Seasonal and Spatial Variation of Prices of Some Important Agricultural Commodities in Assam.

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Deepika Das Borah

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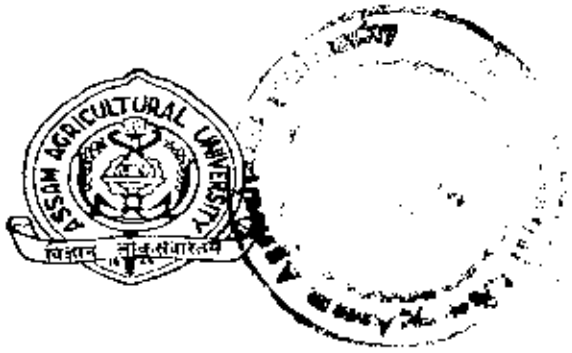

DEPARTMENT OF AGRICULTURAL STATISTICS

ASSAM AGRICULTURAL UNIVERSITY

JORHAT- 785013

ASSAM.

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DEPARTMENT OF AGRICULTURAL STATISTICS

ASSAM AGRICULTURAL UNIVERSITY

JORHAT – 7850013.

Dr. A. C. Bora

Professor & Head

Dated Jorhat the 23/09/2004

CERTIFICATE

This is to certify that the thesis entitled **"Seasonal and Spatial Variation of Prices of Some Important Agricultural Commodities in Assam"** submitted to the Faculty of Agriculture, Assam Agricultural University, Jorhat in fulfilment of the requirement for the degree of **Doctor of Philosophy** in **Agricultural Statistics** is a record of original research work carried out by Ms. **Deepika Das Borah** under my personal supervision and guidance.

All help received by her have been duly acknowledged.

No part of this thesis has been reproduced elsewhere for any other degree.

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The...23/9/04...

Guide

(Dr. A.C Bora)

Professor and Head

Deptt. of Agricultural Statistics,

A.A.U. Jorhat.

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(Ms. Deepika Das Borah)

ABSTRACT

The marketable surplus of agricultural products grown over different places in the state is not only negligible but also suffers from variation from district to district. Again some districts of the state are to depend heavily on supply from other state and on inter-district movement of the commodities. Under such situations spatial variation in prices of such commodities is an obvious consequence. Moreover in certain seasons, more particularly in festive seasons, the demand of certain commodities grows up which in turn plays a crucial role in increasing the price causing seasonal variation in prices of such commodities in different places.

The Present Study was undertaken with a view to studying the seasonal and spatial variation of prices of important agricultural commodities in Assam viz. rice (both common and fine), mustard, potato, onion, lentil, green gram, black gram and sugar. The study is entirely based on secondary data on wholesale monthly price from 1980-1999 (twenty years) for the ten districts of Assam and Assam as a whole (which is the average of the ten districts). The yearly production of the crop in different districts and the data for cost of cultivation of some crops were also collected from different government agencies.

The present study has been carried out with the objectives.

1.- to construct the monthly price index of each commodity for each district and the state as a whole,

2.- to study the trend in prices of each commodity for each district and for the state as a whole and to examine the relation between the cost of production and the price of different commodities,

3.- to test the spatial variation of prices using analysis of covariance technique with yearly production as the covariate,

4.- to test the seasonal variation of prices by analysis of variance technique and

5.- to study the consistency of price variation of different commodities over time and space by calculating stability index.

Analyzing the monthly average prices during the period of study, the distribution of different commodities according to different levels of price rise and price variation during a year in different districts of Assam reveals that except for potato the price rise for all other commodities remained within 50 per cent during a year considering January as the base month. As regard the variation, it was found that except potato, mustard and onion the prices of all other commodities remained more or less uniform during the year in different districts. Also

it was found that sugar and onion were the only commodities, which suffered least and most respectively from price variation in the state over the years during 1980–1999 taking 1980 as base year. Further, it was evident from the result that price variation was sharper during 1990–1999 in different districts and Assam as a whole for different commodities under consideration.

The functional form of the trend of prices for all the commodities included in the study was found to be exponential and the extent of variation of observed prices from trend prices over the years varied from district to district.

The analysis of seasonal indices of price of different commodities under consideration during the period 1980–1999, showed that for majority of commodities such as rice (common), mustard, potato, onion, lentil and black gram, sowing season was the season of price rise. However, testing the variation between seasonal indices of price of different commodities in different districts no significant difference was found in prices between the seasons of the year for rice (common) and rice (fine). Similar situation was observed for green gram, black gram and sugar also. For potato, onion, mustard and lentil a significant price variation was noticed between the seasons.

An almost perfect correlation between the price and the cost of cultivation in both types of rice and mustard was observed.

The analysis on the effect of the total production of a commodity in the district in its price revealed no significant effect except in the case of rice. Eliminating the effect of the production of the district in the price, variation in prices of both types of rice was found to exist between the districts of the state. The stability indices of price on different commodities show that it were the three types of pulses – lentil, green gram and black gram along with onion that suffered from instability in prices over the years in different districts. Similar was the situation for potato, onion and mustard over the months of a year in majority of the districts.

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INTRODUCTION

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INTRODUCTION

1.1 INTRODUCTION OF THE STUDY

Agriculture is the main backbone of the Indian Economy. It contributes nearly 25 per cent of Gross Domestic Product (GDP) and about 70 per cent of the population is dependent on agriculture for their livelihood. According to advance estimates released by the Ministry of Statistics and Programme Implementation, the growth under agriculture and allied sectors are estimated at 5.70 per cent during 2001-02 from a lower level of – 0.20 per cent in preceding year. During that year estimated food grains production was 211.32 million tones against 195.92 million tonnes in 2000–01(India2003). Per capita per day net availability of foodgrains went up to 429 grams in 2002–2003, against 395 grams during early fifties (Frontline, 12th March, 2004.). The increase in food grains production during 2001- 02 was dominated by rice, which was 91.61 million tonnes compared to 84.87 million tonnes in the year 2000–01(India 2003). It is undoubtedly true that in Indian economy agriculture played a vital role. This sector gives raw materials to non-agricultural sectors also.

Fluctuation in agricultural production and rapid growth rate of population adversely effected supply and demand of agricultural commodities reflecting impacts on both producers and consumers. Through the prices consumer desires to meet their demand and producer expects commensurating reward for their effort. Therefore, the studies on prices of agricultural commodities are very important for taking policy decision for the benefit of both producer and consumer.

The major problem of the agricultural product is that its demand is not confined to the place where it is produced. It may be demanded in a place, which may be several hundred miles away from the area where it is produced. Another problem is the non-availability of specialized marketing system developed for seasonal crops. Again, expensive and extensive care is to be taken for storage and transportation of perishable commodities like fruits. It is obvious that fruits cannot be stored for a long period and it

has to reach the consumer without being affected in its quality. A.S. Srivastava and J.P. Bhatti (1976) in their study concluded that there is a substantial variation in the prices and supply during fruit season. Examination of demand function revealed that price had negative and statistically significant impact on the quantity demand of wholesale / retail sale.

Without a proper marketing arrangement the process of production of agricultural or industrial production cannot attain dynamism. Particularly dynamism in marketing of agricultural produce is very important as these are not long time storable and in fact some of these are easily perishable. Poor farmers are compelled to sell their produces in distress particularly in festive seasons even without considering the reasonability of prices. Rich farmers are also compelled to sell a part of their produce due to lack of proper storage facility particularly in the harvesting season even though the prices of the produce are mostly affected by the surplus supply to the markets. Therefore, it can be assumed that the extent of price fluctuation of agricultural commodities in Assam is controlled by the seasonality and erratic supply of produce to the markets. Lack of proper marketing system also contributes to a large extent, the instability and erratic movement of prices in the state, especially in rainy season when the transport and communication is greatly affected by the flood and rainwater.

The persistent tendency of agricultural prices to fall was a disturbing feature of the Indian economy in the first five-year plan and therefore stabilization of agricultural prices caught the attention of the policy makers during the second five-year plan. The magnitude of the price fluctuation varied from state to state due to diverse geographical and topographical situation of different states of the country (Agricultural Price Variations and Price Support Policies, 1956). On this issue Shukla and Misra (1979) threw light in their study on Agricultural Price Behavior in Uttar Pradesh and stated that in the first plan period the price trend was falling for all the crops and the fall was significantly at 8.60 per cent and 4.10 per cent respectively for rice and maize among cereals, 7 per cent for arahar, 14.50 per cent for castor and 8.60 per cent for groundnut. Hence, to arrest the price falling of agricultural commodities several state governments had to adopt certain ad-hoc price support policies.

With the advent of modern technological innovation in Indian agriculture and with the adoption of high yielding varieties, farm production has reached a new dimension. Moreover it is seen that agriculture has become more commercialized than what it was before. Hence, necessity of raising or stabilizing the farm income by adopting meticulous agricultural price policy has become imperative for this vital sector of the economy.

For the analysis of price behavior, in order to device the appropriate ways and means for reducing the price fluctuations, there is a need to have a thorough understanding of prices over time .The inter-relations between the prices and arrivals of farm products is required for assessing the extent of price fluctuations over time. To formulate appropriate policies for reducing instability in the prices there is a greater need to have empirical evidences on the issue. To the farmers, to decide the optimum time for disposing their produces to their best advantage study of such price behaviour is essential.

1.2 NOTE ON THE SAMPLE AREA

1.2.1 Physiography:

Assam is the eastern most state of the Indian union, which is located between $24^0 8'$ and $27^0 56'$ North latitude and 89 ^{0} 82 $'$ East and 96 ^{0} East Longitude with a total area of 78438 square kilometer.

Assam by virtue of its situation in the Eastern Himalayan region, enjoys a hot and humid climate with average relative humidity of 85- 90 per cent. The maximum temperature ranges from 33^0c to 37^0c and minimum temperature is from 10^0c to 12^0c. The average rainfall in the state varies from 1800mm to3500 mm, concentrated in four months from June to September. The state has a chronic flood problem with occasional drought.

Depending on climate and geographical situation the state has been divided into six agricultural zones covering different district of the state, viz.

1.North Bank Plains : Lakhimpur, Dhemaji , Sonitpur and Darrang districts.

2.Upper Brahmaputra Valley : Dibrugarh ,Tinsukia ,Sivasagor ,Jorhat and Golaghat districts.

3. Central Brahmaputra Valley : Nagaon and Morigaon districts.

4. Lower Brahmaputra Valley: Dhubri , Goalpara , Bongaigaon, Kokrajhar, Kamrup, Nalbari and Barpeta district.

5. Barak Valley: Cacher, and Hailakandi districts and

6. Hills Zone : Karbi Anglong and North Cacher Hills districts.

1.2.2 Demography:

As per 2001 census the population of the state is 2.66 crores of which 1.37 crores are male and 1.28 crores are female. The per square kilometer density of population is 340 person and the literacy rate of the state is 64.28 per cent.

1.2.3 Agriculture:

Assam is an agricultural state. The economy of the state is mainly dependent on agriculture since about 70 per cent working force is directly involved in this sector. The principal food crop of the state is rice occupying 67.24 per cent of total cropped area. The cash crops of the state are jute, tea, oilseeds, potato, sugarcane etc.. Orange, banana, pineapple etc. are the main horticultural crops of the state. The state has an estimated gross cropped area of 39.44 lakh thousand hectares of which net area sown is 27.01 lakh hectares.(India-2003)

As per record of the Irrigation Department, irrigation potential created in the state up to 2000-2001 was about 8.98 lakh hectares of which the department had covered an area of 5.04 lakh hectares.(Economic Survey of Assam, 2002 –03.)

Uses of fertilizers boost up the production of agricultural commodities to meet the growing need of the state. During 2000-01 total chemical fertilizer used in the state was 140.62 thousand tonnes. (Statistical Handbook of Assam, 2002.)

In spite of having abundant rainwater, optimum sunshine hour, favourable temperature and ample manpower, the productivity of crops in the state is quite low in comparison to the rest of the country. Modern green revolution technology enormously improved the productivity to a remarkable extent. But it failed to find significant adoption in the state of Assam and in N.E. states of India. This is mainly due to dependence on nature.

1.2.4 Economy:

As discussed in the previous section, Assam's economy is mainly agriculture based as more than 70 per cent of its earning comes from agricultures and its allied sectors like fishery, forestry etc.. In addition to that Assam is rich in mineral wealth like oil, coal, limestone and natural gas.

Tea is the major industry of the state, which contributes about 15.6 per cent of world's tea production and 55 per cent of the country's tea output. Assam is the first state of the country where in 1889 the first oil refinery was established at Digboi. Presently there are four oil refineries in the state. Besides, there is a public sector fertilizer factory at Namrup. Other important agriculture based industries of the state are jute, silk and paper. Handloom, sericulture, cane and bamboo are the main cottage industries of the state. Assam is the largest producer in the world of the golden coloured "Muga" silk. However, considering the available natural raw materials and mineral resources like oil, gas, coal etc. the state is yet to reach the desired momentum of industrial development and consequently the speed of economic improvement.

1.3 PROFILE OF DIFFERENT CROPS UNDER STUDY

The crop wise status in India as well as the state of Assam is briefly discussed below.

1.3.1 Rice:

In the global rice production Asia is the major rice-producing continent because of its hot and humid climate. World rice production was 397354 thousand tonnes

in 2000-01 which came down to 396588 thousand tonnes in 2001–02. The Asian countries contribute 92 per cent of this production and consume about 90 per cent of world's rice. India took second position in rice production with 21.4 per cent of world produce in 2000–01(Source- USDA Foreign Agricultural Services (FAS) August 2002). Assam is also occupying a very significant position in the agricultural production. Among other crops, rice is the most dominant field crop, which is covering about 80 per cent of gross cropped area. This is because; the agro climatic condition of the state is favourable for rice. During 2000–2001 in Assam 2646 thousand hectare of area was covered under rice and 3999 thousand tonnes (4.70 per cent of India's production) of rice was produced with an average yield of 15.68 quintals per hectare. The corresponding all India level data for the crop in the year was 44360 thousand hectares and 84870 thousand tonnes and 19.3 quintals per hectare respectively (Agricultural Statistics at a Glance-2002).

During the early plan period after independence, the state was marginally surplus in rice production but turned to a deficit one during the intermediate period of sixties to eighties. In this period, the state had to depend on the inflow of rice from other states. This situation gave rise to highly inconsistent price fluctuation of rice during this period. However, the situation had been reversed to a great extent with the adoption of modern improved technology and bringing in more areas under the crop. At present the state is almost self-sufficient and has been able to impose restrain on the price fluctuation of the crop.

1.3.2 Rape and Mustard:

Among the oilseeds producing countries in the world India is occupying a very remarkable position because of its vast and diverse agro-climatic condition. It contributes about 6 per cent to the Gross Domestic Product (GDP) and it accounted 11.80 per cent of total value of agricultural commodities produced during 1994-95. Over one million farm families are directly involved in the oilseed cultivation in our country. 3.75 per cent of gross cropped area is under rape and mustard, 70 per cent of production are concentrated in six states. These are Utter Pradesh, Rajasthan, Madhya Pradesh,

Haryana and Punjab. In India during 2000-2001, area covered under the crop was 4407 thousand hectares, which produced 4210 thousand tonnes with productivity rate of 9.41 quintals per hectare. To grow more oilseeds Government of India introduced a scheme under "Area Approach" which resulted enormous increase in gross cropped area. During mid eighties the Government of India again adopted the "Technology Mission of Oilseeds" in order to make self-sufficiency in oil seeds production (Directorate of Economics and Statistics, MOA, GOI, New Delhi, 1996).

In Assam, out of the total oilseeds area, about 92 per cent is covered by rape and mustard .It is mostly grown in the Brahmaputra valley and in the bank of other tributaries. The soil of the river valley is very conducive particularly for rape and mustard. During 2000-2001, the total area covered was 274 thousand hectares and production was 141 thousand tonnes. The production of the crop in Assam was 3.35 per cent of India's total production during the period. The most significant development in the oil seed marketing in our country as well as in Assam is the establishment of National Agricultural Co-operative Marketing Federation and National Diary development Board which are designed as a nodal agency for undertaking price support programme.

1.3.3 Potato :

Potato is one of the major starch tuber vegetable crops of the world. It is a wholesome food and consumed by all class of people. Apart from starch, it is a very rich source of body building substances with vitamin, mineral and protein. It is one of the most important commercial vegetable crops in India. Therefore, in some states it is called as "king of vegetables". Potato is extensively cultivated cash crop. In India during 2000–2001 total area covered was 1210 thousand hectares and the total production was 22140 thousand tonnes. The per hectare yield rate was 182.80 quintals. During that period in Assam only 81 thousand hectare of land was cultivated under the crop, which was just 6.70 per cent of all India potato area and produced 677 thousand tonnes. The per hectare yield was 82.50 quintals which was quite low in comparison to all India yield rate. Considering the production and population of the state if we calculate per month per head availability of potato this will stand approximately at 2.12 kilograms only. Thus the

state has to depend more on other potato producing states of the country. Though potato shares a very small area for its production of the total cultivated area of the country compared to rice, wheat, pulses and oilseeds yet the importance of potato as a food crop is high in view of its versatility in production, consumption and marketing processes throughout the country.

1.3.4 Onion:

Onion is one of the most important vegetables in the consumption basket of people across the length and breadth of the country. India produces onion not only for domestic consumption but also to export a sizable amount to the international market. India is second largest producer of onion in the world. In spite of that the seasonal scarcity of onion has been a chronic problem of the country. The uneven supply and disturbances due to natural phenomenon lead to volatile behavior of prices of onion. India's 80 per cent of onion production is contributed by Maharastra, Karnataka and Gujrat. Due to its high demand during last two decades, its production has been doubled increasing the area of cultivation. In the year 2000–2001 the area covered under the crop was 450 thousand hectares and production was 4720 thousand tonnes. In Assam during this year seven thousand hectare of area was cultivated and the production was 17 thousand tonnes. As per 2001 census, there were 49.15 lakh households in the state with the household size of 5.4, if a family consumes one kg. of onion per week this produce can be considered enough to meet the minimum demand of 8/9 months of the state.

1.3.5 Pulse:

Pulses are one of the most important groups of crops in India as these are the main source of protein for predominantly vegetarian people of the country. Since time immemorial, a large number of pulses have been cultivated in our country for its many advantages, for example, they fit suitably in crop rotation, are drought resistant, restore soil fertility, check soil erosion and are the main sources of protein in addition to oil to a limited extent. In the pulse production India occupied first position during 1995-97 by producing 26.0 per cent of world produce. In terms of area 36.6 per cent of world pulse

area was covered in our country during the year (FAO-1997). During 2000-2001 in India, 20030 thousand hectares of land was covered under pulse of which 127 thousand hectares were in Assam. In regard to production it was reported that 10670 thousand tonnes were produced by the country as a whole and Assam produced only 0.58 per cent of India's pulse production during the year. Madhya Pradesh, Maharastra, Utter Pradesh, Andhra Pradesh and Rajasthan are the main pulse producing states of our country. The other states produce to the tune of their own consumption and some states produce less than their needs per annum. So far Assam is concerned, per head per month availability of pulse is approximately 194 grams from its own production and as such it has to depend on the transportation of pulses from other states which becomes a concerning factor in determining the market price of pulses in the state.

1.3.6 Sugarcane:

There are two major sugar-yielding crops in the world, sugarcane and sugar beet. It is an important cash crop in agriculture. This crop is essentially a crop of the tropics and sub-tropics of the world between 30^0 North and South of the equator (Foucounier,R.-1993). It is grown in the belt, which is very near to river. Earlier sugarcane was used only for the preparation of gur and chewing purposes. At present a major portion of world sugar and gur is abstracted from sugarcane. Depending on sugarcane production sugar mills are also grown up in the country. As per report of the Food and Agricultural Organisation-1997, India occupied second position in sugarcane production in the world with 22.60 per cent world production and covered 20 per cent of world's sugarcane area. During 2000–2001, total area under sugarcane in our country was 4300 thousand hectares and production was 299210 thousand tonnes and in Assam it was 27 thousand hectare and 988 thousand tonnes respectively. The total number of sugar factories at present has exceeded 500 against 138 in 1950–51 in our country. In 1998 the Govt. of India has taken major decision to delicence sugar factories to promote increase in area and production to reduce fluctuation in sugar prices. In Assam so far only 3 factories exist which are found to be sufficient to utilize the production of sugarcane of the state. Obviously to meet the demand of sugar in the state, it has to depend on the

supply from other states, which cannot be uniform throughout the year. Thus, variation in price of sugar is an unavoidable consequence.

1.4 GOVERNMENT POLICY ON PRICE MANAGEMENT

The Government has taken a number of measures to arrest the price rise of essential commodities within a reasonable limit. The Cabinet committee on prices and Special Action Committee of Secretaries on Monitoring Prices are functioning under the Chairmanship of Finance Minister and Cabinet Secretary, respectively. Again, under the Chairmanship of Secretary, Ministry of Civil Supplies an Inter Ministerial Committee has been setup. These committees monitor the prices of essential commodities as well as availability of these in the open markets. For the purpose, a control room has been set up in the Ministry, Government of India and similarly in the state and union territories also.

The Ministry of Civil Supplies, Consumer Affairs and Public Distribution has been monitoring the prices of 12 essential commodities on weekly basis and 10 essential commodities on daily basis. Hoarders, black marketers and other social activists indulging in unfair trade practices are being booked and action is being taken against them under Essential Commodities Act 1955 and Prevention of Black Marketing and Maintenance of Essential Commodities Act 1980 and other similar Legislative measures which resulted in the stabilization of prices of essential commodities.

1.5 IMPORTANCE OF THE STUDY

Agriculture occupies most dominant position in the economy of Assam .It contributes half of the state domestic products and engage more than 70 per cent of the state working force. But there exist wide variation in cultivable land area, changes of area under different crops, availability of irrigation facility, application of agricultural inputs etc. between different districts of the state. Variation of such factors of production also leads to the changes in yield of different crops between different districts, which in turn influence the supply and demand of the commodities in the markets of different district. In addition to that, the geographical location being different, natural factors like rainfall, flood, drought etc. behave differently in different districts. The marketable surplus of

agricultural products grown over different places in the state is not only negligible but also suffer from variation from district to district. Further, some districts of the state are to depend heavily on supply from other state and also on inter-district movement of the commodities. All these factors play a crucial role in fixing the prices of the commodities in different places and cause spatial variation in the prices within the state.

Due to different geographical situations the importance of crops are also different. In plain areas of Assam more or less rice is grown in all the districts. Similarly in hilly areas mustard, sugarcane, ginger etc. play a vital role in the economic activities of the people. Therefore, it is presumed that the price of such commodities goes up in the deficit areas in comparison to surplus areas.

Different festivals of the state's people and seasons also influence the price of commodities. In the festive seasons demand for commodities goes up and as a result price also increases. Similarly, seasonal variations in supply and demand also influence the prices of commodities. During the sowing period, the prices of agricultural commodities rise due to shortage of supply. On the other hand in the harvesting time prices of such commodities fall due to sufficient availability. Therefore, to study the behavior of seasonal prices of the commodities for planning the future needs and to prepare plan for import and export etc. will be of immense value.

Increasing trend of population also has a direct linkage with the total availability, supply and demand and prices of the consumable commodities to a considerable extent. During 1981 the population of Assam was 1.80 crores which grew up to 2.66 crores in 2001 and the rises was 47 per cent over the population of 1981. On the other hand, gross cropped area seems to be almost static (16 per cent increase in 2001 over 1981). Hence, the inequilibrium between production and increase in population is sure to result in price changes from time to time. As such, an analytical study on the behaviour of prices of agricultural commodities in the state would be of immense help for the policy makers and management community in general and producers, distributors and consumers in particular.

Transportation to the state is a costly affair due to its geographical situation. Within the state also infrastructure on road transportation is neither up to the mark nor

uniform among the districts. This is particularly more true for the hill districts. In addition to that, the state experiences heavy rainfall during the rainy season for which road blockade due to landslide is a common phenomenon in some of the areas. Flood is the most dominant influencing factor in economic and development activities of the state. Transport network has to suffer a lot during flood, causing many disturbances to supply of essential commodities. The problem becomes worse for the perishable commodities when it cannot reach the proper destination within the desired time period. Further, the cold storage facilities for preserving the essential commodities for the ready availability during the needy period are also not sufficient.

Considering these importances, the present study has been carried out with the following objectives.

1.6. OBJECTIVES

1. - To construct the monthly price index of each commodity for each district and the state as a whole,

2. - to study the trend in prices of each commodity for each district and for the state as a whole and to examine the relation between the cost of production and the price of different commodities,

3. – to test the spatial variation of prices using analysis of co-variance technique with yearly production as the covariate,

4. – to test the seasonal variation of prices by analysis of Variance of technique and

5. – to study the consistency of price variation of different commodities over time and space by calculating stability index.

CHAPTER – II

REVIEW OF LITERATURE

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REVIEW OF LITERATURE

In both agricultural and industrial production marketing arrangement is highly essential for stabilization of prices of commodities. For this purpose, dynamism in marketing system is highly appreciable particularly for agricultural product since these are not long time storable and some are easily perishable. Due to these reasons the prices of commodities varies from one place to another. Therefore to explore the reason of such variations researchers made studies in this direction. Some of the relevant investigations made in the field by different research workers in the country and abroad are reviewed below.

Vyas and Parikh (1961) explored the broad trend and fluctuations in wholesale prices of four principal food grains viz. rice, wheat, jawar and bajri. The analysis was done on the basis of monthly wholesale price index taking base year 1930.

In the study they found that there is a close relationship between the price of rice and the general index of prices. It was also observed that between prices of wheat and prices of two minor cereals jawar and bajri it has close relationship. They found significant change in the pattern or magnitude of seasonal deviation during the year under the review.

Chandra (1962) examined the comparative fluctuation in the index numbers of wholesale prices particularly foodgrains for twelve years from 1950 to 1961. He observed that food articles have been most unstable in prices. During the period he found greater price instability in two years i.e. 1960-61. Coefficient of variation of monthly wholesale price index numbers (1952-53 =100) have been worked out for whole the years and for all the groups of food articles.For fuel, power light and lubricants index has been found most stable as these are statutorily fixed. Again it was revealed in the study that the prices of food articles are mostly affected by weather and seasonal factors. The average coefficient of variation of the monthly wholesale price index during the period was 4.02 in case of cereals, 7.48 for pulses and 1.96 for gram.

Shastri (1962) in his study reported that Indian farmers have experienced wide fluctuations in the price of major crops from year to year and from season to season. These fluctuations have caused greater hardship both to producers and consumers. Greater fluctuations have also been observed in the price of the same commodity at the same time in different markers in India. Some of these variations can be justified by the costs of transportation from one place to another and other may be due to quality differences. Even with these qualifications, the price disparities have been unreasonable.

Krishna (1968) explore the pricing efficiency in the Indian wheat market where he highlighted the degree of uncertainty faced by private traders due to the fluctuating patterns (both within the season and over the years) of demand for and supply of wheat. The author's suggestion was to minimize price fluctuations through forward price supports and buffer stocks operations.

Paris & Price (1976) analyzed the seasonal price variation of different crops in Philippines. They found that the price fluctuation of vegetables was of widest degree compared to cereals, root crops, legume due to its high perishability and seasonal nature of production .The trend analysis showed that the prices of all the commodities from 1959–70 moved upward due to the influence of natural calamities and political events that took place within the period.

Srivastava and Bhati (1976) in their study on price mechanism of stone fruits in Simla market stated that because of perishable nature of stone fruits, small quantities of produce and immediate need for cash by the growers are the responsible factors for hurried sales. There is substantial variation in the price and supply during the fruit season. Examination of demand function revealed that price has negative and statistically significant impact on the quantity demand of wholesale / retailers. Price elasticity of demand shows that one per cent increase in the average prices will result in 19.80, 12.15 and 7.42 per cent fall in the daily average demand for apricot, peaches and plums, respectively.

Mandavawalla (1979) studied seasonal variations in prices of foodgrains with special reference to wheat and rice. He observed that prices of agricultural commodities varied because of three reasons (a) temporal (b) seasonal and (c) sectoral variations. Besides, seasonal variation in the prices of agricultural commodities are

normal due to the fact that while demand is spread over the entire year, the production is concentrated in 2/3 months. On analyzing the price movement from 1970–71 to 1977–78 he showed that the difference between highest and lowest levels of normal seasonally adjusted price index number was 9.6 per cent for rice and 7.7 per cent for all foodgrains, while cost of storage was around 5 to 6 per cent. The technological changes narrowed down the amplitude of annual fluctuations in foodgrains production. They found three factors contributed to this trend (i) development of irrigation (ii) increase of summer rice. and (iii) green revolution on wheat and rice.

Shukla and Misra (1979) examined the price behaviour in Uttar Pradesh since 1950–51 to 1973–74. The price behaviour in U.P. was not uniform throughout the plan period, in respect of direction and speed. In agriculture the supply conditions have certain peculiarities i.e. (1) it is not easy to increase or withhold the supply at a short notice as there is a gap between decision taken and actual supply. This affects agricultural price move more violently than non-agricultural prices and (2) The expected price behaviour than the prevailing one's determines farm output as well as adjustment.

They found price trend during first plan period decreasing for all crops but significant for rice and maize (8.6 and 4.1 per cent) among cereals, 7 per cent for arahar, 14.5 and 8.6 per cent for castor seeds and groundnut, respectively. They found the price trend decreasing again in second plan for crops like wheat, barley and jowar among cereals and mustard, sugarcane and potato among non- food crops. There was a raising trend after this period and the price rose more than 12 per cent per annum in the period.

They also found that different commodities had different price fluctuations and production could not respond equally. The price-output relationship showed that production of wheat; rice and production of jower, barley and gram were negatively related. The area-price relationship was found positive.

Homma et al. (1980) made an analysis of seasonality of agricultural producer prices of 16 agricultural products in three Brazilian states viz. Acre, Amazons and Para. The study indicated that staple food crops were the most sensitive in price variation due to the imbalance of supply and demand and the quality of the harvest. Acre and Para state showed a more typical behaviour than Amazon state, where beans, maize and rice can be imported to overcome food shortage. A regular price variation for meat

was observed, despite the high reliance on cattle imports. It was suggested that the government should improve long-term social welfare through appropriate price control mechanism.

Chatha and Kaul (1982) in their paper on a study into the price behaviour and marketing margins of potato in Punjab adopted the harmonic analysis of the potato prices for Jallunder, Ludhiana and Pathankot markets of Punjab where they found a definite cycle of 3 year-period for price of potato. A divergent pattern in the behaviour of potato prices was observed which kept the prices away from stable equilibrium. The instability in prices and hence in income of growers needed an immediate check. The study had further shown that a wide gap existed between the price received by the producers and the price paid by the consumers.

Kumar et al. (1984) in their study analyzed the behaviour of average retail price of vegetables in different localities / colonies of Delhi at a given point of time with respect to wholesale price. They came to the conclusion from their study that the behaviour of the average retail prices of tomato was not different in east Patel Nagar and Ajmeri gate Mandies during January to March 1977. Similarly the price behaviour of tomato was nearly the same in the month of February and March in East Patel Nagar Mandi. The concentration ratios were very small and were near to zero showing the inelastic nature of the retail price of tomato in both the colonies.

Puhazhendhi and Ramasamy (1984) in their paper intended to figure out cyclical changes in the production and price series of potato. Specifically an attempt was made to measure the length of production and price cycles of the commodity in question. From their analysis it was revealed that regular cycles of a given length have not appeared both in production and prices. The harmonic analysis revealed that the cycles of four years in production and six years in prices were not discernible. The production and price cycles did not persist in uniform manner. Even though regular cycles of uneven length existed the correlogram analysis showed that the series vanished in the later years.

Brorsen et al. (1985) in their study on "Marketing Margins and Price Uncertainty: The case of U.S. wheat market," determine the impact of price uncertainty on domestic U.S. wheat market margins. A theoretical model of price determination in a marketing channel was developed, allowing for risk aversion. If marketing firms are

decreasingly absolute risk averse, then it was shown that an increase in price should result in higher expected marketing margins. The empirical evidence from the wheat-marketing channel was found to support the theoretical model. Increased in price variability significantly increases wheat marketing margins for both the farm -mill margin and retail margin.

Hosamani et al. (1985) studied the structure and movement of market arrivals and price behaviour of cotton in Belgaum district of Karnataka state taking two important markets i.e. Saundatti and Bailhongal. In their study it was found that the pattern of market arrivals of cotton indicated a seasonal character in both the markets. During the peak period, arrivals tended to be very high particularly in Bailhongal market. This resulted in the wider variations in prices in both the markets especially in Bailhongal market. There was a greater response of prices to arrivals in peak periods. The seasonal pattern of arrivals indicated that the farmers had been compelled to sell their produce immediately after the harvest due to number of reasons - financial pressures, inadequacy of ware housing facility to withhold stocks. Thus they incur not only additional costs on storage but also take the consequence of price fluctuations etc.

Narayana et al. (1985) examined the trends and fluctuations in prices and output of cardamom in India where they found that the cyclical fluctuation in prices of cardamom are to a very large extent due to the very definite condition of supply, and fluctuation in prices have implicit bearing on the conditions of supply through farmer's response.

Satyanarayana et al. (1987) made an attempt to study the seasonal stability in arrivals and price of turmeric both bulbs and fingers. In their result it was revealed that the seasonal movement of arrivals and prices of both fingers and bulbs reached the peak stage during March to June and attained lowest from September to February, with price registering an exactly reverse situation. The growth function revealed that the arrival of fingers was independent of time and the prices of bulbs were more affected by its arrivals when compared to fingers.

Singh and Mehra (1988) in their study on seasonality pattern of market arrival and prices of potato in Punjub, estimated trend in the market arrivals and prices

using wireless method .To study the structure of arrivals and prices of potato, time series analysis were done, where they considered multiplicative scheme because of exponential nature of agricultural growth.

Agro Economic Research Center (1989) examined the prices of store-worthy vegetables like onion and potato where prices were found more or less stable in different points of time as well as in different locations, whereas prices of other vegetables were found identical in different localities but varying at different points of time. The vegetable growers, who sell directly to the consumers got about 86 per cent of consumers rupee and the consumers also got vegetables at much cheaper rates than through any other channels.

Barbhuya and Santra (1989) in their study proposed to examine the observed inter-farm differences in price of raw jute received by producers and also they attempted to identify the possible factors (market or otherwise) contributing to the observed variations in prices of raw jute received by different classes of farmers. The study clearly discerned significant variations in prices of raw jute received by different classes of farmers in the district under study. Part of the inter-farm differences in prices could be attributed to the differences in the time of sale. While large farmers realized relatively higher prices through delayed disposal of their produce, comparatively early sales of the smaller producers obviously prevented them to derive advantages of the seasonal rise in prices. Further it was also noted that farmers who disposed their produce at the secondary market, were found to have realized higher than those who enacted sales at their doorsteps or at most at the market within the village. In both the years under investigation the inter-farm differences in price due to inter-farm differences in the timing of sale were found to be highly significant. Variation in prices due to differences in place of sale was also noted to be significant.

Agarwal and Sharma (1990) studied the price behaviour of pulse crops in Rajasthan with the objective - (1) to estimate the inter - year price behaviour of pulse crop in selected districts markets of Rajasthan, India and (2) to analyze the intra-year behaviour of prices of pulse crops. The study was limited to five major pulse crops and covered 9 districts and 6 markets in Rajasthan. The inter – and intra - year price variation

in pulse crops showed that during the last 15 years prices had increased at alarming rates for all the pulse crops.

Sidhu (1990) explored some aspects of agricultural and pricing policies in India and mentioned that agricultural price policy in India is an effective instrument of market stabilization only if it is backed by well developed and efficient market infrastructure, Since market prices in case of fibers and oilseeds were higher than support price, the price policy did not influence the seasonal pattern of their prices. Further, price policy of wheat and paddy predominantly increased the seasonal variability in prices.

Ahmed and Dhoumick (1991) investigated the behaviour of price, productivity and acreage response of some important crops in Assam where they found that acreage under principal crops in Assam was mainly influenced by the yield of the crops, lag acreage and area under irrigation. This was true for wheat, rapeseed and mustard, jute and potato. Productivity for all the five crops under study was below all India average. Besides, the farmers in this region of the country were not price responsive. They suggested use of improved seeds and post harvest technology in cultivation of all crops.

Kumar (1991) in his study found that the role of farm harvest prices was affecting the crop hectareage and subsequently the production of two foodgrains i.e. rice and wheat. The empirical findings on the basis of analysis of time series data of the district, through trend values and the Karl Pearson's zero order product- moment correlation co-efficient, revealed that the prices experienced rising trend both for wheat and rice crops; while area recorded a rising trend for wheat but no definite trend was observed in case of rice. Production showed a continuous rising trend during the period 1968-69 to 1977-78 for wheat, while only a slight increasing trend in case of rice and that the extent of increase in production during the entire period of study was of the order of 274 per cent in case of wheat and only 35 per cent for rice.

Jayaraj (1992) examined the spatial pricing efficiency in groundnut markets in Tamilnadu. Price integration or transmission as shown by the result of the analysis was efficient and instantaneous between markets. The results of co-relation co-efficient of residual of price series between markets were lower than those obtained between prices of absolute price series. The residual price series are well co-related and thus the high

values of co-relation co-efficient of absolute price series between markets were not accidental.

Mohanty and Naik (1992) in their study examined the cost of production and market prices of groundnut in two situations like - with and without subsidy in major groundnut producing district of Orissa and they estimated the return per rupee at various cost of production with and without subsidy in the existing market price. Their study clearly indicated that the market price available for the groundnut growers in the state was favorable which encouraged the growers to extend their area to a significant extent and also the market price was favorable in all the districts except in Garjan. It was mainly due to the fact that the major area under groundnut in the district was in kharif season.

Moreira et al. (1992) verified the presence of a cyclical price variation component in seasonal fruits produced in the state of Sao Paulo, Brazil. It utilized farm prices for nine years (except for apples where the period of analysis was eight years). In the study, they observed absence of biennial cyclical variation in prices. High implantation and maintenance costs result in only minor production variations. Stable demand also contributed to price stability.

Sabur and Elahi (1992) examined the seasonal price trend of paddy in Bangladesh. The terms of trade improved in favour of agriculture in the 1980s as shown by the trend in real paddy prices and trend in agricultural prices compared to industrial prices. The annual price fluctuation of paddy was found less than in industrial price. Seasonal price variation of paddy was found to have declined in recent years. The study showed that the internal procurement had no significant impact on seasonal variation in paddy prices in Bangladesh. However, the seasonal storage period and production of rice *and wheat influenced the seasonal price variation of Aman paddy significantly.*

Cauvery (1993) in his study made an attempt to estimate the acreage response of groundnut in South Arcot. From his study it was shown that changes in acreage under groundnut were positively associated with price as the cultivation of groundnut was more profitable than the cultivation of other crop.

Dhillon and Goal (1993) studied the seasonal pattern of market arrivals and price of onion in Ludhiana for the period from 1979–80 to 1989–90 and found maximum

arrivals of onion in the month of June and lowest in November. The lowest and highest seasonal indices for price were found in the month of June and November respectively and showed an opposite moment with market arrivals.

Katre et al. (1993) in their study on paddy analyzed the trend and variability in arrivals and price of paddy in selected markets in Maharastra state. From their study they came to the conclusion that the variability in price was comparatively less than the variability in arrivals in most of the markets. This might be due to Government efforts to check prices through public distribution system and open trade policy allowing inter state arrivals.

Sabur and Haque (1993) in their study on price of rice in Mymensing town market investigated the seasonal and cyclical variation of retail and wholesale prices of rice and forecast the future prices. Compound growth rates of real prices indicated that consumers seemed to be better off with respect of rice price since independence, particularly during the 1980's. Seasonal price variation of fine rice was found to be higher compared with coarse rice because of the continuous flow of the latter in the market. Peak price month has changed to April from September and seasonal price variation has reduced markedly due to higher production of Boro paddy.

Selvaraj et al. (1993) in their study threw light on production and price behaviour of potato in Nilgiri district. The study showed that during early years the magnitude of swings was high both in production and price. However, in the later years, the magnitude of swings was less due to technological development in production and improvement in marketing environment. This clearly indicated that these variations could be minimized further with dissemination of agricultural technology at right time and right cost.

Agarwal and Satya (1994) in their study on price behaviour of groundnut in markets of Rajasthan analysed (1) growth rates of area, yields and production of groundnuts; and (2) inter and intra year price behaviour of groundnuts in selected markets. The study of growth rates was based on data for the period 1956–57 to 1989–90 in four major groundnut growing districts of the state Chittooragarh, Sawaimadhapur, Sri Ganagadhar and Bhilwara. In the study wholesale prices were found increasing at a rate of 10 per cent per annum while that of farm harvest prices by 7–11 per cent per annum.

Seasonality of prices was observed at all markets, but the magnitude of price variation was less at Jaipur and Kekri markets because of the greater volume and more regular arrivals of the crop.

Babar and Lohar (1994) explored the trends in arrival and prices of jaggery in Sangli regulated market and observed that the seasonal indices of arrivals of jaggery were observed to be higher during the months of August – January except in the month of December. The seasonal indices of prices of jaggery showed that it was the highest during the month of October followed by August and September. They found an increasing trend of price over the period of years.

Ingole et al. (1994) studied the price spread in tur and gram in Nagpur district of Maharastra .The percentage share of marketing cost of tur at the level of producer, wholesaler, dal wholesaler and retailer was 3.61, 2.65, 0.62 and 0.62 per cent of the consumer price respectively. Corresponding figures for gram were 3.15, 1.32, 0.33 and 0.67 per cent respectively.

Camargo et al. (1995) In their paper on "Integration of the onion and tomato markets in the Mercosul" explored the horticultural whole sale markets of Sao Paulo, Brazil and Buenos Aires (Argentina) and presented the different aspects of production and trade of onion and tomato. The seasonal variation in prices of these two products in the wholesale market was considered. The highest onion prices occurred from July to September in Buenas Aires and from March to July in Sao Paulo. It was suggested that integration of Argentinian and Brazalian production could be beneficial to consumers but would require a readjustment of the amounts produced in the two countries requiring production planning. Brazil should export onion to Argentina from July to September, while Argentina should export to Brazil from April to July.

In case of tomato, the highest price occurred from August to October in Argentina and from April to June in Brazil. The biannual price variation showed greatest differentiation for Argentinanian prices, while in Brazil, the effect of adjustment in planting areas of both processing and table tomatoes were not stable.

Babu and Sebastian (1996) examined the seasonal price behaviour in coconut and coconut products in Trivandrum of Kerela state covering a time span of 20

years from 1971 – 1990. It was clearly established that the average farm harvest prices of coconut was subjected to pronounced seasonal fluctuation despite the production of nuts round the year. During harvest period the grower dispose the nuts in raw form even neglecting the sell price.

Sharma and Sharma (1996) in a study on variation in wholesale prices observed 3 to 7 times higher monthly wholesale price variation for vegetable in comparison to cereals. The coefficient of variation calculated in Delhi market was 30 per cent for potato, 42 per cent for onion, 36 per cent for tomato, 11 per cent for wheat and 6 per cent for rice. Among the four markets considered in the study, price variation in Delhi and Calcutta were more than that in Bombay and Madras in case of monthly potato wholesale prices, whereas variation in monthly onion wholesale prices was found to be highest in Bombay. They explain that high price variation was because of higher production in the locality. However, they found maximum price for tomato in Kolkota market for which they could not give any specific reason.

Walbeek Van and Walbeek (1996) in their research note on "Some Aspects of Variability and Seasonality in four fresh produce markets" investigation was made in variability and seasonality in prices and quantities of five fresh vegetables sold in the four largest national fresh produce markets in South Africa. A variability index based on the coefficient of variation was used throughout the study. The results were based on monthly data for the period 1980–93. Prices were generally found to be more variable than quantities. The five vegetables investigated were subject to a similar degree of variation in quantity. Potatoes and tomatoes were subject to a substantially less price variation than onions, carrots and cabbage. The prices of the vegetables were subject to substantially more seasonal variation than the quantities. However, despite significant seasonal variation in the quantity and particularly the price of fresh vegetables, non-seasonal (random) variation dominated the overall variability in the data.

Katola and Dixit (1997) made a statistical investigation on price behaviour of groundnut oil and oilseeds. The study was conducted taking 14 years (1976 –1990) data from Rajkot regulated market.

The result of the study was that the price of groundnut oil and the oil seeds exhibited very high inter-year fluctuations. In general, groundnut and groundnut oil were

found to be relatively more sensitive to intra-year market pressure. In comparison to other oilseeds the prices of groundnut and groundnut oils were very high. Prices of all the commodities under the study reflected that the post harvest prices fell and rose in off-season. In order to understand the relationship between arrivals and prices, the coefficients of correlation was worked out and they found that during 1984,1986, 1989,1990.1993 and1994 there existed a positive non significant relationship between arrivals and prices in markets .In the rest of the periods statistically significant relationship was found. Out of eleven coefficients of correlation from eleven years six were found positive and remaining five were negative.

Mouron and Carint (1997) in their reports on changing prices for apples, oranges and bananas in two super markets in central Wadenswil revealed that although there was price variation throughout the year, apples was always dearer than the other two fruits. The study further showed that price levels over the period 1989-97 fluctuated most for apples and that for bananas there was hardly any overall increase. Producer costs had, however, been reduced which brought benefit to larger producers specially.

Sharma and Vashist (1997) in their paper on spatial and temporal variation in the prices of dairy products in India stated that spatial variation in the prices of dairy product like milk, ghee and butter across the markets was found to be statistically significant as revealed by analysis of variance. The prices of milk was found higher in eastern and western markets as compared to northern and southern markets due to abundant supply. They also found that the price of milk was highest in metropolitan cities (except Delhi) than other market centers due to higher demand of milk. Price of butter was also observed higher in eastern region than western region. During 1963–88, the annual percentage increase in case of milk ranged from 7.38 to 11.71 per cent for wholesale price and 6.52- 10.20 per cent in retail market, whereas the corresponding increase in price of ghee was 2.88 - 9.72 per cent in wholesale and 9.30 - 9.99 percent in retail market. For butter the increase were 9.25 per cent and 11.15 per cent respectively in the two markets.

Sharma and Tiwari (1997) in their paper investigated on price behaviour of temperate stone fruits in Northern Indian Markets and examined the spatial and inter-temporal price differential and degree of competitiveness in the selected stone fruit

markets in North India. They pointed out that the stone fruit prices increased significantly during the period 1977–91. They also observed wide fluctuations in prices over time and space between all the selected markets.

Mipramavar and Gummagolmath (1998) investigated the seasonal indices of arrivals and prices and market concentration of potato in regulated markets of Northern Karnataka where they found that arrival of potato was maximum in the month of November in both the markets indicating glut during harvesting season. This situation prevailed mainly due to lack of storage facilities in the study area. However, price did not decreased during glut period.

The seasonal index of arrivals to market was found to be highest during the harvest season and correspondingly decreased during post-harvest period. Similarly, the average prices were found to be low during post-harvest period and the price started increasing during lean season and pre-harvest season.

Savadatti and Narappanavar (1998) studied the price formulation of pulses in India where they analyzed the prices at three levels. Their report revealed that whenever there was an increase of one unit in wholesale price of grain, the increase in farm harvest price of gain was 0.9129 and 0.9154 for gram and tur respectively, which was smaller than the increase in wholesale and retail price of split pulse (dal).

Sharma and Vashist (1998) studied price behaviour of meat and other related products in India. The study revealed different types of seasonal pattern in different markets of meat (goat) prices. The monthly price indices of meat (goat) were highest in the months of May and June in Delhi, Kanpur and Kolkota markets. For Bombay and Allahabad it was in September and January and for Madras, Bangalore and Hydarabad markets it was in January and March. Lowest price index was observed in February for Delbi, Ahmadabad and Patna, in September for Kolkota, Madras and Hydarabad , in October for Bangalore, in November for Kanpur and in the month of June for Bombay market. Interesting observation was that for beef the month-to-month price variation in retail price was found to be not significant. The wholesale prices for all the three types of meat were higher than the average price in winter and monsoon month and lower in summer months. Both retail and wholesale price was found in increasing trend

during the period 1963-88. In all most all the markets the annual growth rate in prices of mutton was observed lower than goat meat.

