.00	100.00	100.00	104.00	100.00	116.00	138.00	150.00	154.00	154.00	154.00
Gram	0.0014	100.00	118.00	122.00	133.00	172.00	169.00	170.00	370.00	559.00	506.00	394.00
Rus fare	0.1455	100.00	136.00	173.00	182.00	200.00	245.00	345.00	455.00	482.00	527.00	573.00
Washing soap	0.0285	100.00	125.00	119.00	124.00	157.00	169.00	172.00	188.00	181.00	171.00	169.00
Aluminum utensils	0.0057	100.00	100.00	104.00	104.00	112.00	119.00	139.00	162.00	169.00	162.00	165.00
Medicine	0.0156	100.00	105.00	105.00	105.00	110.00	114.00	120.00	123.00	126.00	126.00	127.00
Foot-wear	0.0385	100.00	141.00	164.00	187.00	225.00	229.00	276.00	280.00	285.00	377.00	424.00
Weighted Index	1.0000	100.00	121.47	138.80	147.77	160.73	171.82	198.46	229.00	254.73	265.43	293.42

Appendix III(a) Index of input prices paid by farmers (Pakistan) using domestic prices

Input	$Q_{oj}^P$ (value in Rs.'000)	$W_{oj}$ (Weight)	$P_i$									
			1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83*
Fertilizer	1187054	0.5156	100.00	96.97	90.22	82.85	82.85	78.88	92.84	122.30	124.80	131.88
Seeds	555705	0.2414	100.00	135.20	133.00	147.00	162.00	170.31	176.25	197.26	217.80	—
L.D.O.	177124	0.0770	100.00	141.00	141.00	141.00	142.00	156.00	275.00	420.30	432.80	432.80
Water	371030	0.1611	100.00	92.33	101.69	114.96	128.71	137.78	136.04	155.18	211.02	232.28
Pesticides	11219	0.0048	100.00	152.00	226.00	253.00	260.00	351.00	388.00	488.00	465.00	—
$\sum Q_{oj} P_{oj}$	2302132											
$\sum W_{oj} \left[ \frac{P_{ij}}{P_{oj}} \times 100 \right]$		1.0000	100.00	109.09	107.00	108.79	114.74	117.67	135.36	170.38	186.47	184.08

\* For 1982-83 the weights were calculated using the base year values of Fertilizer L.D.O. and water only. The same has been done in case of Provinces also.

Appendix III(b)

Index of input prices paid by farmers (Punjab) using domestic prices

Input	$Q_{oj}^P$ (value in Rs.'000)	$W_{oj}$ (Weight)	$P_i$									
			1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83
Fertilizer	732088	0.5056	100.00	96.96	90.12	82.85	82.85	78.88	92.86	122.35	124.86	131.82
Seeds	356557	0.2462	100.00	135.20	133.00	147.00	162.00	170.31	176.25	197.26	217.80	—
L.D.O.	82363	0.0569	100.00	141.00	141.00	141.00	142.00	156.00	275.00	420.30	432.80	432.80
Water	269000	0.1857	100.00	98.02	111.32	133.77	137.08	148.20	145.73	155.04	210.19	234.36
Pesticides	7849	0.0054	100.00	152.00	226.00	253.00	260.00	351.00	388.00	488.00	465.00	—
$\sum Q_{oj} P_{oj}$	1447857											
$\sum W_{oj} \left[ \frac{P_{ij}}{P_{oj}} \times 100 \right]$		1.0000	100.00	109.30	108.00	112.30	116.70	120.10	135.00	165.70	183.00	181.00

Appendix III(c) Index of input prices paid by farmers (Sindh) using domestic prices

Input	$q_{oj}^p$ (value in Rs. '000)	$W_{oj}$ (Weight)	$P_i$									
			1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83
Fertilizer	374382	0.5645	100.00	96.93	90.39	82.80	82.80	78.80	92.78	122.23	124.70	132.01
Seeds	109909	0.1657	100.00	135.20	133.00	147.00	162.00	170.31	176.25	197.26	217.80	-
L.D.O.	80060	0.1207	100.00	141.00	141.00	141.00	142.00	156.00	275.00	420.30	432.80	432.80
Water	95430	0.1440	100.00	77.06	67.25	60.72	86.74	96.65	95.57	136.54	204.65	212.20
Pesticides	3370	0.0051	100.00	152.00	226.00	253.00	260.00	351.00	388.00	488.00	465.00	-
$\sum q_{oj}^p P_{oj}$	663151											
$\sum W_{oj} \left[ \frac{ij}{P_{oj}} \times 100 \right]$		1.0000	100.00	106.00	101.00	98.22	104.60	107.24	130.41	174.56	190.56	191.00