Shelke and Kalyankar (1998) in their paper on pattern of market and prices of Okra in Parbhani district of Maharastra state estimated that the inter year variation in market arrivals of Okra was between 42.47 and 72.19 per cent of the average annual arrivals during the period 1988 to 1997. The coefficient of co-relation between annual arrival and annual prices was negative. The lowest arrivals of Okra were recorded during 1991 while the maximum arrivals were observed during 1997. There was a clear seasonality in pattern of arrivals of Okra. The inter year coefficient of variation varied between 9.03 and 21.25 per cent. The intra year variation in market prices ranged between 12.62 and 18.98 per cent. The lowest price for Okra was observed during April and highest in the month of June.

Mehta and Kamra (1999) analyzed the price variability of onion from the period 1990–91 to 1998–99. They observed that production of onion was doubled in past two decades with a compound growth rate of 3.50 per cent and this was mainly due to growth in area under onion. Besides, they found seasonality in its price behaviour. They observed that the price of onion was lower in the month of February to May and rose during September to November. It was also found that timely action and fine-tuning of production system response to market necessitated the closer and rational understanding of agricultural situation of the country.

Kalyankar and Shelke (1999) investigate the inter and inter-year fluctuations in arrival and prices of sunflower in Parbhani district of Maharastra and noticed that inter year variations in market arrivals of sunflower was between 27.9 and 205.4 per cent of the average annual arrivals during the period 1989 to 1995. The co-efficient of co-relation between annual arrival and annual prices was negative .The lowest arrival of sunflower was recorded during 1989 and highest during 1995. They found clear seasonality in the pattern of arrivals of sunflower .The intra –year co-efficient of variation in prices varied between 60.20 and 172.70 per cent and variation in market price was between 65.70 and 157.70 per cent during 1990 – 1992. The lowest price of sunflower was observed in March and the highest in the month of December.

Patil (1999) in his paper on "Price Behaviour of Rapeseed and Mustard" observed that during the last one and half decade, price increased by more than 9 per cent per annum in different markets of Gujrat state. The prices of the crop exhibited conspicuous seasonality during the study period and felt necessity of price rise minimization for the commodity. He also suggested that by adopting modern location specific technology and different price instrument, price can be regulated. The need of rural godown and storage facility and linking of co-operative credit facilities were emphasized for controlling of the price of commodities.

Prakash and Srivastava (1999) in their paper on "Seasonal glut in post harvest months: A major constraints in marketing of pigeon pea in Uttar Pradesh" expressed that the coefficient of correlation between monthly market arrivals and monthly average whole sale market prices for different years of the period was found negatively co-related for all the years except 1991-92. They also stated that increase in arrivals led to reduction in prices. For 1992–93 they observed perfect positive correlation between market arrivals and prices .The overall coefficient of correlation arrivals and prices in the study period was negative. They found a clear trend in the market arrivals during different months. More than half of the total arrivals reached the market during April to June when prices were low. Farmers could get better price storing the products to sell after June/July.

Shende et al. (1999) in their paper on seasonal behaviour on wholesale prices of sugar found that seasonality in prices of jaggery was more pronounced when compared to the prices of sugar. However, for sugar and jaggery the seasonal behaviour in the prices were more pronounced during the month from January to May. They suggested that farmers should realize higher price by selling their products during these months.

Mehta and Srivastava (2000) examined the seasonality in prices of agricultural commodities taking wholesale price index data.. They observed that seasonality of price variation for the commodities like maize and groundnut was in a narrow band and quite evenly spread. It was also expressed that due to perishability of commodities like potato and onion, the seasonal index varied over a very wide range since there is a cost involved in post-harvest management of off-season losses due to perishability.

Shende et al. (2000) in their paper on "Onion Price Behaviour" investigated the behaviour in prices of onion during a span of eight years (1990–91 to 1997–98) where they found positive growth .It was pronounced that the seasonal prices of onion were sumptuous for consecutive four months December, January, February and March and suggested that onion growers should realize higher prices by selling their produces during these months.

Singh et al. (2000) examined the prices and arrivals of rapeseed and mustard in Haryana where they found that the indices of prices of rapeseed and mustard from 1985-86 to 1995-96 showed the general tendency of rising with each passing year except few years while the arrival indices indicated great fluctuation from year to year in all the markets. The time series analysis showed significant increase of prices in case of rapeseed and mustard. They also found that there existed definite seasonality in arrivals and prices of both the commodities in different seasons of the year. Eighty per cent of total arrivals arrived at markets in harvest period when prices were quite low.

Agro Economic Research Center (2001) studied on price spread of major agricultural commodities in West Bengal where they attempted to examine the price spread of agricultural commodities. The price spread in case of potato was more pronounced than paddy. This was because of more perishability in nature of potato needs special attention. Better storage facility and modernization of cold storage can play an important role in stabilizing the potato price. Price movement of potato was more erratic as there was no definite price policy for potato like paddy where minimum price was available. Due to lack of marketing facility 20 million ton of foodgrains i.e. 10 per cent of foodgrains are being squandered away. Hence better marketing facility and development of infrastructure would help in stabilize the prices of such commodities.

Alam and Alam (2001) in their paper on price behaviour of rice in Bangladesh (1972/73 to 1993/94) expressed that prices of all types of rice fluctuated to a greater extent. It was also found that annual prices of rice in the sub-period – II (1983/84 to1993/94) were more stable than in the sub-period -I (1972/73 to 1982/83). The price stability in the sub-period - II was influenced by the stable supply of rice. They observed significant negative growth trends of all types of rice, which implied that the real prices of rice declined significantly. The real price of all type of rice were declined

at faster rate in period -II than period -I owing to increased supply of rice blessed with advancement in technology of rice production including irrigation technology .To have more well integrated market they suggested to develop transportation and communication system.

Ansari and Ahmed (2000-2001) performed the time series analysis of tea prices with application of Arima Modeling and co-integration analysis. The main objective of the study was to analyze the behaviour of tea prices vis-a-vis the industrialized countries' export prices using the time series and the co-integration analysis. They found that the movement in world tea prices could have significant effect on foreign exchange earning of many tea-exporting countries, which happen to be developing countries. The result from the fitted ARIMA models indicated that autoregressive processes generated both price series and there was no influence for external exogenous shock. The result provided some indirect evidence supporting the secular deterioration of the commodity in terms of trade for tea prices.

Stevens (2001) conducted a survey of seasonal price and price variation characteristics in soyabeans marketing. This paper reviewed the seasonal structures of the soyabean market in the U.S.A. for the period 1988-99 and suggested in broad terms the management implications for those that seek to improve their marketing performance.

Wan-Li et al. (2001) explored the price variation prediction of agricultural products by using time series data in Japan through mathematical analysis. They analyzed the changed in retail prices of egg. They observed decline in eggs price with the influence of cost reduction due to large-scale poultry farming. In terms of seasonal variation, two price peaks were shown in one year with consumption depression in January and the summer season. In terms of cyclical fluctuation, the egg price cycle became long due to the minimum price guarantee system of the government.

Barman (2002) investigated the production and prices of coconut and its oil in Bangladesh for the period 1950-51to 1994-95. In the study it was stated that the Present productivity of coconut was lower than the productivity in the fifties because of diseased plant and frequent occurrence of devastating cyclonic storms. In price analysis of coconut and coconut oils from year to year fluctuations of the prices were of high order with coefficient of variation from 18 to 29 per cent showing the erratic behaviour of

prices. The compound growth rate of prices was 5.51, 6.26 and 7.96 per cent for green and dry coconut and coconut oil respectively.

Freitas et al. (2002) in their paper "Changes in the seasonal variation of peanut prices in primary and wholesale markets, 1990–2001" evaluated the impact of Brazil's economic stabilization plan on groundnut price behaviour at the producers and wholesaler levels. This study compared the seasonal variation of groundnuts prices during 1990- 94 and 1995–2001. It was concluded that the economic stabilization plan caused shifts in the amplitude of the seasonal price variation at both markets level.

CHAPTER – III

MATERIALS AND METHODS

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MATERIALS AND METHODS

The methods adopted in the present study are incorporated in this chapter. To meet the objectives of the study different statistical procedures and formulae are used. These are discussed under the following sections.

1. Study area / coverage of area,
2. Period of study,
3. Collection of data,
4. Analytical technique

3.1 STUDY AREA

In conducting the study all the ten districts available during 1980, in Assam are taken in to consideration. Though the numbers of districts have been increased to 24 for the convenient of administrative purpose, the newly created districts are not considered as such, because statistical data as required for the present study are not available for these new districts. However, the places under the new districts are covered under the original ten districts and in that way these places are included for the study as a part of the original ten districts.

3.2 PERIOD OF STUDY

The period of reference for the present study was 20 years from 1980 to 1999.

3.3 COLLECTION OF DATA

This study is entirely based on secondary data. Time series data on wholesale prices of nine principal food items viz. rice (common), rice (fine), mustard, potato, onion, lentil, green gram, black gram and sugar are considered. In the study, wholesale monthly price data from 1980 to 1999 (twenty years) for the ten districts and Assam as a whole (which is the average of ten districts) were collected from the agencies

like Directorate of Economics and Statistics, Assam Agricultural Marketing wings of concerned districts, Head Quarters of Agriculture Department, Government of Assam.

To examine the effect of production on price, production data for the sample commodities were collected for the period from the Basic Agricultural Statistics published by the Directorate of Agriculture, Statistical wing, Government of Assam.

To explore the relation between price and cost of cultivation, data were collected from the "Cost of Cultivation of Principal Crops in India" published by Government of India. Data relating to cost of cultivation are available for two commodities only viz. rice and mustard. Due to non-availability of published data for other commodities in this aspect, this analysis could not be extended to other commodities. For rice and mustard also data were found available only for twelve / thirteen years within the reference period.

3.4 ANALYTICAL TECHNIQUE

To meet the different objectives of the study following analytical procedures have been adopted.

3.4.1 Index Number:

Price indices of the selected food items have been calculated for different months of the year and for different years of the study period commoditywise and districtwise using chain index method.

Chain Indices:

Under this method series of index number are calculated for each year with the preceding year data as base which are called link indices viz. P_{01}, P_{12}, P_{23},.....$P_{(k\ k-1)}$ where $P_{r\ s}$ represents the price index number with r as base year and s as given year, and the basic index number is obtained by the successive multiplications of the index number. Where-

$P_{0\ 1}$ = First link

$P_{0\ 2} = P_{0\ 1} \times P_{1\ 2}$

$$P_{03} = P_{01} \times P_{12} \times P_{23} = P_{02} \times P_{23}$$

:

:

$$P_{0k} = P_{0(k-1)} \times P_{(k-1)k}$$

Following are the steps for construction of chain indices.

(1) Express the figure for each period as a percentage of the preceding period to obtain the Link Relatives(L.R.).

(2) These Link Relatives are chained together by successive multiplication to get the chain indices (C. I.) by the following formula.

$$\text{Chain Index} = \frac{\text{Current Year L.R.} \times \text{Preceding Year C.I.}}{100}$$

3.4.2 Coefficient of Variation:

To compare the variation of price indices within and between the year, the coefficient of variation between the index numbers of different months and years are calculated as

$$C.V = \frac{\text{Standard deviation}}{\text{Mean}} \times 100$$

3.4.3 Curve Fitting:

To analyze the trend of price following functional forms have been selected.

(a) Linear : $Y = a + b\,x$

(b) Power Curve : $Y = a\,x^{b}$

(c) Exponential Curve: $Y = a\,e^{b\,x}$

Where Y is dependent variable (price) and x (time) is independent variable.

a, b, are constants to be calculated.

The functional form having the highest value of coefficient of determination has been selected for fitting the trend of price for each of the nine commodities districtwise. For the selected function, trend values have been computed and curve (both for observed and trend value) have been drawn for price of nine commodities districtwise.

For calculating the coefficient of determination following formula has been used.

$$R^2 = 1 - \frac{\sum (Y_i - \hat{Y}_i)^2}{\sum (Y_i - \bar{Y})^2}$$

Where Y_i = Observed Value

$\hat{Y}_i$ = Estimated Value

$\bar{Y}$ = Average Observed Value of Price,

3.4.4 Seasonal Price Indices:

To study the seasonal price behaviour following multiple model of time series analysis is used for the quarterly wholesale prices of commodities.

$Y = T \times C \times S \times I$

Where-

- Y – Quarterly wholesale prices
- T – Trend values
- C = Cyclical variations
- S = Seasonal variations
- I = Irregular variations

Seasonal indices were worked out for the period under study by ratio to trend method for realistic comparison of the price variations over time and place. Here

the whole year is divided into four seasons viz. pre-sowing season, sowing season, harvesting season and post-harvesting season. To get the price of each season, price of three months were averaged. The advantage of this method lies in the fact that "ratio to trend" can be obtained for each month / quarter for which data are available. Division of the year into the above four seasons has been made for each crop under study according to the time period as shown in the following table.

Season / Crop	Pre-sowing	Sowing	Harvesting	Post harvesting
Rice (Kharif)	April - June	July - Sept	Oct - Dec	Jan - March
Mustard	July - Sept	Oct - Dec	Jan - March	April -June
Potato	July - Sept	Oct - Dec	Jan - March	April -June
Onion	July - Sept	Oct - Dec	Jan - March	April -June
Lentil	July - Sept	Oct - Dec	Jan - March	April -June
Green gram (Rabi)	April -June	July - Sept	Oct - Dec	Jan -March
Black gram	April- June	July - Sept	Oct - Dec	Jan -March

For sugarcane the sowing / transplanting time is March to May and harvesting period is December to February thus covering about ten to eleven months of the year for sowing and harvesting activities.

Measurement of seasonal variation by this method consists of the following steps --

1. To obtain trend values, least square method has been used with the help of the appropriate trend equation selected under Section 3.4.3.
2. Express the original data as the percentage of trend values. This percentage contains the seasonal, cyclical and irregular variation.
3. The cyclical and irregular components are then wiped out by averaging the percentages for different seasons.

4. Finally the average indices are adjusted by multiplying them throughout by a constant K, where –

$$K = \frac{400}{\text{Total of the indices}}$$

3.4.5 Analysis of Variance:

Seasonal indices for different commodities over the years are subjected to analysis of variation test to judge significance of difference in seasonal price variation for each commodity. These are studied for each place.

The linear statistical model considered for the analysis of variance is

$$Y_{ij} = \mu + \beta_i + \lambda_j + e_{ij}$$

Where - μ is the general effect,

Y_{ij} is seasonal index, for j-th district in the i-th season,

β_i is the effect due to season – i

λ_j is the effect due to j-th district, e_{ij} is the error.

3.4.6 Coefficient of Correlation:

To examine the relation between cost of cultivation and the prices of commodities for different years the coefficient of correlation is calculated using the formula.

$$r = \frac{\Sigma xy - \frac{\Sigma x \cdot \Sigma y}{N}}{\sqrt{\left[\Sigma x^2 - \frac{(\Sigma x)^2}{N}\right]\left[\Sigma y^2 - \frac{(\Sigma y)^2}{N}\right]}}$$

Where, x and y are two variables representing prices of commodities and cost of cultivation of that Commodity respectively.

3.4.7 Analysis of Covariance:

Spatial variations in prices of different commodities are generally influenced by the quantum of local production of the commodity during the year. Taking this concept into account, the variations in prices between places are tested with the help of analysis of covariance, taking the production of the commodity of the place as covariate.

The model for analysis of covariance is--

$Y_{ij} = \mu_i + \beta(X_{ij} - X_{00}) + e_{ij}$ (i = 1,2----20 . j =1, 2 -----10.)

Where μ_i = General effect,

$\beta (X_{ij} - X_{00})$ = Effect due to the production of commodities.

e_{ij} = the error component in the analysis of covariance,

X_{ij} = Production of i th year for j th commodity,

X_{00}= Average production,

Y_{ij} = Price of i th year for j th commodity.

To test the effect of production on price, the ' t ' test is used by the following formula __

$$t = \frac{\hat{\beta}}{\sqrt{V(\hat{\beta})}}$$

Where -

$\hat{\beta}$ = Estimated regression coefficient of price on production.

$V(\hat{\beta})$ = Variance of regression coefficient β.

3.4.8 Stability Index:

To study the stability of price of i th commodity over the years and over the months within a year in the k th district, the following model has been used. (Ref. Eberhart and Russel (1960)

$$P_{i\,j\,(k)} = \mu_i + B_i I_{j\,(k)} + e_{i\,j\,(k)}$$

Where $P_{i\,j(k)}$ =Average price index of i th commodity in the j th year/month in the district k.

μ_i – Mean price of the i th commodity over all the year/month.

$I_{j(k)}$ =k-th Location (district in the present case) index for the j th year/month.

B_i =The regression co-efficient of price of the i th commodity on the location index.

$e_{i\,j(k)}$ = Error with reference to the k th district.

Further,

$$I_j = \frac{\sum P_{ij}}{t} - \frac{\sum\sum P_{i\,j}}{t\,s}$$ (t = no of commodity, s = no of years/months)
(i = 1,2,……, 10 , j = 1,2,……..,20
or j = 1,2,……,12)

$$= \frac{\text{Total of average price index of all the commodities in the j th year / month}}{\text{No of commodities}}$$

$$- \frac{\text{Grand Total}}{t \times s}$$

Stability index for the i th commodity over the years/month for the k th district will be Calculated as —

$$S_i = \frac{1}{|\ b_i\ |}, \text{ where } \quad \hat{b_i} = B_i = \frac{\Sigma P_{ij} I_j}{\Sigma I_j^{\,2}}$$

If $S_i = 1$ (i.e $b_i = 1$) the price is stable ,

ie.

< 1 ($|\ b_i\ | > 1$) less stable,

> 1 ($|\ b_i\ | < 1$) more stable.

CHAPTER – IV

RESULT AND DISCUSSION

CHAPTER - IV
RESULT AND DISCUSSION

Data collected from secondary sources as mentioned in the section 3.3, Chapter–III relating to prices of selected agricultural commodities during the period (1980–1999) under study were put to statistical analysis keeping in view the objectives of the study. The methodologies used for the analysis for achieving different objectives are discussed in Chapter–III. In this chapter the result of the analysis and the objectivewise discussion of the results are presented under different sections that follow.

4.1 INDEX NUMBER ON MONTHLY AVERAGE PRICES DURING THE PERIOD

The prices of commodities vary not only from year to year but also fluctuate during different months of the same year. Therefore it is very important to compare the monthly average prices of different commodities for the period 1980–1999 to see the behaviour of the prices in different month of the year. For rationality in comparison index numbers of monthly average prices over the years were calculated for each month commoditywise and districtwise taking January as base.

Table 4.01 – 4.09 show the index numbers monthwise for different commodities for different districts for the period 1980–1999. To explore the extent of fluctuation within the year, coefficients of variation of monthly price indices have also been calculated.

4.1.1 Rice (common):

Table 4.01 presents the districtwise index numbers of monthly average price of rice (common). From index numbers it was observed that the maximum rise (up to 22.21 per cent) was during September /October in the districts except for Cachar where it was in August with a rise of nearly 18.00 per cent and Dibrugarh in November

TABLE - 4.01

INDEX NUMBER ON MONTHLY AVERAGE PRICE DURING 1980 - 1999 OF RICE(COMMON) IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE .

Dist./Month	Jan	Feb	Mar	April	May	June	July	Aug	Sept.	Oct.	Nov.	Dec.	C.V.
Cacher	100	102.75	105.98	109.98	111.14	114.21	115.90	117.90	115.63	115.64	116.69	108.18	5.06
Darrang	100	102.99	107.40	113.66	115.66	119.61	120.66	121.15	121.64	121.69	120.18	117.08	6.35
Dibrugarh	100	100.42	101.17	103.08	107.01	108.76	110.62	112.10	114.60	114.23	116.45	114.28	5.36
Goalpara	100	100.28	100.73	102.85	108.53	106.44	106.25	108.62	108.27	110.23	109.27	111.14	3.65
Kamrup	100	90.67	99.66	99.92	102.99	105.64	107.26	109.64	113.55	114.07	114.02	109.68	6.53
K.Anglong	100	102.07	101.55	104.81	107.89	110.80	114.90	117.21	120.41	122.21	121.06	115.39	6.96
Lakhimpur	100	101.79	104.76	106.59	114.07	114.10	116.60	119.71	119.90	121.14	118.22	112.94	6.30
Nagaon	100	100.56	104.87	107.04	110.16	112.83	113.91	116.59	118.57	116.48	116.78	110.25	5.51
N.C.Hills	100	99.81	101.74	102.66	105.62	106.29	108.13	109.04	109.13	108.86	108.05	107.89	3.25
Sivasagor	100	100.17	101.67	103.21	107.10	110.09	116.58	116.04	110.44	118.72	118.61	115.30	6.30
ASSAM	100	99.75	102.66	104.93	108.57	110.37	112.53	114.26	114.72	115.82	115.46	111.84	5.24

(16.45 per cent). The maximum rise was 22.21 per cent in October in Karbi-Anglong and minimum was 9.13 per cent in September in N.C.Hills. Further, for rice (common) the period of highest price rise was observed to be post monsoon period (September – November).However, considering the coefficients of variation of the monthly price indices, which was below 7.00 per cent, it can be concluded that the prices of rice in different months during a year in different districts did not vary much and were uniform to a great extent. Again, against the common belief that the price rise becomes generally highest during the rainy season (June – August) due to flood, scarcity of food items, problems in transportation etc., none of the districts could experience the sharp rise of price in this period. As reflected by the index numbers the price rise generally starts receding from the month of December in all districts, which was mainly due to arrival of the new harvest of the year. It is further observed that except Kamrup in none of the districts the price during post harvest period (February – April) came below the base period price of January. A similar type of situation was also observed for the state as a whole when the price of the state based on the average of different districts was considered.

4.1.2 Rice (fine):

The index numbers on monthly average price of rice (fine) for the study period are presented in Table 4.02 districtwise and monthwise. It was found from the index number that the maximum price rise was in the month of November in the districts other than Cacher, Darrang, Dibrugarh and Lakhimpur, where it was in the month of October in Cacher and Lakhimpur, and in the month of September and December in Darrang and Dibrugarh respectively. The highest rise of price index was 20.94 per cent in Darrang district in September followed by 20.72 per cent in Kamrup in November and lowest rise was 9.37 per cent in Dibrugarh in December over that of January. In the districts Kamrup, Karbi-Anglong, Nagaon, N.C.Hills and Sivasagor price was gradually increasing from March to November. In Cacher and Lakhimpur increasing price trend was by and large up to October. Although in Darrang the price increased from February to September and decreased from October, it was above the price of all other districts except Kamrup and Karbi-Anglong in the month of October to December. A similar situation was observed in the state as a whole in which highest rise of price was 13.92 per

TABLE - 4.02

INDEX NUMBER ON MONTHLY AVERAGE PRICE DURING 1980 - 1999 OF RICE(FINE) IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE .

Dist./Month	Jan	Feb	Mar	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	C.V
Cacher	100	99.58	101.50	107.80	106.35	107.43	107.95	109.77	109.84	111.73	109.78	107.05	3.63
Darrang	100	101.38	106.45	112.54	116.86	117.33	117.24	118.60	120.94	118.43	117.76	117.02	5.98
Dibrugarh	100	99.48	100.20	101.89	101.41	102.13	104.10	104.26	104.74	105.75	108.73	109.37	3.02
Goalpara	100	103.86	105.23	106.33	106 79	106.20	107.82	106.07	108.72	106.89	109.79	106 79	2.24
Kamrup	100	99.78	100.12	103.67	104.48	108.29	111.19	113.49	117.11	120.17	120.72	117.03	6.99
K.Anglong	100	101.18	102.02	106.82	107.96	108.96	110.41	113.52	114.97	116 29	118.41	112.59	5.51
Lakhimpur	100	102.03	102.95	107.30	107.91	108.43	111.67	114.48	116.79	117.84	114 01	111.25	5.09
Nagaon	100	96.59	99.62	101.79	104.10	103.78	107.53	108.80	111.18	114.21	114.43	110.05	5.33
N.C.Hills	100	102.30	101.28	103.26	107.02	106.71	107.92	106.75	107.85	109.01	111.45	108.95	3.18
Sivasagar	100	99.11	100.80	100.53	103.41	107.75	108.33	112.22	112.13	114.92	115.81	113.77	5.67
ASSAM	100	100.47	101 90	104.96	106.36	107.38	109.18	112.68	112.11	113 46	113.92	111.19	4.52

cent over the base period price of January. Further, the coefficients of variation of monthly price indices, which was found to lie between 2.24 and 6.99 per cent, indicated that the price of rice (fine) was more or less stable during the months of the year and uniform to a great extent over the districts.

4.1.3 Mustard:

For mustard (Table 4.03) the maximum rise in price was observed during November / December in all the districts other than Goalpara where it was in October. The highest rise (17.83 percent) was in Lakhimpur in the month of November and the lowest (2.00 percent) was in Nagaon in November. In Lakhimpur the price rise was generally higher than that of the other districts in majority of the months and during July – December it was particularly much higher. Similarly, in Nagaon also, the price was lower than that of other districts during the year. More particularly, the price of mustard was lower than that of the base period January in Nagaon district for the whole period except for a slight rise during November - December. However, except Lakhimpur in none of the district price rise was observed till July. Similar was the situation for the state as a whole. The variation in price as reflected from the coefficients of variation of index numbers was also very low (below 11.00 per cent) in the districts. Nevertheless, it may be accepted that the price of mustard was not so volatile in different districts and the state as a whole.

4.1.4 Potato:

Table 4.04 presenting the index number on monthly average price of potato reveals that the price rise generally started from the month of May in all the districts other than Nagaon and N.C.Hills, where it began from June/ July. Price rise was found to be higher in November for all the districts other than Goalpara, N.C.Hills and Sivasagor where it was in August, October and September respectively. However observing the pattern of price during the year, the later half of the year may be considered a period of price rise for potato in all the districts and the state. Further, making a comparison among the districts, the two districts~ Darrang and Sivasagor were found to have higher price rise than the other districts in major part of the years. These two districts experienced the highest price rise up to 98.14 per cent and 83.06 per cent respectively. While the

TABLE - 4.03

INDEX NUMBER ON MONTHLY AVERAGE PRICE DURING 1980 - 1999 OF MUSTARD IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE ,

Dist./Month	Jan	Feb	Mar	April	May	June	July	August	Sept	Oct.	Nov.	Dec.	C.V
Cacher	100	93.92	92.60	93.82	94.52	98.69	98.69	100.35	104.08	107.39	110.20	112.25	6.33
Darrang	100	93.04	91.18	93.13	95.61	97.64	98.49	104.65	112.31	121.40	122.99	113.66	10.36
Dibrugarh	100	102.44	103.37	92.75	90.98	92.59	95.85	96.65	99.22	102.18	102.46	101.99	4.38
Goalpara	100	92.98	90.63	90 41	96.55	96.41	99.44	104.13	107.88	112 03	109.68	108.52	7.23
Kamrup	100	84.70	83.23	85.28	90 92	93.79	96.08	103.27	105.21	108.02	109.42	110.19	9.77
K.Anglong	100	93.42	92.35	93.76	94.29	98 31	98.50	99.66	103.97	107.12	110.08	110.79	6.20
Lakhimpur	100	88.10	87.74	96.59	102.08	104.09	108.77	111.76	114 37	116.28	117.83	115.81	9.67
Nagaon	100	86.14	79.87	81 99	84.59	87.81	90.71	94.01	96.48	99.60	102.00	100.45	8.14
N.C.Hills	100	93.92	92.60	93.82	94.52	98.69	98.69	100.35	104.08	107.39	110.20	112.31	6.34
Sivasagor	100	98.96	93 11	94.44	97.71	98.26	100.23	104.40	106.72	110.10	112.91	113.26	6.43
ASSAM	100	93.86	92.05	91.42	93.44	95.87	98.01	106 17	103.80	106.92	108.40	108.45	5.83

TABLE- 4.04

INDEX NUMBER ON MONTHLY AVERAGE PRICE DURING 1980 - 1999 OF POTATO IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE .

Dist./Month	Jan	Feb	Mar	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	C.V
Cacher	100	85.65	90.24	96.81	112.37	117.25	122.22	130.21	147.13	146.54	147.96	142.07	18.48
Darrang	100	96.33	102.58	119.27	125.40	128.92	134.51	143.68	158.35	144.55	198.14	132.38	20.45
Dibrugarh	100	83.99	81 62	89.92	106.52	118.97	126.68	119.96	140.02	137.55	141.30	137.94	18.61
Goalpara	100	96.13	100.19	101.06	117.27	128.41	135.18	143.80	136.67	141.73	137.79	124.60	14.29
Kamrup	100	83.31	78.87	86.37	101.33	105.86	121.11	122.02	127.97	138.54	149.48	141.10	20.21
K.Anglong	100	96.55	100.85	99.83	105.22	107.94	121.67	132.68	145.60	157.79	163.89	155.68	19.95
Lakhimpur	100	86.21	86.25	102.04	111.55	119 67	126.42	133.70	143.02	151.06	151.74	140.94	18.82
Nagaon	100	90.19	80.43	83.04	93.83	98.71	108.20	113.92	118.21	130.98	135.03	129.62	16.87
N.C.Hills	100	88.88	86.98	90.25	96.05	105.45	107.28	116.81	120 10	123.09	122.12	111.88	12.03
Sivasagor	100	93.06	101.53	124.52	140.47	151.29	162.71	171.76	183.06	174.82	173.65	167.29	21.55
ASSAM	100	83.67	84.28	91.55	102.08	108.69	116.61	122.21	135.01	133.49	140.35	127.66	17 09

N.C.Hills had the lowest price rise of 23.09 per cent, the state as a whole had it up to 40.35 per cent over that of January. As regards the variation in prices during the year, it may be mentioned that the coefficients of variation of monthly price indices was found to be less than 22.00 per cent and in majority of the districts it was around 20.00 per cent, which indicates the presence of some amount of volatility in the price of potato in all the districts and the state during the year.

4.1.5 Onion:

In the case of onion (Table 4.05) the highest price rise was observed during November/ December. It was the Darrang district with highest price rise of 46.03 per cent followed by Dibrugarh with 41.59 per cent price rise – both in the month of November. In Kamrup district as revealed by the table, the price during February – November did not come above the January price. In other words in this district the price was below that of January in all the months except December, the price of which was almost at par with January. However, the data also disclose that the price of onion did not rise above that of January up to August for all the districts other than Darrang and Dibrugarh where the price rise commenced from August and maintained it up to December. It was also evident that the amount of rise in these two districts was higher than that of the other districts in different months other than December where the price came below the level reached in Cachar, Karbi-Anglong and Sivasagor. The state as a whole also experienced the similar price situation with a highest price rise of 23.00 per cent in November. Further the coefficients of variation, which were between 20–27 per cent for districts like Cachar, Dibrugarh, Darrang, Lakhimpur and Sivasagor and between 10–20 per cent for the remaining districts reveals that the price of onion in different districts and the state as a whole suffered from inconsistency to a certain extent, although may be considered tolerable.

4.1.6 Lentil:

The month of December was the period for highest price of lentil (Table 4.06) for all the districts except Cachar, Goalpara, Kamrup and Lakhimpur for which the highest rise was during November. As reflected by the index numbers, the price of lentil was found to be lower than that of January during the period from February to June in

TABLE - 4.05

INDEX NUMBER ON MONTHLY AVERAGE PRICE DURING 1980 - 1999 OF ONION IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE .

Dist./Month	Jan	Feb	Mar	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	C.V
Cacher	100	86.42	79.28	67.88	63.87	61.10	81.41	93.05	107.20	119.35	133.99	136.87	26.35
Darrang	100	95.20	88.98	85.42	80.21	85.22	90.89	102.07	120.65	138.21	146.03	121.16	20.04
Dibrugarh	100	86 33	85.81	76.67	75.45	75.45	82 32	104.07	124.33	130.19	141.59	118.79	22.44
Goalpara	100	87 32	80.33	77.73	74.00	72.61	77 10	83.41	95 97	95.93	108.30	120.69	16.02
Kamrup	100	84.46	73.33	72.25	74.04	72.79	81.18	83.74	86.64	89.37	94.39	100.01	11.55
K.Anglong	100	93.22	87.83	87.31	81.85	80.08	80.43	94.03	109.96	121.02	124.96	130.48	17.42
Lakhimpur	100	87 04	75.82	66.70	62.17	62 59	82.47	89.24	104.89	115.07	119.77	117.77	22.48
Nagaon	100	86.39	72.59	66.98	66.13	65.95	75 13	82 58	91.16	101.10	116.75	108.96	19.52
N.C.Hills	100	84.83	81.07	78.69	74.67	75.62	72.55	77.65	87.47	104.84	112.68	112.56	16.16
Sivasagor	100	94.75	73.36	66.81	65.50	67.92	84.84	89.87	101.80	113.28	119.47	129.39	22.33
ASSAM	100	88.26	79.46	74.71	72.09	72.16	80.67	89.08	101.25	111.98	123.00	115.84	18.42

TABLE - 4.06

INDEX NUMBER ON MONTHLY AVERAGE PRICE DURING 1980 - 1999 OF LENTIL IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE .

Dist./Month	Jan	Feb	Mar	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	C.V
Cacher	100	96.97	97.11	96.56	95.82	97.82	101.71	104.46	104.68	107.33	108.50	107.49	4.49
Darrang	100	99.34	95.26	99.23	101.03	104.59	104.23	106.22	107.24	105.74	105.88	107.39	3.63
Dibrugarh	100	99.43	100.88	96.37	96.52	97.61	97.18	101.83	102.42	105.69	107.63	111.54	4.49
Goalpara	100	103.35	102.03	99.03	101.55	105.67	106.34	107.18	110.87	113.34	114.37	113.22	4.90
Kamrup	100	96.40	99.57	94.63	92.87	95.51	104.54	100.34	105.34	110.51	114.68	108.97	6.48
K.Anglong	100	100.61	97.77	94.58	96.37	95.59	98.73	102.53	104.49	107.83	107.79	110.53	4.97
Lakhimpur	100	97.30	95.34	93.16	95.56	97.71	100.03	103.85	105.79	108.34	110.53	110.49	5.77
Nagaon	100	98.94	96.65	94.13	94.22	95.45	100.70	99.28	100.78	103.12	106.43	107.01	4.11
N.C.Hills	100	101.77	100.67	95.77	97.38	99.40	100.42	102.53	102.44	105.09	104.45	107.78	3.13
Sivasagor	100	97.12	97.17	98.51	99.33	100.80	103.31	104.08	105.40	106.64	110.25	110.91	4.45
ASSAM	100	99.14	98.24	96.14	96.98	98.90	101.65	103.16	104.84	107.28	108.95	109.46	4.35

almost all the districts and started rising from July onwards. However, the rise of price in lentil may not be considered much prominent since the highest rise in this case was found to be 14.68 per cent to that of January price. The coefficient of variation was also found to be below 7.00 per cent in all the districts. As a whole for the state also, the picture was similar to that of different districts. Thus the price of lentil during a year for all the districts and the state as a whole may be considered uniform over months in the districts.

4.1.7 Green gram:

From Table 4.07 it is observed that the price of green gram was maximum in the month of October or November in the districts like Darrang, Dibrugarh, Goalpara, Kamrup, Karbi-Anglong, Sivasagor and Assam as a whole, but for Cachar and Nagaon it was in July while for Lakhimpur it was in August. The highest rise of price was 13.85 per cent in the month of November in Kamrup and the lowest rise was 7.35 per cent in Darrang in the month of October. It is also revealed by the index numbers that in all the districts the price during the year was above the price of January but for one or two months. It was also evident that the price rise, which was gradual towards the later part of the year, did not show any marked difference from that of January in all the districts. Further, it was found that the coefficients of variation of index numbers on green gram in different districts ranged from 2.00 per cent to 5.00 per cent. From this it may be concluded that the price of green gram remained almost uniform during the months of the year in all the districts and in the state by and large.

4.1.8 Black gram:

Similar kind of index numbers for black gram for different districts and Assam as a whole are shown in Table 4.08. From these index numbers it was found that the maximum price rise was in the month of October for the districts other than Karbi-Anglong and Sivasagor where it was in the month of September. In two districts, – Dibrugarh and Goalpara, the price rise was highest in November. The highest price rise was 20.81 per cent in Lakhimpur and lowest was 10.95 per cent in Sivasagor in October and December respectively. In the month of February and March the price was below the price of January in the majority of the districts. The price of black gram from February to May in Dibrugarh and Sivasagor was below the level of January and then rose gradually

TABLE - 4.07

INDEX NUMBER ON MONTHLY AVERAGE PRICE DURING 1980 - 1999 OF GREEN GRAM IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE .

Dist./Month	Jan	Feb	Mar	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	C.V
Cacher	100	100.97	104.43	105.97	108.28	105.07	113.11	111.50	109.90	106.87	109.94	109.11	3.59
Darrang	100	102.85	102.18	103.60	104.76	106.27	105.94	106.54	106.54	107.35	103.07	106.97	2.11
Dibrugarh	100	101.01	99.34	105.35	104.69	108.25	107.98	107.32	107.19	109.39	109.06	108.00	3.27
Goalpara	100	101.16	99.47	102.32	107.78	107.09	106.93	106.17	109.00	108.45	110.30	109.36	3.50
Kamrup	100	100.20	104.11	104.32	109.35	110.70	110.77	111.91	109.81	111 19	113.85	109.68	4.11
K.Anglong	100	100.47	100.03	99.39	101.73	102.77	104.18	107.52	108.56	108.77	109.00	107.79	3.58
Lakhimpur	100	102.12	103.98	106.58	108.26	107 80	110.91	111.43	111.25	111.20	108.45	109.13	3.37
Nagaon	100	101.79	103.32	104.65	106.79	108.23	108.77	107.14	107.15	106.50	107.75	104.57	2.47
N.C.Hills	100	101.52	102.97	102.00	103.20	104.33	103.61	107.30	106.76	108.37	107.98	109.48	3.54
Sivasagor	100	102.56	104.51	106.33	107.82	112.22	110.30	112 22	114.28	114.60	111.46	110.35	4.11
ASSAM	100	103.55	102.42	103.17	105.68	107.14	107.40	108.85	108.97	109.19	109.01	108.42	2.82

TABLE - 4.08

INDEX NUMBER ON MONTHLY AVERAGE PRICE DURING 1980 - 1999 OF BLACK GRAM IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE .

Dist./Month	Jan	Feb	Mar	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	C.V
Cacher	100	101.93	101.94	105.55	107.87	113.88	114.98	115.77	116.56	117.50	115.92	113.29	5.67
Darrang	100	98.72	97.15	101.37	104.42	108.26	111.91	113.85	116.58	117.88	114.21	110.91	6.51
Dibrugarh	100	96.25	98.33	96.79	97.61	99.96	102.00	104.57	108.81	111.01	113.30	111.29	5.60
Goalpara	100	97.67	97.87	102.90	111.18	115.42	114.51	115.51	110.50	114.39	116.47	115.26	6.55
Kamrup	100	94.56	97.25	100.86	103.40	107.85	111.18	112.36	112.73	114.28	106.70	110.42	5.98
K.Anglong	100	93.04	96.89	101.52	102.91	101.68	111.45	112.17	118.39	115.27	115.14	115.60	7.66
Lakhimpur	100	102.02	103.77	106.39	109.53	113.62	114.64	114.72	117.14	120.81	117.70	109.93	5.77
Nagaon	100	98.65	98.77	103.00	106.60	112.36	114.25	116.36	117.01	118.87	112.03	108.21	6.49
N.C.Hills	100	102.38	100.75	100.35	101.59	101.26	101.72	108.69	107.28	114.03	110.92	109.60	4.47
Sivasagor	100	101.23	98.60	96.58	97.12	102.38	105.32	107.36	108.59	108.12	108.40	110.95	4.62
ASSAM	100	99.12	98.98	100.44	104.17	107.63	110.23	112.32	113.17	114.78	112.38	111.34	5.47

to maximum. In other districts the price rise started from the month of April. Further, the coefficients of variation were between 4.00 to 7.00 per cent in all the districts. It was evident from the coefficient of variation that the price remained almost uniform during the months of the year and also among the districts.

4.1.9 Sugar:

Referring to the Table 4.09 for monthly price index of sugar it was observed that price rise in sugar was highest (19.29 per cent) in Goalpara. In addition to that, the price of sugar in Goalpara district was found to be gradually rising from February to December. A similar type of situation was observed in Karbi-Anglong and N.C.Hills also, though the maximum rise was to the extent of 6.85 per cent, which was much below the rise in Goalpara. In other districts such as Darrang, Dibrugarh, Kamrup, Nagaon Sivasagor the gradual price rise was observed up to September with a maximum rise up to 14.73 per cent in Sivasagor whereas in Cacher and Lakhimpur it continued up to November with a maximum rise to 10.80 per cent in Lakhimpur and then fell sharply. For the state as a whole also price rise was gradual from February to November. However, as disclosed by the coefficients of variation for different districts, the price of sugar to a great extent was uniform during the year in the state over the districts.

Summarizing the results presented in the preceding discussion, Table 4.10 shows the distribution of different commodities according to different levels of price rise and price variation during a year in different districts of Assam. The table reveals that except for potato the price rise for all other commodities remained within 50.00 per cent within a year considering January as the base month. For potato the price rise may go beyond 50.00 per cent but remained within 100.00 per cent in Darrang, Karbi-Anglong, Lakhimpur and Sivasagor and none of the commodities had a rise above 100.00 per cent. As regards the variation, it is clear from the table that except potato, mustard and onion the prices of all other commodities remain more or less uniform (coefficient of variation< 10.00 per cent) during the year in different districts. The price of onion and potato was found volatile in all districts whereas for mustard it was more or less uniform except Darrang district.

TABLE - 4.09

INDEX NUMBER ON MONTHLY AVERAGE PRICE DURING 1980 - 1999 OF SUGAR IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE .

Dist./Month	Jan	Feb	Mar	April	May	June	July	August	Sept.	Oct.	Nov.	Dec.	C.V
Cacher	100	99.38	100.21	100.70	104.40	106 28	107.75	108.49	108.50	109.43	109.94	105.91	3.65
Darrang	100	95.55	100.92	101.30	102.26	103.32	104.11	104.82	105 22	104.51	104.54	104.38	2 61
Dibrugarh	100	99.22	100.97	101 77	101.77	106.29	107.13	108.43	109.50	110.05	108 80	107.70	3.69
Goalpara	100	108.15	108.52	109.02	111.78	114.66	115.21	116.60	116.15	116.20	115.85	119 29	4.56
Kamrup	100	107.20	102.53	103.32	106.79	108.73	110.39	111.59	112.23	111.80	111.14	109.86	3.61
K.Anglong	100	100.28	100.95	100.61	102.01	103.64	104.63	105.71	106.65	106 74	106.24	106.85	2.56
Lakhimpur	100	100.51	101.16	103.15	105.54	107.38	109.15	109.49	110.48	110.80	110.10	108 27	3.70
Nagaon	100	105.23	101.22	101.66	103.95	105.43	108.97	109.94	110.25	109.10	108.42	107.48	3.26
N.C.Hills	100	99.46	98.87	97 56	98.80	99.75	101.12	105.99	105.77	105.68	106.80	106.69	3.39
Sivasagor	100	100 31	101.63	104.20	107 36	109.73	110.70	112.36	114.73	112.96	112.79	111.84	4.73
ASSAM	100	101.36	101 58	102.17	104.27	106 30	107.70	109 16	109 76	109.55	109.31	108.64	3.36

TABLE 4.10

COMMODITY WITH DIFFERENT PRICE CHARACTERISTICS DURING THE YEAR IN DIFFERENT DISTRICTS OF ASSAM.

Price Rise	Cacher	Darrang	Dibrugarh	Goalpara	Kamrup	K.Anglong	Lakhimpur	Nagoan	N.C.Hills.	Sivasagor
More than 100%	nil	nil	nil	nil	nil	nil	nil	nil	nil	nil
50% to 100%	nil	potato	nil	nil	nil	potato	potato	nil	nil	potato
Below 50%	Rice(com), Rice (fine), Mustard, Potato, Onion, Lentil, G.gram. B,gram, Sugar.	Rice(com), Rice (fine), Mustard, Onion, Lentil, G.gram. B,gram, Sugar.	Rice(com), Rice (fine), Mustard, Potato, Onion, Lentil, G.gram, B,gram. Sugar.	Rice(com). Rice (fine), Mustard, Potato, Onion, Lentil, G.gram, B,gram. Sugar.	Rice(com), Rice (fine). Mustard, Potato, Onion, Lentil, G.gram, B,gram, Sugar.	Rice(com), Rice (fine). Mustard, Onion. Lentil. G.gram. B,gram. Sugar	Rice(com), Rice (fine). Mustard, Onion, Lentil, G.gram, B,gram. Sugar.	Rice(com), Rice (fine), Mustard, Potato. Onion. Lentil, G.gram B,gram, Sugar.	Rice(com), Rice (fine). Mustard, Potato, Onion, Lentil, G.gram. B,gram, Sugar	Rice(com), Rice (fine). Mustard, Onion. Lentil. G.gram. B,gram, Sugar
Volatile C.V >10%	Potato, Onion.	Potato, Onion, Mustard.	Potato, Onion.	Potato, Onion	Potato, Onion.	Potato, Onion	Potato, Onion,	Potato, Onion.	Potato, Onion	Potato, Onion.
Uniform C.V.<10%	Rice(com), Rice (fine). Mustard, Lentil, G.gram, B.gram, Sugar.	Rice(com), Rice (fine). Lentil, G.gram, B,gram, Sugar	Rice(com). Rice (fine), Mustard. Lentil, G.gram. B,gram, Sugar	Rice(com). Rice (fine). Mustard. Lentil, G.gram. B,gram, Sugar.	Rice(com), Rice (fine). Mustard, Lentil, G.gram. B,gram, Sugar.	Rice(com). Rice (fine). Mustard. Lentil, G.gram. B,gram, Sugar	Rice(com), Rice (fine). Mustard, Lentil, G.gram, B,gram, Sugar.	Rice(com). Rice (fine). Mustard. Lentil, G.gram, B gram, Sugar.	Rice(com). Rice (fine), Mustard, Lentil, G.gram, B,gram. Sugar.	Rice(com). Rice (fine), Mustard, Lentil, G.gram, B,gram, Sugar.

4.2 INDEX NUMBER OF YEARLY AVERAGE PRICE

In this section, the pattern and the range of price (maximum – minimum) of commodities included in the study over the years have been dealt with. The yearly average price of the commodities in different years were converted to an index number relative to that of 1980 in order to achieve rationality in comparing the price of different years.

Yearly price index of different commodities in different districts of Assam and in the state of Assam as a whole for the study period has been presented in Table 4.11 to 4.19. The result reveals that there was a general trend of price rise in all the districts of Assam except a few years. A similar type of increasing trend was shown in all India Price Index Number of wholesale price from 1982–83 to 1992– 93 particularly in food articles (page 309, India-1994).

To explore the extent of variability and to make a comparison of variation among districts in the prices during the period 1980--1999, coefficients of variation were calculated from the index numbers of wholesale prices, commoditywise and districtwise and have been presented towards the bottom of the tables. Also shown are the ranges of variation in price indices for the two break-up periods 1980–89 and 1990- 1999 at the bottom of the table .The information and conclusions derived from different tables are as follows.

4.2.1 Rice (common):

Index numbers of yearly average prices of rice (common) for different districts as shown in Table 4.11 indicate that the highest increase in price which was more than 400 per cent above the minimum in 1981, was in Dibrugarh district and similar price behavior was observed in Kamrup district also. The lowest rise, which was nearly 300 per cent above that of 1981was observed in two districts Karbi-Anglong and Darrang. In the remaining districts namely, Cachar, Goalpara, Lakhimpur, Nagaon, N.C.Hills and Sivasagor the rise was between 300–400 per cent above the minimum. Although, the rise in most of the districts may be considered usual, the lowest rise in Karbi-Anglong districts was unusual in the sense that, it, being a hill district produces

TABLE : 4.11

INDEX NUMBER ON YEARLY AVERAGE PRICE OF RICE (COMMON) IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE.