Appendix III(d) Index of input prices paid by farmers (N.W.F.P.) using domestic prices

Input	$q_{oj}^p$ (value in Rs. '000)	$W_{oj}$ (Weight)	$P_i$									
			1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83
Fertilizer	74972	0.4814	100.00	96.96	90.12	82.85	82.85	78.88	92.86	122.35	124.86	131.82
Seeds	67904	0.4359	100.00	135.20	133.00	147.00	162.00	170.31	176.25	197.26	217.80	-
L.D.O.	10273	0.0660	100.00	141.00	141.00	141.00	142.00	156.00	275.00	420.30	432.80	432.80
Water	2600	0.0167	100.00	113.00	462.30	308.00	627.59	723.22	663.40	1074.00	917.80	1030.00
Pesticides	-	-	-	-	-	-	-	-	-	-	-	-
$\sum q_{oj}^p P_{oj}$	155749											
$\sum W_{oj} \left[ \frac{ij}{P_{oj}} \times 100 \right]$		1.0000	100.00	116.80	118.40	118.40	130.30	135.00	150.70	190.50	199.00	195.00



Appendix III(e) Index of input prices paid by farmers (Baluchistan) using domestic prices

Input	q <sub>oj</sub> P <sub>oj</sub> (value in Rs. '000)	W <sub>oj</sub> (Weight)	P <sub>i</sub>									
			1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83
Fertilizer	5612	0.1586	100.00	96.86	90.16	82.71	82.71	78.75	92.78	122.35	124.84	131.87
Seeds	21335	0.6031	100.00	135.20	133.00	147.00	162.00	170.31	176.25	197.26	217.80	—
L.D.O.	4428	0.1252	100.00	141.00	141.00	141.00	142.00	156.00	275.00	420.30	432.80	432.80
Water	4000	0.1131	100.00	116.20	47.60	69.80	250.00	75.40	83.00	41.50	44.40	117.50
Pesticides	—	—	—	—	—	—	—	—	—	—	—	—
Σ q <sub>oj</sub> P <sub>oj</sub>	35375	—	—	—	—	—	—	—	—	—	—	—
$\sum W_{oj} \left[ \frac{P_{ij}}{P_{oj}} \times 100 \right]$	1.0000	1.0000	100.00	127.65	117.52	127.31	156.86	143.24	164.81	195.67	210.36	224.14

Appendix IV(a) Index of prices received by farmers (Pakistan) using international prices

Commodity	q <sub>oj</sub> P <sub>oj</sub> (value in Rs. '000)	W <sub>oj</sub> (Weight)	P <sub>i</sub>									
			1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83
Wheat	12866758	0.3433	100.00	105.00	88.00	72.00	70.00	88.00	103.00	106.00	97.00	90.00
Rice	10641616	0.2840	100.00	93.00	80.00	84.00	96.00	102.00	110.00	116.00	102.00	90.00
Cotton	11377336	0.3036	100.00	103.00	105.00	116.00	112.00	114.00	126.00	130.00	116.00	109.00
Maize	979958	0.0261	100.00	111.00	103.00	91.00	161.00	165.00	168.00	174.00	185.00	191.00
Citrus fruits	1021641	0.0272	100.00	117.00	132.00	148.00	87.00	99.00	119.00	127.00	110.00	102.00
Jawar	406951	0.0110	100.00	109.00	101.00	90.00	85.00	94.00	111.00	119.00	110.00	109.00
Banana	176359	0.0047	100.00	123.00	141.00	159.00	176.00	189.00	220.00	243.00	241.00	257.00
Σ q <sub>oj</sub> P <sub>oj</sub>	37470619	—	—	—	—	—	—	—	—	—	—	—
$\sum W_{oj} \left[ \frac{P_{ij}}{P_{oj}} \times 100 \right]$	1.0000	1.0000	100.00	102.00	93.00	92.00	94.00	102.00	115.00	119.00	108.00	100.00