Year/Dist.	Cacher	Darrang	Dibrugarh	Goalpara	Kamrup	K.Anglong	Lakhimpur	Nagaon	N.C.Hills	Sivasagor	Assam
1980	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1981	100.29	97.08	99.57	101.93	99.05	97.90	101.22	89.97	100.56	100.41	98.71
1982	128.39	119.34	132.62	117.20	119.99	118.64	119.19	103.51	122.63	130.41	120.70
1983	147.57	136.65	153.22	123.24	139.04	134.28	141.66	116.09	134.20	148.57	137.07
1984	145.88	140.10	162.02	134.75	139.74	135.25	140.91	129.10	142.10	161.02	142.44
1985	144.58	136.15	149.36	135.36	132.76	136.38	143.75	125.59	141.47	139.59	137.95
1986	148.07	143.06	168.67	143.88	149.95	138.11	141.88	137.29	130.44	145.71	144.30
1987	167.87	159.51	196.14	157.96	168.36	148.68	150.04	135.79	159.09	175.31	160.68
1988	183.68	101.50	214.16	173.40	219.92	154.72	166.64	150.67	173.89	197.76	171.61
1989	211.05	108.26	252.36	198.51	208.87	169.02	182.06	143.31	196.52	214.29	185.79
1990	219.86	145.19	269.53	189.51	207.12	170.72	186.27	161.71	190.44	245.10	195.08
1991	220.47	222.44	281.55	204.61	231.85	187.76	198.24	186.45	224.45	256.53	219.41
1992	257.83	217.24	268.88	253.48	327.60	231.78	250.90	236.45	240.88	292.04	256.94
1993	279.78	241.10	268.67	263.73	368.29	244.15	258.20	254.01	268.40	311.96	274.37
1994	301.55	271.72	329.18	277.43	424.94	254.28	282.06	265.89	276.02	335.31	299.92
1995	324.15	286.33	355.36	353.58	398.28	288.93	326.67	322.24	289.97	387.10	330.93
1996	353.72	260.68	417.60	368.34	410.03	294.40	329.58	330.67	339.59	400.00	347.28
1997	371.18	358.26	442.70	394.64	405.12	345.92	358.73	315.38	384.01	426.53	373.90
1998	413.10	316.95	472.75	405.84	469.13	378.73	385.48	339.63	360.50	468.37	396.40
1999	463.46	386.40	532.40	451.99	492.81	369.62	469.81	458.19	405.33	480.49	447.88
C.V.	44.66	44.87	47.08	48.16	50.67	42.86	46.49	49.23	43.21	47.52	45.87
1980-89*	111.05	62.43	152.79	98.51	120.87	71.12	82.06	60.70	96.52	114.29	67.08
1990-99*	234.62	241.21	262.87	262.48	285.69	208.01	283.54	296.48	214.89	235.39	252.80

* Range = (maximum - minimum) of index number

TABLE - 4.11

INDEX NUMBER ON YEARLY AVERAGE PRICE OF RICE (COMMON) IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE.

Year/Dist.	Cacher	Darrang	Dibrugarh	Goalpara	Kamrup	K.Anglong	Lakhimpur	Nagaon	N.C.Hills	Sivasagor	Assam
1980	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1981	100.29	97.08	99.57	101.93	99.05	97.90	101.22	89.97	100.56	100.41	98.71
1982	128.39	119.34	132.62	117.20	119.99	118.64	119.19	103.51	122.63	130.41	120.70
1983	147.57	136.65	153.22	123.24	139.04	134.28	141.66	116.09	134.20	148.57	137.07
1984	145.88	140.10	162.02	134.75	139.74	135.25	140.91	129.10	142.10	161.02	142.44
1985	144.58	136.15	149.36	135.36	132.76	136.38	143.75	125.59	141.47	139.59	137.95
1986	148.07	143.06	168.67	143.88	149.95	138.11	141.88	137.29	130.44	145.71	144.30
1987	167.87	159.51	196.14	157.96	168.36	148.68	150.04	135.79	159.09	175.31	160.68
1988	183.88	101.50	214.16	173.40	219.92	154.72	166.64	150.67	173.89	197.76	171.61
1989	211.05	108.26	252.36	198.51	208.87	169.02	182.06	143.31	196.52	214.29	185.79
1990	219.86	145.19	269.53	189.51	207.12	170.72	186.27	161.71	190.44	245.10	195.08
1991	220.47	222.44	281.55	204.61	231.85	187.76	198.24	186.45	224.45	256.53	219.41
1992	257.83	217.24	268.88	253.48	327.60	231.78	250.90	236.45	240.88	292.04	256.94
1993	279.78	241.10	268.67	263.73	368.29	244.15	258.20	254.01	268.40	311.96	274.37
1994	301.55	271.72	329.18	277.43	424.94	254.28	282.06	265.89	276.02	335.31	299.92
1995	324.15	286.33	355.36	353.58	398.28	288.93	326.67	322.24	289.97	387.10	330.93
1996	353.72	260.68	417.60	368.34	410.03	294.40	329.58	330.67	339.59	400.00	347.28
1997	371.18	358.26	442.70	394.64	405 12	345.92	358.73	315.38	384.01	426.53	373.90
1998	413.10	316.95	472.75	405.84	469.13	378.73	385.48	339.63	360.50	468.37	396.40
1999	463.48	386.40	532.40	451.99	492.61	369.62	469.81	458.19	405.33	480.49	447.88
C.V.	44.66	44.87	47.08	48.16	50.67	42.86	46.49	49.23	43.21	47.52	45.87
1980-89*	111.05	62.43	152.79	98.51	120.87	71.12	82.06	60.70	96.52	114.29	87.08
1990-99*	234.62	241.21	262.87	262.48	285.69	208.01	283.54	296.48	214.89	235.39	252.80

* Range = (maximum - minimum) of index number

less rice and as such depends mainly on the imports from other districts, which should have resulted in more price rise. It is also observed that in districts like Cachar, Goalpara, Lakhimpur, Karbi-Anglong and Sivasagor, the price was rising generally with times but in districts like Darrang, Dibrugarh, Kamrup, Nagaon and N.C.Hills a moderately fluctuating behavior of the prices could be observed from the index numbers. In the state as a whole, the maximum rise in 1999 was about 400 per cent above the minimum in 1981 and it was generally upwards over the years. Further, a comparison among the coefficients of variation of the index numbers of the districts reveal that the price variation was more in all the plain districts than in the two hills districts– Karbi-Anglong and N.C.Hills. However, a comparison among the range of price indices for the two break-up periods 1980–89 and 1990–1999 reveals that the price change was highest during 1980–89 in Dibrugarh (152.79 per cent) and above 100 per cent only in Cachar, Kamrup and Sivasagor whereas during 1990–99, in all the districts it was between 200–300 per cent. For the state as a whole during 1980–89 it was below 100 per cent but in 1990–99 it was above 200 per cent. Thus, it was evident from the results that price variation was sharper during 1990–99 for the different districts and the state as a whole than in 1980–89.

4.2.2 Rice (fine):

Table 4.12 shows the index number of yearly average prices of rice (fine) for different districts of Assam and the state as a whole. Analyzing the index numbers it was found that in Nagaon district the increase of price index was highest and was more than 500 per cent above the minimum in 1980. The lowest rise of price, which was about 300 per cent above the minimum, was observed in the district of Karbi-Anglong. In the remaining districts namely, Cachar, Darrang, Dibrugarh, Goalpara, Kamrup, Lakhimpur, N.C.Hills and Sivasagor the rise was between 300–500 per cent above the minimum. Moreover, from the index numbers for each of the districts like Dibrugarh, Goalpara, Kamrup, Karbi-Anglong, Lakhimpur and Sivasagor it is clear that the price was rising generally with time. However in Cachar, Darrang, Nagaon, N.C.Hills it was fluctuating moderately. In the state as a whole the maximum rise of price in 1999 was

TABLE - 4.12

INDEX NUMBER ON YEARLY AVERAGE PRICE OF RICE (FINE) IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

Year/Dist.	Cacher	Darrang	Dibrugarh	Goalpara	Kamrup	K.Anglong	Lakhimpur	Nagaon	N.C.Hills	Sivasagor	ASSAM
1980	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1981	96.56	112.18	107.54	108.27	103.04	102.51	105.69	103.00	104.66	97.24	104.03
1982	123.73	122.31	149.80	117.35	119.23	120.66	118.79	139.30	108.41	139.59	124.81
1983	143.99	144.06	185.71	132.57	144.27	137.22	137.62	161.57	124.63	176.06	147.13
1984	140.00	158.93	198.02	140.73	157.54	131.16	147.99	158.46	132.60	176.24	152.77
1985	145.32	158.41	220.63	155.40	164.75	133.15	143.56	126.66	162.51	180.48	157.22
1986	172.12	181.27	225.40	154.94	153.54	136.27	161.41	171.58	137.79	188.40	165.92
1987	176.66	181.79	247.22	160.53	170.09	145.70	155.56	172.80	213.36	205.52	180.79
1988	193.35	97.73	280.75	165.71	169.29	155.49	168.60	169.69	220.94	195.95	179.19
1989	227.52	104.55	287.30	186.58	194.98	173.34	177.44	161.16	251.85	221.18	196.15
1990	335.01	132.95	306.75	215.77	129.11	179.31	182.87	159.81	284.48	237.57	211.33
1991	311.67	260.81	349.21	219.86	148.87	196.60	205.44	178.89	273.87	255.25	233.75
1992	264.51	291.88	331.35	230.33	188.79	242.30	255.25	252.77	261.19	297.79	256.73
1993	287.20	291.23	351.19	239.99	202.80	251.48	272.44	284.17	289.25	319.52	274.15
1994	302.59	301.95	386.51	267.87	212.28	277.56	293.90	327.88	310.19	349.72	297.90
1995	332.25	302.11	414.29	386.14	403.60	307.44	333.97	393.10	316.34	393.19	358.83
1996	357.86	252.92	463.10	451.17	422.03	310.93	359.24	448.85	344.17	399.26	382.61
1997	387.84	357.14	484.92	437.81	467.02	384.27	401.67	416.37	439.37	430.94	420.48
1998	418.80	391.88	500.00	402.62	450.73	385.67	444.41	462.11	395.43	494.84	432.53
1999	460.45	425.58	539.29	423.49	456.61	376.19	491.64	636.67	445.23	500.55	475.07
C.V.	43.74	46.30	41.41	49.38	55.43	44.65	49.41	57.46	46.12	45.12	42.05
1980-89*	130.96	84.06	187.30	86.58	94.98	73.34	77.44	72.80	151.85	123.94	96.16
1990-99*	195.94	292.63	232.54	235.40	337.91	206.36	308.77	476.86	184.04	262.98	263.74

* Range = (maximum - minimum) of index number

TABLE - 4.13

INDEX NUMBER ON YEARLY AVERAGE PRICE OF MUSTARD IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE.

Year/Dist.	Cacher	Darrang	Dibrugarh	Goalpara	Kamrup	K.Anglong	Lakhimpur	Nagaon	N.C.Hills	Sivasagor	ASSAM
1980	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1981	121.45	146.11	100.00	106.71	106.71	121.33	104.80	121.33	121.22	103.53	109.79
1982	106.28	125.31	97.89	89.32	89.32	99.67	88.61	99.67	106.08	101.38	97.66
1983	128.44	159.49	102.25	114.30	114.30	128.52	112.39	128.52	128.20	100.15	114.63
1984	132.04	179.17	102.11	124.92	124.92	131.98	127.97	131.98	131.78	103.37	119.62
1985	133.14	133.48	91.83	86.42	86.42	134.25	128.88	134.25	132.88	96.78	109.72
1986	157.39	174.26	97.89	107.64	116.31	158.25	137.38	158.25	157.09	94.79	125.27
1987	202.51	266.04	116.20	174.32	191.39	203.13	163.08	203.13	202.12	114.42	163.95
1988	190.67	156.77	118.73	172.66	177.05	191.37	166.63	176.12	190.30	141.56	160.85
1989	167.38	158.59	127.04	181.79	143.42	168.29	178.30	146.30	167.06	130.98	151.46
1990	190.61	153.30	134.51	228.37	217.47	190.34	163.69	209.35	190.24	144.17	176.78
1991	248.12	183.87	126.34	185.39	226.53	249.47	204.19	237.42	247.64	154.14	194.48
1992	258.59	235.25	130.85	271.17	225.42	260.00	213.54	242.08	258.09	225.46	215.82
1993	250.63	301.07	122.68	258.25	229.85	251.99	204.37	246.26	250.14	214.72	209.17
1994	240.77	264.35	180.42	232.24	233.81	242.08	249.14	253.25	240.31	193.10	220.85
1995	238.30	178.00	209.44	306.77	240.45	239.60	276.44	286.87	237.84	234.82	245.24
1996	256.83	215.49	189.01	245.80	260.65	255.02	277.58	310.86	256.34	224.39	242.12
1997	336.02	271.83	245.63	264.71	288.69	337.85	259.16	312.80	335.37	246.32	283.40
1998	342.24	536.72	347.89	272.27	499.63	344.10	277.13	278.26	341.58	241.56	329.06
1999	373.00	515.43	465.49	350.49	309.35	375.03	320.50	375.03	372.29	292.64	374.29
C.V.	37.73	51.20	58.29	40.39	48.47	38.12	36.33	37.61	37.72	38.44	40.88
1980-89*	102.51	166.04	35.21	95.37	104.97	103.46	89.69	103.46	102.12	46.77	66.29
1990-99*	182.39	383.42	342.81	165.10	282.16	184.69	156.81	165.68	182.05	148.47	197.51

* Range = (maximum - minimum) of index number

more than 300 per cent above that of 1980. A comparison among the coefficients of variation of the index numbers of different districts reveals that the price variation was highest (57.46 per cent) in Nagaon, although variations in price in other districts also were not less (above 40.00 per cent in each district). However, a comparison among the range of price indices for the decade 1980–89 and 1990–99 reveals that the price changes was highest during 1980–89 in Dibrugarh (187.30 per cent) and above 100 per cent only in Cacher, N.C.Hills and Sivasagor whereas during 1990–99 in all the district it was between 200 per cent to 500 per cent except in Cacher and N.C.Hills. For the state as a whole it was below 100 percent in 1980–89 and above 200 per cent during 1990–99. Thus it led to the conclusion that the price rise in rice (fine) was sharper during 1990–99 for the different districts of Assam.

4.2.3 Mustard:

The index numbers of yearly average prices for mustard (Table 4.13) show that from 1980 to 1999 the price rise was highest in Darrang, which was about 436.72 per cent and the lowest was about 192.64 per cent in Sivasagor district. Next to Darrang , Dibrugarh district experienced a rise up to about 365 per cent above that of 1980. In all other districts the rise remained in between 200 -- 280 per cent of the price of 1980, which was also identical to that of the whole state. However, as indicated by the coefficients of variation, the price of mustard varied less in districts like Cacher, Karbi-Anglong, Lakhimpur, Nagaon, N.C.Hills and Sivasagor than Darrang, Dibrugarh, Goalpara and Kamrup and also than the state as a whole. Dibrugarh faced the maximum variation during the period as indicated by the highest value (58.29 per cent) of coefficient of variation. Higher variation in price in some of the districts was further evident from the fact that unlike rice the price of mustard in the intermediate years of the study period fluctuated frequently. However, observing the range of price index in the two break-up periods 1980–89 and 1990–99, it can be mentioned that the variation in price of mustard was sharper during 1990–99 since the range of variation was between 35.21 – 166.04 per cent and 148.47 – 383.42 per cent in the two periods respectively.

4.2.4 Potato:

For potato (Table 4.14), the price rise was highest (about 590 per cent) in Sivasagor and lowest (about 220 per cent) in Nagaon districts when compared with that of 1980. The extent of rise as reflected by the maximum index number was between 400-500 per cent in Cacher, Darrang, and Dibrugarh and between 300 - 400 per cent in Goalpara, Karbi-Anglong, Lakhimpur and N.C.Hills. Also it is evident from the index numbers of 1999 that the price of the commodity dropped considerably in all the districts in that year. The situation was similar for the whole state also where the maximum rise of price was within 400 per cent of the price of 1980. The values of coefficients of variation for different districts and the state as a whole further reflect that the variation in price of potato was large during the study period and the extent of variation was almost of same order in different districts. Again considering the two periods 1980-89 and 1990–99 separately, the range of index numbers showed that in districts like Cacher, Goalpara, Lakhimpur and N.C.Hills the price variation were less and below 100 per cent during 1980–89. Similarly, in Darrang, Dibrugarh, Kamrup, Nagaon and Sivasagor also it was less but more than 100 per cent and less than 150 per cent. However, in Karbi-Anglong it was above 300 per cent indicating that in this district the price variation was largest during 1980–89. During 1990–99 also the situation was similar in this district whereas the situation in all other districts and the state as a whole changed markedly as reflected by the range of price index lying between 300– 500 per cent except in Goalpara, Kamrup and Nagaon where it was between 175–300 per cent although the situation in Kamrup and Nagaon remained more or less similar in the two periods.

4.2.5 Onion:

In the case of onion the price rise between 1980–99 as reflected by the index numbers (Table 4.15) was vary high in almost all the districts and in the state as a whole. The rise was to the extent of 900 per cent and more in Cacher, Darrang, Dibrugarh, Kamrup and Sivasagor and more than 700 per cent in Karbi-Anglong, Lakhimpur, N.C.Hills and in the state as a whole. Only in Nagaon district the rise was within 500 per cent, which was least also. Further, the coefficients of variation of different districts for the whole period make it evident that except for Nagaon, all the districts of the state

TABLE - 4.14

INDEX NUMBER ON YEARLY AVERAGE PRICE OF POTATO IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE.

Year/Dist.	Cacher	Darrang	Dibrugarh	Goalpara	Kamrup	K.Anglong	Lakhimpur	Nagaon	N.C.Hills	Sivasagor	ASSAM
1980	100	100.00	100	100.00	100.00	100	100.00	100.00	100.00	100	100.00
1981	105.33	100.00	117.85	102.32	92.88	95.25	90.02	99.64	107.67	126.21	102.74
1982	94.15	95.44	101.68	90.55	93.15	68.96	82.36	94.78	104.72	122.07	95.99
1983	113.26	128.58	128.62	123.54	112.60	110.29	104.02	115.65	126.69	125.17	118.21
1984	114.91	118.94	150.17	94.74	115.94	106.02	113.71	108.29	132.77	149.66	119.26
1985	111.81	114.61	137.37	102.77	153.94	98.36	94.37	143.79	119.93	121.38	118.94
1986	181.51	183.72	230.3	162.54	239.65	157.24	156.41	223.84	170.59	202.41	188.67
1987	147.33	153.41	178.79	155.35	153.89	410.90	131.02	143.73	159.10	163.45	182.40
1988	147.07	221.13	192.59	134.41	152.52	136.04	130.21	142.46	168.95	188.62	159.11
1989	159.76	220.55	187.21	143.18	141.84	154.18	132.39	132.48	153.65	182.07	158.68
1990	166.34	253.46	185.86	107.24	157.56	163.58	148.65	147.16	164.78	206.55	168.14
1991	181.31	166.57	154.21	132.43	206.46	201.64	181.80	192.84	177.71	295.86	201.50
1992	206.89	239.61	189.9	264.80	210.57	176.08	166.81	196.68	193.55	213.45	204.22
1993	251.17	319.28	228.94	350.65	344.47	200.23	199.01	321.74	216.52	277.03	267.77
1994	263.59	257.61	285.52	347.20	211.39	205.45	191.25	197.44	257.38	281.72	246.66
1995	342.05	311.20	366.33	297.96	289.49	281.86	260.09	270.38	265.55	395.86	303.15
1996	411.44	481.52	411.45	345.22	344.74	341.02	311.58	319.69	360.87	420	370.73
1997	314.34	300.76	363.97	233.73	213.58	299.58	234.28	317.24	316.39	264.83	307.68
1998	544.28	577.37	589.23	393.32	366.37	480.87	480.95	230.08	498.41	688.97	477.48
1999	361.73	525.40	419.53	315.79	329.68	287.12	322.93	319.08	326.42	586.9	369.91
C.V	55.39	57.25	53.89	51.65	43.77	53.22	53.46	41.51	48.88	60.45	48.72
1980-89*	87.36	125.69	130.30	71.99	146.77	321.94	74.05	129.06	70.59	102.41	92.68
1990-99*	377.94	410.80	435.02	286.08	208.81	317.29	332.30	174.58	333.63	482.42	309.34

* Range = (maximum - minimum) of index number

TABLE - 4.16

INDEX NUMBER ON YEARLY AVERAGE PRICE OF ONION IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE.

Year/Dist.	Cacher	Darrang	Dibrugarh	Goalpara	Kamrup	K.Anglong	Lakhimpur	Nagaon	N.C.Hills	Sivasagor	ASSAM
1980	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1981	116.11	119.87	121.89	146.57	118.92	98.09	109.84	136.94	127.51	122.34	120.62
1982	104.44	116.82	139.35	152.87	114.47	86.13	108.16	138.66	137.90	134.04	120.28
1983	127.82	153.92	152.66	169.98	136.44	108.85	130.40	151.57	136.15	132.98	137.06
1984	114.67	135.40	156.80	146.20	126.85	94.73	123.31	125.40	145.21	153.72	129.90
1985	123.07	127.61	161.24	151.20	129.96	93.17	138.65	192.31	146.88	132.45	137.47
1986	133.43	163.93	211.83	179.74	137.03	127.74	153.38	231.28	158.50	188.88	163.44
1987	220.07	211.66	157.10	327.05	577.44	160.78	202.98	233.55	229.40	235.11	245.14
1988	187.20	353.46	237.87	258.18	654.88	141.57	209.00	211.94	218.82	208.24	258.01
1989	177.62	360.17	222.49	224.83	667.74	153.95	174.59	176.11	187.86	189.89	241.06
1990	*249.89*	*398.09*	*262.72*	*186.53*	*679.26*	*209.39*	*218.28*	*251.27*	*202.08*	*256.38*	*279.85*
1991	217.68	433.44	201.18	254.79	698.55	245.43	280.47	301.11	214.63	366.49	307.48
1992	178.49	433.44	243.20	367.51	791.26	180.14	189.88	194.59	206.90	204.79	286.06
1993	319.55	379.77	235.50	519.09	857.45	267.39	318.09	318.32	299.93	309.31	375.35
1994	311.06	329.72	342.60	551.33	862.81	277.46	309.74	317.97	365.70	347.07	386.70
1995	360.91	323.79	445.56	442.25	767.52	302.78	335.29	364.73	352.64	348.67	389.44
1996	361.12	414.09	402.72	432.00	1034.46	316.97	339.72	396.00	422.05	348.67	435.71
1997	410.97	466.98	461.83	534.90	409.97	315.82	355.66	346.26	431.33	371.81	406.53
1998	1018.72	1037.15	1164.50	769.61	710.18	937.34	998.00	381.63	889.76	1072.34	883.77
1999	502.83	1135.66	686.98	696.73	581.99	498.37	532.82	590.08	512.25	624.47	619.11
C.V	77.24	75.65	79.26	58.71	60.42	81.26	74.99	45.38	66.17	74.22	62.45
1980-89*	120.07	260.17	137.87	227.05	567.74	74.65	109.00	133.55	129.40	135.11	158.01
1990-99*	840.23	811.87	963.32	583.08	624.49	757.20	808.12	395.49	687.68	867.55	603.92

* Range = (maximum - minimum) of index number

suffered from large variation in prices of onion during the period under study. It is also observed that there was a sudden sharp jump in the prices of onion during the later part of nineties. The district, which suffered most from unstable prices, was Karbi-Anglong, which is evident from the coefficient of variation value of 81.26 per cent. The least suffered district was Nagaon (C.V. = 45.38 per cent). Again, it was the decade of nineties that experienced much higher price variation in all the districts other than Goalpara and Kamrup, although it was more or less identical in both the decades in Kamrup.

4.2.6 *Lentil:*

For lentil (Table 4.16) the two districts Dibrugarh and Sivasagor experienced the maximum change, which was more than 600 per cent above that of 1980 during the period 1980–1999. Next to these two districts, Cacher, Goalpara, Kamrup and Nagaon had the extent of change up to about 500 per cent during the period. The remaining districts namely Darrang, Karbi-Anglong, Lakhimpur, N.C.Hills and the state as a whole also experienced the extent of price change exceeding 400 per cent, during the period. However, the extent of price change was much higher during 1990–99 than that was in the period 1980–89. In fact during the decade of eighties the extent of change was below 200 percent and more or less uniform for the all districts. During 1990–99, the extent of variation was between 300 – 400 per cent except for Dibrugarh and Sivasagor, where it was 496.20 per cent and 458.00 per cent respectively. Thus it is observed that rise in price of lentil was sharper during 1990–99. Dibrugarh and Sivasagor experienced the higher price rise among the districts. Further, the coefficients of variation for all the districts and for the state were between 50–70 per cent indicating a higher order of variation in prices in all the districts and state as a whole. However, the movement of price of lentil in the districts of the state may be considered more or less uniform.

4.2.7 Green gram:

From the index numbers of green gram (Table 4.17) it is observed that the rise in yearly average price was highest (nearly 700 per cent) in 1998 in Sivasagor from a minimum in 1980 and was followed by Dibrugarh with a rise of 614.09 per cent. Thus in these two districts the rise in prices of green gram was higher than those in other ones where the rise was limited to less than 450 per cent. In the state as a whole this was just

TABLE - 4.18

INDEX NUMBER ON YEARLY AVERAGE PRICE OF LENTIL IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE.

Year/Dist.	Cacher	Darrang	Dibrugarh	Goalpara	Kamrup	K.Anglong	l.Lakhimpur	Nagaon	N.C.Hills	Sivasagor	ASSAM
1980	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100	100.00
1981	124.23	121.22	120.38	124.78	120.88	126.84	127.82	128.17	131.99	125.4	131.99
1982	104.10	98.29	106.33	100.81	98.49	100.98	102.35	103.86	121.00	114.71	121.00
1983	114.37	96.95	104.30	98.14	99.04	103.52	101.86	99.46	116.29	110.43	116.29
1984	143.12	129.71	143.04	130.50	124.59	131.82	137.49	129.43	152.06	149.73	152.06
1985	146.40	136.70	149.87	134.66	173.65	138.69	149.60	143.79	155.14	149.6	155.14
1986	153.43	148.07	161.52	141.54	145.47	150.30	147.06	163.89	154.19	170.32	154.19
1987	151.68	150.01	159.75	150.00	147.17	157.23	150.57	156.78	172.10	160.96	172.10
1988	189.94	271.58	183.80	191.02	180.16	185.62	185.56	181.20	199.62	232.49	199.62
1989	226.09	263.75	248.10	214.20	215.12	215.47	215.80	214.21	234.42	281.55	234.42
1990	219.12	269.11	249.62	221.61	243.73	232.30	225.99	240.20	239.38	279.41	239.38
1991	225.10	265.61	344.81	259.19	290.20	273.28	274.28	286.00	266.98	324.33	266.98
1992	291.81	277.15	347.85	316.08	319.76	279.29	249.16	315.13	324.46	312.3	324.46
1993	300.78	273.03	342.78	356.14	309.34	288.17	242.86	304.86	324.34	307.62	324.34
1994	361.93	293.84	384.81	383.03	361.76	309.18	322.93	356.53	336.71	402.94	336.71
1995	493.50	426.95	507.34	338.20	435.35	410.67	409.07	472.33	435.05	499.33	435.05
1996	605.69	442.82	735.70	488.50	566.14	549.40	530.76	619.47	538.65	649.47	538.65
1997	544.24	417.89	683.54	493.74	431.41	594.94	463.52	581.62	557.47	601.2	557.47
1998	549.60	564.60	680.51	512.32	537.11	558.96	530.94	583.71	573.45	710.83	573.45
1999	616.21	543.44	745.82	600.21	599.74	516.27	561.52	629.85	520.03	737.41	520.03
C.V	62.01	54.47	68.01	57.93	58.42	60.04	57.96	62.91	55.65	63.95	55.65
1980-89*	126.09	174.63	148.10	116.06	116.63	115.47	115.80	114.75	134.42	181.55	134.42
1990-99*	397.09	298.99	496.20	378.60	356.01	362.64	335.53	389.65	334.07	458.00	334.07

* Range = (maximum - minimum) of index number

TABLE - 4.17

INDEX NUMBER ON YEARLY AVERAGE PRICE OF GREEN GRAM IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE.

Year/Dist.	Cacher	Darrang	Dibrugarh	Goalpara	Kamrup	K.Anglong	Lakhimpur	Nagaon	N.C.Hills	Sivasagor	ASSAM
1980	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1981	105.86	111.61	110.94	104.38	107.39	105.00	109.64	97.41	110.60	114.51	107.39
1982	92.78	98.30	107.78	96.63	97.69	95.56	94.09	79.06	110.62	115.35	97.96
1983	98.49	102.92	108.57	99.92	101.09	99.00	89.92	84.72	114.14	117.27	100.89
1984	114.60	129.32	133.93	126.26	124.66	121.98	124.24	99.03	126.88	147.96	132.21
1985	141.95	145.36	142.28	142.82	142.16	138.91	135.91	111.80	147.56	163.91	140.48
1986	102.54	124.22	143.86	107.35	113.77	123.22	133.53	112.35	137.62	167.39	124.59
1987	122.11	127.77	150.17	125.81	117.02	139.20	132.59	137.83	142.08	169.54	134.86
1988	173.52	216.86	213.75	192.40	181.50	197.67	212.64	195.41	195.56	291.80	203.68
1989	190.60	217.19	235.17	197.52	196.68	194.93	213.94	211.96	213.54	302.81	213.67
1990	178.03	218.58	225.70	207.76	207.38	201.12	204.00	206.31	222.45	311.03	214.49
1991	210.90	336.27	387.15	231.87	227.86	204.56	211.17	226.68	237.13	344.24	254.36
1992	268.48	351.29	411.72	286.87	290.10	252.71	277.60	288.60	285.17	377.70	302.83
1993	282.45	349.00	433.82	322.39	302.05	280.48	300.15	300.49	309.05	435.25	324.12
1994	308.67	350.31	445.32	322.30	327.32	290.05	328.02	325.63	307.36	482.13	340.43
1995	372.07	365.16	531.23	347.15	330.90	329.88	387.68	383.02	338.10	519.18	381.17
1996	458.74	368.92	667.42	407.10	419.63	423.54	474.01	449.56	437.22	518.35	454.26
1997	419.53	351.94	606.31	422.79	393.79	482.40	437.25	481.88	476.41	562.59	456.00
1998	494.18	518.94	647.35	470.60	484.89	503.94	516.12	449.54	484.71	780.82	522.79
1999	508.54	495.48	714.09	540.88	532.26	490.08	547.56	539.08	516.37	758.99	552.19
C.V	58.90	52.34	64.60	55.94	55.98	56.99	58.13	59.83	53.76	60.94	56.86
1980-89*	97.82	118.89	135.17	100.89	98.99	102.11	124.02	132.90	113.64	202.81	115.71
1990-99*	330.51	300.36	488.39	333.12	324.88	302.82	343.56	332.77	293.92	469.79	337.70

* Range = (maximum - minimum) of index number

above 450 per cent during the whole period. While considering the break-up of the whole period into 1980–89 and 1990–99, it is observed that the highest range of variations was in Dibrugarh (135.17 and 488.39) and in Sivasagor (202.81 and 469.79) in the two periods respectively. For all other districts and the state as a whole it was around 100 per cent in 1980-89 and between 300 – 350 per cent in 1990–99 except in N.C.Hills. Thus it also indicates that three to four times rise in price of green gram was only during 1990–99. Again considering the high values of coefficients of variations (52.34 per cent to 64.60 per cent) it can be inferred that all the districts as well as the state as a whole suffered largely from variation in prices of green gram during the whole period although the extent of variation between the districts was more or less of same order.

4.2.8 Black gram:

From the Table 4.18 it is observed that the maximum change of price index, which was above 700 per cent of 1980, was in Kamrup and Dibrugarh district during the period 1980–1999. Similarly, in the district of Cacher, Goalpara, Lakhimpur and Nagaon, Sivasagor and the state as a whole the maximum change was between 600–700 per cent of the price of 1980. For three districts viz. Darrang, Karbi-Anglong and N.C.Hills it was between 500–600 per cent. But the extent of price change was not same in the two decades; it was much higher in 1990–99 than in 1980–89. During the period of 1980–89 the extent of price change was below 200 per cent in Darrang, Karbi-Anglong, Nagaon and N.C.Hills. Similarly, for Cacher, Dibrugarh, Goalpara, Lakhimpur and Sivasagor it was from 200 per cent to 300 per cent, but in Kamrup district it was above 300 per cent. During the next decade i.e. *1990–99*, the change of price was between *400 – 500* per cent in all the districts other than the two districts – Cacher and Dibrugarh where it was above 500 per cent. Further, the coefficient of variation values for all the districts and for the state as a whole was between 54 per cent and 65 per cent, which indicate that the price was more volatile over the years, although the variation in price of black gram may be considered uniform in all the districts.

4.2.9 Sugar:

The price of sugar as reflected by the index number in Table 4.19 seemed to come below the level of 1980 in the early years of eighties in most of the districts and in

TABLE - 4.18

INDEX NUMBER ON YEARLY AVERAGE PRICE OF BLACK GRAM IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE.

Year/Dist.	Cacher	Darrang	Dibrugarh	Goalpara	Kamrup	K.Anglong	Lakhimpur	Nagaon	N.C.Hills	Sivasagor	ASSAM
1980	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00
1981	111.80	92.25	100.00	94.13	96.85	92.31	109.95	97.66	121.01	115.43	102.81
1982	213.68	130.46	106.99	148.98	130.35	102.95	142.11	111.91	113.74	107.42	129.47
1983	202.53	149.13	155.20	183.49	173.28	130.06	185.74	136.41	131.53	155.86	157.29
1984	211.63	185.29	174.19	245.14	205.37	163.40	234.71	150.31	146.96	183.79	186.86
1985	264.01	167.59	182.08	275.32	248.73	163.88	242.18	179.69	169.33	189.65	204.45
1986	213.47	185.04	187.81	171.41	276.65	175.37	259.53	171.22	184.35	186.72	198.46
1987	258.59	193.89	205.73	222.02	292.24	174.73	259.34	186.25	217.03	216.41	219.26
1988	293.65	216.06	245.52	254.89	405.44	251.32	279.98	214.38	248.99	267.58	265.27
1989	365.50	240.31	318.64	325.08	352.97	220.63	307.48	238.44	272.60	347.27	292.22
1990	279.76	253.86	289.96	365.72	360.95	251.25	328.49	251.88	192.94	316.02	282.27
1991	388.13	352.19	617.56	404.14	523.75	327.05	413.12	349.44	410.92	673.05	433.76
1992	337.90	306.61	630.82	491.58	812.55	340.86	372.01	304.22	419.75	687.50	455.64
1993	345.54	313.70	630.11	533.47	512.15	330.36	310.98	311.09	419.27	686.72	428.49
1994	501.39	440.63	660.93	596.97	812.55	317.37	449.43	451.41	439.78	720.31	521.65
1995	777.85	631.97	835.13	772.07	774.11	500.25	744.13	700.31	475.79	750.00	677.14
1996	777.85	692.91	840.50	716.66	501.99	586.35	644.58	700.31	585.02	695.70	666.50
1997	796.60	685.20	688.17	476.54	636.33	524.71	601.91	717.19	672.55	794.14	655.28
1998	609.16	590.55	638.35	694.50	812.55	613.58	631.31	548.44	643.93	695.70	842.75
1999	741.06	677.17	728.67	797.93	832.12	671.17	776.13	667.19	536.61	794.14	721.38
C.V	57.42	62.30	63.40	56.78	57.36	59.37	54.55	65.19	56.87	61.81	57.29
1980-89*	265.50	148.06	218.64	230.95	308.59	159.01	207.48	140.78	172.60	247.27	192.22
1990-99*	516.84	439.05	550.54	432.21	471.17	419.92	465.15	465.31	479.61	478.12	439.11

* Range = (maximum - minimum) of index number

TABLE - 4.19

INDEX NUMBER ON YEARLY AVERAGE PRICE OF SUGAR IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE.

Year/Dist.	Cacher	Darrang	Dibrugarh	Goalpara	Kamrup	K.Anglong	Lakhimpur	Nagaon	N.C.Hills	Sivasagor	ASSAM
1980	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100.00	100	100.00
1981	103.97	103.65	128.36	109.61	102.97	109.63	103.66	103.72	112.16	137.12	110.14
1982	79.55	80.40	99.17	83.78	79.66	79.52	79.41	81.83	99.41	105.59	85.79
1983	72.72	73.77	87.56	77.45	72.74	74.17	73.65	75.21	86.67	91.71	77.82
1984	80.59	82.53	95.03	85.14	78.55	81.09	82.87	91.23	98.13	100.54	86.85
1985	97.96	96.23	112.77	95.32	94.84	92.24	88.66	94.20	109.23	118.4	98.97
1986	94.41	95.05	105.80	100.57	94.84	95.12	97.06	95.77	107.38	111.89	99.16
1987	95.60	94.68	120.73	106.33	93.42	98.25	97.72	98.55	109.29	129.1	103.01
1988	103.63	137.24	125.37	111.77	105.52	101.80	105.96	109.21	116.73	151.71	115.48
1989	124.00	126.90	163.35	128.90	124.95	107.50	128.70	133.38	132.90	186.31	133.17
1990	122.62	139.07	187.89	148.04	135.26	130.02	133.59	138.30	130.83	196.94	143.35
1991	136.04	135.42	242.29	132.50	136.74	139.98	138.61	139.81	145.15	232.79	153.17
1992	151.10	136.45	269.32	145.25	140.26	153.70	143.50	143.41	161.22	212.52	161.29
1993	173.30	142.72	280.10	151.92	146.67	166.32	171.55	149.97	215.26	246.04	179.69
1994	211.51	164.62	295.19	175.24	178.88	223.39	212.00	182.90	235.22	312.07	214.05
1995	206.30	208.66	284.91	214.22	212.95	229.45	211.06	217.73	241.60	310.72	229.71
1996	218.94	228.74	307.46	230.02	210.48	251.31	219.26	215.21	264.60	296.76	240.72
1997	229.26	238.35	325.54	220.83	222.42	249.00	231.04	227.42	262.18	335.86	249.55
1998	246.02	242.66	338.81	244.92	236.27	261.62	253.26	241.58	275.47	365.95	265.61
1999	249.49	243.59	338.06	261.95	252.04	246.81	252.07	257.70	259.87	357.39	267.16
C.V	40.65	39.49	46.51	39.00	39.83	44.13	41.13	39.25	41.16	45.54	41.21
1980-89*	51.28	63.47	75.79	51.45	52.21	33.33	55.05	58.17	46.23	94.60	55.35
1990-99*	126.87	108.17	150.92	129.45	116.78	131.60	119.67	119.40	144.64	169.01	123.81

* Range = (maximum - minimum) of index number

TABLE - 4.20

COMMODITIES UNDER DIFFERENT RANGE OF PRICE VARIATION IN DIFFERENT DISTRICTS DURING 1980-1999.

Range of Index number	Cacher	Darrang	Dibrugarh	Goalpara	Kamrup	K.Anglong	Lakhimpur	Nagaon	N.C.Hills	Sivasagor	ASSAM
Below 200%	Sugar	Sugar		Sugar	Sugar	Sugar	Sugar	Sugar	Sugar	Mustard	Sugar
Between 200-400 %	Rice(com) Rice(fine) Mustard	Rice(com) Rice (fine)	Sugar Mustard	Rice (com) Rice (fine) Mustard Potato	Rice(com) Rice(fine) Potato	Rice(com) Rice(fine) Mustard Potato	Rice(com) Rice(fine) Mustard Potato	Rice(com) Mustard Potato	Rice(com) Rice(fine) Mustard Potato	Rice(com) Sugar	Rice(com) Rice(fine) Mustard Potato
Between 400-600 %	Potato Lentil Greengram	Mustard Potato Lentil Greengram	Rice(com) Rice(fine) Potato	Lentil Greengram	Mustard Lentil Greengram	Lentil Greengram Blackgram	Lentil Greengram	Rice(fine) Lentil Greengram Onion	Lentil Greengram Blackgram	Rice(fine) Potato	Lentil Greengram
Between 600-800 %	Blackgram	Blackgram	Lentil Greengram Black gram	Blackgram Onion	Blackgram		Blackgram	Blackgram	Onion	Lentil Greengram Blackgram	Blackgram Onion
800 % and above	Onion	Onion	Onion		Onion	Onion	Onion			Onion	

the state as a whole. For Cacher, Darrang, Kamrup, Karbi-Anglong, Lakhimpur and Nagaon it was up to 1987 that the price came below the level of 1980. The highest rise seemed to occur in Sivasagor from 91.71 to 365.95 and least rise in Darrang district from 73.77 to 243.59. Further, the index number for 1983 in all the districts were minimum during the whole period, which showed that the price of sugar in that particular year was minimum in all the districts during the period of study. Further, comparing the range of index number of the period 1980–89 with that of 1990–99, it may be concluded that price escalation during 1980–89 was lower than that of 1990–99. The highest range of price escalation in both the decades were in Sivasagor districts as indicated by range of index numbers 94.60 and 169.01 respectively. As compared to the other commodities, price escalation in both the periods was much less for sugar. Further it is observed that the coefficient of variation for all districts and the state as a whole were between 39.00 to 46.51 per cent indicating a variation of price over the years in all districts and Assam as a whole. However, the proportion of increment of prices over the minimum ones may be considered more or less uniform during the period under study.

The summary of the result and discussion made thus far has been presented in the Table 4.20. It is found that by and large sugar and onion are the only commodities, which suffers least and most respectively from price variation in the state. For sugar it was below 200 per cent and for onion it was 800 per cent and more. On the other hand the price variation for both types of rice, mustard and potato remained largely within 400 per cent in the state. Referring to the price variation in the three particular pulse commodities, viz, lentil, green gram and black gram in different districts of Assam it was found to be fluctuating between 400 – 800 per cent all over the state.

4.3 TREND IN PRICE OF AGRICULTURAL COMMODITIES

To analyze the price trend of each commodity in different districts of Assam the following functional forms were obtained using the observed prices of the commodities as discussed in the section 3.4.3 of Chapter III.

(a) Linear $Y = a + bx$

TABLE - 4.21

COEFFICIENT OF DETERMINATION (R SQUARE) UNDER DIFFERENT TREND EQUATIONS FOR DIFFERENT COMMODITIES .

Commodity / District	Onion			Lentil			Green Gram			Black Gram			Sugar		
	1	2	3	1	2	3	1	2	3	1	2	3	1	2	3
Cachar	0.5830	0.6708	0.8625	0.8650	0.7602	0.9584	0.8883	0.7231	0.9464	0.8210	0.8415	0.8936	0.8703	0.5909	0.8779
Darrang	0.6523	0.7445	0.8511	0.8947	0.7902	0.9377	0.9065	0.7827	0.9277	0.8630	0.8260	0.9532	0.8463	0.5941	0.8869
Dibrugarh	0.5740	0.6753	0.8476	0.8672	0.7740	0.9656	0.9165	0.7866	0.9637	0.8626	0.8416	0.9153	0.9028	0.6772	0.8900
Goalpara	0.8035	0.7387	0.8826	0.9101	0.7741	0.9665	0.9165	0.7611	0.9587	0.8810	0.8699	0.9046	0.8596	0.6031	0.8849
Kamrup	0.6087	0.7183	0.6720	0.8983	0.8347	0.9590	0.8822	0.7329	0.9114	0.8450	0.9038	0.8856	0.8619	0.5848	0.8763
K.Anglong	0.5703	0.6409	0.8642	0.8647	0.7649	0.9583	0.8874	0.7830	0.9662	0.9005	0.8434	0.9710	0.8389	0.5635	0.8551
Lakhimpur	0.5760	0.7002	0.8689	0.8700	0.7594	0.9531	0.9037	0.7639	0.9608	0.8701	0.8937	0.9233	0.8753	0.6015	0.8862
Nagaon	0.8086	0.7886	0.8719	0.8800	0.7649	0.9632	0.9212	0.7552	0.9580	0.8377	0.8107	0.9514	0.8705	0.6102	0.8924
N.C.Hills	0.6611	0.7065	0.8835	0.9006	0.8025	0.9713	0.9175	0.7984	0.9798	0.9054	0.8350	0.9466	0.8615	0.6291	0.8896
Sivsagor	0.5702	0.6996	0.8441	0.8828	0.7968	0.9698	0.9238	0.8443	0.9762	0.8906	0.8501	0.9191	0.9124	0.7019	0.9148

Trend equations-

1. $Y = a + bx$
2. $Y = ax^{b}$
3. $Y = ae^{bx}$

TABLE- 4.21

COEFFICIENT OF DETERMINATION (R SQUARE) UNDER DIFFERENT TREND EQUATIONS FOR DIFFERENT COMMODITIES.

Commodity / District	Rice (Common)			Rice (Fine)			Mustard			Potato		
	1	2	3	1	2	3	1	2	3	1	2	3
Cacher	0.9423	0.8631	0.9600	0.9372	0.8700	0.9400	0.9094	0.8359	0.9369	0.7808	0.7100	0.9091
Darrang	0.8272	0.6454	0.8318	0.7781	0.5900	0.7386	0.5460	0.5369	0.6495	0.7868	0.7474	0.8965
Dibrugarh	0.9366	0.8805	0.9748	0.9849	0.9639	0.9428	0.6045	0.4843	0.7643	0.7460	0.7028	0.8553
Goalpara	0.9239	0.8121	0.9850	0.8697	0.7940	0.9564	0.8722	0.7382	0.8625	0.7292	0.6018	0.7729
Kamrup	0.9307	0.8291	0.9629	0.7337	0.6294	0.8070	0.7547	0.7039	0.8594	0.7364	0.7166	0.7993
K.Anglong	0.9166	0.7995	0.9724	0.9160	0.7894	0.9702	0.9080	0.8336	0.9317	0.5418	0.5963	0.6953
Lakhimpur	0.9041	0.8030	0.9737	0.8954	0.7946	0.9727	0.9535	0.8407	0.9614	0.7191	0.6619	0.8726
Nagaon	0.8802	0.7594	0.9570	0.8008	0.6993	0.8939	0.9221	0.8279	0.9312	0.6104	0.6399	0.7619
N.C.hills	0.9405	0.8330	0.9805	0.9513	0.8785	0.9508	0.9093	0.8354	0.9370	0.7705	0.7285	0.9067
Sivasagor	0.9547	0.8549	0.9809	0.9462	0.8893	0.9647	0.8804	0.6703	0.9009	0.7114	0.7033	0.8710

Trend equations- $Y=a+bx$

$Y=a \times b$

$Y=a\, e^{bx}$

contd..

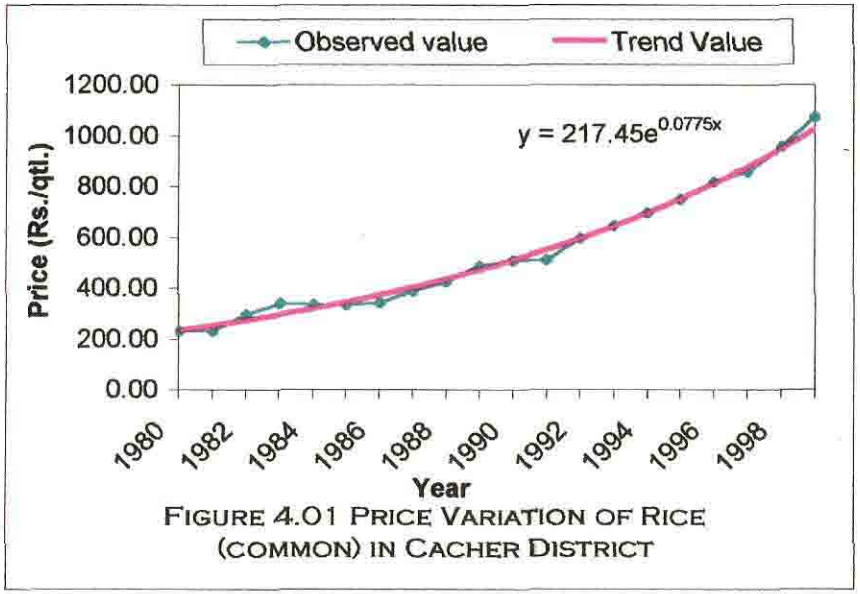

FIGURE 4.01 PRICE VARIATION OF RICE (COMMON) IN CACHER DISTRICT

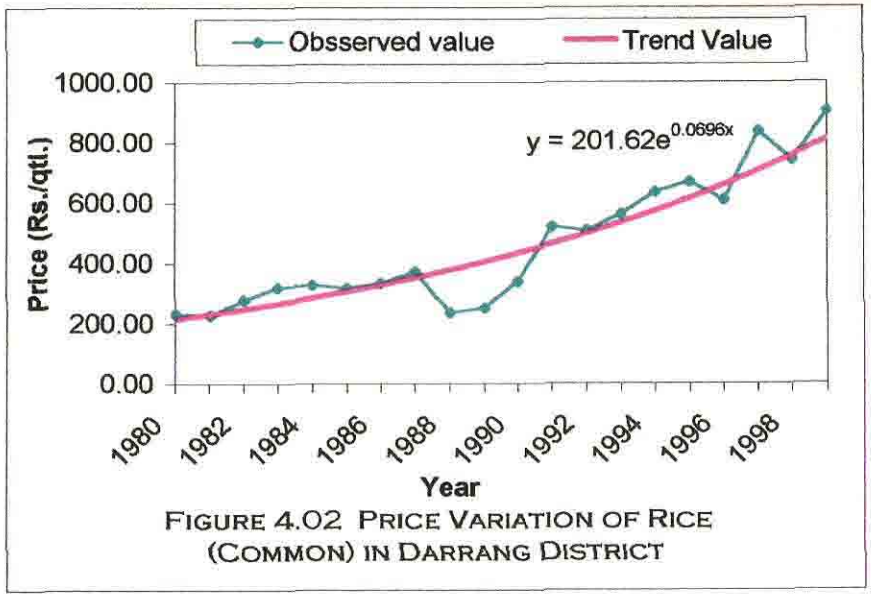

FIGURE 4.02 PRICE VARIATION OF RICE (COMMON) IN DARRANG DISTRICT

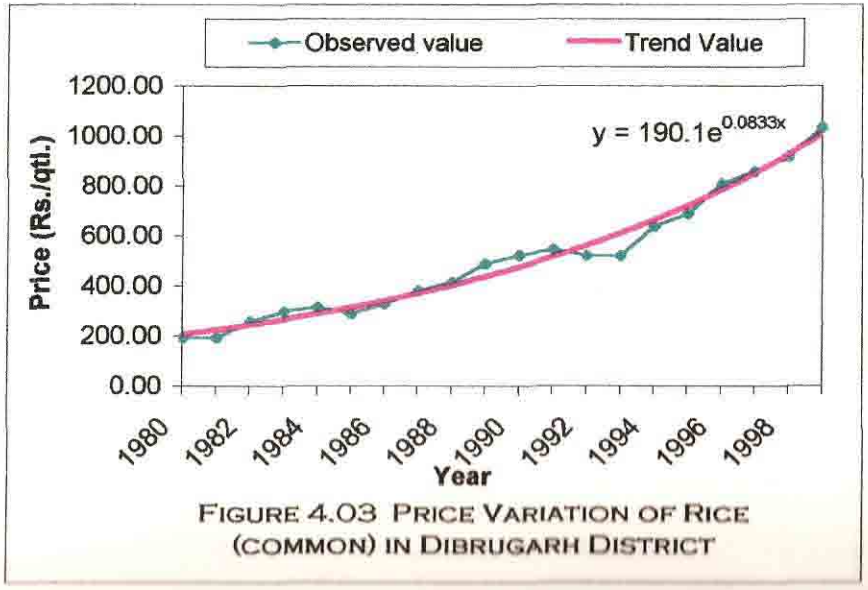

FIGURE 4.03 PRICE VARIATION OF RICE (COMMON) IN DIBRUGARH DISTRICT

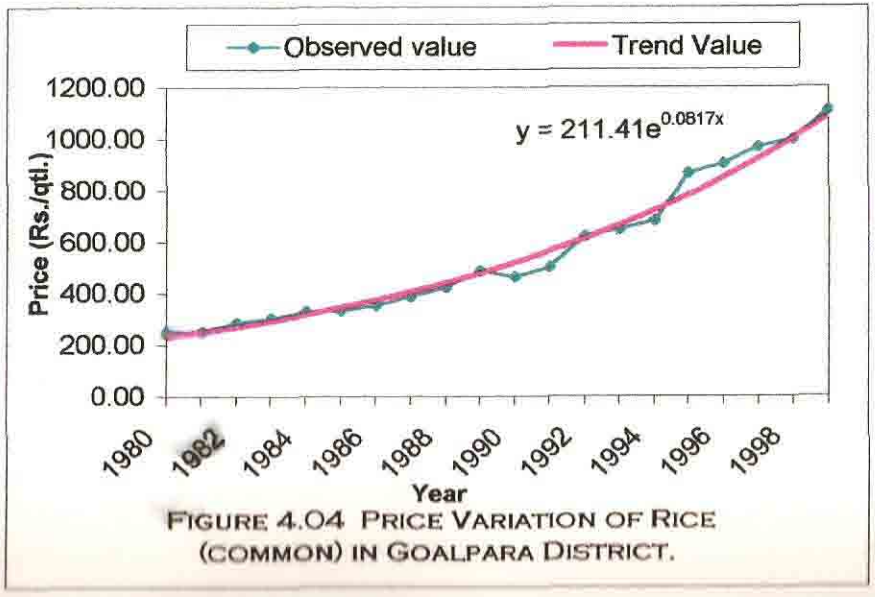

FIGURE 4.04 PRICE VARIATION OF RICE (COMMON) IN GOALPARA DISTRICT.

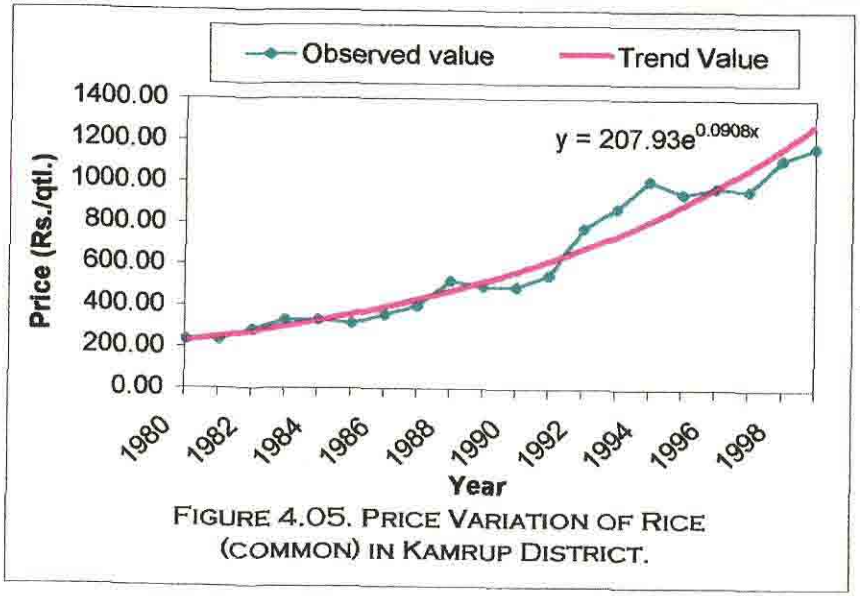

FIGURE 4.05. PRICE VARIATION OF RICE (COMMON) IN KAMRUP DISTRICT.

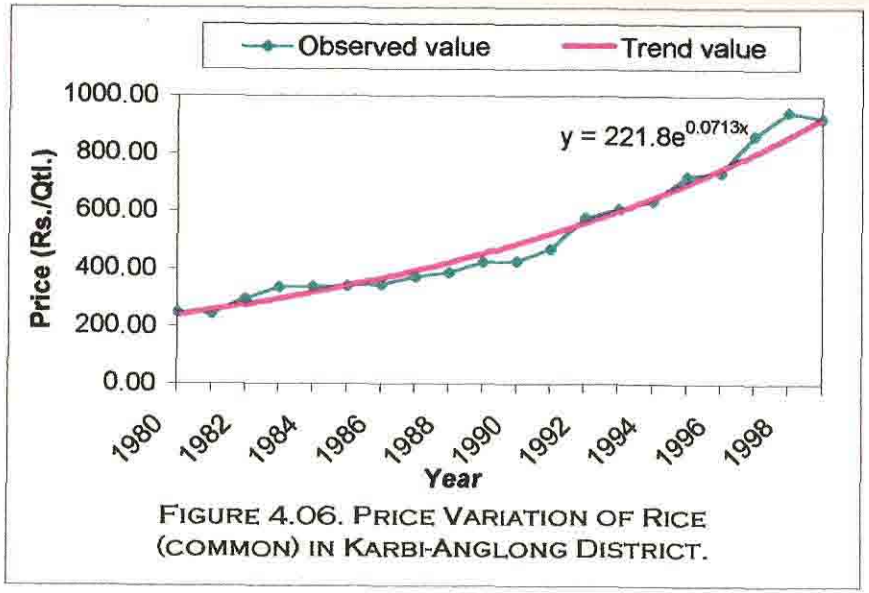

FIGURE 4.06. PRICE VARIATION OF RICE (COMMON) IN KARBI-ANGLONG DISTRICT.

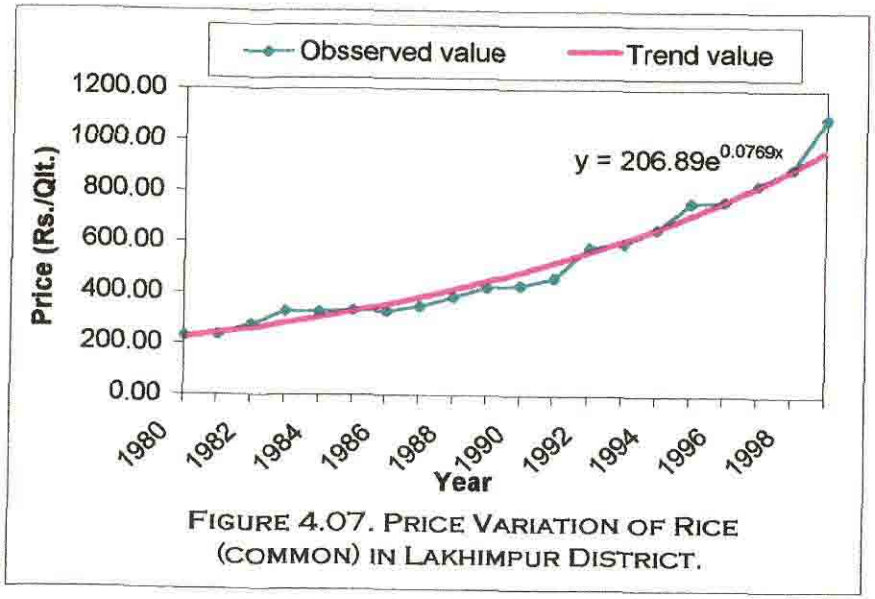

FIGURE 4.07. PRICE VARIATION OF RICE (COMMON) IN LAKHIMPUR DISTRICT.

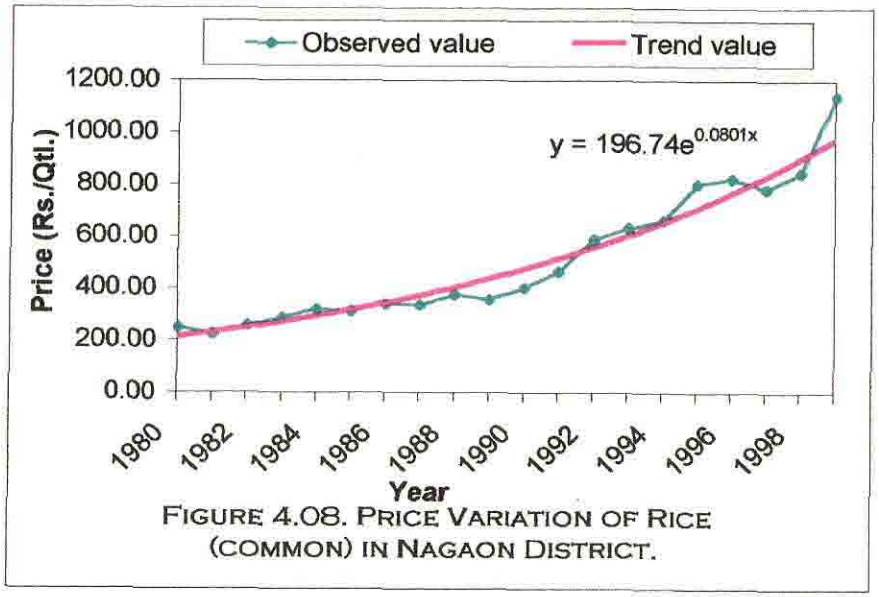

FIGURE 4.08. PRICE VARIATION OF RICE (COMMON) IN NAGAON DISTRICT.

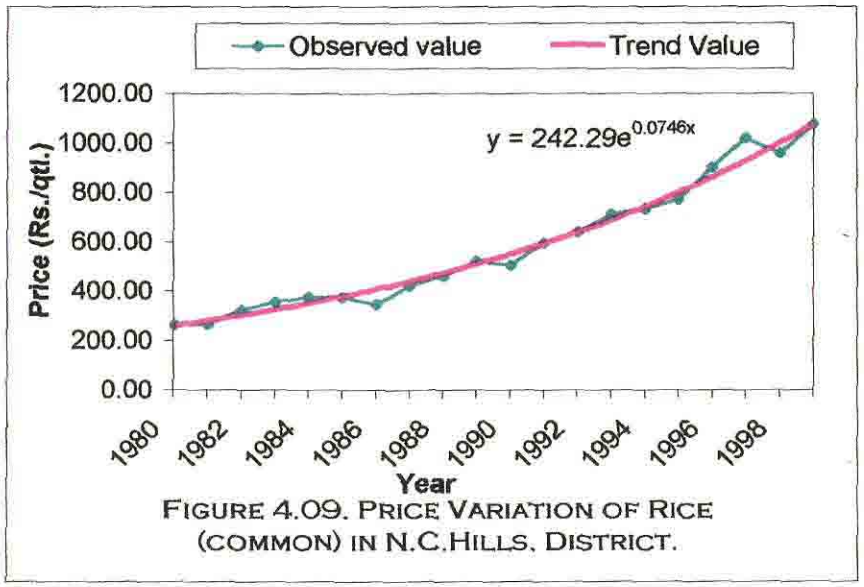

FIGURE 4.09. PRICE VARIATION OF RICE (COMMON) IN N.C.HILLS. DISTRICT.

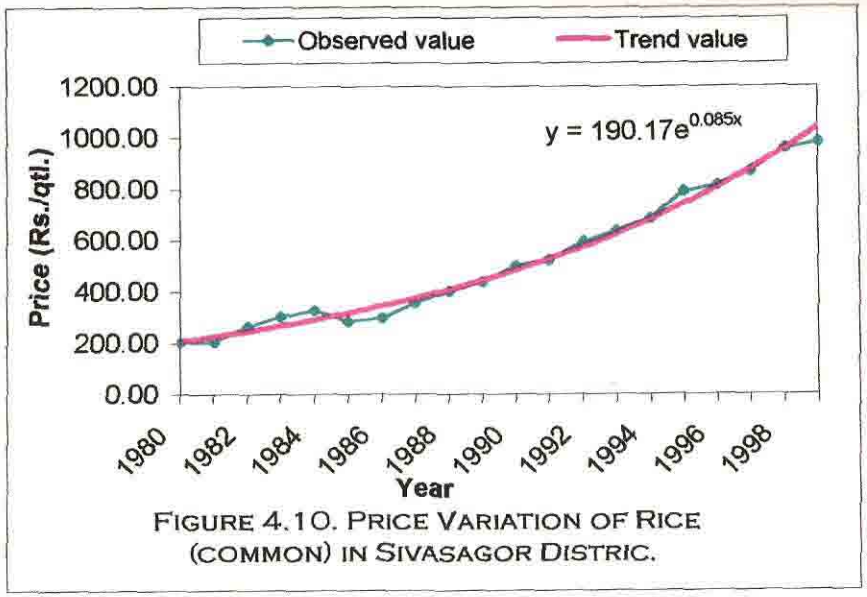

FIGURE 4.10. PRICE VARIATION OF RICE (COMMON) IN SIVASAGOR DISTRIC.

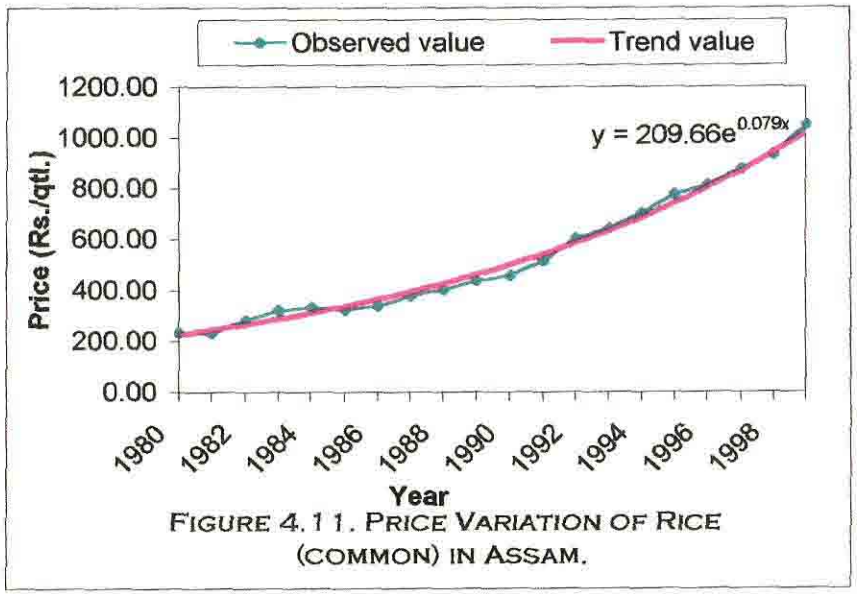

FIGURE 4.11. PRICE VARIATION OF RICE (COMMON) IN ASSAM.

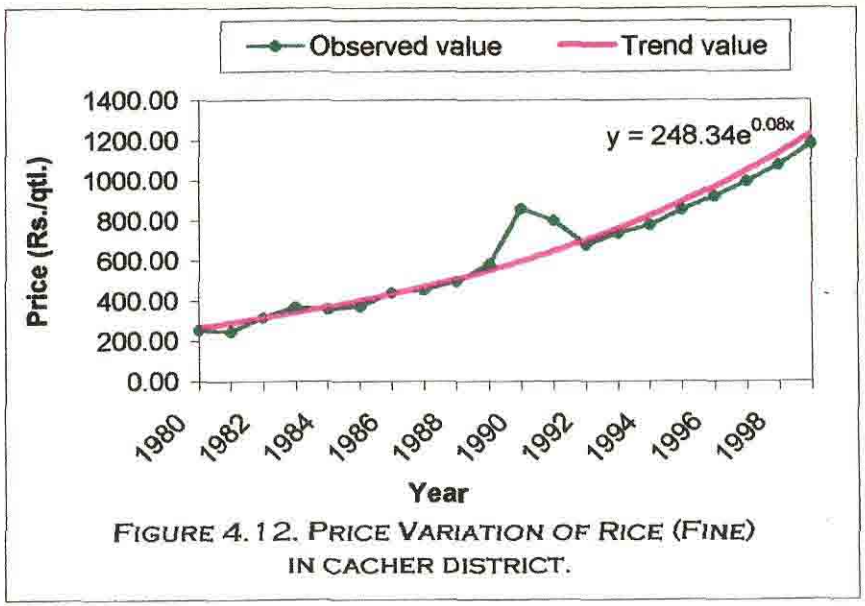

FIGURE 4.12. PRICE VARIATION OF RICE (FINE) IN CACHER DISTRICT.

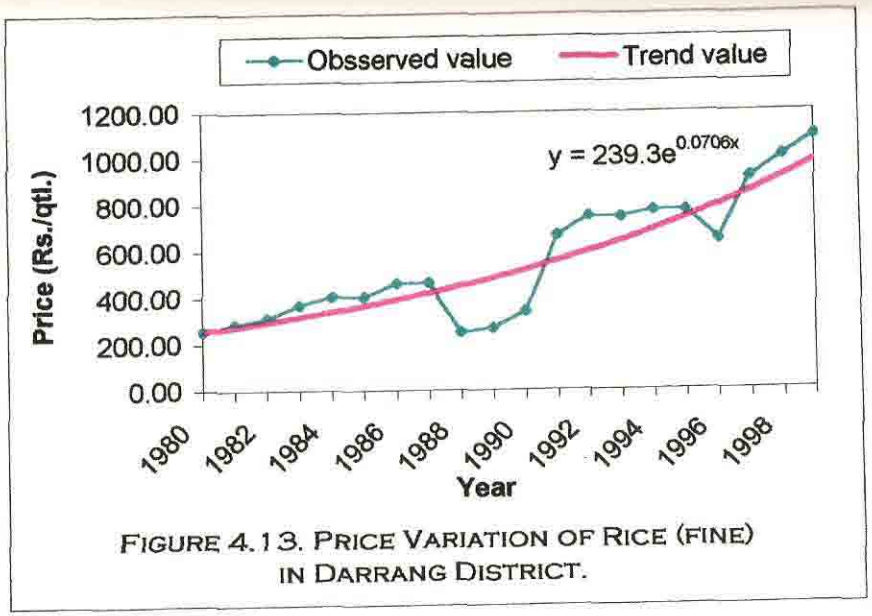

FIGURE 4.13. PRICE VARIATION OF RICE (FINE) IN DARRANG DISTRICT.

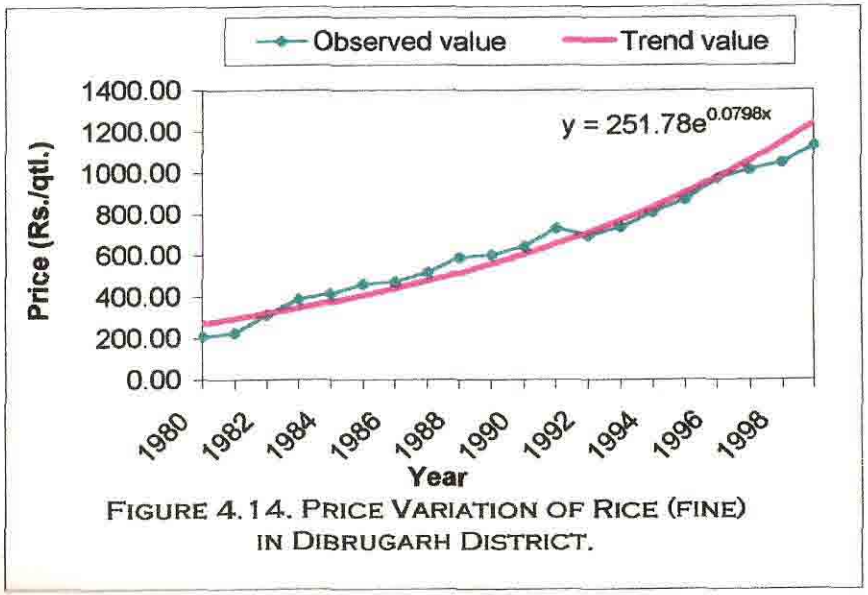

FIGURE 4.14. PRICE VARIATION OF RICE (FINE) IN DIBRUGARH DISTRICT.

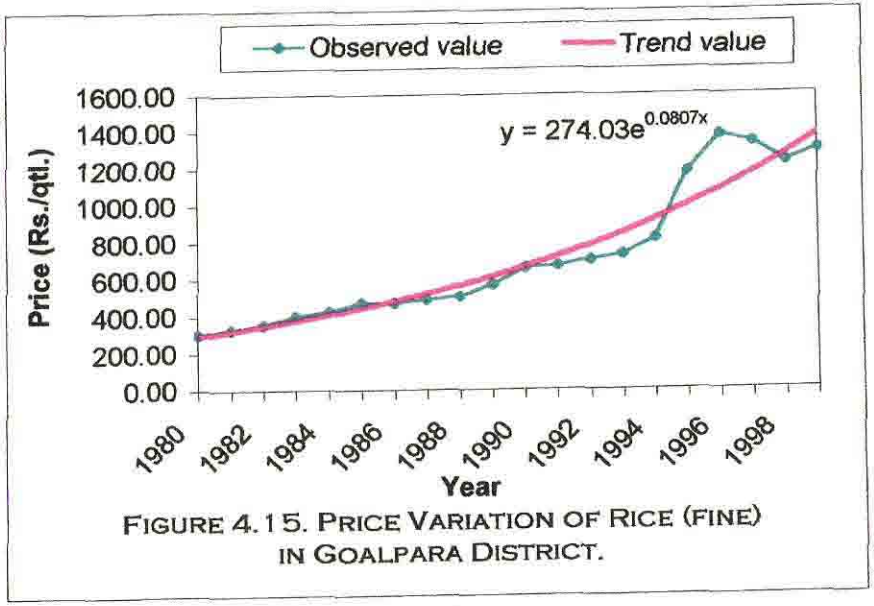

FIGURE 4.15. PRICE VARIATION OF RICE (FINE) IN GOALPARA DISTRICT.

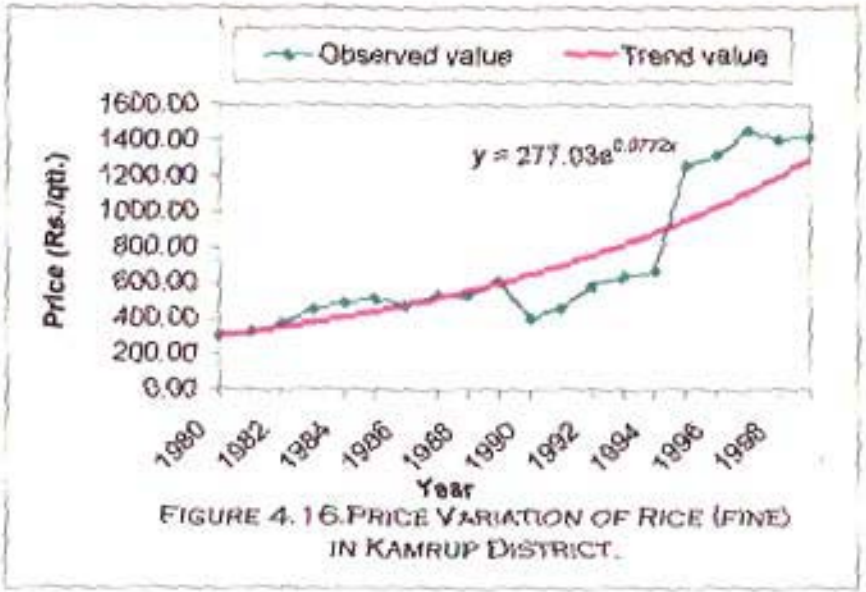

FIGURE 4.16. PRICE VARIATION OF RICE (FINE) IN KAMRUP DISTRICT.

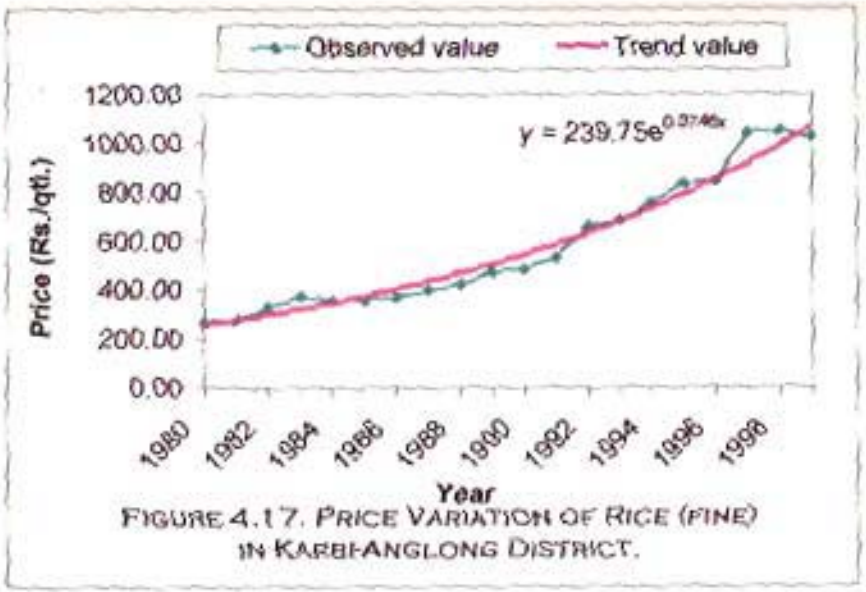

FIGURE 4.17. PRICE VARIATION OF RICE (FINE) IN KARBI-ANGLONG DISTRICT.

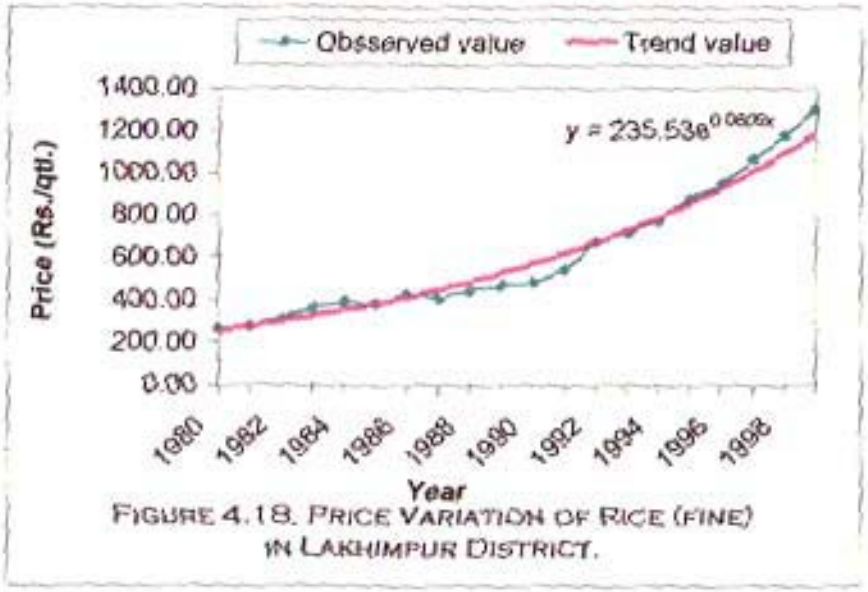

FIGURE 4.18. PRICE VARIATION OF RICE (FINE) IN LAKHIMPUR DISTRICT.

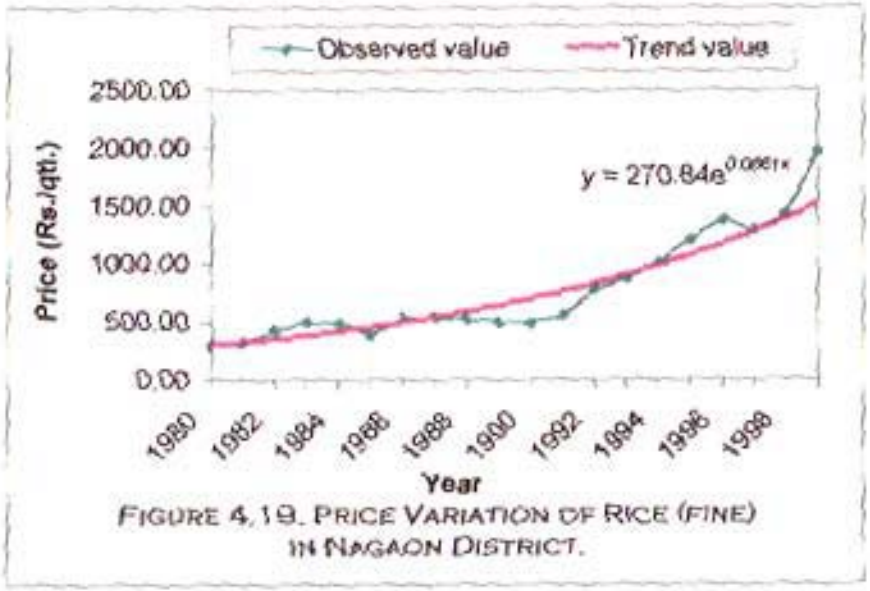

FIGURE 4.19. PRICE VARIATION OF RICE (FINE) IN NAGAON DISTRICT.

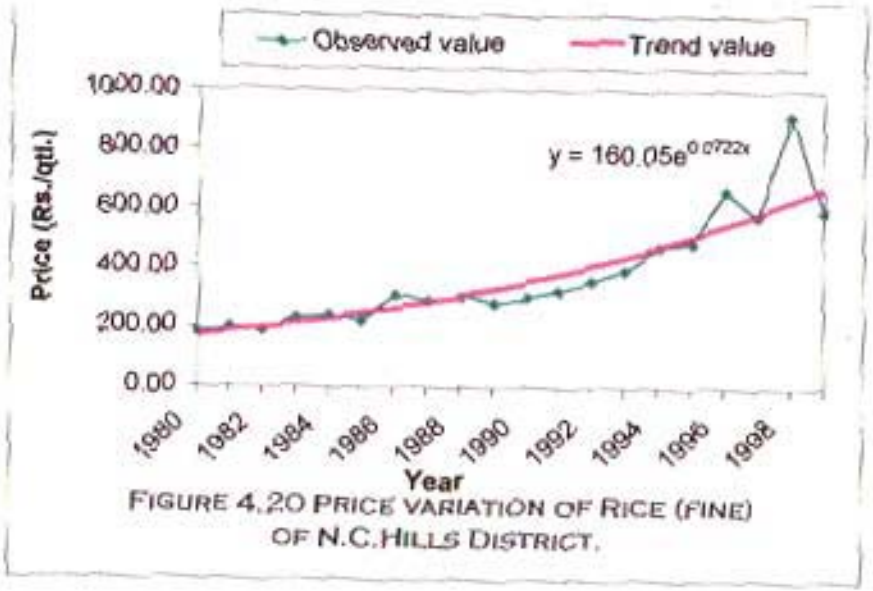

FIGURE 4.20 PRICE VARIATION OF RICE (FINE) OF N.C.HILLS DISTRICT.

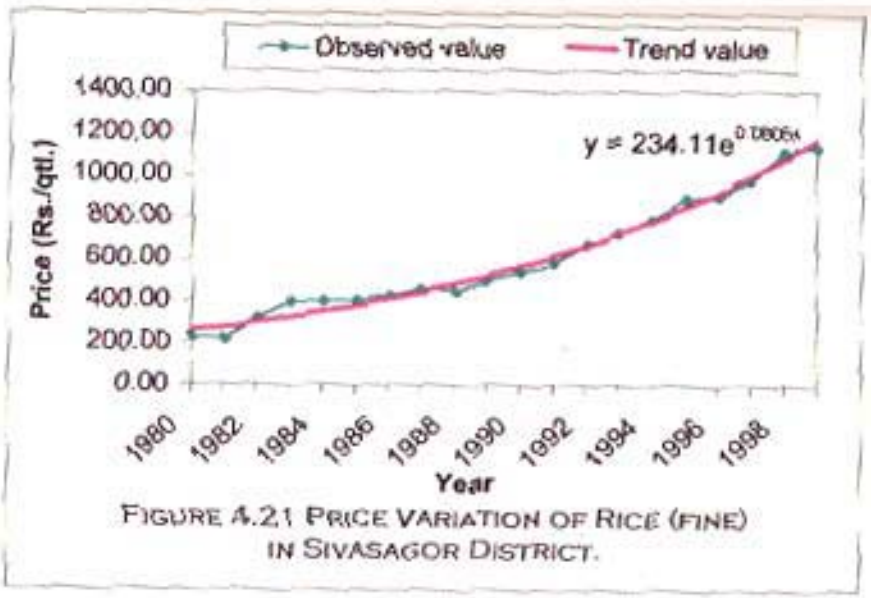

FIGURE 4.21 PRICE VARIATION OF RICE (FINE) IN SIVASAGOR DISTRICT.

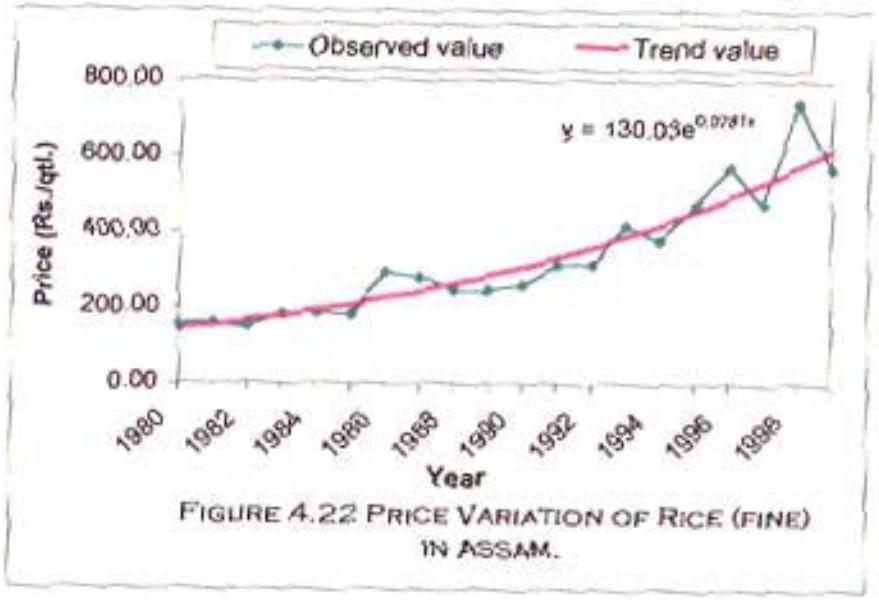

FIGURE 4.22 PRICE VARIATION OF RICE (FINE) IN ASSAM.

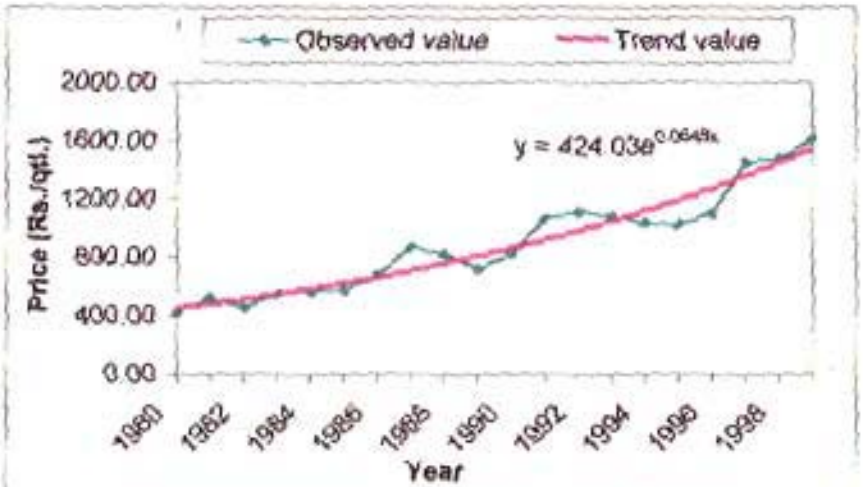

FIGURE 4.23. PRICE VARIATION OF MUSTARD IN CACHER DISTRICT.

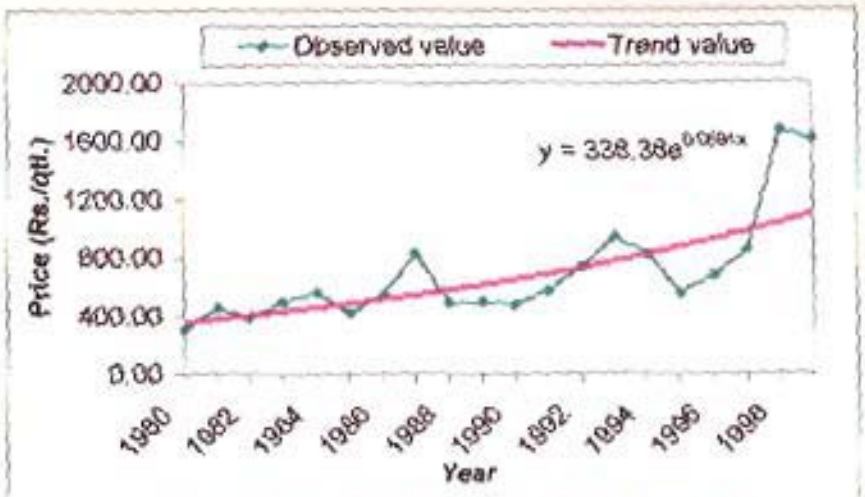

FIGURE 4.24. PRICE VARIATION OF MUSTARD IN DARRANG DISTRICT

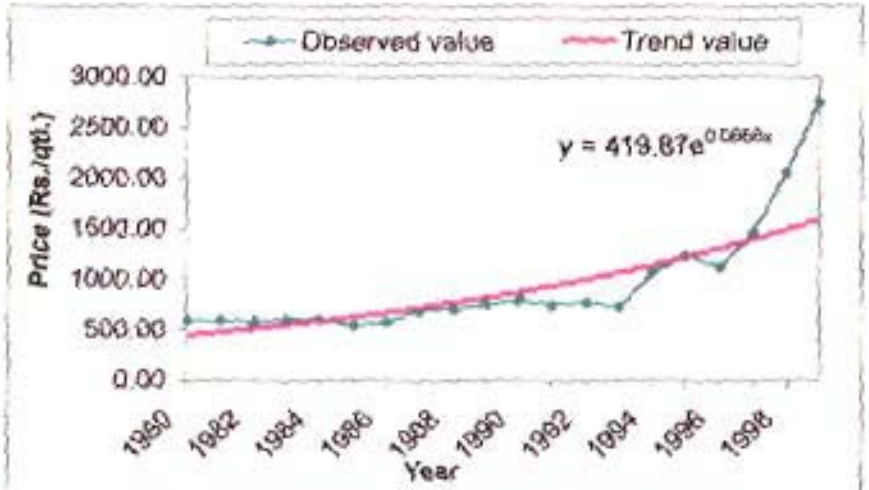

FIGURE 4.25. PRICE VARIATION OF MUSTARD IN DIBRUGARH DISTRICT.

FIGURE 4.26. PRICE VARIATION OF MUSTARD IN GOALPARA DISTRICT.

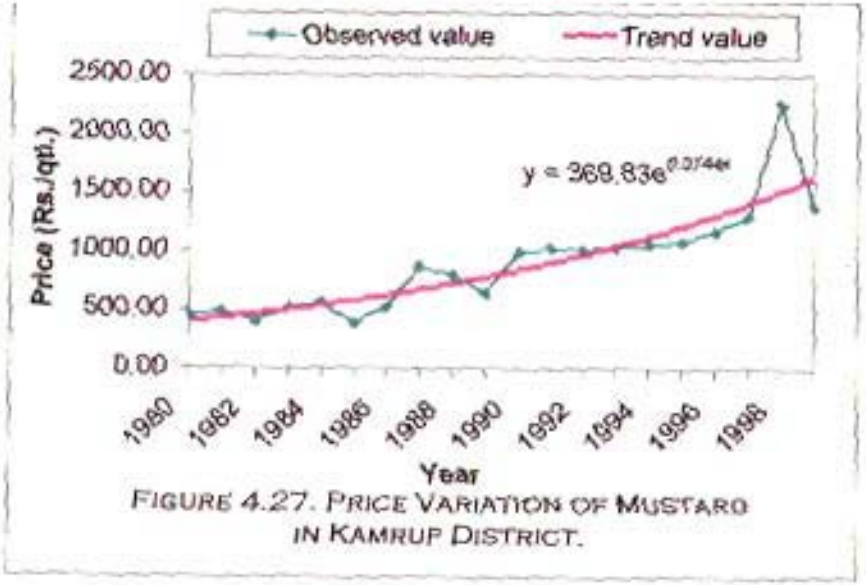

FIGURE 4.27. PRICE VARIATION OF MUSTARD IN KAMRUP DISTRICT.

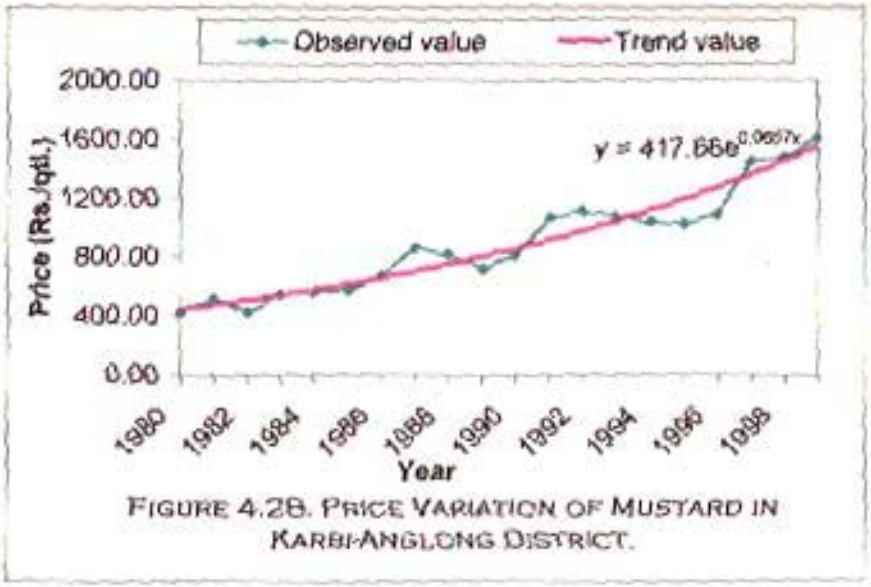

FIGURE 4.28. PRICE VARIATION OF MUSTARD IN KARBI-ANGLONG DISTRICT.

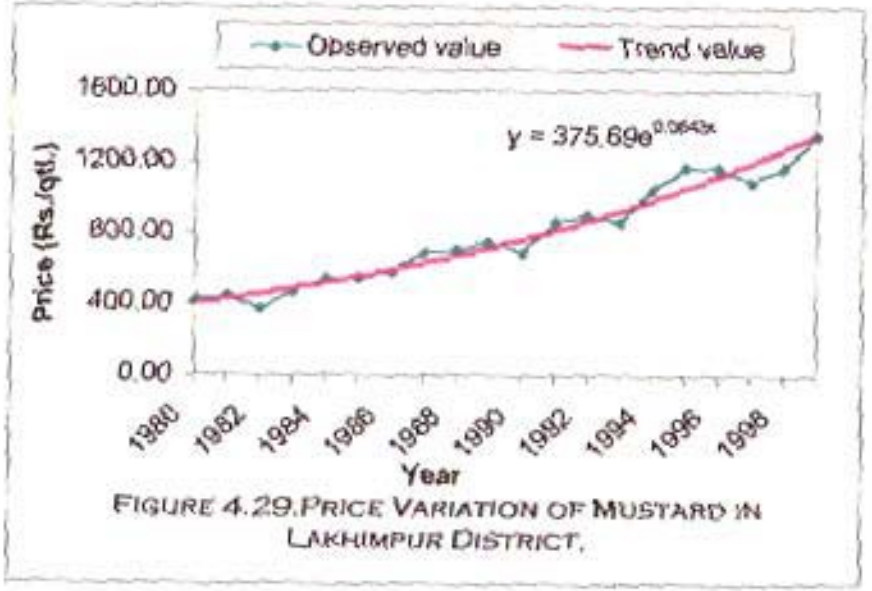

FIGURE 4.29.PRICE VARIATION OF MUSTARD IN LAKHIMPUR DISTRICT.