## Appendix IV(b)

Index of prices received by farmers (Punjab) using International prices

Commodity	$q_{oj}^P$ (value in Rs. '000)	$W_{oj}$ (Weight)	$P_i$									
			1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83
Wheat	9554144	0.4024	100.00	105.00	88.00	72.00	70.00	88.00	103.00	106.00	97.00	90.00
Rice	4830794	0.2035	100.00	93.00	80.00	84.00	96.00	102.00	110.00	116.00	102.00	90.00
Cotton	7802379	0.3286	100.00	103.00	105.00	116.00	112.00	114.00	126.00	130.00	116.00	109.00
Citrus fruit	952784	0.0401	100.00	117.00	132.00	148.00	161.00	165.00	168.00	174.00	185.00	191.00
Maize	440221	0.0185	100.00	111.00	103.00	91.00	87.00	99.00	119.00	127.00	110.00	102.00
Jawar	150790	0.0063	100.00	109.00	101.00	90.00	85.00	94.00	111.00	119.00	110.00	109.00
Banana	7034	0.0003	100.00	123.00	141.00	159.00	176.00	189.00	220.00	243.00	241.00	257.00
$\Sigma q_{oj} P_{oj}$	23738146											
$\Sigma W_{oj} \left[ \frac{P_{ij}}{P_{oj}} \times 100 \right]$		1.0000	100.00	103.00	94.00	92.00	93.00	101.00	113.00	119.00	108.00	101.00

## Appendix IV(c)

Index of prices received by farmers (Sindh) using international prices

Commodity	$q_{oj}^P$ (value in Rs. '000)	$W_{oj}$ (Weight)	$P_i$									
			1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83
Wheat	2101480	0.1846	100.00	105.00	88.00	72.00	70.00	88.00	102.00	106.00	97.00	90.00
Rice	5353100	0.4702	100.00	93.00	80.00	84.00	96.00	101.00	110.00	116.00	102.00	90.00
Cotton	3574957	0.3140	100.00	103.00	105.00	116.00	112.00	113.00	126.00	130.00	116.00	109.00
Maize	16352	0.0014	100.00	111.00	103.00	91.00	87.00	99.00	119.00	127.00	110.00	102.00
Jawar	118286	0.0104	100.00	109.00	101.00	90.00	85.00	94.00	111.00	119.00	110.00	109.00
Citrus fruit	56469	0.0049	100.00	117.00	132.00	148.00	161.00	165.00	168.00	174.00	185.00	191.00
Banana	163127	0.0143	100.00	123.00	141.00	159.00	176.00	189.00	220.00	242.00	241.00	257.00
$\Sigma q_{oj} P_{oj}$	11383770											
$\Sigma W_{oj} \left[ \frac{P_{ij}}{P_{oj}} \times 100 \right]$		1.0000	100.00	99.20	91.00	93.09	97.75	104.28	115.72	121.00	108.00	99.19

Appendix IV(d) Index of prices received by farmers (N.W.F.P.) using international prices

Commodity	$q_{oj} P_{oj}$ (value in Rs. '000)	$W_{oj}$ (Weight)	$P_{ij}$									
			1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83
Wheat	1023586	0.5360	100.00	105.00	88.00	72.00	70.00	88.00	103.00	106.00	97.00	90.00
Rice	312950	0.1638	100.00	93.00	80.00	84.00	96.00	102.00	110.00	116.00	102.00	90.00
Maize	519936	0.2722	100.00	111.00	103.00	91.00	87.00	99.00	119.00	127.00	110.00	102.00
Jawar	20342	0.0106	100.00	109.00	101.00	90.00	85.00	94.00	111.00	119.00	110.00	109.00
Citrus Fruits	27128	0.0142	100.00	117.00	132.00	148.00	161.00	165.00	168.00	174.00	185.00	191.00
Banana	5694	0.0030	100.00	123.00	141.00	159.00	176.00	189.00	220.00	242.00	241.00	257.00
$\Sigma q_{oj} P_{oj}$	1909636.6											
$P_{ij} \left[ \frac{ij}{P_{oj}} \times 100 \right]$			1.0000	105.09	91.81	80.58	80.84	94.50	109.71	115.00	103.00	95.53

Appendix IV(c) Index of prices received by farmers (Baluchistan) using international prices

Commodity	$q_{oj} P_{oj}$ (value in Rs. '000)	$W_{oj}$ (Weight)	$P_{ij}$									
			1973-74	74-75	75-76	76-77	77-78	78-79	79-80	80-81	81-82	82-83
Wheat	187548	0.4119	100.00	105.00	88.00	72.00	70.00	88.00	103.00	106.00	97.00	90.00
Rice	144772	0.3179	100.00	93.00	80.00	84.00	96.00	102.00	110.00	116.00	102.00	90.00
Maize	3449	0.0075	100.00	111.00	103.00	91.00	87.00	99.00	119.00	127.00	110.00	102.00
Jawar	119510	0.2625	100.00	109.00	101.00	90.00	85.00	94.00	111.00	119.00	110.00	109.00
$\Sigma q_{oj} P_{oj}$	455279											
$P_{ij} \left[ \frac{ij}{P_{oj}} \times 100 \right]$			1.0000	102.31	89.03	80.64	82.51	93.89	107.27	112.89	102.00	95.14