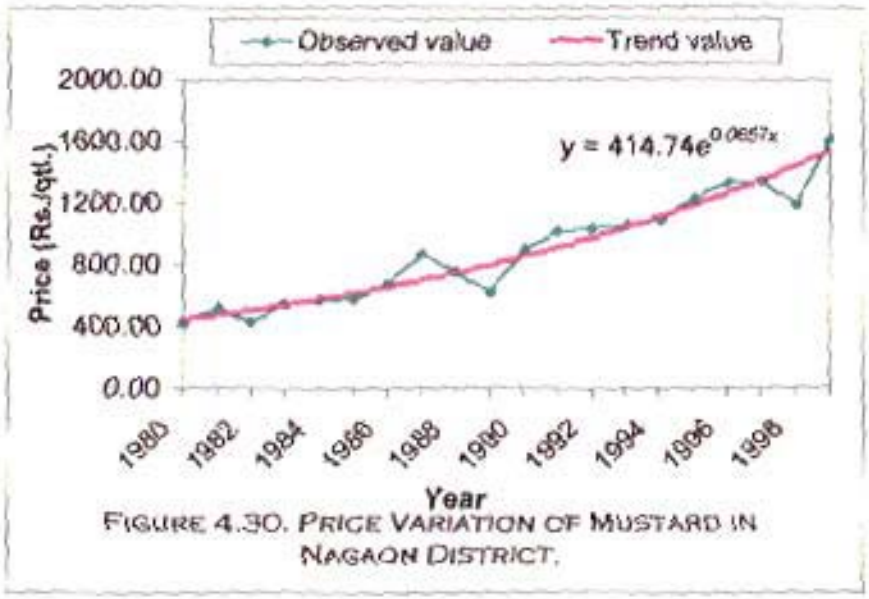

FIGURE 4.30. PRICE VARIATION OF MUSTARD IN NAGAON DISTRICT.

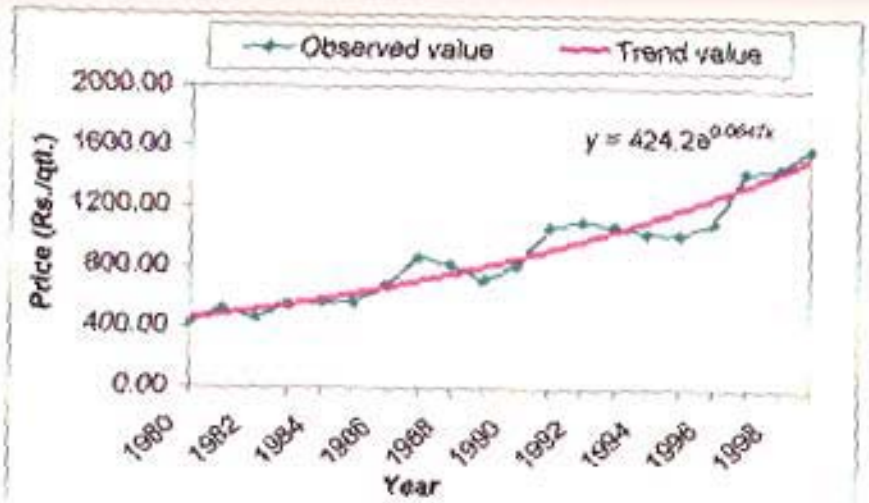

FIGURE 4.31. PRICE VARIATION OF MUSTARD IN N.C.HILLS DISTRICT.

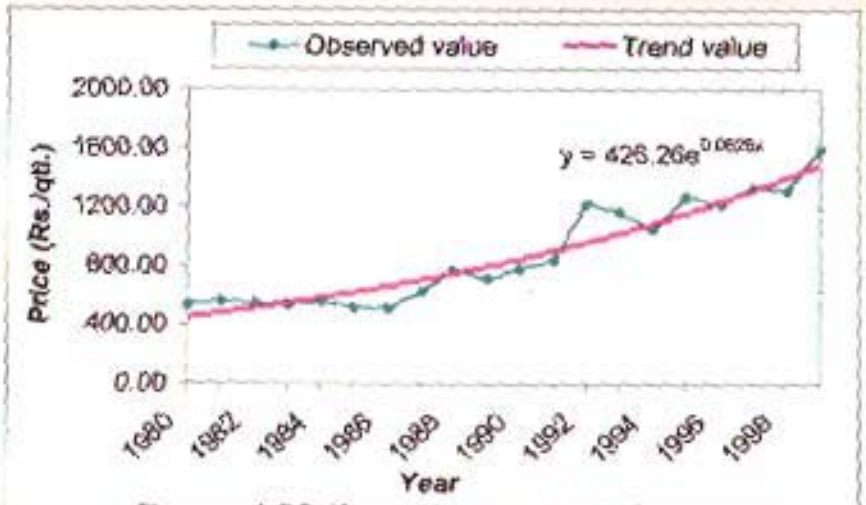

FIGURE 4.32. PRICE VARIATION OF MUSTARD IN SIVASAGOR DISTRICT.

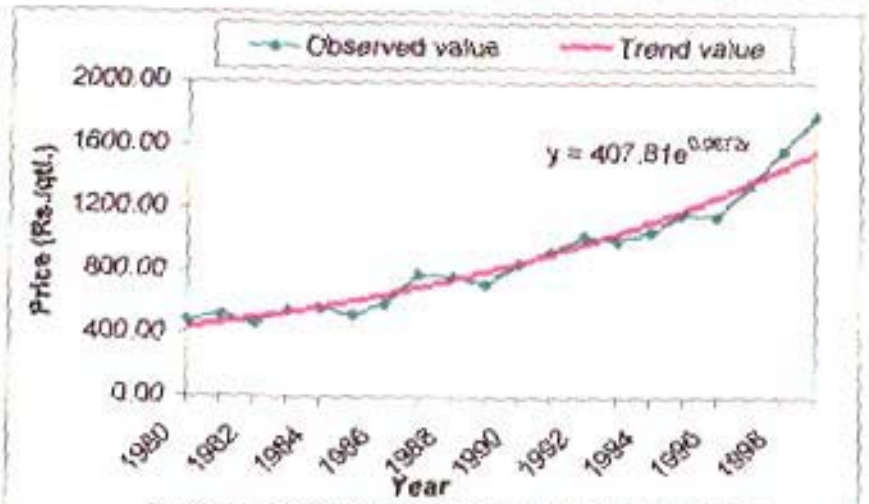

FIGURE 4.33. PRICE VARIATION OF MUSTARD IN ASSAM.

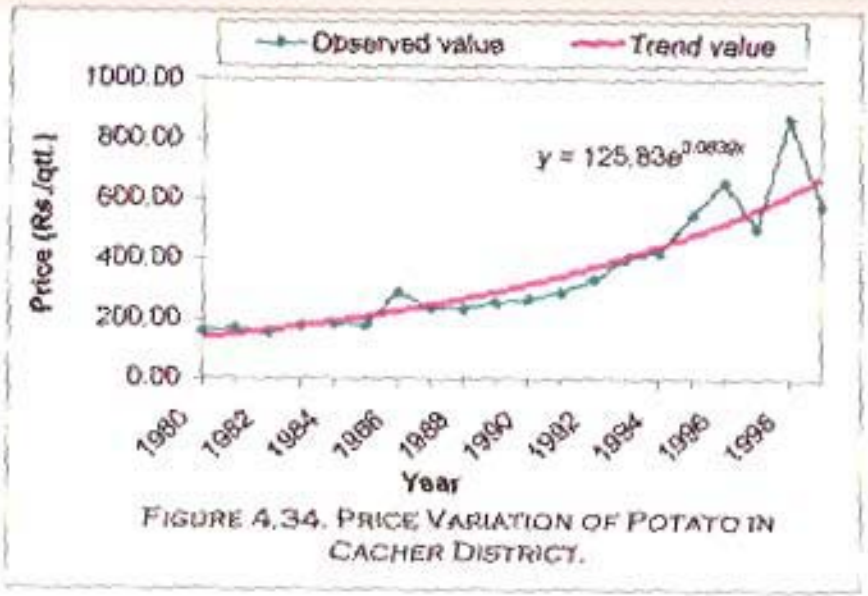

FIGURE 4.34. PRICE VARIATION OF POTATO IN CACHER DISTRICT.

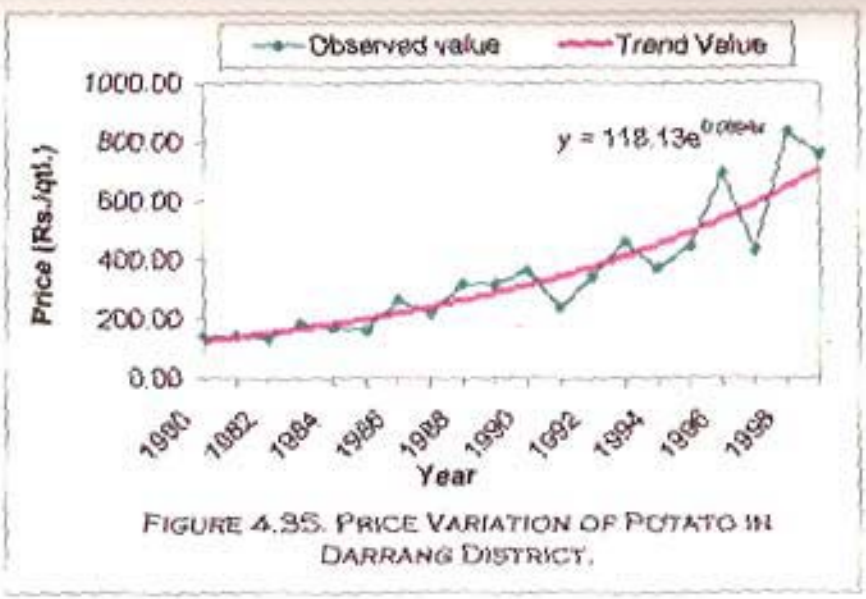

FIGURE 4.35. PRICE VARIATION OF POTATO IN DARRANG DISTRICT.

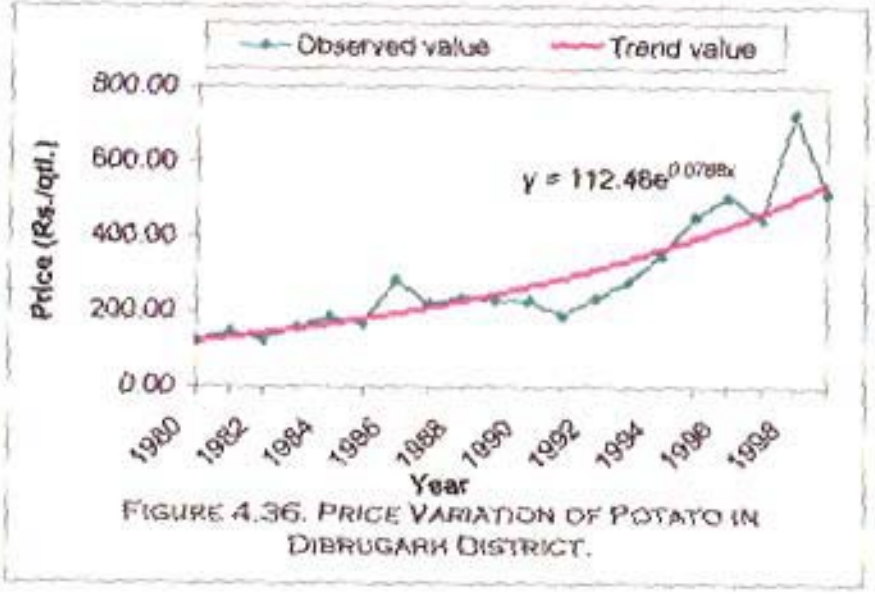

FIGURE 4.36. PRICE VARIATION OF POTATO IN DIBRUGARH DISTRICT.

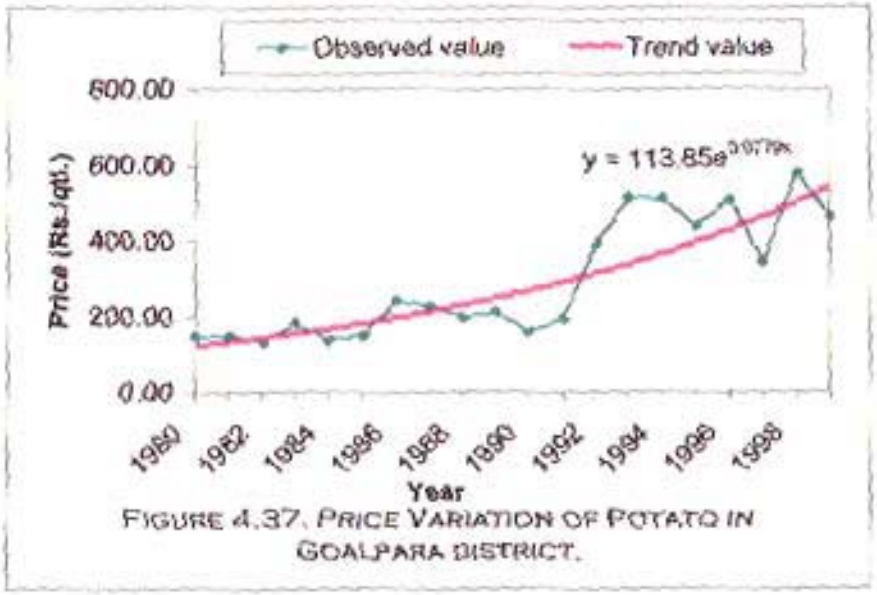

FIGURE 4.37. PRICE VARIATION OF POTATO IN GOALPARA DISTRICT.

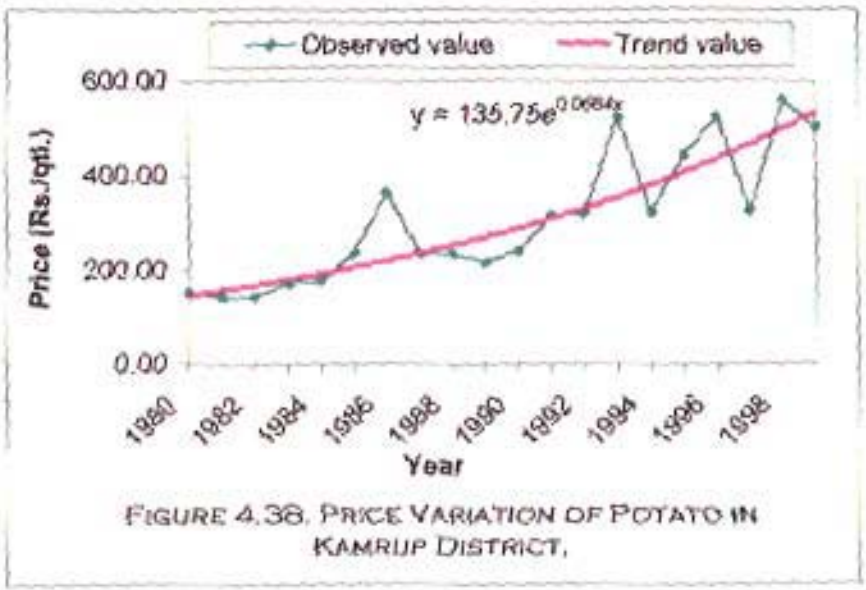

FIGURE 4.38. PRICE VARIATION OF POTATO IN KAMRUP DISTRICT.

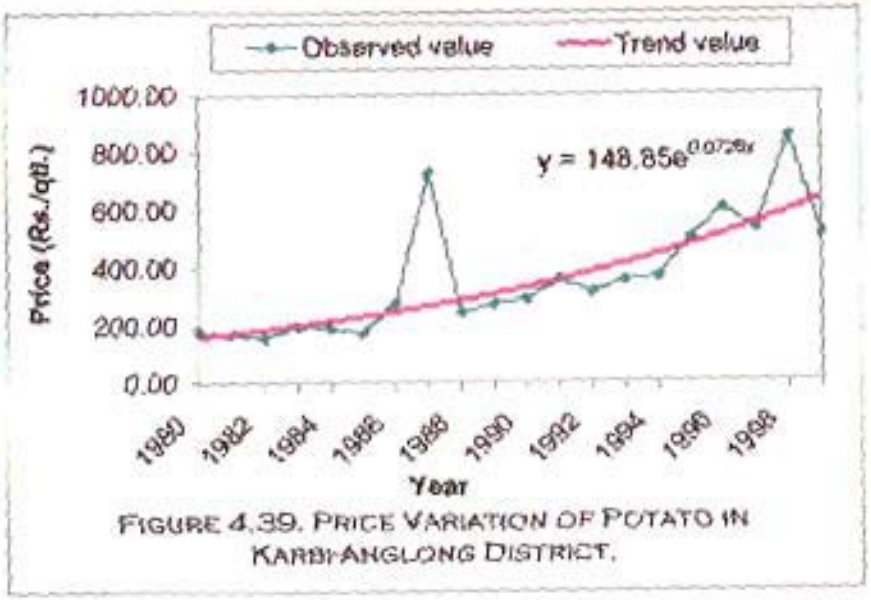

FIGURE 4.39. PRICE VARIATION OF POTATO IN KARBI ANGLONG DISTRICT.

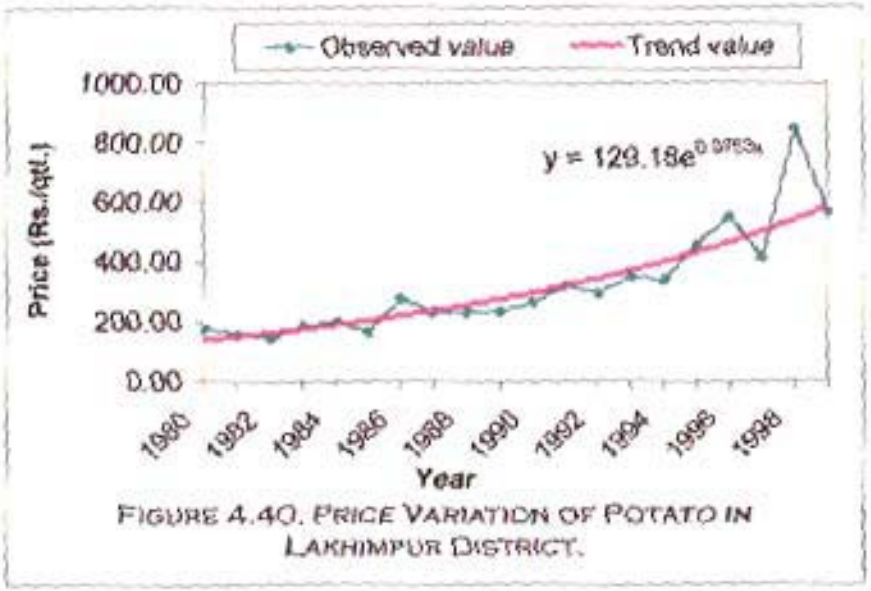

FIGURE 4.40. PRICE VARIATION OF POTATO IN LAKHIMPUR DISTRICT.

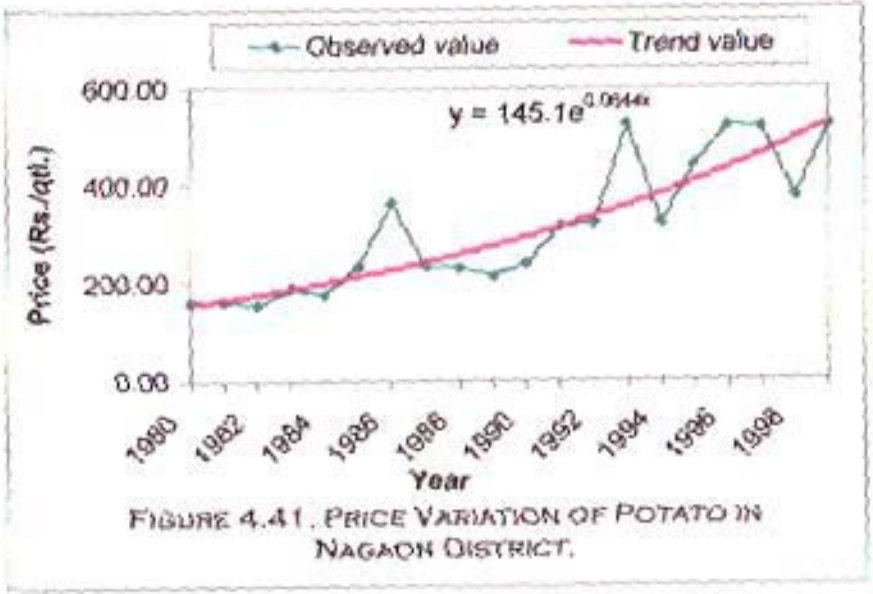

FIGURE 4.41. PRICE VARIATION OF POTATO IN NAGAON DISTRICT.

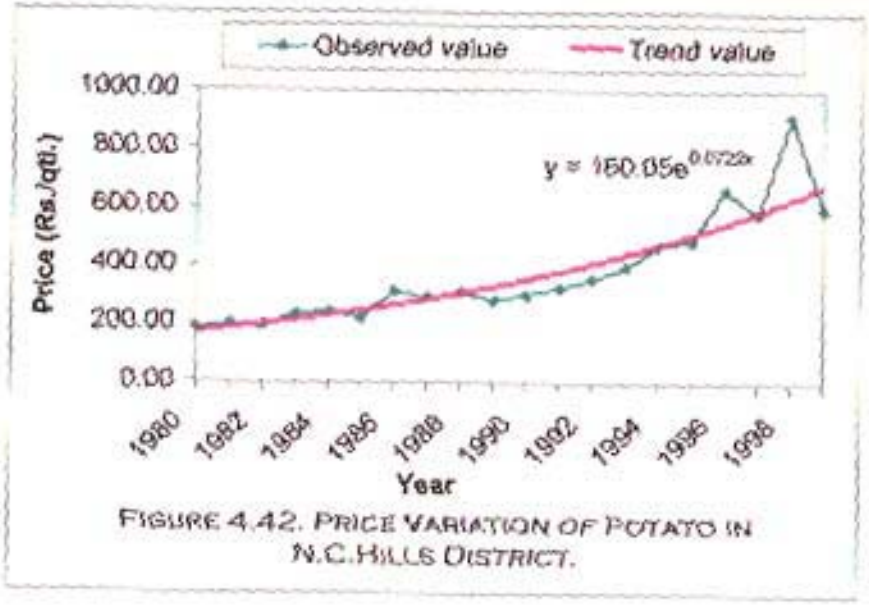

FIGURE 4.42. PRICE VARIATION OF POTATO IN N.C.HILLS DISTRICT.

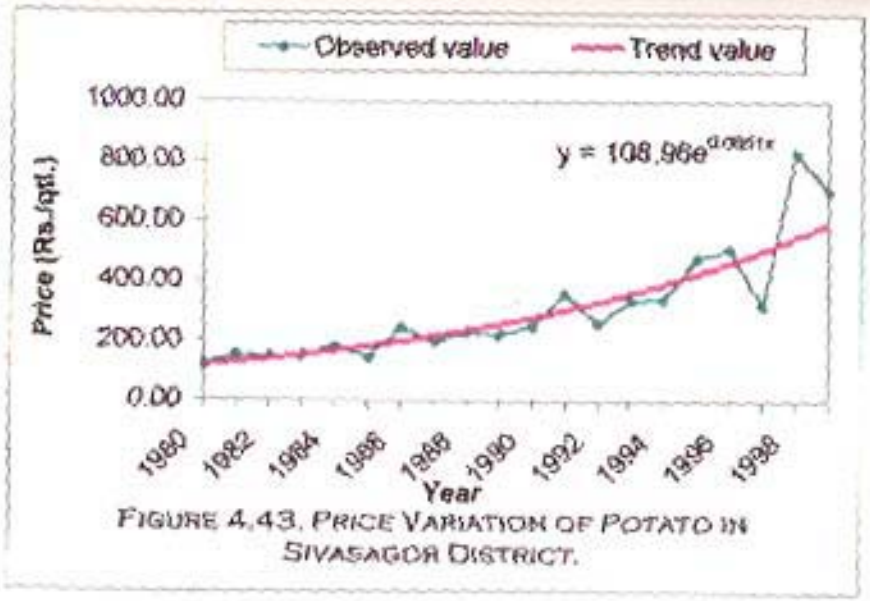

FIGURE 4.43. PRICE VARIATION OF POTATO IN SIVASAGOR DISTRICT.

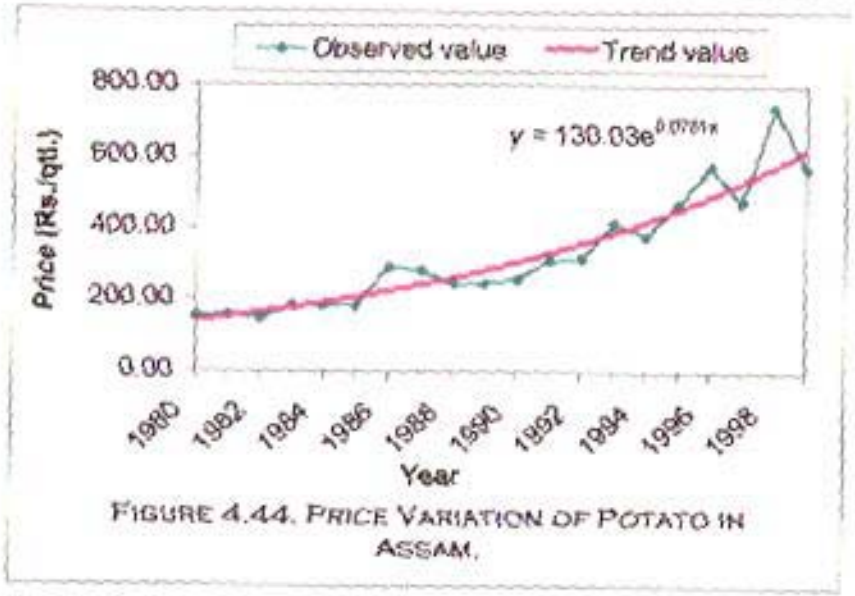

FIGURE 4.44. PRICE VARIATION OF POTATO IN ASSAM.

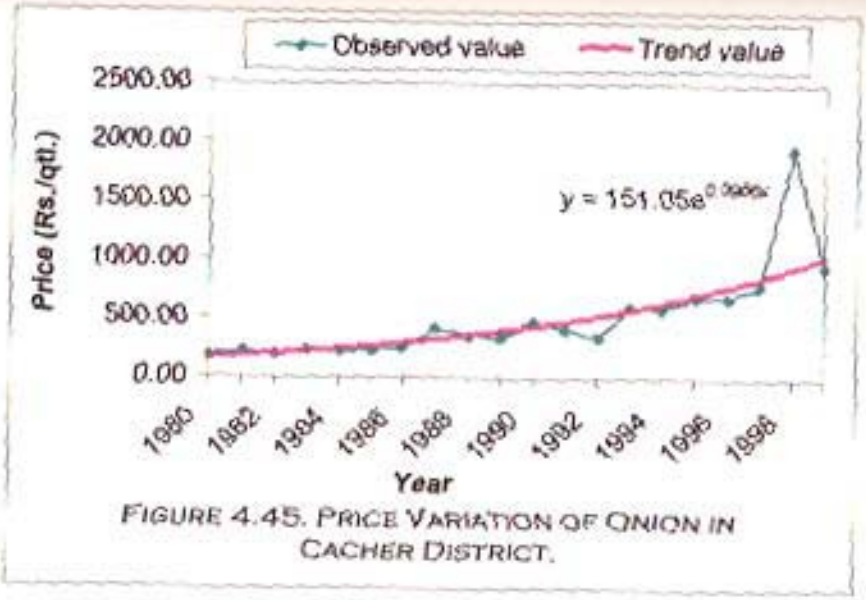

FIGURE 4.45. PRICE VARIATION OF ONION IN CACHER DISTRICT.

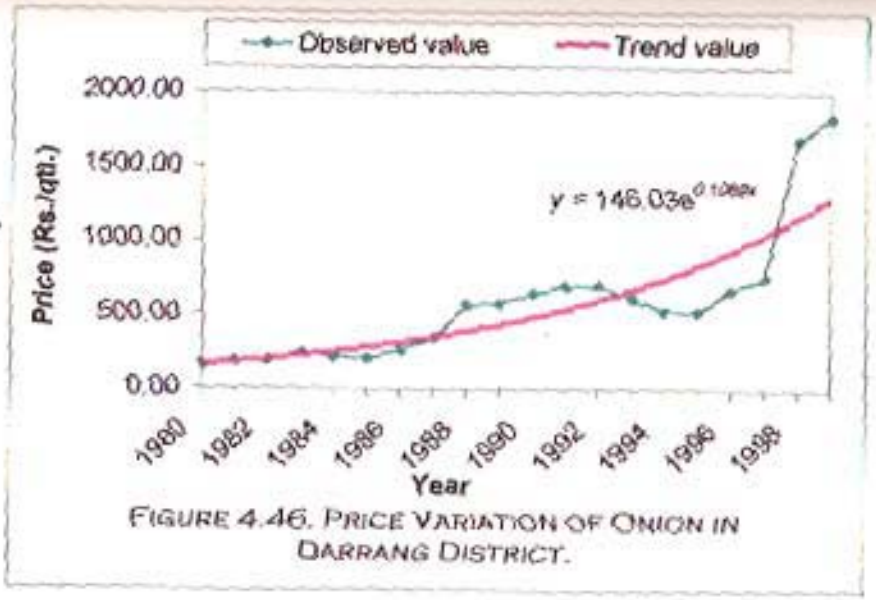

FIGURE 4.46. PRICE VARIATION OF ONION IN DARRANG DISTRICT.

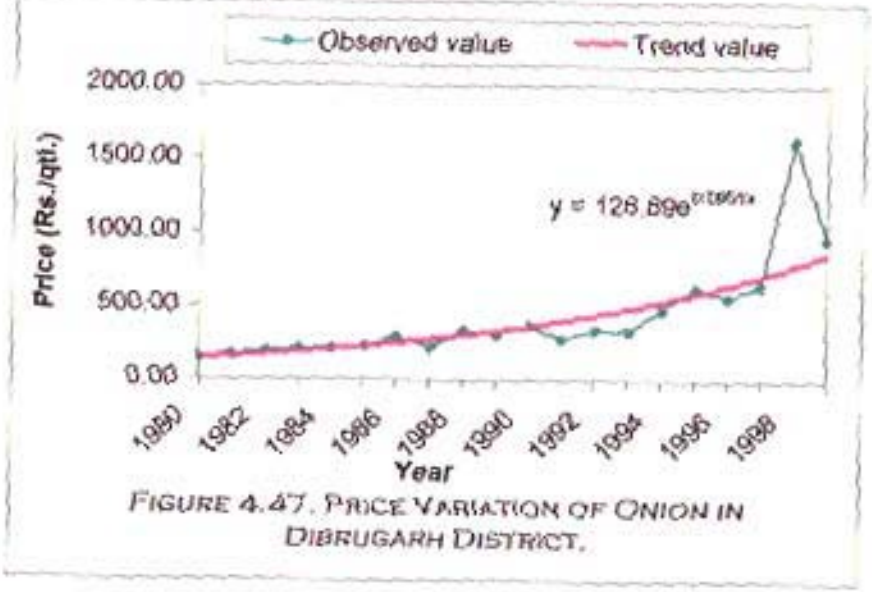

FIGURE 4.47. PRICE VARIATION OF ONION IN DIBRUGARH DISTRICT.

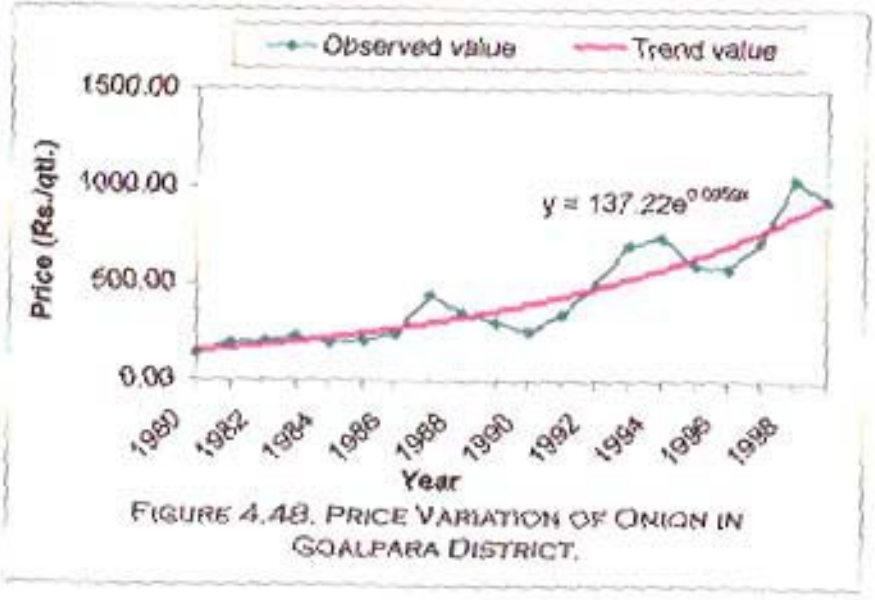

FIGURE 4.48. PRICE VARIATION OF ONION IN GOALPARA DISTRICT.

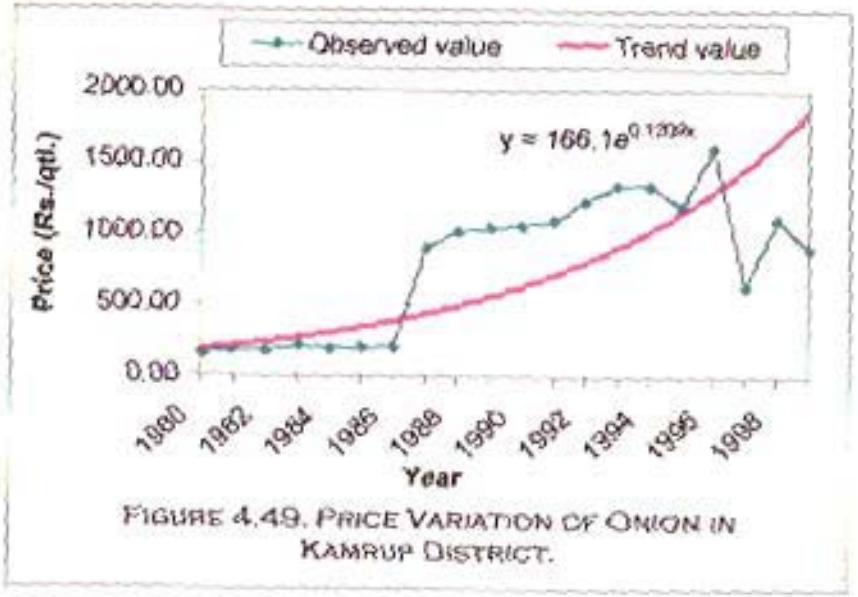

FIGURE 4.49. PRICE VARIATION OF ONION IN KAMRUP DISTRICT.

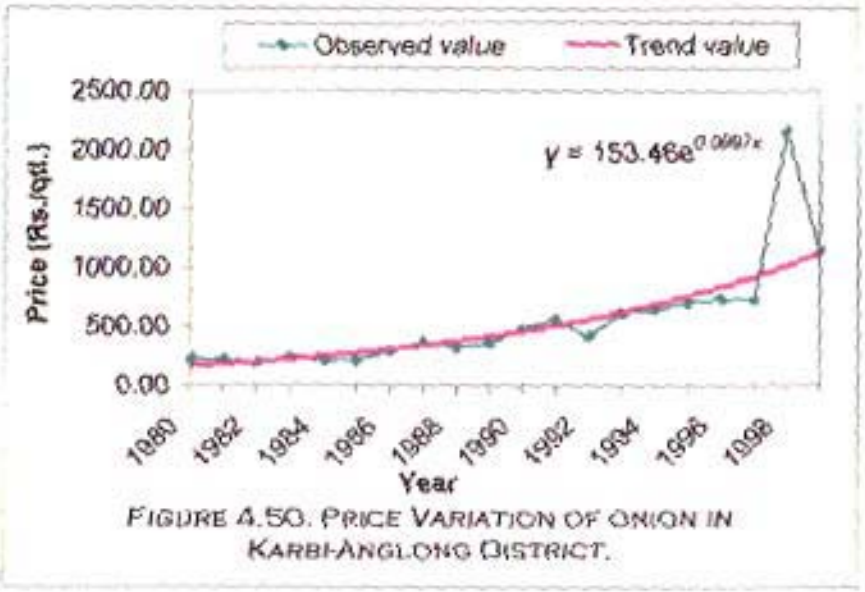

FIGURE 4.50. PRICE VARIATION OF ONION IN KARBI-ANGLONG DISTRICT.

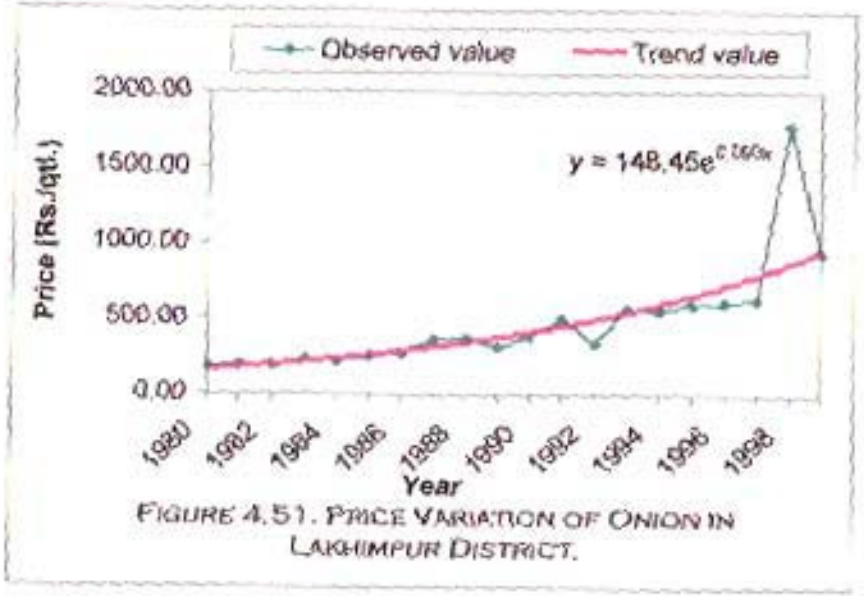

FIGURE 4.51. PRICE VARIATION OF ONION IN LAKHIMPUR DISTRICT.

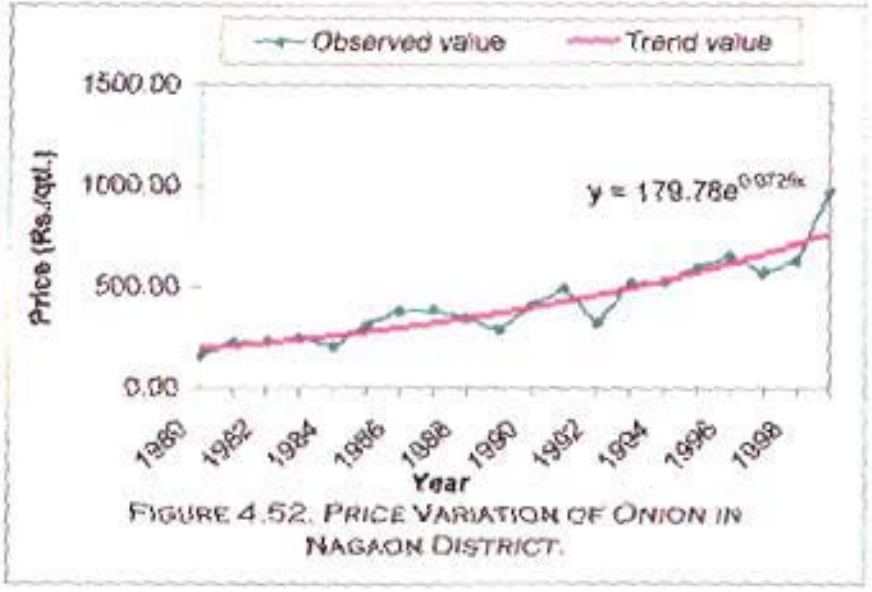

FIGURE 4.52. PRICE VARIATION OF ONION IN NAGAON DISTRICT.

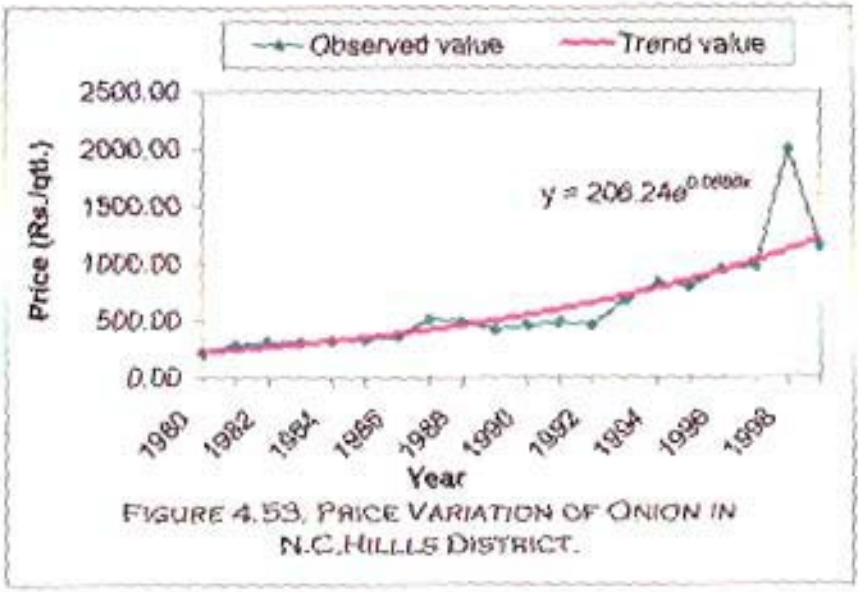

FIGURE 4.53. PRICE VARIATION OF ONION IN N.C.HILLS DISTRICT.

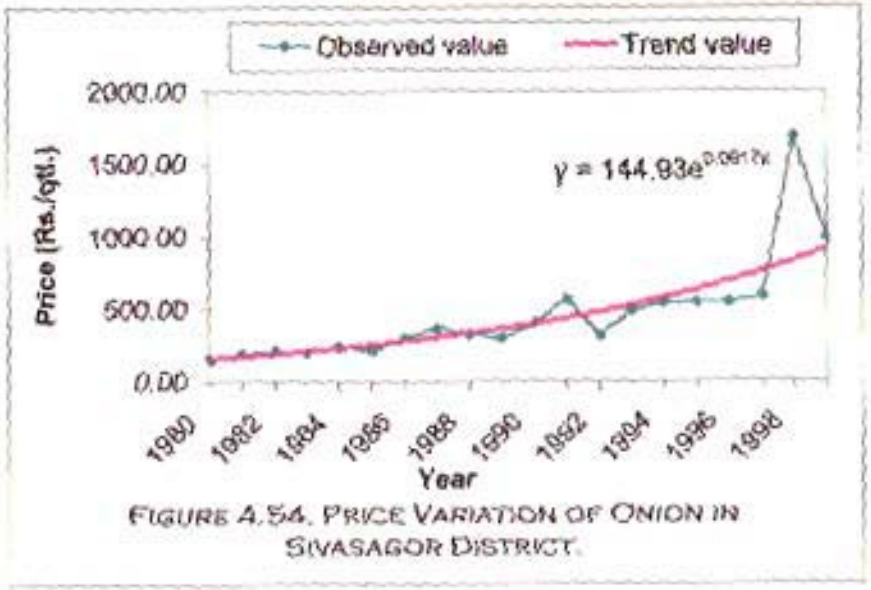

FIGURE 4.54. PRICE VARIATION OF ONION IN SIVASAGOR DISTRICT.

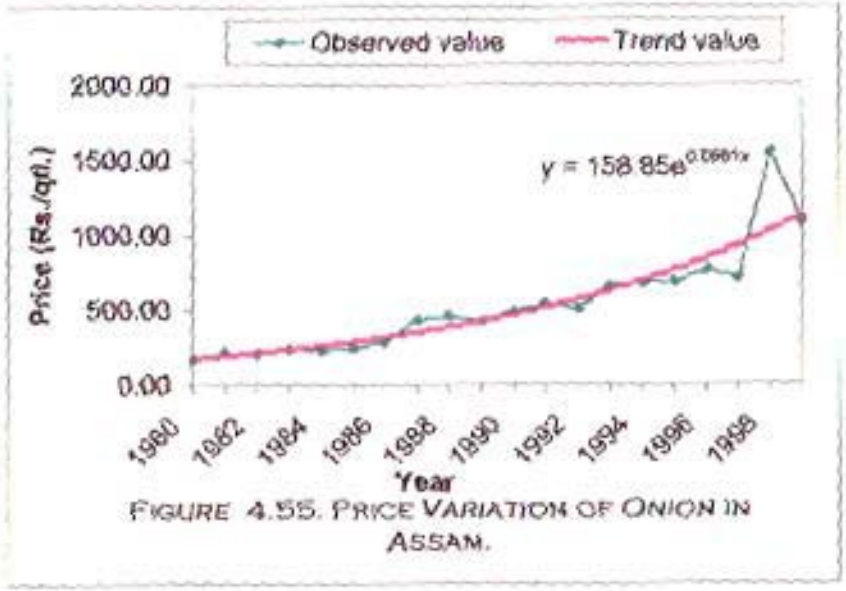

FIGURE 4.55. PRICE VARIATION OF ONION IN ASSAM.

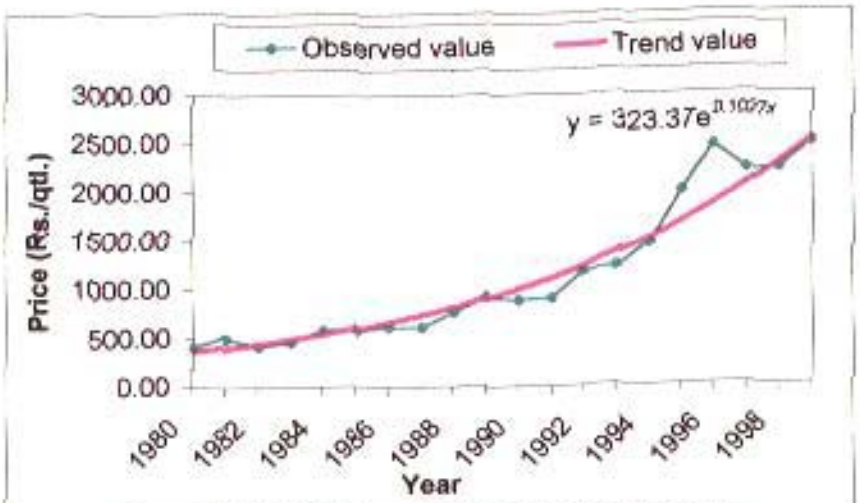

FIGURE 4.56. PRICE VARIATION OF LENTIL IN CACHER DISTRICT.

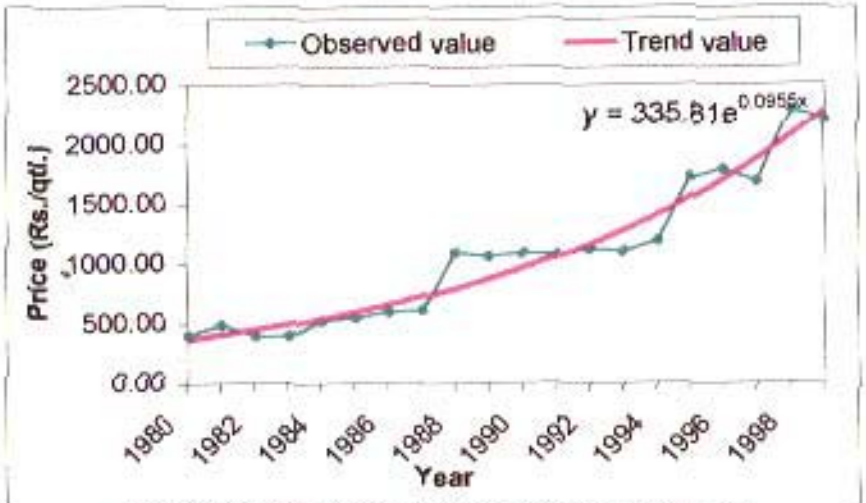

FIGURE 4.57. PRICE VARIATION OF LENTIL IN DARRANG DISTRICT.

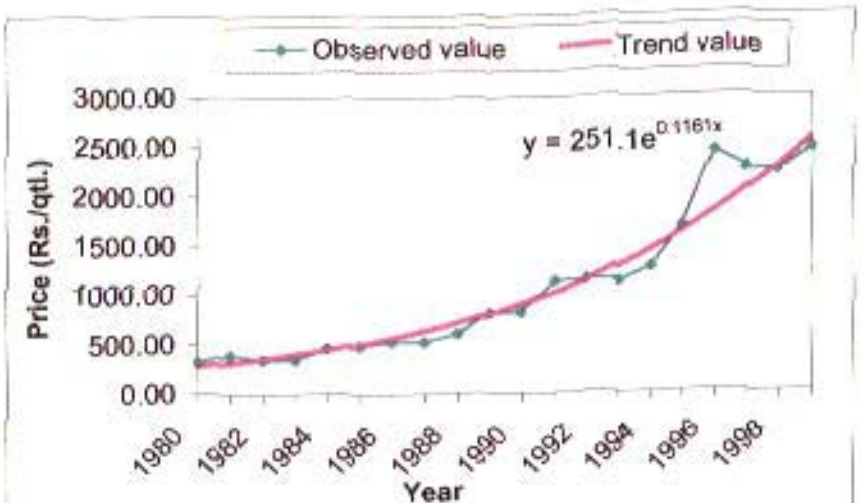

FIGURE 4.58. PRICE VARIATION OF LENTIL IN DIBRUGARH DISTRICT.

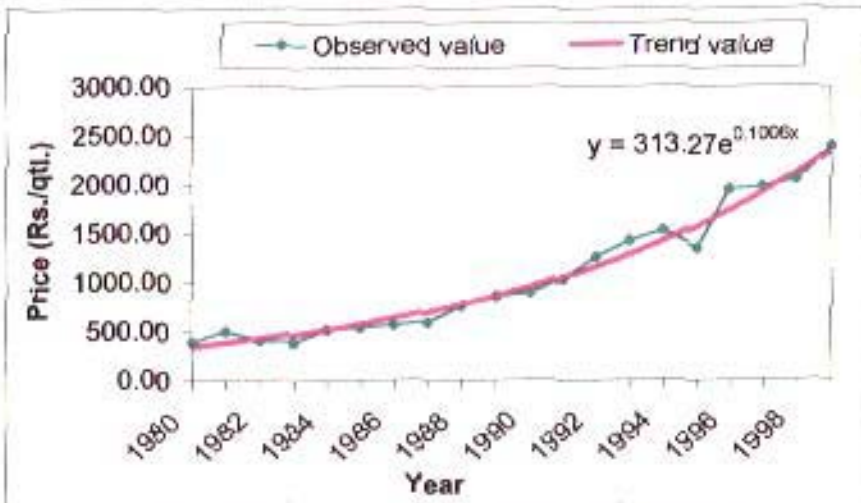

FIGURE 4.59. PRICE VARIATION OF LENTIL IN GOALPARA DISTRICT.

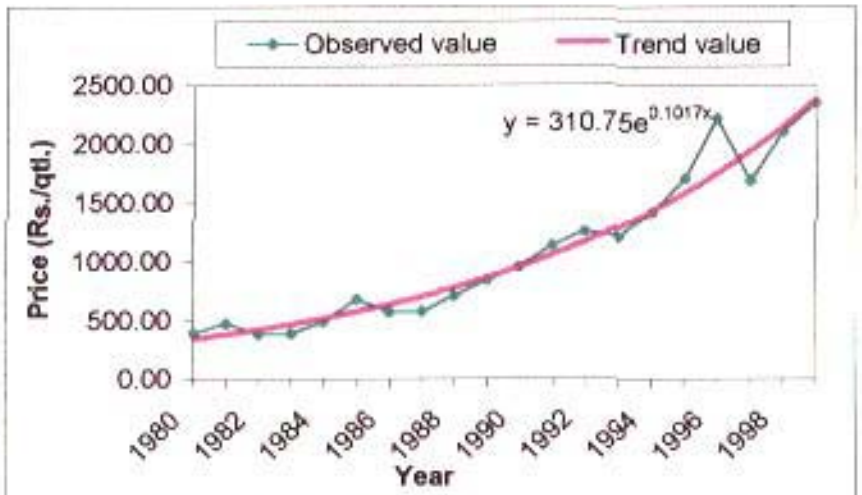

FIGURE 4.60. PRICE VARIATION OF LENTIL IN KAMRUP DISTRICT.

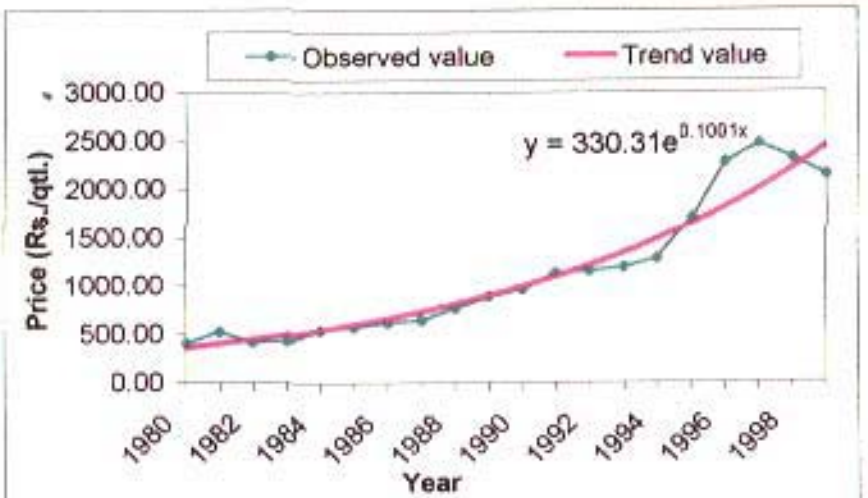

FIGURE 4.61. PRICE VARIATION OF LENTIL IN KARBI-ANGLONG DISTRICT.

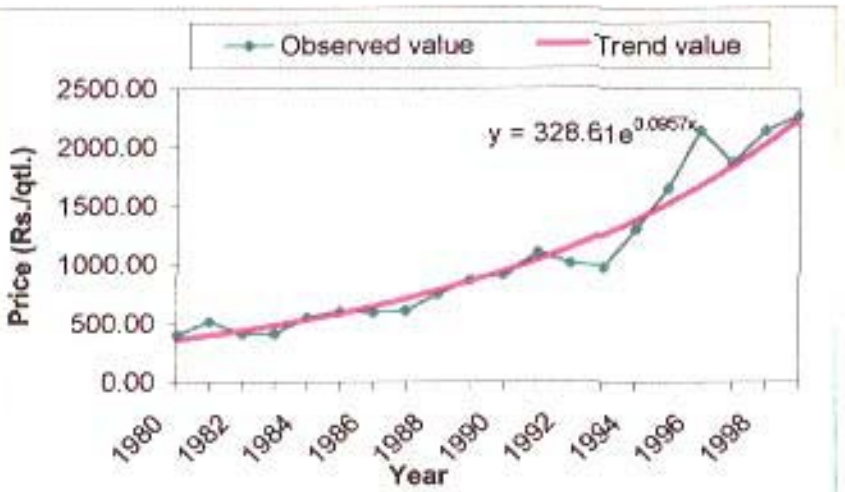

FIG.62. PRICE VARIATION OF LENTIL IN LAKHIMPUR DISTRICT.

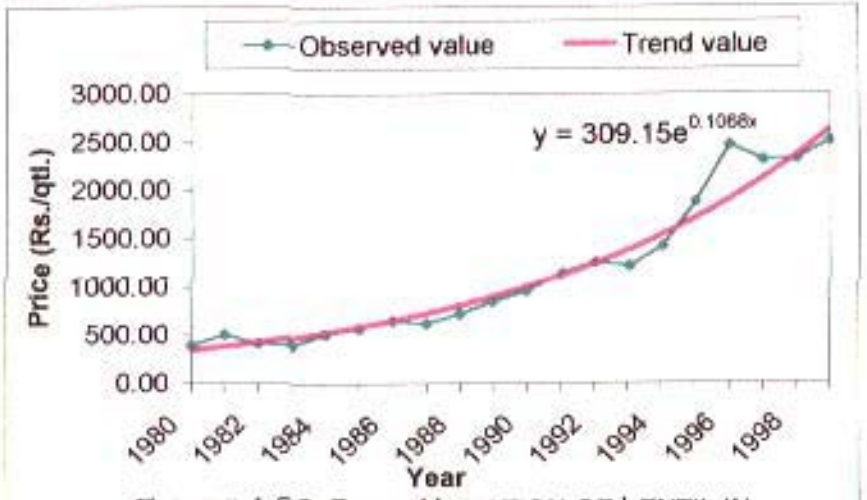

FIGURE 4.63. PRICE VARIATION OF LENTIL IN NAGAON DISTRICT.

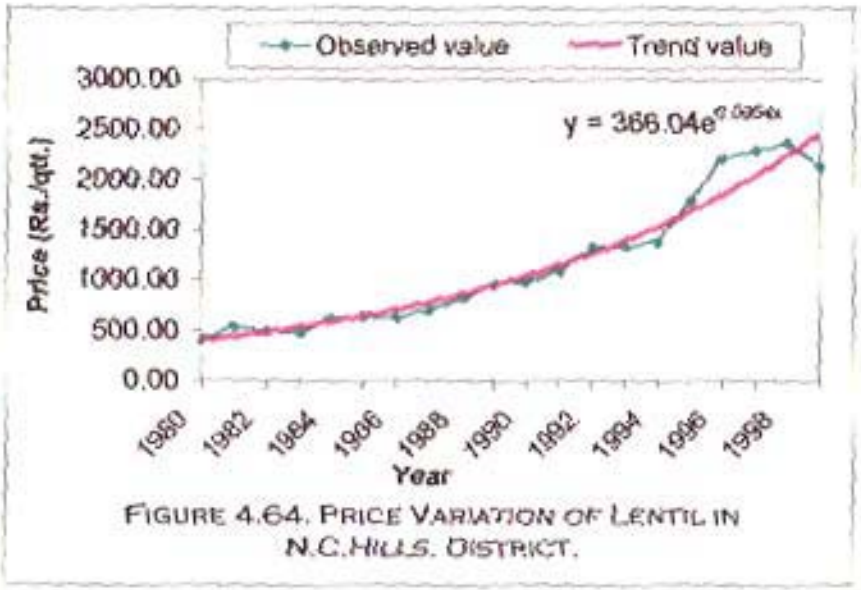

FIGURE 4.64. PRICE VARIATION OF LENTIL IN N.C.HILLS. DISTRICT.

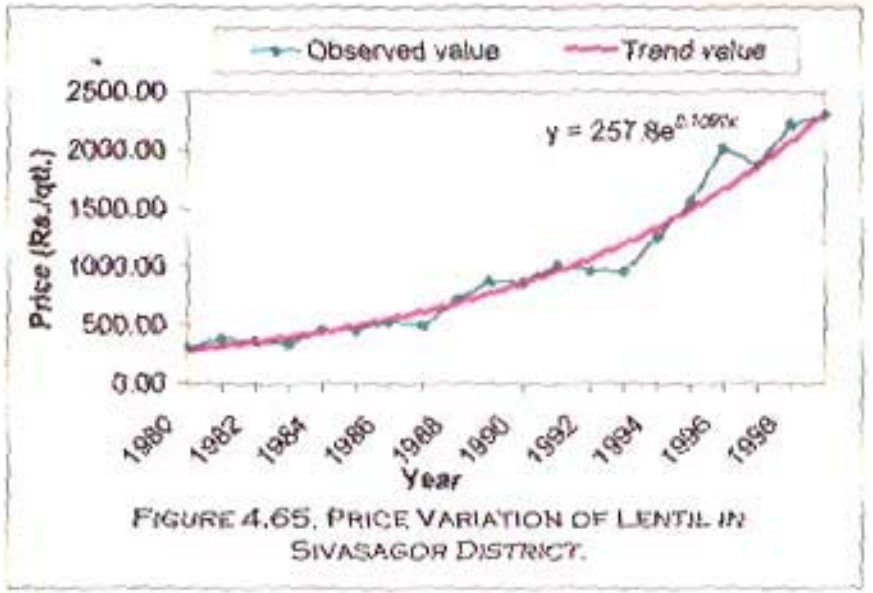

FIGURE 4.65. PRICE VARIATION OF LENTIL IN SIVASAGOR DISTRICT.

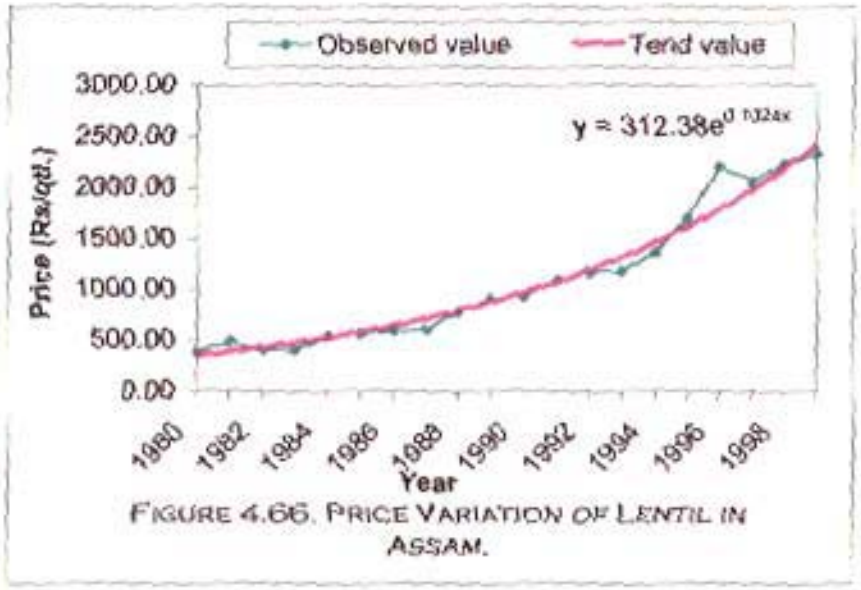

FIGURE 4.66. PRICE VARIATION OF LENTIL IN ASSAM.

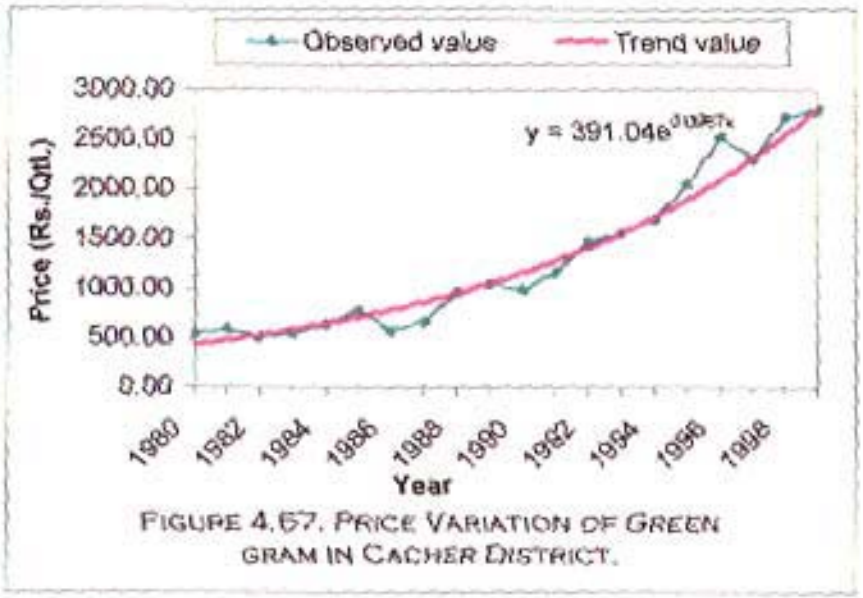

FIGURE 4.67. PRICE VARIATION OF GREEN GRAM IN CACHER DISTRICT.

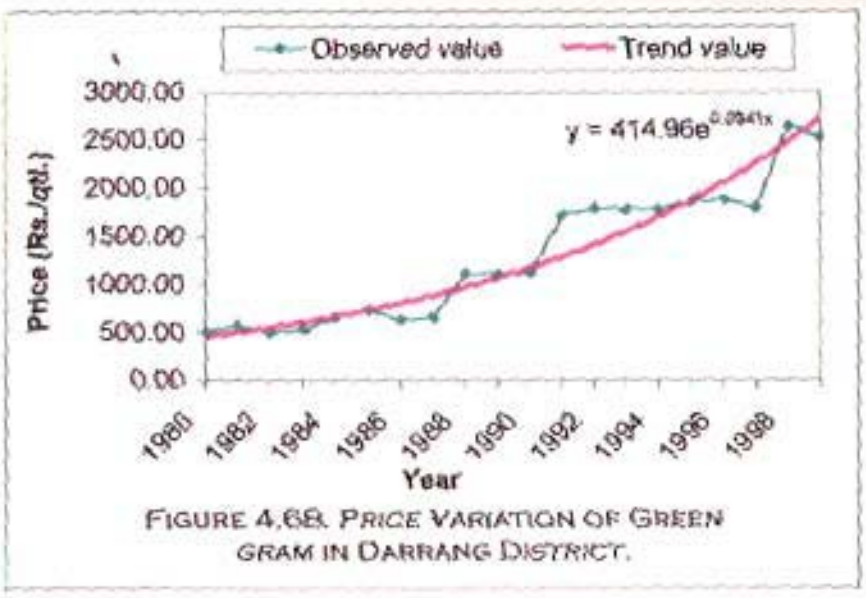

FIGURE 4.68. PRICE VARIATION OF GREEN GRAM IN DARRANG DISTRICT.

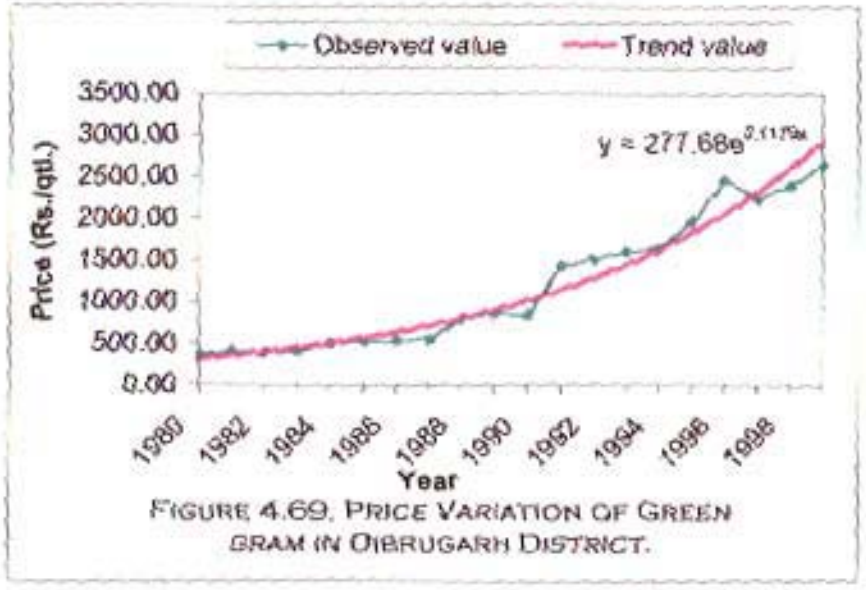

FIGURE 4.69. PRICE VARIATION OF GREEN GRAM IN DIBRUGARH DISTRICT.

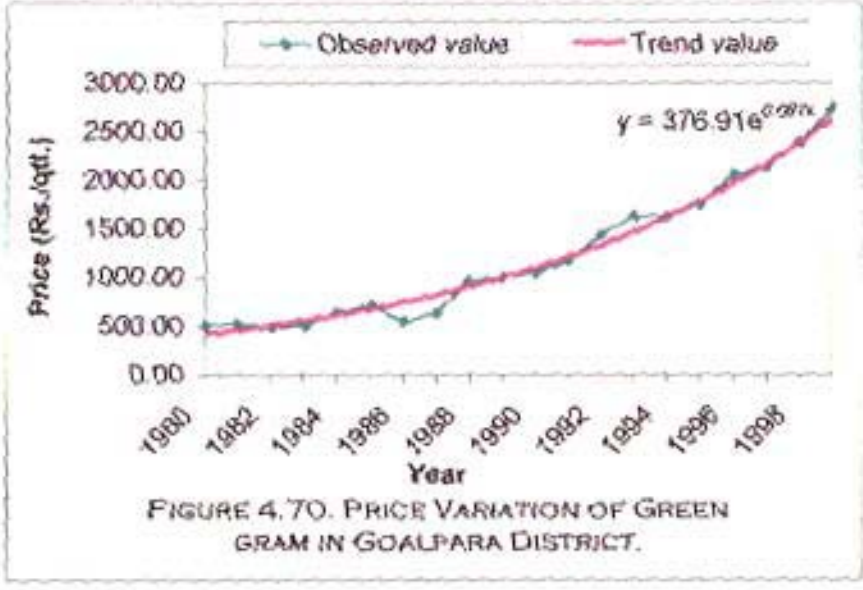

FIGURE 4.70. PRICE VARIATION OF GREEN GRAM IN GOALPARA DISTRICT.

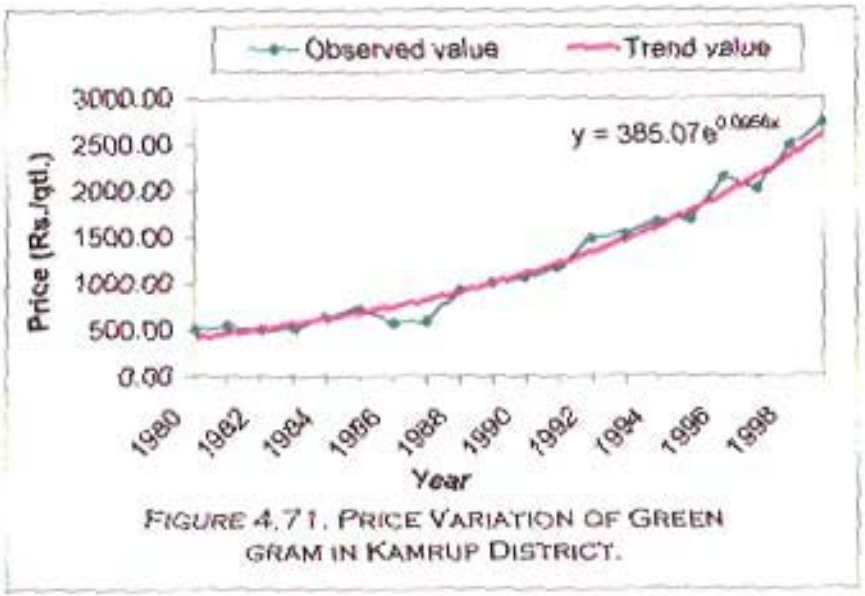

FIGURE 4.71. PRICE VARIATION OF GREEN GRAM IN KAMRUP DISTRICT.

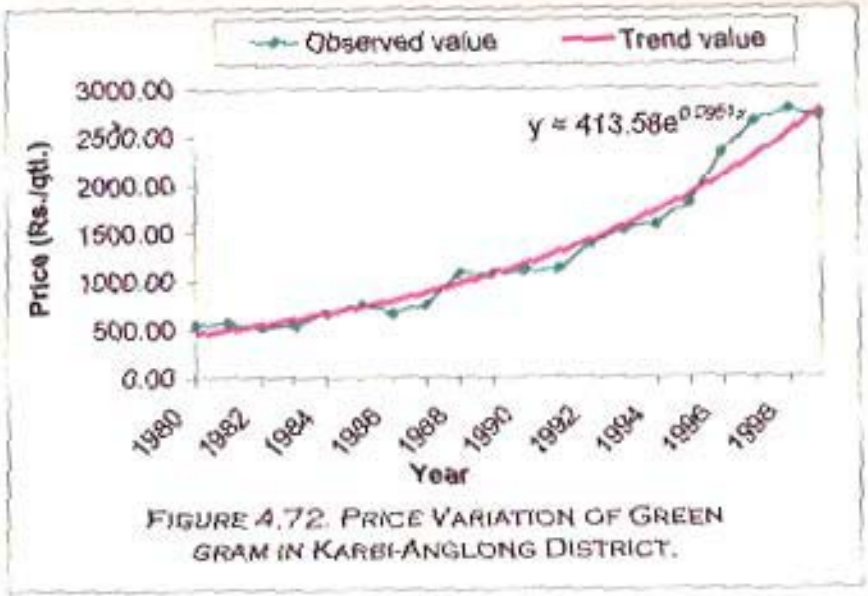

FIGURE 4.72. PRICE VARIATION OF GREEN GRAM IN KARBI-ANGLONG DISTRICT.

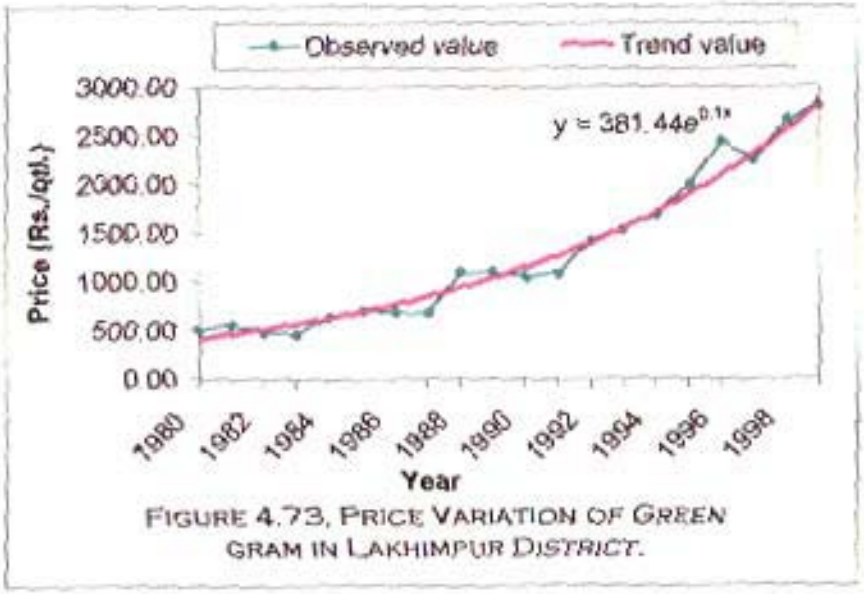

FIGURE 4.73. PRICE VARIATION OF GREEN GRAM IN LAKHIMPUR DISTRICT.

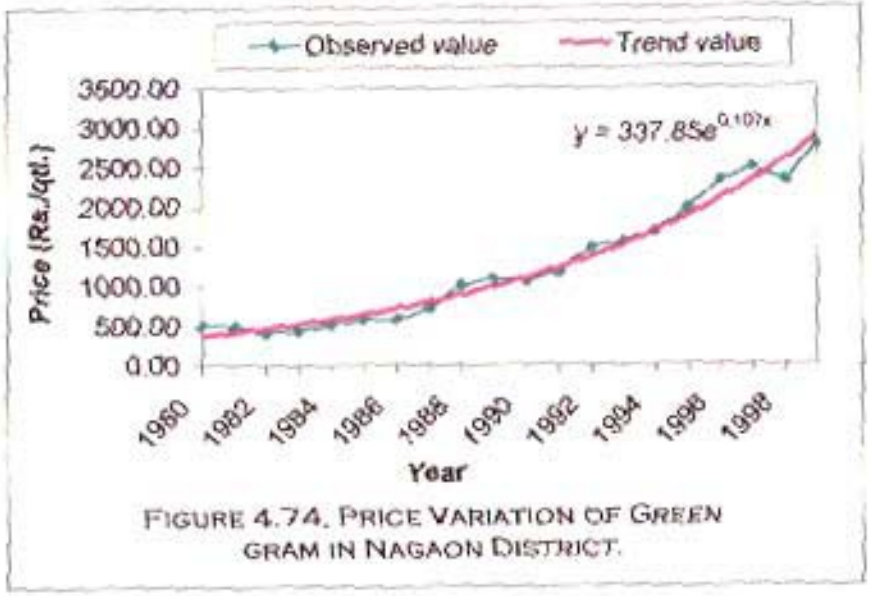

FIGURE 4.74. PRICE VARIATION OF GREEN GRAM IN NAGAON DISTRICT.

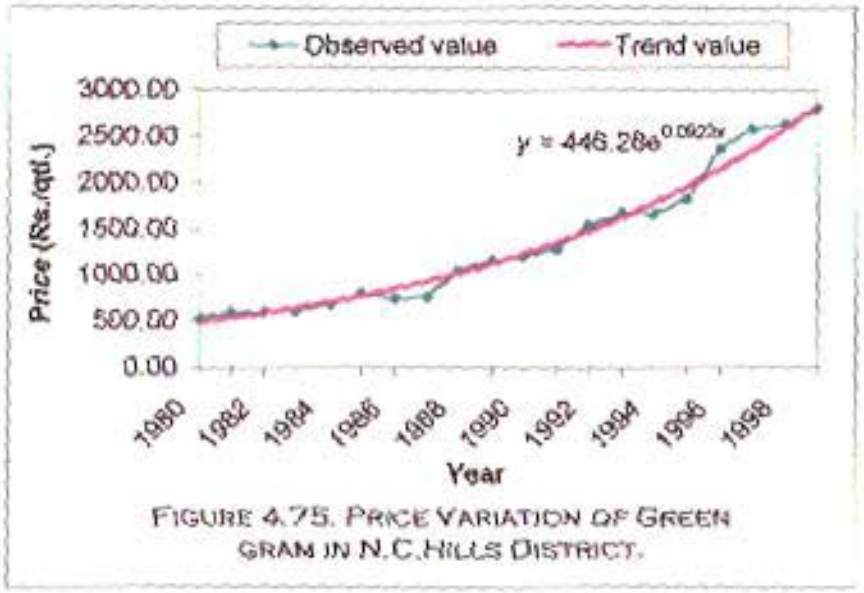

FIGURE 4.75. PRICE VARIATION OF GREEN GRAM IN N.C.HILLS DISTRICT.

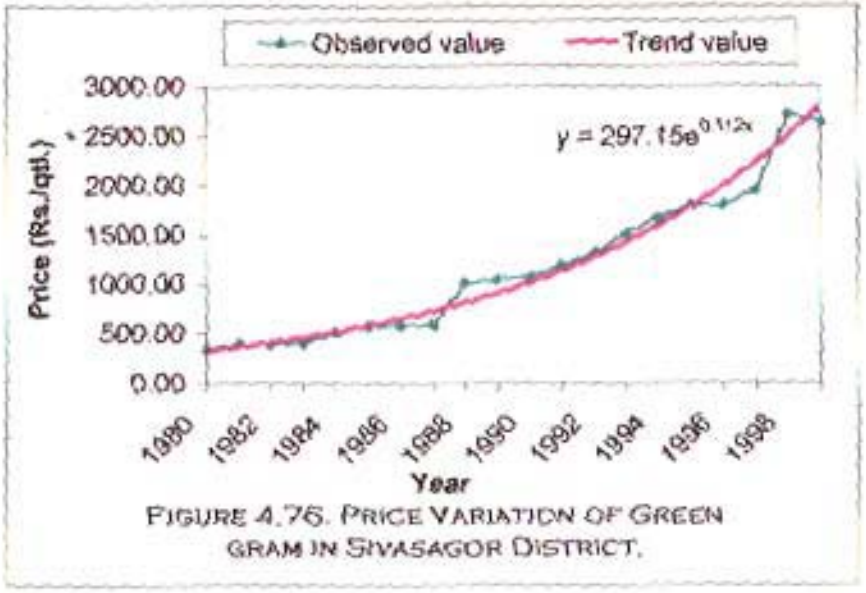

FIGURE 4.76. PRICE VARIATION OF GREEN GRAM IN SIVASAGOR DISTRICT.

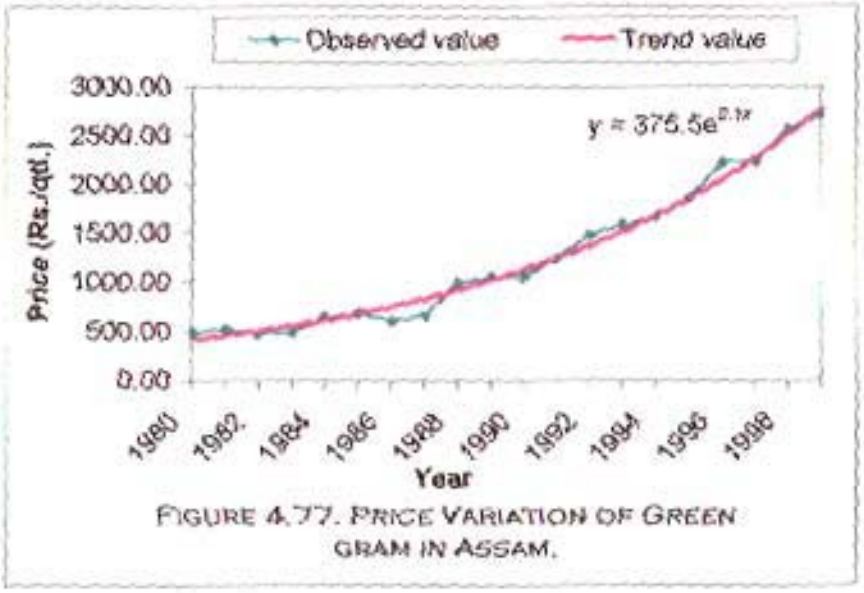

FIGURE 4.77. PRICE VARIATION OF GREEN GRAM IN ASSAM.

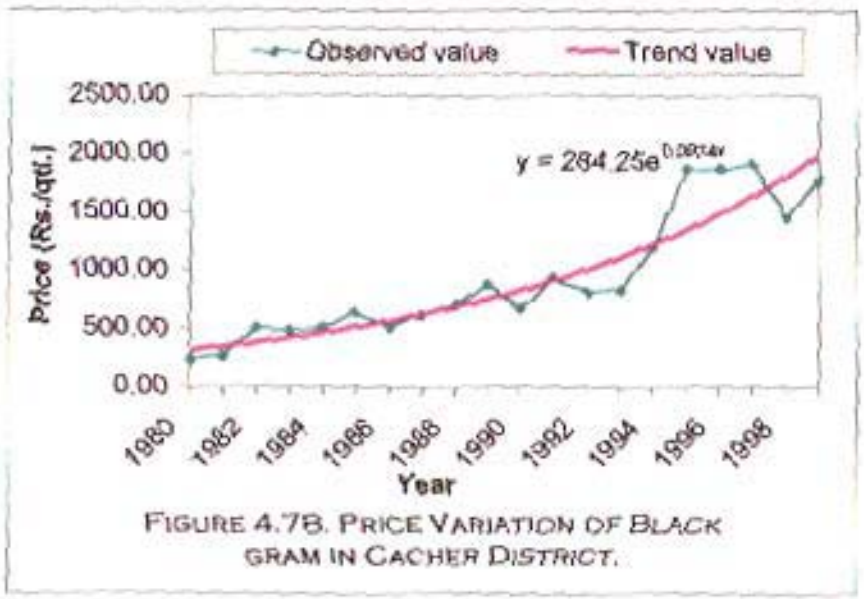

FIGURE 4.78. PRICE VARIATION OF BLACK GRAM IN CACHER DISTRICT.

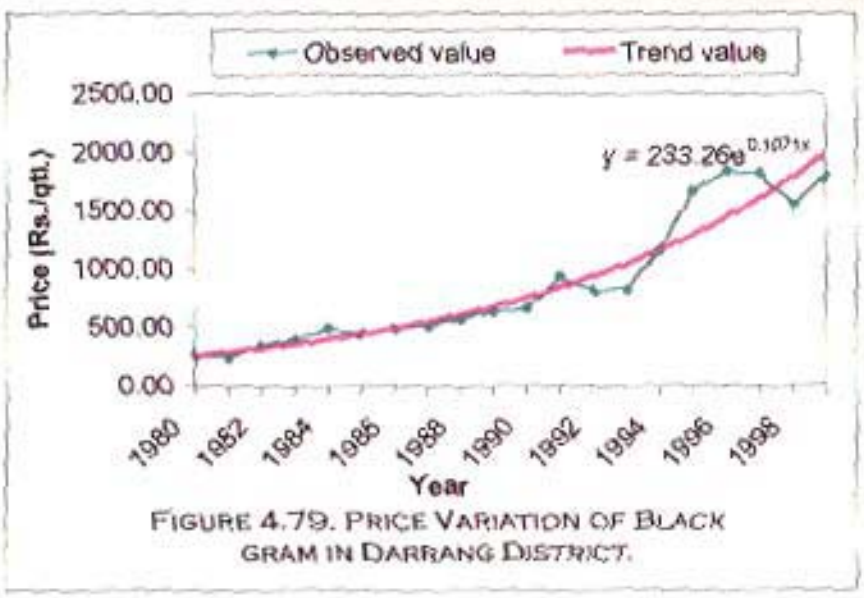

FIGURE 4.79. PRICE VARIATION OF BLACK GRAM IN DARRANG DISTRICT.

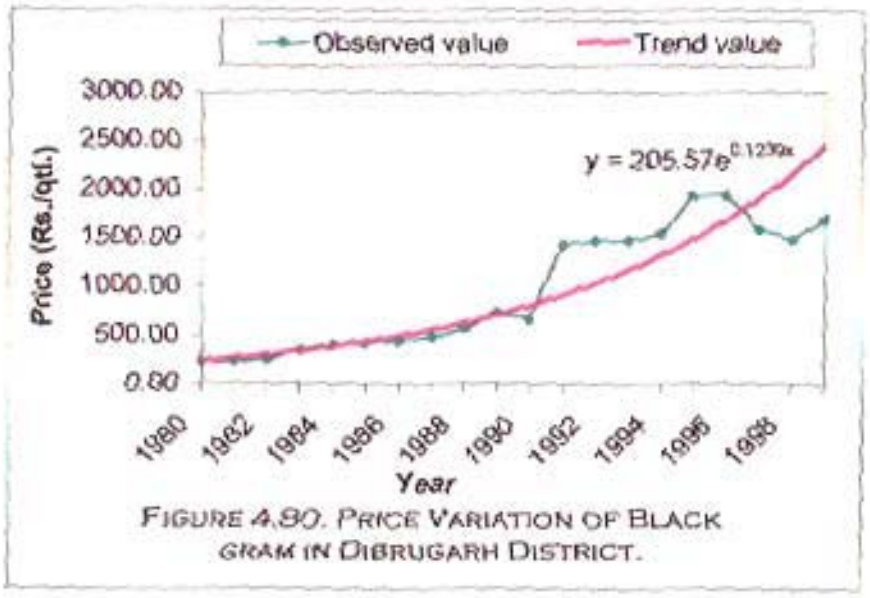

FIGURE 4.80. PRICE VARIATION OF BLACK GRAM IN DIBRUGARH DISTRICT.

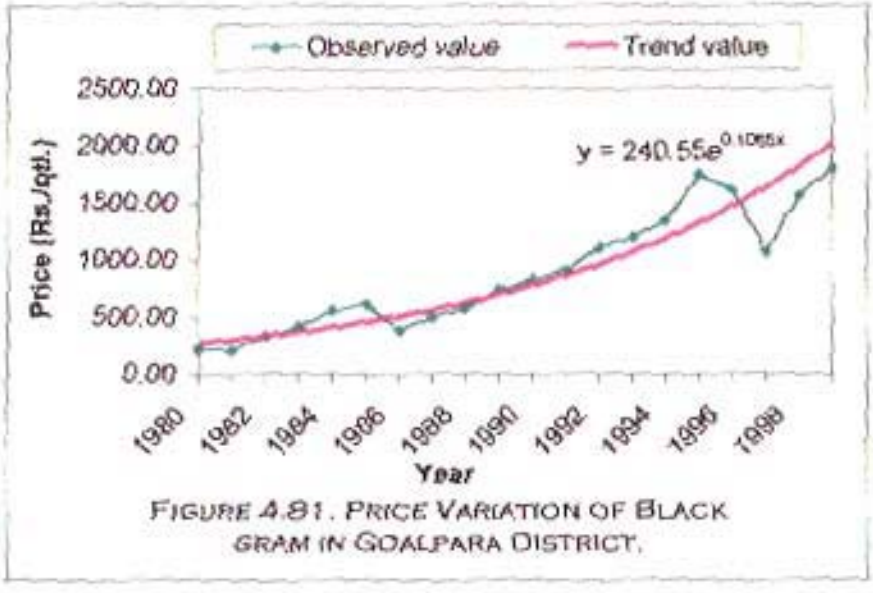

FIGURE 4.81. PRICE VARIATION OF BLACK GRAM IN GOALPARA DISTRICT.

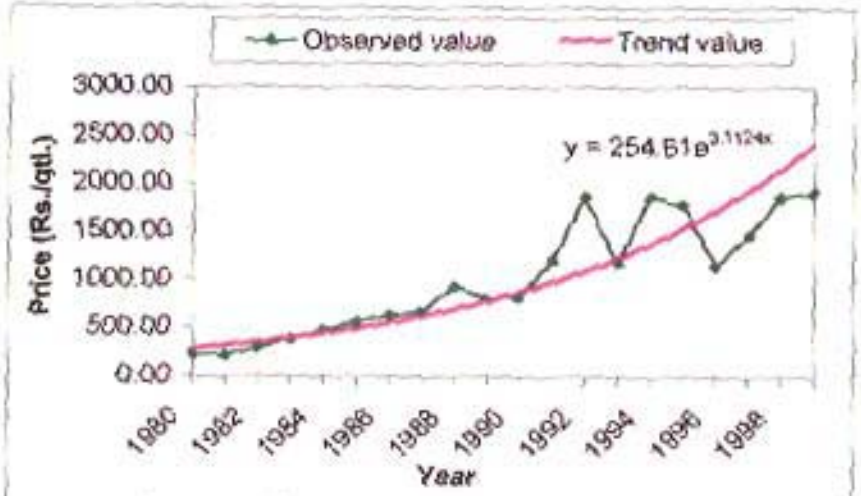

FIGURE 4.82. PRICE VARIATION OF BLACK GRAM IN KAMRUP DISTRICT.

FIGURE 4.83. PRICE VARIATION OF BLACK GRAM IN KARBI-ANGLON DISTRICT.

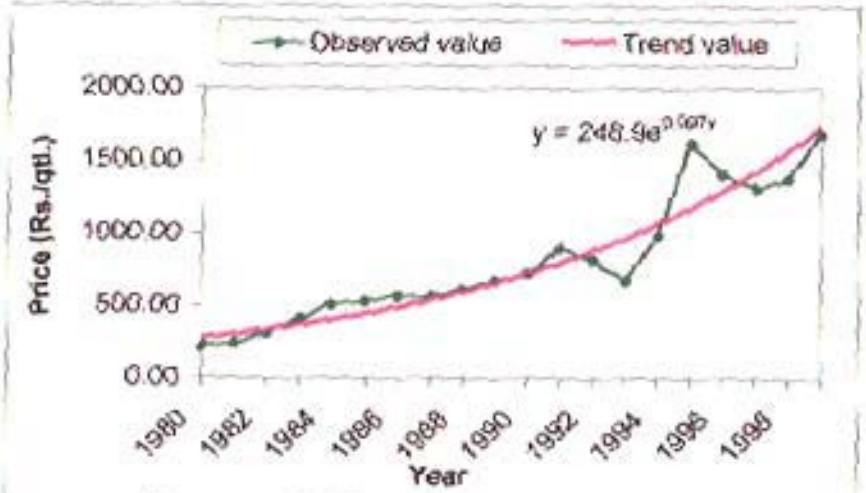

FIGURE 4.84. PRICE VARIATION OF BLACK GRAM IN LAKHIMPUR DISTRICT.

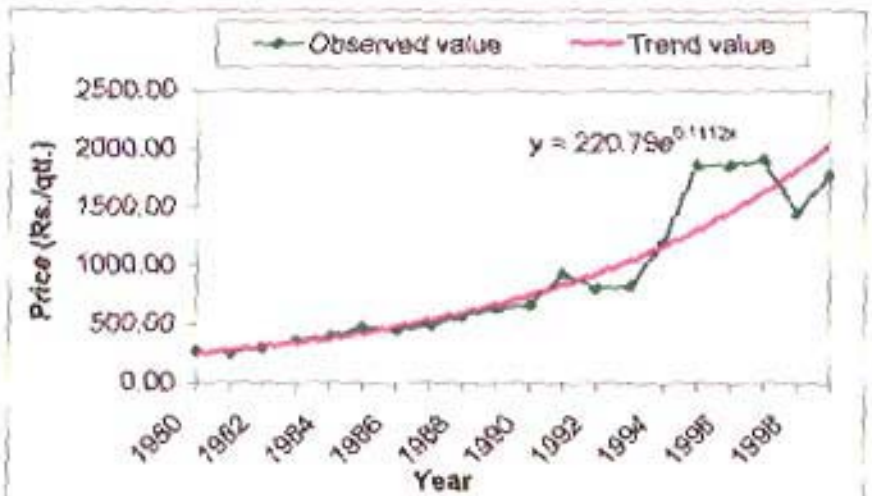

FIGURE 4.85. PRICE VARIATION OF BLACK GRAM IN NAGAON DISTRICT.

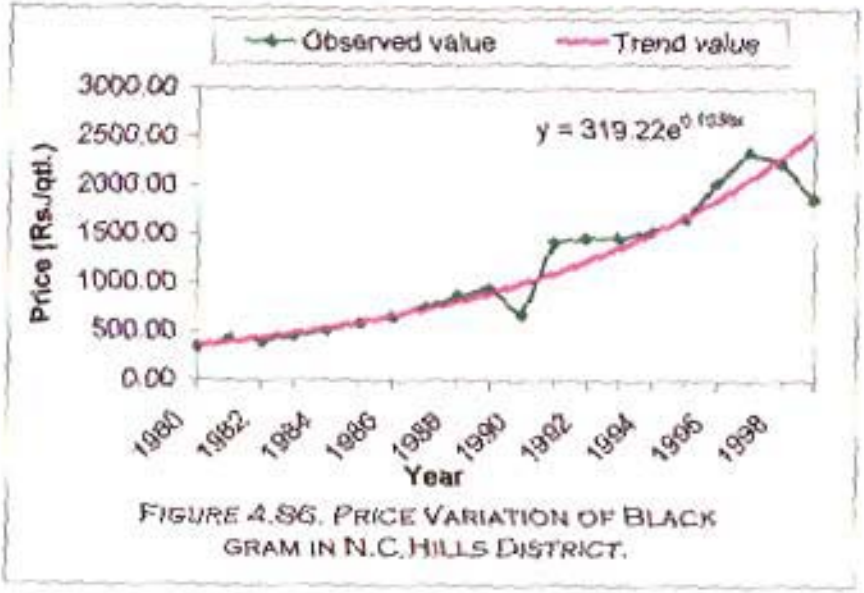

FIGURE 4.86. PRICE VARIATION OF BLACK GRAM IN N.C.HILLS DISTRICT.

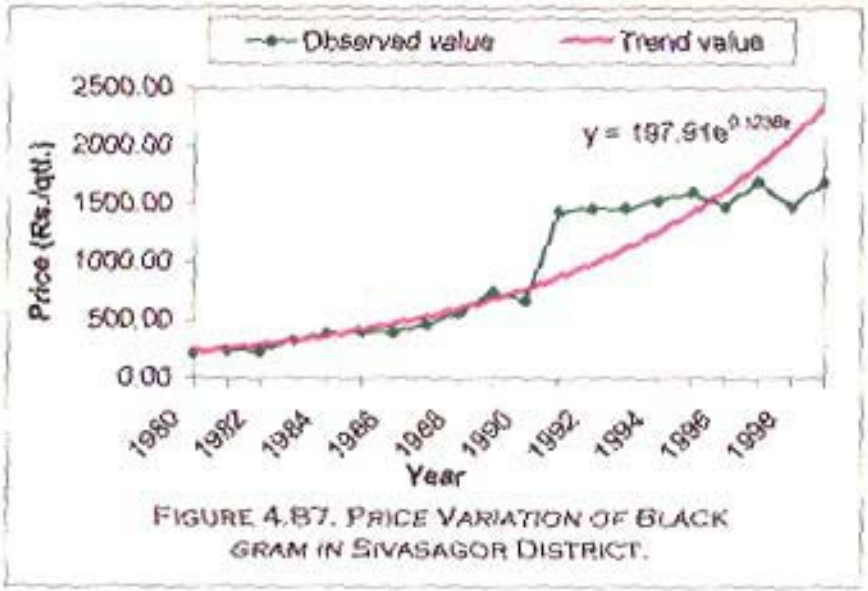

FIGURE 4.87. PRICE VARIATION OF BLACK GRAM IN SIVASAGOR DISTRICT.

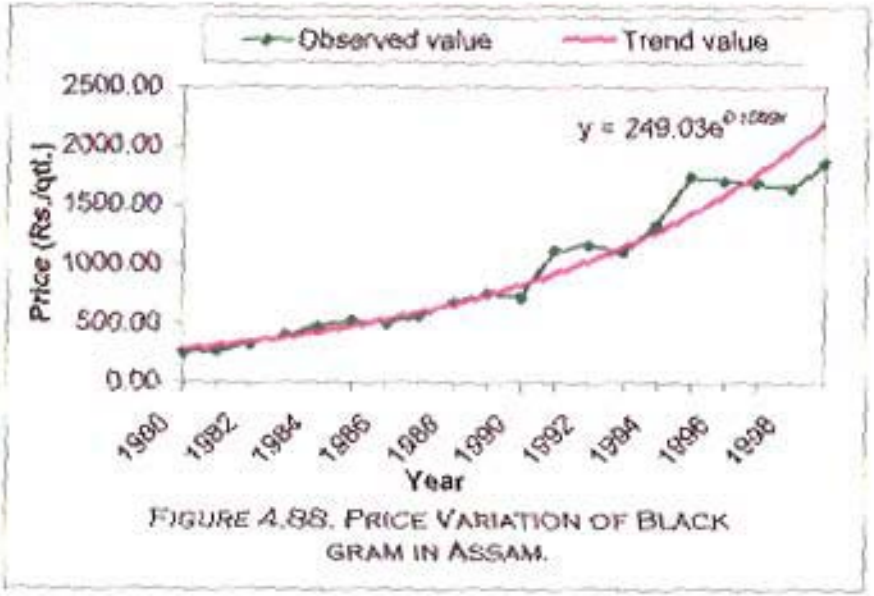

FIGURE 4.88. PRICE VARIATION OF BLACK GRAM IN ASSAM.

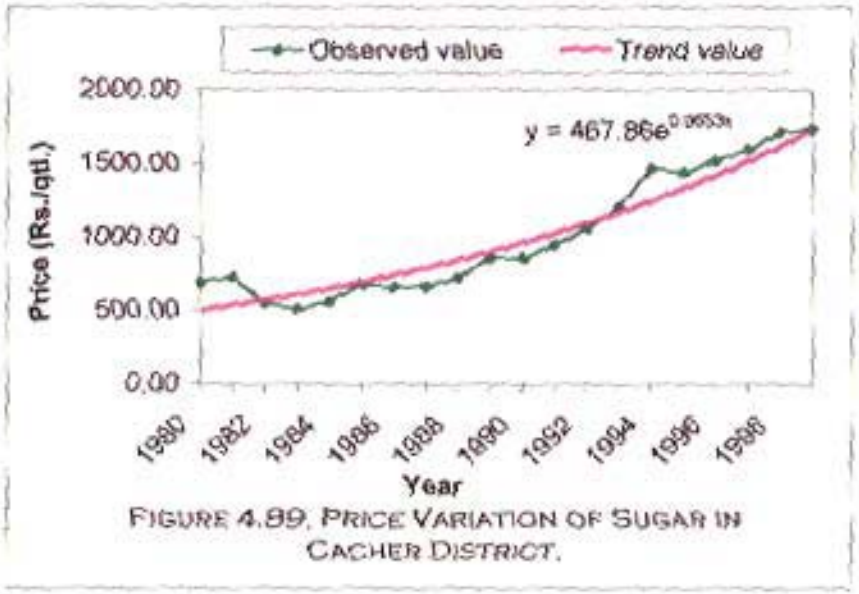

FIGURE 4.89. PRICE VARIATION OF SUGAR IN CACHER DISTRICT.

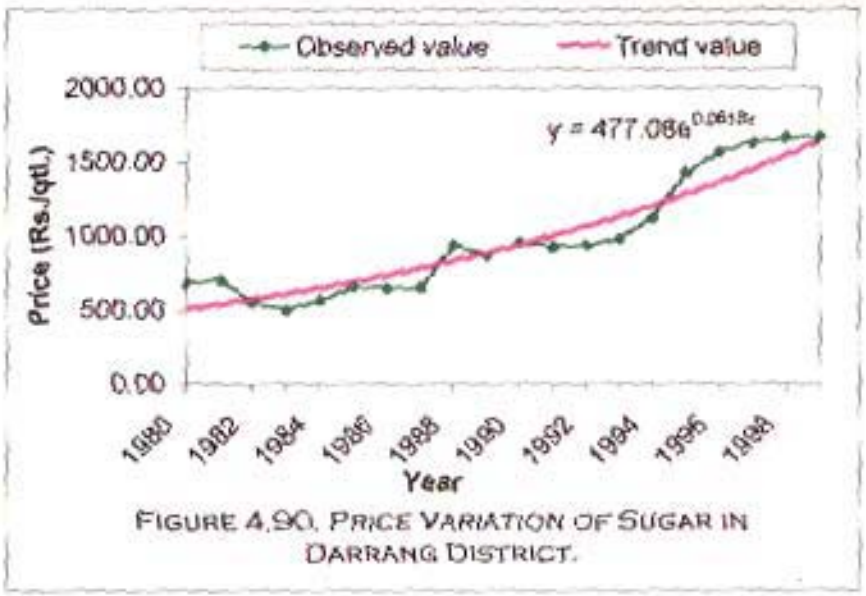

FIGURE 4.90. PRICE VARIATION OF SUGAR IN DARRANG DISTRICT.

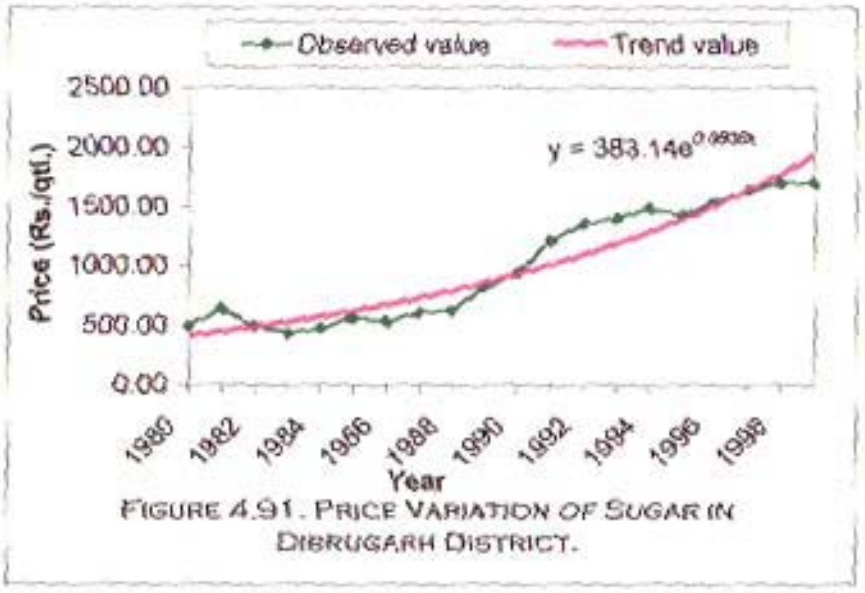

FIGURE 4.91. PRICE VARIATION OF SUGAR IN DIBRUGARH DISTRICT.

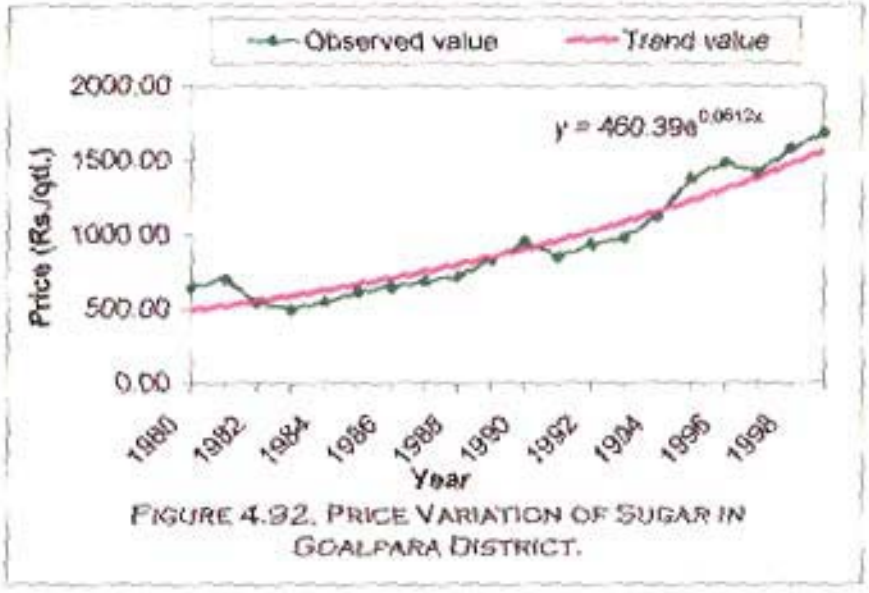

FIGURE 4.92. PRICE VARIATION OF SUGAR IN GOALPARA DISTRICT.

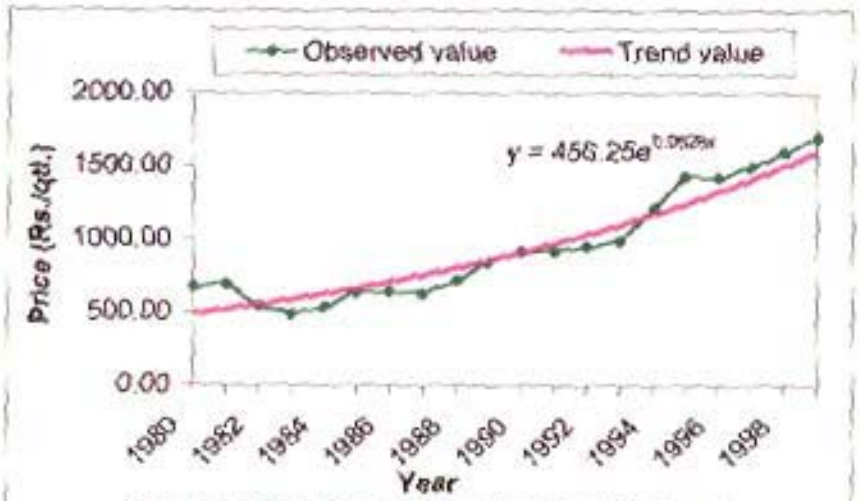

FIGURE 4.93. PRICE VARIATION OF SUGAR IN KAMRUP DISTRICT.

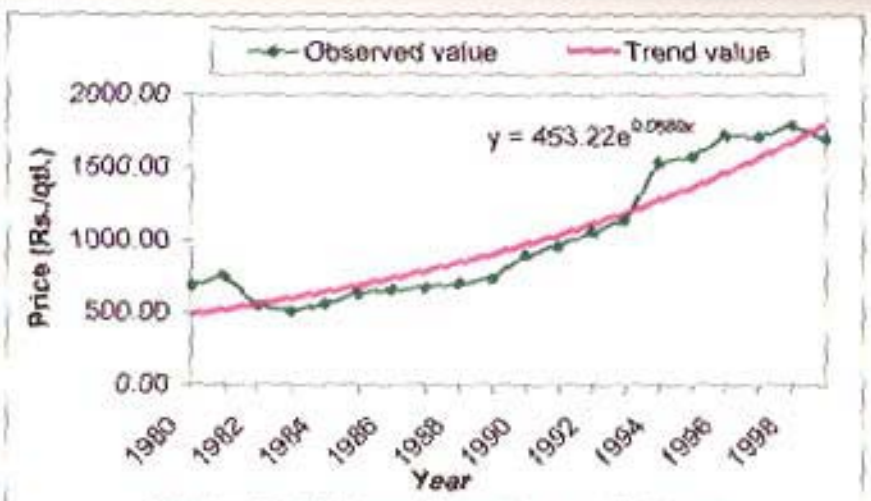

FIGURE 4.94.PRICE VARIATION OF SUGAR IN KARBI ANGLONG DISTRICT.

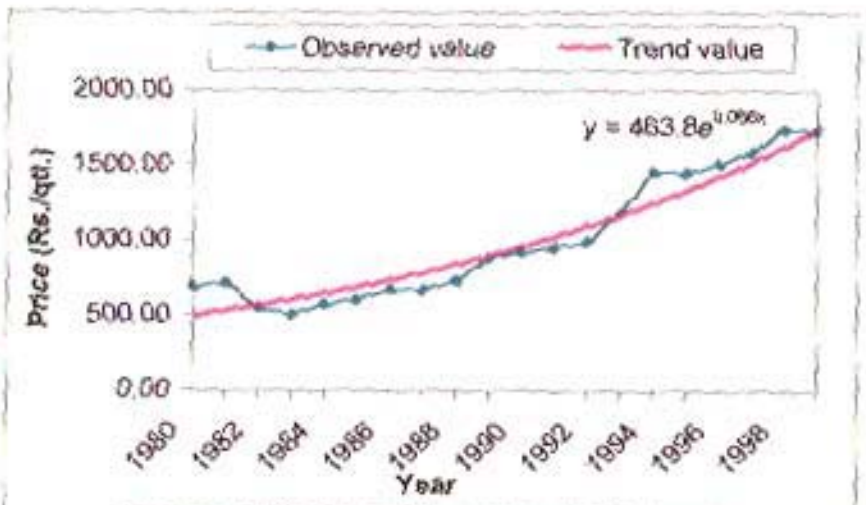

FIGURE 4.95. PRICE VARIATION OF SUGAR IN LAKHIMPUR DISTRICT.

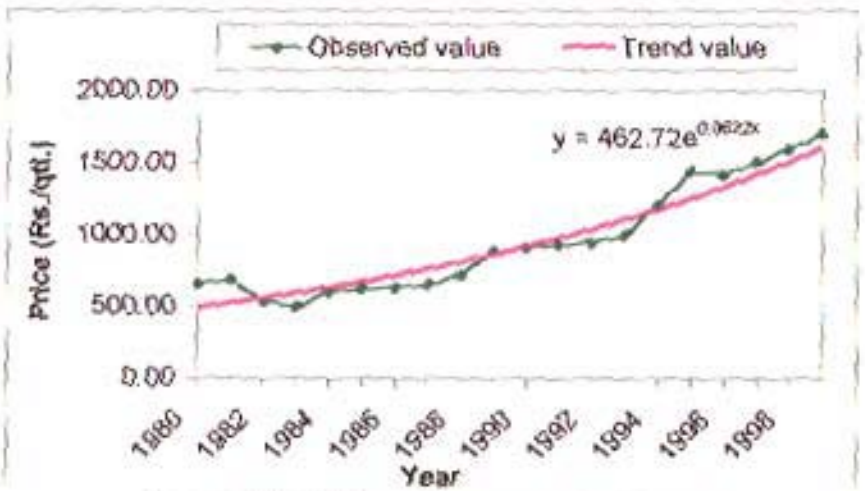

FIGURE 4.96. PRICE VARIATION OF SUGAR IN NAGAON DISTRICT.

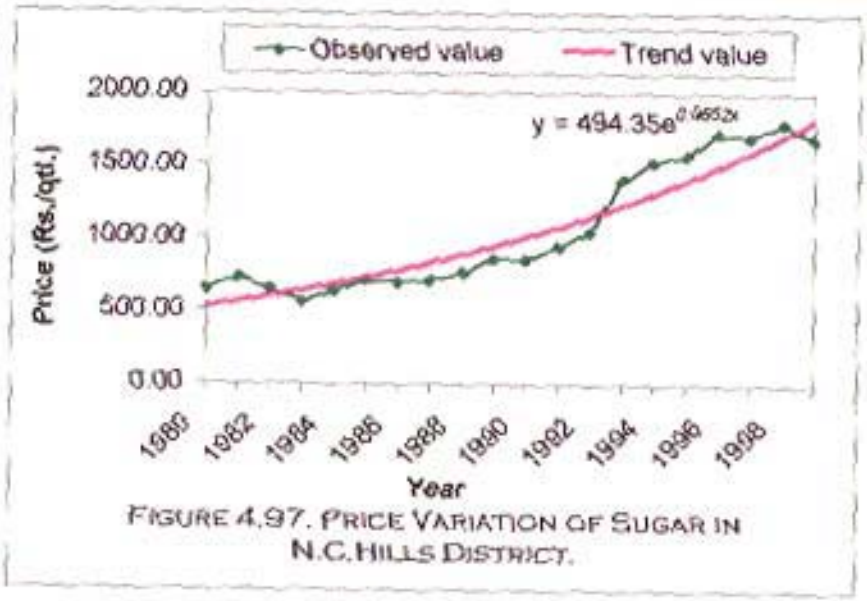

FIGURE 4.97. PRICE VARIATION OF SUGAR IN N.C.HILLS DISTRICT.

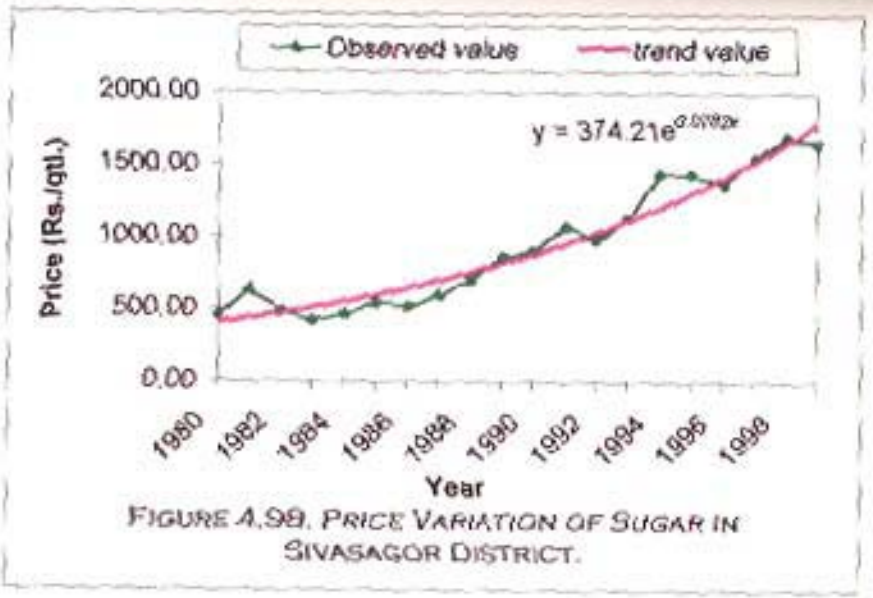

FIGURE 4.98. PRICE VARIATION OF SUGAR IN SIVASAGOR DISTRICT.

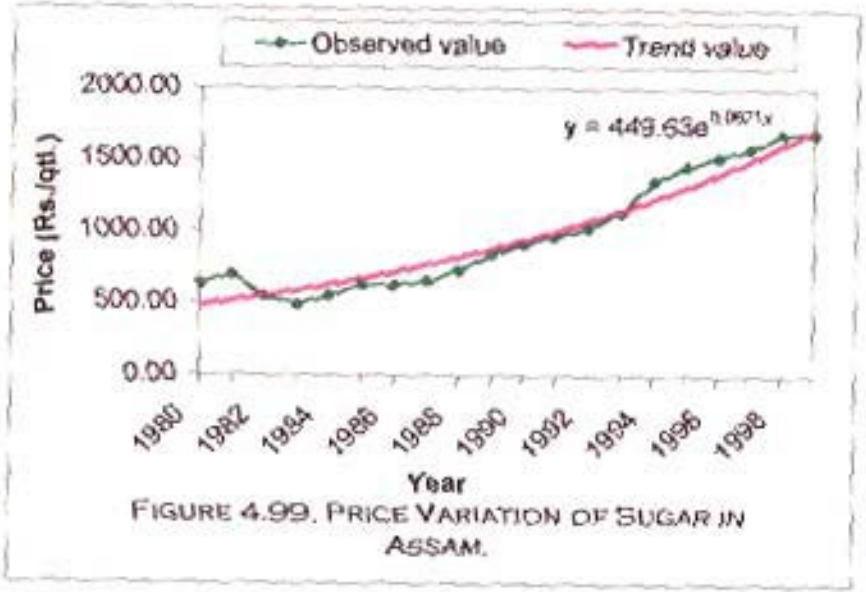

FIGURE 4.99. PRICE VARIATION OF SUGAR IN ASSAM.

(b) Power curve $Y = ax^b$

(c) Exponential Curve $Y = ae^{bx}$

Using above functional forms the coefficient of determination (R^2) has been calculated for each commodity in each of the different districts from the observed prices of the commodity during the period of the study. The discussion on the results of the trend analysis are as follows–

The Table 4.21 shows the R^2 values for each commodity under different forms of trend equations. It is observed that R^2 values for exponential form of the function are highest in majority of the commodities in different districts. Therefore the exponential form of equation has been considered for calculating the trend value.

The trend values of prices are calculated from the trend equations of prices for nine commodities districtwise. The graphs of observed and trend values of price commoditywise and districtwise are shown in Figure 4.01 - 4.99. From the figures it can be comprehended that there was an increasing trend of price of all the commodities during the study period over the years, but the extent of variation of observed prices from the trend prices over the years varied from district to district. The details of the trend analysis are as follows.

4.3.1 Rice (common) and Rice (fine):

As observed in Table 4.22 and 4.23, the spatial variation of prices of rice (common) and rice (fine) from district to district was noticeable. The price in the districts during the year 1980 in case of rice (common) and of rice (fine) varies from a minimum of Rs.194.17 (Dibrugarh) to a maximum of Rs.265.83 (N.C.Hills) per quintal (Table 4.22) and from a minimum of Rs.210.00 (Dibrugarh) to a maximum of Rs.312.98 (Kamrup) per quintal (Table 4.23) respectively. In 1999, this was Rs.1024.17 (Karbi-Anglong) to 1960.42 (Nagaon) in respect of rice (fine)(Table 4.23) and Rs.904.17 (Darrang) to Rs.1170.83 (Kamrup) per quintal in respect of rice (common)(Table 4.22).

Considering the difference (Observed value – trend value) in case of rice (common) it was observed that in Cachar district in most of the years of eighties the observed price were less than the trend values whereas the situation was reversed in

TABLE - 4.22

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF RICE (COMMON) IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

Year	*Cacher*		*Darrang*		*Dibrugarh*		*Goalpara*		*Kamrup*	
	Observed value	Trend value	Obsserved value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	231.58 (-)	234.97	234.00	216.15	194.17	127.47	245.58	229.41	237.58	227.69
1981	232.25 (-)	253.91	227.17 (-)	231.73	193.33	167.87	250.33	248.94	235.33 (-)	249.34
1982	297.33	274.37	279.25	248.44	257.50	208.28	287.83	270.13	285.08	273.04
1983	341.75	296.48	319.75	266.34	297.50	248.68	302.67	293.13	330.33	298.99
1984	337.83	320.37	327.83	285.54	314.58	289.09	330.92	318.08	332.00	327.41
1985	334.83 (-)	346.18	318.58	306.12	290.00 (-)	329.49	332.42 (-)	345.16	315.42 (-)	358.53
1986	342.92 (-)	374.08	334.75	328.19	327.50 (-)	369.90	353.33 (-)	374.54	356.25 (-)	392.60
1987	388.75 (-)	404.22	373.25	351.84	380.83 (-)	410.30	387.92 (-)	406.42	400.00 (-)	429.92
1988	425.83 (-)	436.80	237.50 (-)	377.20	415.83 (-)	450.71	425.83 (-)	441.02	522.50	470.78
1989	488.75	472.00	253.33 (-)	404.39	490.00 (-)	491.11	487.50	478.57	496.25 (-)	515.53
1990	509.17 (-)	510.03	339.75 (-)	433.54	523.33 (-)	531.51	465.42 (-)	519.31	492.08 (-)	564.53
1991	510.58 (-)	551.13	520.50	464.79	546.67 (-)	571.92	502.50 (-)	563.52	550.83 (-)	618.19
1992	597.08	595.54	508.33	498.29	522.08 (-)	612.32	622.50	611.49	778.33	676.95
1993	647.92	643.53	564.17	534.21	521.67 (-)	652.73	647.67 (-)	663.55	875.00	741.30
1994	698.33	695.39	635.83	572.71	639.17 (-)	693.13	681.33 (-)	720.03	1009.58	811.76
1995	750.67 (-)	751.42	670.00	613.99	690.00 (-)	733.54	868.33	781.33	946.25	888.91
1996	819.17	811.97	610.00 (-)	658.25	810.83	773.94	904.58	847.85	974.17	973.41
1997	859.58 (-)	877.41	838.33	705.70	859.58	814.35	969.17	920.02	962.50 (-)	1065.93
1998	956.67	948.11	741.67 (-)	756.56	917.92	854.75	996.67 (-)	998.35	1114.58 (-)	1167.24
1999	1073.33	1024.51	904.17	811.09	1033.75	895.15	1110.00	1083.33	1170.83 (-)	1278.19

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bx}$

contd..

TABLE - 4.22

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF RICE (COMMON) IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

Year	K.Anglong		Lakhimpur		Nagaon		N.C.Hills.		Sivasagor		Assam	
	Observed value	Trend value	Obsserved value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	249.92	238.19	231.83	223.43	249.17	213.15	265.83	261.06	204.17 (-)	207.04	234.98	226.89
1981	244.67 (-)	255.79	234.87 (-)	241.29	224.17 (-)	230.92	267.33 (-)	281.28	205.00 (-)	225.41	231.95 (-)	245.55
1982	296.50	274.70	276.33	260.57	257.92	250.18	326.00	303.06	266.25	245.41	283.63	265.73
1983	335.58	295.00	328.42	281.40	289.25	271.04	356.75	326.53	303.33	267.18	322.08	287.58
1984	338.00	316.80	326.67	303.90	321.67	293.65	377.75	351.83	328.75	290.88	334.69	311.22
1985	340.83	340.21	333.25	328.19	312.92 (-)	318.14	376.08 (-)	379.08	285.00 (-)	316.69	324.15 (-)	336.80
1986	345.17 (-)	365.36	328.92 (-)	354.42	342.08 (-)	344.67	346.75 (-)	408.44	297.50 (-)	344.78	339.07 (-)	364.49
1987	371.58 (-)	392.36	347.83 (-)	382.75	338.33 (-)	373.41	422.92 (-)	440.07	357.92 (-)	375.37	377.57 (-)	394.45
1988	386.67 (-)	421.36	386.33 (-)	413.35	375.42 (-)	404.55	462.25 (-)	474.16	403.75 (-)	408.67	403.23 (-)	426.87
1989	422.42 (-)	452.49	422.08 (-)	446.39	357.08 (-)	438.29	522.42	510.88	437.50 (-)	444.93	436.56 (-)	461.96
1990	426.67 (-)	485.94	431.83 (-)	482.07	402.92 (-)	474.84	506.25 (-)	550.45	500.42	484.40	458.39 (-)	499.94
1991	469.25 (-)	521.85	459.58 (-)	520.60	464.58 (-)	514.44	596.67	593.08	523.75 (-)	527.38	515.55 (-)	541.04
1992	579.25	560.41	581.67	562.22	589.17	557.34	640.33	639.02	596.25	574.17	603.75	585.51
1993	610.17	601.83	598.58 (-)	607.16	632.92	603.82	713.50	688.51	636.92	625.10	644.70	633.64
1994	635.50 (-)	646.31	653.92 (-)	655.69	662.50	654.18	733.75 (-)	741.84	684.58	680.56	704.74	685.73
1995	722.08	694.07	757.33	708.10	802.92	708.74	770.83 (-)	799.30	790.33	740.94	777.60	742.10
1996	735.75 (-)	745.37	764.08 (-)	764.70	823.92	767.84	902.75	861.21	816.67	806.67	816.03	803.11
1997	864.50	800.45	831.67	825.83	785.83 (-)	831.88	1020.83	927.91	870.83 (-)	878.24	878.58	869.13
1998	946.50	859.61	893.67	891.84	846.25 (-)	901.25	958.33 (-)	999.78	956.25	956.15	931.44 (-)	940.57
1999	923.75	923.14	1089.17	963.13	1141.67	976.41	1077.50	1077.22	981.00 (-)	1040.98	1052.41	1017.89

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bX}$

TABLE - 4.23

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF RICE (FINE) IN DIFFERENT DISTRICT AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

	Cacher		*Darrang*		*Dibrugarh*		*Goalpara*		*Kamrup*	
Year	Observed value	Trend value	Obsserved value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	257.08 (-)	269.02	256.67 (-)	256.81	210.00 (-)	279.19	305.50	297.06	312.08	299.27
1981	248.25 (-)	291.43	287.92	275.59	225.83 (-)	302.39	330.75	322.03	321.58 (-)	323.29
1982	318.08	315.70	313.92	295.75	314.58 (-)	327.51	358.50	349.09	372.08	349.24
1983	370.17	342.00	369.75	317.39	390.00	354.71	405.00	378.43	450.25	377.27
1984	359.92 (-)	370.48	407.92	340.60	415.83	384.18	429.92	410.24	491.67	407.55
1985	373.58 (-)	401.34	406.58	365.52	463.33	416.09	474.75	444.72	514.17	440.26
1986	442.50	434.76	465.25	392.26	473.33	450.66	473.33 (-)	482.09	479.17	475.59
1987	454.17 (-)	470.97	466.58	420.95	519.17	488.09	490.42 (-)	522.61	530.83	513.76
1988	497.08 (-)	510.20	250.83 (-)	451.75	589.58	528.64	506.25 (-)	566.53	528.33 (-)	555.00
1989	584.92	552.69	268.33 (-)	484.79	603.33	572.55	570.00 (-)	614.15	608.50	599.54
1990	861.25	598.72	341.25 (-)	520.25	644.17	620.12	659.17 (-)	665.77	402.92 (-)	647.66
1991	801.25	648.59	669.42	558.31	733.33	671.63	671.67 (-)	721.72	464.58 (-)	699.64
1992	680.00 (-)	702.61	749.17	599.15	695.83 (-)	727.42	703.67 (-)	782.38	589.17 (-)	755.79
1993	738.33 (-)	761.13	747.50	642.98	737.50 (-)	787.85	733.17 (-)	848.13	632.92 (-)	816.45
1994	777.92 (-)	824.52	775.00	690.02	811.67 (-)	853.30	818.33 (-)	919.41	662.50 (-)	881.97
1995	854.17 (-)	893.19	775.42	740.49	870.00 (-)	924.18	1179.67	996.69	1259.58	952.76
1996	920.00 (-)	967.56	649.17 (-)	794.66	972.50 (-)	1000.95	1378.33	1080.46	1317.08	1029.23
1997	997.08 (-)	1048.17	916.67	852.79	1018.33 (-)	1084.10	1337.50	1171.26	1457.50	1111.83
1998	1076.67 (-)	1135.47	1005.83	915.18	1050.00 (-)	1174.16	1230.00 (-)	1269.70	1406.67	1201.06
1999	1183.75 (-)	1230.04	1092.33	982.12	1132.50 (-)	1271.70	1293.75 (-)	1376.42	1425.00	1297.46

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bX}$

contd..

TABLE - 4.23

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF RICE (FINE) IN DIFFERENT DISTRICT AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

Year	K.Anglong		Lakhimpur		Nagaon		N.C.Hills.		Sivasagor		Assam	
	Observed value	Trend value	Obsserved value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	272.25	258.32	265.17	255.36	307.92	295.19	284.50 (-)	291.57	226.25 (-)	253.74	270.41 (-)	277.10
1981	279.08	278.33	280.25	276.89	317.17 (-)	321.74	297.75 (-)	316.11	220.00 (-)	275.01	281.30 (-)	300.02
1982	328.50	299.88	315.00	300.23	428.92	350.66	308.42 (-)	342.71	315.83	298.06	337.51	324.85
1983	373.58	323.11	364.92	325.52	497.50	382.19	354.58 (-)	371.55	398.33	323.04	397.86	351.73
1984	357.08	348.14	392.42	352.96	487.92	416.56	377.25 (-)	402.82	398.75	350.13	413.10	380.83
1985	362.50 (-)	375.10	380.67 (-)	382.69	390.00 (-)	454.01	462.33	436.72	408.33	379.48	425.13	412.35
1986	371.00 (-)	404.15	428.00	414.94	528.33	494.84	392.00 (-)	473.47	426.25	411.29	448.68	446.47
1987	396.67 (-)	435.46	412.50 (-)	449.91	532.08 (-)	539.33	607.00	513.31	465.00	445.76	488.86	483.41
1988	423.33 (-)	469.18	447.08 (-)	487.82	522.50 (-)	587.82	628.58	556.51	443.33 (-)	483.13	484.53 (-)	523.41
1989	471.92 (-)	505.52	470.50 (-)	528.92	496.25 (-)	640.68	716.50	603.34	500.42 (-)	523.63	530.40 (-)	566.72
1990	488.17 (-)	544.68	484.92 (-)	573.49	492.08 (-)	698.29	809.33	654.12	537.50 (-)	567.53	571.45 (-)	613.61
1991	535.25 (-)	586.87	544.75 (-)	621.81	550.83 (-)	761.07	779.17	709.17	577.50 (-)	615.10	632.08 (-)	664.39
1992	659.67	632.32	676.83	674.21	778.33 (-)	829.50	743.08 (-)	768.84	673.75	666.67	694.21 (-)	719.36
1993	684.67	681.30	722.42 (-)	731.02	875.00 (-)	904.09	822.92 (-)	833.55	722.92	722.55	741.33 (-)	778.89
1994	755.67	734.06	779.33 (-)	792.62	1009.58	985.38	882.50 (-)	903.69	791.25	783.12	805.53 (-)	843.34
1995	837.00	790.92	885.58	859.40	1210.42	1073.98	900.00 (-)	979.74	889.58	848.77	970.30	913.12
1996	846.50 (-)	852.18	952.58	931.82	1382.08	1170.55	979.17 (-)	1062.19	903.33 (-)	919.92	1034.60	988.67
1997	1046.17	918.18	1065.08	1010.34	1282.08	1275.80	1250.00	1151.58	975.00 (-)	997.04	1137.02	1070.48
1998	1050.00	989.30	1178.42	1095.47	1422.92	1390.51	1125.00 (-)	1248.49	1119.58	1080.62	1169.59	1159.06
1999	1024.17 (-)	1065.92	1303.67	1187.78	1960.42	1515.54	1266.67 (-)	1353.55	1132.50 (-)	1171.21	1284.64	1254.97

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bx}$

almost all the years of nineties. In Darrang district majority of the years of eighties and nineties the observed price were above the trend values of prices. Dibrugarh experienced slightly different situation. Here, trend values of prices were higher from the middle of eighties (1985) to the middle of nineties (1995). Almost a similar type of situation was in Goalpara district. In Kamrup district equal numbers of years of the two decades experienced lower price than the trend values of prices. Trend values of prices were higher during 1986–1991 in Karbi-Anglong. In other words the observed prices in this districts were higher than the trend values in early eighties and in most of the years during nineties. In the other four districts namely, Lakhimpur, Nagaon, N.C.Hills and Sivasagor, a more or less similar type of situation was observed in which mostly the later years of eighties experienced lower prices than the trend values of prices. A comparison of the behaviour of observed and trend values of prices in different districts further revealed that the districts can be placed into two distinct groups showing similar type of behaviour in prices of rice (common) among the districts of the groups.

Group I – Cacher, Darrang, Kamrup, Karbi-Anglong, Lakhimpur, Nagaon, N.C.Hills, and Sivasagor, with random occurrence of trend price above the observed ones.

Group II -- Dibrugarh and Goalpara, with trend price above the observed price during mid eighties to mid nineties.

The situation of the state as a whole was also similar to that of Dibrugarh and Goalpara.

In case of rice (fine), it was observed from Table 4.23 that in Cacher, Dibrugarh, Goalpara and N.C.Hills the observed prices were less than the trend prices in majority of the years. In Cacher, Dibrugarh and N.C.Hills most of the years of nineties, the observed prices were below trend prices. Other four districts viz. Karbi-Anglong, Lakhimpur, Nagaon and Sivasagor the observed prices were above the trend values in majority of the years. The observed prices in Darrang, and Kamrup district were below the trend value for only five and seven years respectively. In Goalpara, Karbi-Anglong, Lakhimpur, and Nagaon district from 1985 to 1991 for majority of the years the observed

value were below trend value. In the state of Assam as a whole the situation was same with Sivasagor district.

4.3.2 Mustard:

Table 4.24 shows that in the year 1980 the lowest price of mustard was Rs.312.08 per quintal in Darrang district and highest price was Rs.591.67 per quintal in Dibrugarh district. During 1999 the lowest price of that commodity was in Lakhimpur district (Rs.1351.17/qtl.) and highest in Dibrugarh district (Rs.2754.17/qtl.). It may be mentioned here that the price of mustard in Dibrugarh district was much higher than the lowest price in both the years. It may be due to less production of mustard in Dibrugarh district in comparison to its production in other district of the state. Further, observing the deviation of trend over the observed prices of mustard in different years, it was noticed that in districts like Cachet, Goalpara, Karbi-Anglong, Nagaon and N.C.Hills observed prices were above the trend value of prices in more number of years. However, in Dibrugarh, Lakhimpur and Sivasagor the observed prices were lower than the trend value in maximum years. In Darrang and Kamrup it was evenly distributed over the trend values. But the peculiarity observed in Dibrugarh and Lakhimpur was that the observed price was lower particularly from mid eighties (1985) to mid nineties (1995–96). The two districts were adjacent geographically and as such same factors may be responsible for maintaining the price behaviour in the two districts. In the state as a whole the observed price was evenly distributed over the trend values of prices.

4.3.3 Potato:

From Table 4.25 it is observed that in 1980 the lowest price of potato was Rs.123.75 (Dibrugarh) and in 1999 it was Rs.465.00 (Goalpara) per quintal. Similarly the highest price for the commodity in the year 1980 was Rs.183.58 (N.C.Hills) and Rs.758.33 (Darrang) in 1999 per quintal. It was also found that the observed prices over the years in different districts follow the exponential trend. Comparing the trend values for the commodity with the observed prices over the years, it was found that in districts like Darrang, Goalpara, the observed prices were above the trend values for more number of years whereas in districts like Cacher, Kamrup, Karbi-Anglong, Lakhimpur,

TABLE - 4.24

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF MUSTARD IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

	Cacher		*Darrang*		*Dibrugarh*		*Goalpara*		*Kamrup*	
Year	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	431.25 (-)	452.42	312.08 (-)	358.98	591.67	448.79	451.75	409.80	451.75	398.39
1981	523.75	482.70	456 00	380.84	591.67	479.69	482.08	439.65	482.08	429.17
1982	458.33 (-)	515.02	391.08 (-)	404.02	579.17	512.73	403 50 (-)	471.66	403.50 (-)	462.31
1983	553.92	549.50	497 75	428.62	605.00	548.04	516.33	506.02	516.33	498.02
1984	569.42 (-)	586.28	559.17	454.71	604.17	585.78	564 33	542 87	564.33	536.49
1985	574.17 (-)	625.53	416.58 (-)	482.40	543.33 (-)	626.12	390.42 (-)	582 41	390 42 (-)	577.92
1986	678.75	667.41	543.83	511.77	579.17 (-)	669.24	486.25 (-)	624.82	525.42 (-)	622.56
1987	873.33	712.09	830.25	542.92	687.50 (-)	715.33	787.50	670.33	864.58	670.65
1988	822.25	759.76	489.25 (-)	575.98	702.50 (-)	764.59	780.00	719.15	799.83	722.45
1989	721.83 (-)	810.62	494.92 (-)	611.04	751.67 (-)	817.25	821.25	771.52	647.92 (-)	778.25
1990	*822.00 (-)*	*864.89*	*478.42 (-)*	*648.25*	*795.83 (-)*	873.53	1031.67	827.71	982.42	838.36
1991	1070.00	922.79	573.83 (-)	687.71	747.50 (-)	933.69	837.50 (-)	888.00	1023.33	903.11
1992	1115.17	984.57	734.17	729.58	774.17 (-)	997.99	1225.00	952.67	1018.33	972.86
1993	1080.83	1050.48	939.58	774.00	725.83 (-)	1066.72	1166.67	1022.05	1038.33 (-)	1048.00
1994	1038.33 (-)	1120.81	825.00	821.12	1067.50 (-)	1140.18	1049.17 (-)	1096.49	1056.25 (-)	1128.95
1995	1027.67 (-)	1195.84	555.50 (-)	871.11	1239.17	1218.71	1385.83	1176.35	1086.25 (-)	1216.15
1996	1107.58 (-)	1275.90	672.50 (-)	924.15	1118.33 (-)	1302 64	1110.42 (-)	1262.02	1177.50 (-)	1310.08
1997	*1449.08*	*1361.31*	*848.33 (-)*	*980.41*	*1453.33*	*1392.35*	*1195.83 (-)*	*1353.93*	*1304.17 (-)*	*1411.27*
1998	1475.92	1452.45	1675 00	1040.10	2058.33	1488.23	1230.00 (-)	1452.54	2257.08	1520.27
1999	1608.58	1549.68	1608.58	1103.42	2754.17	1590.72	1583.33	1558.33	1397.50 (-)	1637.69

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bX}$

contd..

TABLE - 4.24

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF MUSTARD IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

Year	*K.Anglong*		*Lakhimpur*		*Nagaon*		*N.C.Hills.*		*Sivasagor*		*Assam*	
	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	428.92 (-)	446.02	421.58	328.74	428.92 (-)	442.90	432.08 (-)	452.55	543.33	453.80	477.29	436.16
1981	520.42	476.31	441.83	377.43	520.42	472.98	523.75	482.80	562.50	483.11	524.02	466.47
1982	427.50 (-)	508.65	373.58 (-)	426.12	427.50 (-)	505.10	458.33 (-)	515.07	550.83	514.32	466.14 (-)	498.90
1983	551.25	543.19	473.83 (-)	474.80	551.25	539.40	553.92	549.50	544.17 (-)	547.55	547.10	533.58
1984	566.08 (-)	580.08	539.50	523.49	566.08 (-)	576.03	569.42 (-)	586.23	561.67 (-)	582.92	570.92	570.66
1985	575.83 (-)	619.47	543.33 (-)	572.18	575.83 (-)	615.14	574.17 (-)	625.41	525.83 (-)	620.58	523.67 (-)	610.33
1986	678.75	661.54	579.17 (-)	620.86	678.75	656.91	678.75	667.21	515.00 (-)	660.67	597.92 (-)	652.75
1987	871.25	706.46	687.50	669.55	871.25	701.52	873.33	711.81	621.67 (-)	703.35	782.54	698.13
1988	820.83	754.43	702.50 (-)	718.24	755.42	749.16	822.25	759.38	769.17	748.78	767.73	746.65
1989	721.83 (-)	805.66	751.67 (-)	766.92	627.50 (-)	800.03	721.83 (-)	810.14	711.67 (-)	797.16	722.88 (-)	798.55
1990	816.42 (-)	860.37	690.08 (-)	815.61	897.92	854.36	822.00 (-)	864.29	783.33 (-)	848.65	843.75 (-)	854.06
1991	1070.00	918.80	860.83 (-)	864.30	1018.33	912.38	1070.00	922.06	837.50 (-)	903.48	928.25	913.43
1992	1115.17	981.19	900.25 (-)	912.98	1038.33	974.33	1115.17	983.68	1225.00	961.84	1030.08	976.92
1993	1080 83	1047.82	861.58 (-)	961.67	1056.25	1040.49	1080.83	1049.43	1166.67	1023.98	998.37 (-)	1044.82
1994	1038.33 (-)	1118.97	1050.33	1010.36	1086.25 (-)	1111.15	1038.33 (-)	1119.58	1049.17 (-)	1090.13	1054.12 (-)	1117.45
1995	1027.67 (-)	1194.96	1165.42	1059.04	1230.42	1186.61	1027.67 (-)	1194.41	1275.83	1160.55	1170.51 (-)	1195.12
1996	1093.83 (-)	1276.10	1170.25	1107.73	1333.33	1267.18	1107.58 (-)	1274.24	1219.17 (-)	1235.52	1155.63 (-)	1278.19
1997	1449.08	1362.76	1092.58 (-)	1156.42	1341.67 (-)	1353.23	1449.08	1359.41	1338.33	1315.34	1352.65 (-)	1367.04
1998	1475.92	1455.30	1168.33 (-)	1205.10	1193.50 (-)	1445.13	1475.92	1450.27	1312.50 (-)	1400.31	1570.58	1462.06
1999	1608.58	1554.12	1351.17	1253.79	1608.58	1543.26	1608.58	1547.20	1590.00	1490.77	1786.47	1563.69

(-) indicates the observed value is below trend value.

* Trend equatio $Y = ae^{bx}$

TABLE - 4.25

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF POTATO IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

Year	*Cacher*		*Darrang*		*Dibrugarh*		*Goalpara*		*Kamrup*	
	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	160.92	136.84	144.33	129.18	123.75	121.68	147.25	123.07	152.17	145.36
1981	169.50	148.82	144.33	141.26	145.83	131.66	150.67	133.04	141.33 (-)	155.65
1982	151.50 (-)	161.84	137.75 (-)	154.47	125.83 (-)	142.45	133.33 (-)	143.82	141.75 (-)	166.67
1983	182.25	176.01	185.58	168.91	159.17	154.13	181.92	155.47	171.33 (-)	178.47
1984	184.92 (-)	191.41	171.67 (-)	184.71	185.83	166.77	139.50 (-)	168.07	176.42 (-)	191.10
1985	179.92 (-)	208.17	165.42 (-)	201.98	170.00 (-)	180.44	151.33 (-)	181.69	234.25	204.63
1986	292.08	226.38	265.17	220.87	285.00	195.23	239.33	196.41	364.67	219.12
1987	237.08 (-)	246.20	221.42 (-)	241.53	221.25	211.24	228.75	212.32	234.17 (-)	234.63
1988	236.67 (-)	267.74	319.17	264.12	238.33	228.56	197.92 (-)	229.52	232.08 (-)	251.24
1989	257.08 (-)	291.18	318.33	288.81	231.67 (-)	247.30	210.83 (-)	248.11	215.83 (-)	269.03
1990	267.67 (-)	316.66	365.83	315.82	230.00 (-)	267.57	157.92 (-)	268.21	239.75 (-)	288.07
1991	291.75 (-)	344.38	240.42 (-)	345.36	190.83 (-)	289.51	195.00 (-)	289.94	314.17	308.47
1992	332.92 (-)	374.51	345.83 (-)	377.66	235.00 (-)	313.25	389.92	313.43	320.42 (-)	330.30
1993	404.17 (-)	407.29	460.83	412.97	280.83 (-)	338.93	516.33	338.82	524.17	353.69
1994	424.17 (-)	442.94	371.82 (-)	451.59	353.33 (-)	366.72	511.25	366.27	321.67 (-)	378.73
1995	550.42	481.70	449.17 (-)	493.83	453.33	396.79	438.75	395.95	440.50	405.54
1996	862.08	523.86	695.00	540.01	509.17	429.32	508.33	428.03	524.58	434.25
1997	505.83 (-)	569.71	434.09 (-)	590.51	450.42 (-)	464.52	344.17 (-)	462.70	325.00 (-)	464.99
1998	875.83	619.57	833.33	645.73	729.17	502.60	579.17	500.19	557.50	497.91
1999	582.08 (-)	673.80	758.33	706.12	519.17 (-)	543.81	465.00 (-)	540.71	501.67 (-)	533.16

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bX}$

contd..

TABLE - 4.25

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF POTATO IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

Year	K.Anglong		Lakhimpur		Nagaon		N.C.Hills.		Sivasagor		Assam	
	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	177.33	160.06	176.25	139.26	162.92	150.35	183.58	110.92	120.83	118.64	154.93	140.58
1981	168.92 (-)	172.11	158.67	150.18	162.33	161.27	197.67	139.07	152.50	129.18	159.18	152.00
1982	157.75 (-)	185.07	145.17 (-)	161.92	154.42 (-)	172.98	192.25	167.22	147.50	140.65	148.73 (-)	164.35
1983	195.58 (-)	199.01	183.33	174.58	188.42	185.54	232.58	195.37	151.25 (-)	153.14	183.14	177.70
1984	188.00 (-)	213.99	200.42	188.24	176.42 (-)	199.01	243.75	223.52	180.83	166.75	184.78 (-)	192.13
1985	174.42 (-)	230.11	166.33 (-)	202.96	234.25	213.46	220.17 (-)	251.67	146.67 (-)	181.56	184.28 (-)	207.74
1986	278.83	247.43	275.67	218.83	364.67	228.96	313.17	279.81	244.58	197.69	292.32	224.62
1987	728.67	266.06	230.92 (-)	235.95	234.17 (-)	245.59	292.08 (-)	307.96	197.50 (-)	215.25	282.60	242.86
1988	241.25 (-)	286.10	229.50 (-)	254.40	232.08 (-)	263.42	310.17 (-)	336.11	227.92 (-)	234.37	246.51 (-)	262.59
1989	273.42 (-)	307.64	233.33 (-)	274.30	215.83 (-)	282.55	282.08 (-)	364.26	220.00 (-)	255.18	245.84 (-)	283.92
1990	290.08 (-)	330.81	262.00 (-)	295.75	239.75 (-)	303.07	302.50 (-)	392.41	249.58 (-)	277.85	260.51 (-)	306.98
1991	357.58	355.72	320.42	318.88	314.17 (-)	325.08	326.25 (-)	420.56	357.50	302.53	312.18 (-)	331.92
1992	312.25 (-)	382.50	294.00 (-)	343.82	320.42 (-)	348.68	355.33 (-)	448.70	257.92 (-)	329.40	316.40 (-)	358.88
1993	355.08 (-)	411.31	350.75 (-)	370.71	524.17	374.00	397.50 (-)	476.85	334.75 (-)	358.66	414.86	388.03
1994	364.33 (-)	442.28	337.08 (-)	399.70	321.67 (-)	401.16	472.50 (-)	505.00	340.42 (-)	390.52	382.16 (-)	419.55
1995	499.83	475.58	458.42	430.96	440.50	430.29	487.50 (-)	533.15	478.33	425.21	469.68	453.63
1996	604.75	511.39	549.17	464.66	520.83	461.53	662.50	561.30	507.50	462.98	574.39	490.48
1997	531.25 (-)	549.90	412.92 (-)	501.00	516.83	495.05	580.83 (-)	589.45	320.00 (-)	504.10	476.69 (-)	530.32
1998	852.75	591.31	847.67	540.18	374.83 (-)	531.00	915.00	617.60	832.50	548.88	739.78	573.40
1999	509.17 (-)	635.83	569.17 (-)	582.43	519.83 (-)	569.56	599.25 (-)	645.74	709.17	597.64	573.12 (-)	619.98

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bx}$

Nagaon and N.C.Hills the observed prices were below the trend prices for majority of the years. In Dibrugarh and Sivasagor it was evenly distributed. However, in the state as a whole for the majority of the years, the observed prices were below the trend prices. Another important feature observed was that it was from the later part of eighties that the observed prices were below the trend prices in most of the years in districts like Cacher, Dibrugarh, Karbi-Anglong, Lakhimpur, Nagaon, N.C.Hills, Sivasagor and Assam as a whole.

4.3.4 Onion:

In Table 4.26 the observed and trend value of prices of onion from the year 1980 to1999 have been shown. The price of onion was found highest (Rs.230.75/qtl.) in Karbi-Anglong district and lowest (Rs.134.92/qtl.) in Goalpara district during 1980. During 1999 the lowest price of onion rose up to Rs.905.00 per quintal in Kamrup district and the highest in Darrang to Rs.1834.08 per quintal. The distribution of observed and trend values over the years further shows that in seven districts namely Cacher, Darrang, Goalpara, Karbi-Anglong, Lakhimpur, N.C.Hills, Sivasagor and in the state as a whole, the observed price was below the trend price for majority of the years whereas it was evenly distributed in Dibrugarh and Kamrup. But in Nagaon district only for seven years out of twenty the observed price was lower than the trend prices. In Kamrup and Darrang another important observation was that the observed price was lower in most part of eighties whereas in Cacher, Lakhimpur and N.C.Hills it was mostly during nineties.

4.3.5 Lentil, Green gram, Black gram:

For the commodities lentil, green gram and black gram the observed and trend values are shown in the Table 4.27, 4.28 and 4.29 respectively. The observed data shows that in 1980 the lowest prices were Rs.311.67, Rs.347.50 and Rs.213.33/qtl for the three commodities respectively in Sivasagor district. However, for the same year, the highest price for lentil was Rs.414.83 in Karbi-Anglong, Rs.551.42 for green gram in Cacher and Rs.349.42 for black gram in N.C.Hills. In the year 1999 the lowest and highest price for the three commodities varied from Rs.2141.67 (Karbi-Anglong) to Rs. 2504.17 (Nagaon) per quintal in case of lentil, from Rs.2529.42 (Darrang) to

TABLE - 4.26

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF ONION IN DIFFERENT DISTRICTS AND ASSAM AS WHOLE

(Price in Rs./ Qtl.)

Year	*Cacher*		*Darrang*		*Dibrugarh*		*Goalpara*		*Kamrup*	
	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	191.42	166.37	161.50 (-)	162.83	140.83 (-)	141.75	134.92 (-)	147.08	155.50 (-)	187.45
1981	222.25	183.24	193.58	181.56	171.67	155.89	197.75	162.88	184.92 (-)	211.53
1982	199.92 (-)	201.83	188.67 (-)	202.45	196.25	171.44	206.25	180.37	178.00 (-)	238.72
1983	244.67	222.30	248.58	225.75	215.00	188.55	229.33	199.74	212.17 (-)	269.40
1984	219.50 (-)	244.84	218.67 (-)	251.72	220.83	207.36	197.25 (-)	221.18	197.25 (-)	304.02
1985	235.58 (-)	269.67	206.08 (-)	280.68	227.08 (-)	228.05	204.00 (-)	244.94	202.08 (-)	343.09
1986	255.42 (-)	297.02	264.75 (-)	312.97	298.33	250.80	242.50 (-)	271.24	213.08 (-)	387.18
1987	421.25	327.15	341.83 (-)	348.98	221.25 (-)	275.82	441.25	300.36	897.92	436.94
1988	358.33 (-)	360.33	570.83	389.13	335.00	303.34	348.33	332.62	1018.33	493.09
1989	340.00 (-)	396.87	581.67	433.90	313.33 (-)	333.61	303.33 (-)	368.34	1038.33	556.46
1990	478.33	437.12	642.92	483.82	370.00	366.89	251.67 (-)	407.89	1056.25	627.97
1991	416.67 (-)	481.45	700.00	539.48	283.33 (-)	403.49	343.75 (-)	451.69	1086.25	708.67
1992	341.67 (-)	530.28	700.00	601.55	342.50 (-)	443.75	495.83 (-)	500.19	1230.42	799.74
1993	611.67	584.06	613.33 (-)	670.76	331.67 (-)	488.02	700.33	553.91	1333.33	902.52
1994	595.42 (-)	643.30	532.50 (-)	747.93	482.50 (-)	536.71	743.83	613.39	1341.67	1018.50
1995	690.83 (-)	708.54	522.92 (-)	833.98	627.50	590.26	596.67 (-)	679.25	1193.50	1149.39
1996	691.25 (-)	780.40	668.75 (-)	929.93	567.17 (-)	649.15	582.92 (-)	752.19	1608.58	1297.10
1997	786.67 (-)	859.55	754.17 (-)	1036.92	650.42 (-)	713.91	721.67 (-)	832.97	637.50 (-)	1463.80
1998	1950.00	946.73	1675.00	1156.22	1640.00	785.14	1038.33	922.41	1104.33 (-)	1651.91
1999	962.50 (-)	1042.74	1834.08	1289.25	967.50	863.47	940.00 (-)	1021.47	905.00 (-)	1864.21

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bX}$

contd..

TABLE - 4.26

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF ONION IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

Year	*K.Anglong*		*Lakhimpur*		*Nagaon*		*N.C.Hills.*		*Sivasagor*		*Assam*	
	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	230.75	169.55	178.75	162.92	164.67 (-)	193.30	224.50 (-)	225.35	156.67 (-)	158.85	175.56	175.22
1981	226.33	187.32	196.33	178.80	225.50	207.83	286.25	246.22	191.67	174.10	211.76	193.28
1982	198.75 (-)	206.96	193.33 (-)	196.22	228.33	223.46	309.58	269.03	210.00	190.82	211.16 (-)	213.21
1983	251.17	228.66	233.08	215.35	249.58	240.26	305.67	293.96	208.33 (-)	209.15	240.63	235.18
1984	218.58 (-)	252.63	220.42 (-)	236.33	206.50 (-)	258.33	326.00	321.19	240.83	229.24	228.05 (-)	259.42
1985	216.00 (-)	279.12	247.83 (-)	259.37	316.67	277.75	329.75 (-)	350.95	207.50 (-)	251.25	241.33 (-)	286.16
1986	294.75 (-)	308.38	274.17 (-)	284.65	380.83	298.64	355.83 (-)	383.46	295.92	275.38	286.93 (-)	315.66
1987	371.00	340.71	362.83	312.39	384.58	321.09	515.00	418.99	368.33	301.83	430.36	348.19
1988	326.67 (-)	376.43	373.58	342.83	349.00	345.24	491.25	457.80	326.25 (-)	330.81	452.97	384.08
1989	355.25 (-)	415.90	312.08 (-)	376.25	290.00 (-)	371.20	421.75 (-)	500.22	297.50 (-)	362.58	423.20 (-)	423.67
1990	483.17	459.50	390.17 (-)	412.92	413.75	399.11	453.67 (-)	546.56	401.67	397.40	491.29	467.34
1991	566.33	507.67	501.33	453.16	495.83	429.12	481.83 (-)	597.19	574.17	435.57	539.80	515.51
1992	415.67 (-)	560.90	339.42 (-)	497.33	320.42 (-)	461.39	464.50 (-)	652.52	320.83 (-)	477.40	502.20 (-)	568.65
1993	617.00 (-)	619.70	568.58	545.80	524.17	496.08	673.33 (-)	712.97	484.58 (-)	523.25	658.95	627.26
1994	640.25 (-)	684.67	553.67 (-)	598.99	523.58 (-)	533.38	821.00	779.02	543.75 (-)	573.50	678.88 (-)	691.91
1995	698.67 (-)	756.45	599.33 (-)	657.37	600.58	573.49	791.67 (-)	851.19	546.25 (-)	628.57	683.70 (-)	763.23
1996	731.42 (-)	835.76	607.25 (-)	721.44	652.08	616.61	947.50	930.05	546.25 (-)	688.94	764.93 (-)	841.90
1997	728.75 (-)	923.38	635.75 (-)	791.75	570.17 (-)	662.97	968.33 (-)	1016.22	582.50 (-)	755.10	713.69 (-)	928.68
1998	2162.92	1020.19	1783.92	868.92	628.42 (-)	712.82	1997.50	1110.36	1680.00	827.62	1551.53	1024.40
1999	1150.00	1127.14	952.42 (-)	953.60	971.67	766.42	1150.00 (-)	1213.23	978.33	907.10	1086.90 (-)	1129.99

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bX_i}$

TABLE - 4.27

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF LENTIL IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

Year	Cacher		Darrang		Dibrugarh		Goalpara		Kamrup	
	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	404.08	358.35	404.42	369.46	329.17	282.01	399.17	346.42	391.83	344.02
1981	502.00	397.10	490.25	406.48	396.25	316.73	496.08	383.09	473.67	380.84
1982	420.67 (-)	440.05	397.50 (-)	447.22	350.00 (-)	355.72	402.42 (-)	423.63	385.92 (-)	421.61
1983	462.17 (-)	487.65	392.08 (-)	492.03	343.33 (-)	399.51	391.75 (-)	468.47	388.08 (-)	466.75
1984	578.33	540.39	524.58 (-)	541.34	470.83	448.70	520.92	518.05	488.17 (-)	516.71
1985	591.58 (-)	598.84	552.83 (-)	595.59	493.33 (-)	503.94	537.50 (-)	572.87	680.42	572.03
1986	620.00 (-)	663.61	598.83 (-)	655.27	531.67 (-)	565.98	565.00 (-)	633.50	570.00 (-)	633.26
1987	612.92 (-)	735.39	606.67 (-)	720.93	525.83 (-)	635.65	598.75 (-)	700.55	576.67 (-)	701.06
1988	767.50 (-)	814.93	1098.33	793.18	605.00 (-)	713.91	762.50 (-)	774.69	705.92 (-)	776.11
1989	913.58	903.07	1066.67	872.66	816.67	801.79	855.00 (-)	856.68	842.92 (-)	859.19
1990	885.42 (-)	1000.74	1088.33	960.11	821.67 (-)	900.50	884.58 (-)	947.35	955.00	951.17
1991	909.58 (-)	1108.98	1074.17	1056.32	1135.00	1011.36	1034.58 (-)	1047.61	1137.08	1052.99
1992	1179.17 (-)	1228.93	1120.83 (-)	1162.17	1145.00	1135.87	1261.67	1158.48	1252.92	1165.71
1993	1215.42 (-)	1361.85	1104.17 (-)	1278.63	1128.33 (-)	1275.70	1421.58	1281.09	1212.08 (-)	1290.50
1994	1462.50 (-)	1509.14	1188.33 (-)	1406.76	1266.67 (-)	1432.75	1528.92	1416.67	1417.50 (-)	1428.66
1995	1994.17	1672.37	1726.67	1547.73	1670.00	1609.13	1350.00 (-)	1566.60	1705.83	1581.59
1996	2447.50	1853.25	1790.83	1702.83	2421.67	1807.23	1949.92	1732.40	2218.33	1750.91
1997	2199.17	2053.70	1690.00 (-)	1873.47	2250.00	2029.72	1970.83	1915.75	1690.42 (-)	1938.34
1998	2220.83 (-)	2275.82	2283.33	2061.20	2240.00 (-)	2279.59	2045.00 (-)	2118.50	2104.58 (-)	2145.85
1999	2490.00 (-)	2521.97	2197.75 (-)	2267.75	2455.00 (-)	2560.23	2395.83	2342.71	2350.00 (-)	2375.56

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bX}$

contd..

TABLE - 4.27

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF LENTIL IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

Year	*K.Anglong*		*Lakhimpur*		*Nagaon*		*N.C.Hills.*		*Sivasagor*		*Assam*	
	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	414.83	365 09	403.42	361.61	397.58	343.99	411.83	402.68	311.67	287.49	386.80	346.06
1981	526.17	403.52	515.67	397.93	509.58	382.77	543.58	442.99	390.83	320.60	484.61	383.38
1982	418.92 (-)	446.01	412.92 (-)	437.89	412.92 (-)	425.91	498.33	487.33	357.50	357.52	405.71 (-)	424.72
1983	429.42 (-)	492.96	410.92 (-)	481.87	395.42 (-)	473.91	478.92 (-)	536.11	344.17 (-)	398.69	403.63 (-)	470.51
1984	546.83	544.86	554.67	530.26	514.58 (-)	527.33	626.25	589.78	466.67	444.60	529.18	521.25
1985	575.33 (-)	602.23	603.50	583.52	571.67 (-)	586.77	638.92 (-)	648.81	466.25 (-)	495.81	571.13 (-)	577.45
1986	623.50 (-)	665.63	593.25 (-)	642.12	651.58 (-)	652.90	635.00 (-)	713.76	530.83 (-)	552.90	591.97 (-)	639.71
1987	652.25 (-)	735.71	607.42 (-)	706.60	623.33 (-)	726.49	708.75 (-)	785.20	501.67 (-)	616.58	601.43 (-)	708.69
1988	770.00 (-)	813.16	748.58 (-)	777.57	720.42 (-)	808.38	822.08 (-)	863.80	724.58	687.58	772.49 (-)	785.11
1989	893.83 (-)	898 77	870.58	855.66	851.67 (-)	899.49	965.42	950.27	877.50	766.77	895.38	869.76
1990	963.67 (-)	993.40	911.67 (-)	941.59	955.00 (-)	1000.87	985.83 (-)	1045.39	870.83	855.07	932.20 (-)	963.55
1991	1133.67	1097.98	1106.50	1036.15	1137.08	1113.68	1099.50 (-)	1150.03	1010.83	953.54	1077.80	1067.44
1992	1158.58 (-)	1213.58	1005.17 (-)	1140 21	1252.92	1239.21	1336.25	1265.15	973.33 (-)	1063.35	1168.58 (-)	1182.54
1993	1195.42 (-)	1341.35	979.75 (-)	1254.72	1212.08 (-)	1378.68	1335.75 (-)	1391.79	958.75 (-)	1185.81	1176.33 (-)	1310.05
1994	1282.58 (-)	1482.57	1302.75 (-)	1380.74	1417.50 (-)	1534.30	1386.67 (-)	1531.10	1255.83 (-)	1322.37	1350.93 (-)	1451.31
1995	1703.58	1638.66	1650.25	1519.40	1877.92	1707.23	1791.67	1684.36	1556.25	1474.66	1702.63	1607.80
1996	2279.08	1811.18	2141.17	1671.99	2462.92	1899.65	2218.33	1852.97	2024.17	1644.49	2195.39	1781.16
1997	2468.00	2001.86	1869.92	1839.91	2312.42	2113.77	2295.83	2038.45	1873.75	1833.87	2062.03	1973.22
1998	2318.75	2212 62	2141.92	2024.69	2320.75 (-)	2352.01	2361.67	2242.49	2215.42	2045.06	2225.23	2185.98
1999	2141.67 (-)	2445.57	2265.25	2228.03	2504.17 (-)	2617.11	2141.67 (-)	2466.96	2298.25	2280.58	2323.96 (-)	2421.69

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bx}$

TABLE - 4.28

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF GREEN GRAM IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

	Cacher		*Darrang*		*Dibrugarh*		*Goalpara*		*Kamrup*	
Year	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	551.42	431.60	510.50	455.90	369.58	312.43	504.58	415.30	512.75	451.97
1981	583.75	476.38	569.75	500.89	410.00	351.52	526.67	457.61	550.67	495.28
1982	511.58 (-)	525.79	501.83 (-)	550.31	398.33	395.51	487.58 (-)	504.22	500.92 (-)	542.73
1983	543.08 (-)	580.34	525.42 (-)	604.61	401.25 (-)	445.00	504.17 (-)	555.58	518.33 (-)	594.73
1984	631.92 (-)	640.54	660.17 (-)	664.27	495.00 (-)	500.68	637.08	612.17	639.17 (-)	651.72
1985	*782.75*	*706.99*	*742.08*	*729.81*	*525.83 (-)*	*563.33*	*720.67*	*674.52*	*728.92*	*714.17*
1986	565.42 (-)	780.32	634.17 (-)	801.82	531.67 (-)	633.82	541.67 (-)	743.23	583.33 (-)	782.59
1987	673.33 (-)	861.27	652.25 (-)	880.93	555.00 (-)	713.13	634.83 (-)	818.94	600.00 (-)	857.58
1988	956.83	950.62	1107.08	967.85	790.00 (-)	802.37	970.83	902.35	930.67 (-)	939.75
1989	1051.00	1049.23	1108.75	1063.35	869.17 (-)	902.77	998.67	994.27	1008.50 (-)	1029.79
1990	981.67 (-)	1158.07	1115.83 (-)	1168.27	834.17 (-)	1015.74	1048.33 (-)	1095.54	1063.33 (-)	1128.47
1991	1162.92 (-)	1278.20	1716.67	1283.55	1430.83	1142.84	1170.00 (-)	1207.14	1168.33 (-)	1236.59
1992	*1480.42*	*1410.80*	*1793.33*	*1410.19*	*1521.67*	*1285.84*	*1447.50*	*1330.10*	*1487.50*	*1355.08*
1993	1557.50	1557.15	1781.67	1549.34	1603.33	1446.74	1626.75	1465.58	1548.75	1484.92
1994	1702.08 (-)	1718.68	1788.33	1702.21	1645.83	1627.78	1626.25	1614.86	1678.33	1627.20
1995	2051.67	1896.96	1864.17 (-)	1870.17	1963.33	1831.46	1751.67 (-)	1779.36	1696.67 (-)	1783.11
1996	2529.58	2093.75	1883.33 (-)	2054.69	2466.67	2060.63	2054.17	1960.60	2151.67	1953.96
1997	2313.33	2310.94	1796.67 (-)	2257.43	2240.83 (-)	2318.49	2133.33 (-)	2160.31	2019.17 (-)	2141.19
1998	2725.00	2550.67	2649.17	2480.17	2392.50 (-)	2608.60	2374.58 (-)	2380.36	2486.25	2346.35
1999	2804.17 (-)	2815.26	2529.42 (-)	2724.89	2639.17 (-)	2935.02	2729.17	2622.62	2729.17	2571.17

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bx}$

contd.

TABLE - 4.28

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF GREEN GRAM IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

Year	K.Anglong		Lakhimpur		Nagaon		N.C.Hills.		Sivasagar		Assam	
	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	550.17	454.84	514.25	421.56	515.42	376.00	542.25	489.43	347.50	332.37	491.84	414.99
1981	577.67	500.22	563.83	465.89	502.08	418.47	599.75	536.76	397.92	371.76	528.21	458.64
1982	525.75 (-)	550.13	483.83 (-)	514.89	407.50 (-)	465.73	599.83	588.66	400.83 (-)	415.81	481.80 (-)	506.87
1983	544.67 (-)	605.01	462.42 (-)	569.04	436.67 (-)	518.32	618.92 (-)	645.58	407.50 (-)	465.09	496.24 (-)	560.18
1984	671.08	665.38	638.92	628.89	510.42 (-)	576.86	688.00 (-)	708.00	514.17 (-)	520.21	650.26	619.09
1985	764.25	731.76	698.92	695.03	576.25 (-)	642.01	800.17	776.46	569.58 (-)	581.86	690.94	684.21
1986	677.92 (-)	804.77	686.67 (-)	768.13	579.08 (-)	714.51	746.25 (-)	851.54	581.67 (-)	650.82	612.78 (-)	756.16
1987	765.83 (-)	885.08	681.83 (-)	848.91	710.42 (-)	795.21	770.42 (-)	933.88	589.17 (-)	727.95	663.31 (-)	835.69
1988	1087.50	973.36	1093.50	938.19	1007.17	885.01	1060.42	1024.18	1014.00	814.23	1001.80	923.58
1989	1072.42	1070.47	1100.17	1036.86	1092.50	984.96	1157.92	1123.21	1052.25	910.72	1050.93	1020.71
1990	1106.50 (-)	1177.27	1049.08 (-)	1145.91	1063.33 (-)	1096.20	1206.25 (-)	1231.82	1080.83	1018.65	1054.93 (-)	1128.06
1991	1125.42 (-)	1294.72	1085.92 (-)	1266.43	1168.33 (-)	1219.99	1285.83 (-)	1350.93	1196.25	1139.38	1251.05	1246.70
1992	1390.33 (-)	1423.89	1427.58	1399.62	1487.50	1357.77	1546.33	1481.55	1312.50	1274.41	1489.47	1377.82
1993	1543.08 (-)	1565.95	1543.50 (-)	1546.82	1548.75	1511.11	1675.83	1624.81	1512.50	1425.44	1594.17	1522.73
1994	1595.75 (-)	1722.19	1686.83 (-)	1709.50	1678.33 (-)	1681 77	1666.67 (-)	1781.92	1675.42	1594.37	1674.38 (-)	1682.87
1995	1814.92 (-)	1894.01	1993.67	1889.28	1974.17	1871.70	1833.33 (-)	1954.22	1804.17	1783.33	1874.78	1859.86
1996	2330.17	2082.97	2437.58	2087.98	2317.08	2083.08	2370.83	2143.18	1801.25 (-)	1994.68	2234.23	2055.47
1997	2654.00	2290.79	2248.58 (-)	2307.58	2483.67	2318.33	2583.33	2350.41	1955.00 (-)	2231.07	2242.79 (-)	2271.64
1998	2772.50	2519.34	2654.17	2550.27	2317.00 (-)	2580.15	2628.33	2577.68	2713.33	2495.48	2571.28	2510.55
1999	2696.25 (-)	2770.69	2815.83 (-)	2818.48	2778.50 (-)	2871 54	2800.00 (-)	2826.93	2637.50 (-)	2791.23	2715.92 (-)	2774.59

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bX}$

Rs.2815.83 (Lakhimpur) per quintal for green gram and from Rs.1694.17 (Dibrugarh) to Rs.2195.83 (Karbi-Anglong) per quintal in case of black gram.

From the Table 4.27 it is found that out of ten districts, in seven districts observed price of lentil were below the trend price in most of the years. But only in two districts i.e. Lakhimpur and Sivasagor observed price were lower than the trend values in less number of years. In N.C.Hills it was equally distributed. Another noticeable point is that from 1982 to 1990 observed prices were less than the trend prices in majority of the years in most of the districts. In Table 4.28 it was seen that in Cacher, Goalpara, N.C.Hills and Sivasagor the observed prices of green gram were below trend value in less number of years whereas for most of years the observed prices were below trend prices in case of Dibrugarh, Kamrup, Karbi-Anglong and Nagaon district. The same was evenly distributed in Darrang and Lakhimpur district. However for the state as a whole the observed prices were below the trend prices for less number of years and were observed randomly during the study period.

Observing the deviation of observed price from trend prices of black gram (Table 4.29) it was revealed that out of ten districts of Assam in four districts namely Darrang, Dibrugarh, Nagaon and Sivasagor the observed price were below trend prices in more number of years whereas in two districts Cacher and Goalpara observed prices were above trend prices in more number of years and it was evenly distributed over the trend value in Kamrup, Karbi-Anglong, Lakhimpur, N.C.Hills and Assam as a whole. It is noticeable that the observed prices were below trend value in all the districts in 1998 and 1999, which indicated that the prices increase was less in these two years.

4.3.6 Sugar:

The price movement of sugar is presented in Table 4.30. During 1980 and 1999 the lowest price of sugar varied from Rs.462.50 to Rs.1652.92 in the same district Sivasagor. The highest price (Rs.695.58/qtl.) was observed in Cacher district in 1980 and it rose up to Rs.1737.83 per quintal in Lakhimpur district in 1999.

Observing the deviation of trend over the observed prices of sugar (Table 4.30) in different districts of Assam, it was noticed that in Cacher, Darrang, Goalpara, Kamrup, Karbi-Anglong, Lakhimpur, Nagaon and N.C.Hills district the observed prices

TABLE - 4.29

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF BLACK GRAM IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

Year	Cacher		Darrang		Dibrugarh		Goalpara		Kamrup	
	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	240.08 (-)	313.33	264.58	259.60	232.50 (-)	232.69	225.58 (-)	267.58	229.83 (-)	284.90
1981	268.42 (-)	345.38	244.08 (-)	288.94	232.50 (-)	263.38	212.33 (-)	297.65	222.58 (-)	318.79
1982	513.00	380.72	345.17	321.61	248.75 (-)	298.12	336.08	331.10	299.58 (-)	356.71
1983	486.25	419.66	394.58	357.96	360.83	337.44	413.92	368.31	398.25 (-)	399.15
1984	508.08	462.60	490.25	398.43	405.00	381.95	553.00	409.70	472.00	446.63
1985	633.83	509.92	443.42 (-)	443.47	423.33 (-)	432.33	621.08	455.74	571.67	499.76
1986	512.50 (-)	562.09	489.58 (-)	493.60	436.67 (-)	489.35	386.67 (-)	506.96	635.83	559.21
1987	620.83	619.59	513.00 (-)	549.40	478.33 (-)	553.90	500.83 (-)	563.93	671.67	625.74
1988	705.00	682.97	571.67 (-)	611.51	570.83 (-)	626.96	575.00 (-)	627.30	931.83	700.18
1989	877.50	752.84	635.83 (-)	680.63	740.83	709.66	733.33	697.80	811.25	783.47
1990	671.67 (-)	829.86	671.67 (-)	757.58	674.17 (-)	803.27	825.00	776.21	829.58 (-)	876.67
1991	931.83	914.75	931.83	843.22	1435.83	909.22	911.67	863.44	1203.75	980.96
1992	811.25 (-)	1008.33	811.25 (-)	938.54	1466.67	1029.15	1108.82	960.48	1867.50	1097.66
1993	829.58 (-)	1111.49	830.00 (-)	1044.64	1465.00	1164.90	1203.42	1068.41	1177.08 (-)	1228.23
1994	1203.75 (-)	1225.19	1165.83	1162.73	1536.67	1318.55	1346.67	1188.48	1867.50	1374.35
1995	1867.50	1350.53	1672.08	1294.17	1941.67	1492.47	1741.67	1322.04	1779.17	1537.84
1996	1867.50	1488.69	1833.33	1440.47	1954.17	1689.33	1616.67	1470.60	1153.75 (-)	1720.78
1997	1912.50	1640.99	1812.92	1603.31	1600.00 (-)	1912.16	1075.00 (-)	1635.87	1462.50 (-)	1925.48
1998	1462.50 (-)	1808.86	1562.50 (-)	1784.56	1484.17 (-)	2164.37	1566.67 (-)	1819.70	1867.50 (-)	2154.54
1999	1779.17 (-)	1993.91	1791.67 (-)	1986.29	1694.17 (-)	2449.86	1800.00 (-)	2024.20	1912.50 (-)	2410.85

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bx}$

contd..

TABLE - 4.29

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF BLACK GRAM IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

Year	K.Anglong		Lakhimpur		Nagaon		N.C.Hills.		Sivasagor		Assam	
	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	327.17	304.48	218.50 (-)	274.25	266.67	246.76	349.42 (-)	353.89	213.33 (-)	223.95	256.91 (-)	277.68
1981	302.00 (-)	338.13	240.25 (-)	302.19	260.42 (-)	275.78	422.83	392.60	246.25 (-)	253.41	264.13 (-)	309.63
1982	336.83 (-)	375.49	310.50 (-)	332.97	298.42 (-)	308.22	397.42 (-)	435.54	229.17 (-)	286.75	332.63 (-)	345.25
1983	425.50	416.97	405.83	366.89	363.75	344.47	459.58 (-)	483.18	332.50	324.48	404.10	384.97
1984	534.58	463.04	512.83	404.26	400.83	384.99	513.50 (-)	536.03	392.08	367.17	480.05	429.26
1985	536.17	514.20	529.17	445.43	479.17	430.27	591.67 (-)	594.66	404.58 (-)	415.47	525.24	478.65
1986	573.75	571.02	567.08	490.81	456.58 (-)	480.88	644.17 (-)	659.70	398.33 (-)	470.13	509.87 (-)	533.72
1987	571.67 (-)	634.11	566.67	540.80	496.67 (-)	537.44	758.33	731.86	461.67 (-)	531.98	583.30 (-)	595.13
1988	822.25	704.17	611.75	595.89	571.67 (-)	600.65	870.00	811.91	570.83 (-)	601.97	681.50	663.60
1989	721.83 (-)	781.97	671.83	656.58	635.83 (-)	671.30	952.50	900.72	740.83	681.17	750.74	739.94
1990	822.00 (-)	868.37	717.75 (-)	723.46	671.67 (-)	750.25	674.17 (-)	999.24	674.17 (-)	770.79	725.18 (-)	825.07
1991	1070.00	964.32	902.67	797.16	931.83	838.50	1435.83	1108.53	1435.83	872.19	1114.36	920.00
1992	1115.17	1070.86	812.83 (-)	878.36	811.25 (-)	937.12	1466.67	1229.78	1466.67	986.94	1170.57	1025.85
1993	1080.83 (-)	1189.18	679.50 (-)	967.82	829.58 (-)	1047.34	1465.00	1364.29	1465.00	1116.79	1100.83 (-)	1143.87
1994	1038.33 (-)	1320.57	982.00 (-)	1066.41	1203.75	1170.53	1536.67	1513.52	1536.67	1263.72	1340.16	1275.47
1995	1636.67	1466.48	1625.92	1175.03	1867.50	1308.21	1662.50 (-)	1679.06	1600.00	1429.98	1739.63	1422.22
1996	1918.33	1628.51	1408.42	1294.72	1867.50	1462.08	2044.17	1862.72	1484.17 (-)	1618.11	1712.30	1585.85
1997	1716.67 (-)	1808.44	1315.17 (-)	1426.60	1912.50	1634.04	2350.00	2066.46	1694.17 (-)	1830.99	1683.48 (-)	1768.30
1998	2007.42 (-)	2008.25	1379.42 (-)	1571.92	1462.50 (-)	1826.24	2250.00 (-)	2292.48	1484.17 (-)	2071.88	1651.27 (-)	1971.74
1999	2195.83 (-)	2230.14	1695.83 (-)	1732.03	1779.17 (-)	2041.03	1875.00 (-)	2543.23	1694.17 (-)	2344.46	1853.28 (-)	2198.59

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bx}$

TABLE - 4.30

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF SUGAR IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

Year	*Cacher*		*Darrang*		*Dibrugarh*		*Goalpara*		*Kamrup*	
	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	695.58	499.44	684.92	507.49	502.50	415.38	643.42	489.45	675.25	485.82
1981	723.17	533.14	709.92	539.85	645.00	450.34	705.25	520.34	695.33	517.31
1982	553.33 (-)	569.12	550.67 (-)	574.26	498.33	488.24	539.08 (-)	553.17	537.92 (-)	550.84
1983	505.83 (-)	607.52	505.25 (-)	610.87	440.00 (-)	529.32	498.33 (-)	588.09	491.17 (-)	586.54
1984	560.58 (-)	648.52	565.25 (-)	649.81	477.50 (-)	573.87	547.83 (-)	625.20	530.42 (-)	624.56
1985	681.42 (-)	692.28	659.08 (-)	691.24	566.67 (-)	622.16	613.33 (-)	664.66	640.42 (-)	665.04
1986	656.67 (-)	738.99	651.00 (-)	735.30	531.67 (-)	674.52	647.08 (-)	706.61	640.42 (-)	708.14
1987	665.00 (-)	788.86	648.50 (-)	782.18	606.67 (-)	731.28	684.17 (-)	751.20	630.83 (-)	754.04
1988	720.83 (-)	842.09	940.00	832.04	630.00 (-)	792.82	719.17 (-)	798.61	712.50 (-)	802.91
1989	862.50 (-)	898.92	869.17 (-)	885.09	820.83 (-)	859.54	829.33 (-)	849.01	843.75 (-)	854.95
1990	852.92 (-)	959.58	952.50	941.51	944.17	931.88	952.50	902.60	913.33	910.36
1991	946.25 (-)	1024.33	927.50 (-)	1001.53	1217.50	1010.30	852.50 (-)	959.56	923.33 (-)	969.36
1992	1051.00 (-)	1093.45	934.58 (-)	1065.38	1353.33	1095.32	934.58 (-)	1020.12	947.08 (-)	1032.19
1993	1205.42	1167.23	977.50 (-)	1133.29	1407.50	1187.49	977.50 (-)	1084.50	990.42 (-)	1099.09
1994	1471.25	1246.00	1127.50 (-)	1205.54	1483.33	1287.43	1127.50 (-)	1152.94	1207.92	1170.33
1995	1435.00	1330.07	1429.17	1282.39	1431.67	1395.77	1378.33	1225.71	1437.92	1246.18
1996	1522.92	1419.83	1566.67	1364.15	1545.00	1513.23	1480.00	1303.06	1421.25	1326.95
1997	1594.67	1515.64	1632.50	1451.11	1635.83 (-)	1640.57	1420.83	1385.30	1501.92	1412.96
1998	1711.25	1617.91	1662.00	1543.62	1702.50 (-)	1778.63	1575.83	1472.73	1595.42	1504.54
1999	1735.42	1727.09	1668.42	1642.02	1698.75 (-)	1928.31	1685.42	1565.68	1701.92	1602.05

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bx}$

contd..

TABLE - 4.30

OBSERVED AND TREND VALUE* OF YEARLY AVERAGE PRICE OF SUGAR IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

(Price in Rs./ Qtl.)

Year	K.Anglong		Lakhimpur		Nagaon		N.C.Hills.		Sivasagor		Assam	
	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value	Observed value	Trend value
1980	686.42	485.55	689.42	368.95	660.42	492.42	651.92	527.66	462.50	404.65	635.23	480.84
1981	752.50	520.18	714.67	436.20	685.00	524.02	731.17	563.21	634.17	437.56	699.62	514.21
1982	545.83 (-)	557.29	547.50	503.45	540.42 (-)	557.64	648.08	601.15	488.33	473.15	544.95 (-)	549.69
1983	509.08 (-)	597.04	507.75 (-)	570.69	496.67 (-)	593.43	565.00 (-)	641.65	424.17 (-)	511.64	494.33 (-)	588.06
1984	556.58 (-)	639.62	571.33 (-)	637 94	602.50 (-)	631.52	639.75 (-)	684.88	465.00 (-)	553.25	551.68 (-)	628.87
1985	633.17 (-)	685.25	611.25 (-)	705.19	622.08 (-)	672.04	712.08 (-)	731.02	547.58 (-)	598.26	628.71 (-)	672.52
1986	652.92 (-)	734.12	669.17 (-)	772.44	632.50 (-)	715.17	700.00 (-)	780.27	517.50 (-)	646.92	629.89 (-)	719.19
1987	674.42 (-)	786.49	673.67 (-)	839 68	650.83 (-)	761.07	712.50 (-)	832.84	597 08 (-)	699.54	654.37 (-)	769.10
1988	698.75 (-)	842.59	730.50 (-)	906.93	721.25 (-)	809.91	761.00 (-)	888.95	701.67 (-)	756.44	733.57 (-)	822.48
1989	737.92 (-)	902.69	887.25 (-)	974.18	880.83	861.89	866.42 (-)	948.84	861.67	817.96	845.97 (-)	879.56
1990	892.50 (-)	967.08	921.00 (-)	1041.42	913 33 (-)	917.20	852.92 (-)	1012.77	910.83	884.50	910.60 (-)	940.61
1991	960.83 (-)	1036.06	955.58 (-)	1108.67	923.33 (-)	976.06	946.25 (-)	1081.00	1076.67	956.44	972.98 (-)	1005.89
1992	1055.00 (-)	1109.96	989.33 (-)	1175.92	947.08 (-)	1038.70	1051.00 (-)	1153.83	982.92 (-)	1034.23	1024.59 (-)	1075.70
1993	1141.67 (-)	1189.13	1182.67 (-)	1243.16	990.42 (-)	1105.36	1403.33	1231.57	1137.92	1118.36	1141.43 (-)	1150.35
1994	1533.42	1273.95	1461.58	1310.41	1207.92	1176.29	1533.42	1314.54	1443.33	1209.32	1359.72	1230.19
1995	1575.00	1364.82	1455.08	1377.66	1437.92	1251.78	1575.00	1403.11	1437.08	1307.69	1459.22	1315.57
1996	1725.00	1462.17	1511.58	1444.91	1421 25	1332.11	1725.00	1497.64	1372.50 (-)	1414.06	1529.12	1406.87
1997	1709.17	1566.47	1592.83	1512.15	1501.92	1417.60	1709.17	1598.54	1553.33	1529.07	1585.22	1504.51
1998	1795.83	1678.20	1746.00	1579.40	1595.42	1508.58	1795.83	1706.23	1692.50	1653.45	1687.26	1608.93
1999	1694.17 (-)	1797.91	1737.83	1646.65	1701.92	1605.39	1694.17 (-)	1821.19	1652.92 (-)	1787.94	1697.09 (-)	1720.59

(-) indicates the observed value is below trend value.

* Trend equation $Y = ae^{bx}$

were below the trend values in most of the years whereas in Sivasagor the observed prices were above the trend values in more number of years. But in Dibrugarh, observed prices were equally distributed over the trend prices during the period. It was clearly observed that during 1982 – 1992 in all the districts and in the state as a whole in majority of the years the observed prices were below trend prices indicating that during this period the price did not rise as expected to by the trend of prices in the state.

4.4 SEASONAL VARIATION OF AVERAGE PRICE

It is the common perception that the price of agricultural commodity like rice in a state like Assam where it is considered to be the staple food, behaves differently on different seasons due to some agro-climatic and socio- economic factors inherent with the living practices of the people. The same is true for most of the agricultural commodities consumed or needed by the human population. Of course the timing of the seasons for different commodities may not be same. Considering the different agro- economic and social factors, which are assumed to be associated with price behaviour of the commodities, the seasons for the present studies have been termed as pre-sowing, sowing, harvesting and post-harvesting. The period for each of these seasons for different commodities are defined as per the agricultural norms and are mentioned at the bottom of the reference table for the seasonal price indices of the crop. Table 4.31– 4.34 shows the seasonal indices of nine commodities considered in the study.

4.4.1 Rice (common) and Rice (fine):

Table 4.31 presents the seasonal price indices of the two types of rice i.e. rice (common) and rice (fine) included in the study for different districts of the state. As observed in the table, the seasonal price indices reflects that in some districts such as Dibrugarh, Karbi-Anglong and Nagaon, the price of rice (common) did not show marked differences in the four seasons. On the other hand, the district like Cachar experienced a slightly higher price during harvesting and similarly Darrang during pre-sowing, Goalpara during pre-sowing, sowing and post-harvesting, Kamrup and Lakhimpur during post-harvesting, N.C.Hills during sowing and post-harvesting and in Sivasagor during sowing season. However, based on the values of the seasonal indices, it can be concluded

TABLE - 4.31

SEASONAL PRICE INDICES OF RICE DURING 1980 - 1999 IN DIFFERENT DISTRICTS AND ASSAM AS AWHOLE

Season / District	Rice(common)				Rice(fine)			
	Pre-sowing	Sowing	Harvesting	Post-harvesting	Pre-sowing	Sowing	Harvesting	Post-harvesting
Cacher	99.95	99.93	100.08	99.90	99.97	99.79	99.83	99.70
Darrang	100.20	99.61	99.53	99.68	100.31	99.70	99.60	100.03
Dibrugarh	99.94	99.93	99.86	99.89	99.76	99.62	99.51	99.88
Goalpara	100.07	100.05	99.99	100.04	99.64	99.76	99.52	99.46
Kamrup	99.55	99.64	99.82	100.47	100.06	100.19	100.44	100.74
Karbi Anglong	99.95	99.97	99.89	99.98	100.03	99.99	99.81	99.96
Lakhimpur	99.96	99.95	99.91	100.07	100.00	99.88	99.99	100.08
Nagoan	99.56	99.90	99.58	99.51	99.78	99.83	99.42	99.48
N.C.Hills	99.94	100.04	99.98	100.00	99.68	99.57	99.60	99.80
Sivasagor	99.86	100.13	99.89	99.96	100.20	99.10	100.32	100.06
Assam	99.21	99.20	99.10	99.17	99.67	99.79	99.62	99.66

Pre-Sowing Season - April to June,
Sowing season - July to September,
Harvest season - October to December,
Post-harvest season - January to March,

that by and large the price of rice (common) remained slightly in higher side during the pre-sowing and sowing season in majority of the districts and the state as a whole.

In the case of rice (fine) also, almost similar was the situation in the state. In Cacher, Dibrugarh, Goalpara, Nagaon, N.C.Hills no noticeable seasonal price variation could be observed. In Kamrup district also the variation between the seasons is not noticeable but the values of indices reflects that this district experienced a slightly higher prices in each season over most of the other districts. In Sivasagor district also, in the three seasons viz. pre-sowing, harvesting and post-harvesting the price of rice (fine) was observed to be higher than that in the sowing season. Another, important observation is that *in the sowing season the prices of rice (fine) was lower in most of the districts* which is against the general perception, because the period of the sowing season includes the rainy season and also it is the end of the previous crop year and beginning of the new crop year. As such, exhaustion of old stock and impediments created by rainy season should have influenced the price adversely. However, as it did not happen in that way investigation with more related factors has to be made before coming to a certain definite conclusion.

4.4.2 Mustard and Potato:

In Table 4.32 the seasonal indices of mustard and potato are presented for different districts and the state as a whole. In post-harvesting season (April – June) the seasonal indices of mustard were observed to be lowest in all the districts and Assam as a whole. It indicates that, there was a downward trend of price during the post- harvesting season. Similarly, highest price rise was observed in the sowing season in all the districts other than Dibrugarh, Lakhimpur and Sivasagor. When the price indices of all the districts were compared among different seasons it was observed that in Sivasagor district *the price remained more or less uniform in all the four seasons. Similarly,* in Dibrugarh and Lakhimpur although the price rise was noticeable in harvesting period, it was not much different from that of other three periods. As a whole, the general conclusion that may be made is that for mustard, sowing to harvesting period is the period of price rise.

A similar type of picture is also reflected by the seasonal indices of potato. It was observed from the table that the seasonal index was highest in the sowing

TABLE - 4.32

SEASONAL PRICE INDICES OF MUSTARD AND POTATO DURING 1980 - 1999 IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

Season / District	Mustard				Potato			
	Pre-sowing	Sowing	Harvesting	Post-harvesting	Pre-sowing	Sowing	Harvesting	Post-harvesting
Cacher	99.95	100.24	99.80	99.51	100.06	101.11	99.38	99.64
Darrang	99.62	102.88	98.60	98.04	99.28	100.70	100.02	99.61
Dibrugarh	99.27	99.17	101.84	98.82	99.98	101.46	99.33	100.45
Goalpara	99.31	100.02	99.93	99.12	99.94	101.26	99.76	100.35
Kamrup	99.93	100.40	100.05	99.43	98.90	99.78	100.24	99.09
Karbi Anglong	100.02	100.63	99.80	99.47	95.59	103.05	102.20	99.45
Lakhimpur	99.87	99.92	100.19	99.90	100.37	100.74	98.90	99.79
Nagoan	99.97	100.27	99.78	99.35	98.66	101.12	100.88	99.63
N.C.Hills	99.95	100.25	99.95	99.51	99.35	100.47	99.04	99.18
Sivasagor	99.97	99.84	99.93	99.95	100.39	100.01	98.83	100.67
Assam	*99.45*	*99.52*	*99.58*	*99.20*	*99.75*	*100.16*	*100.03*	*99.91*

Pre-Sowing Season - July to September,
Sowing season - October to december,
Harvest season - January to March,
Post-harvest season - April to June,

season (October – December) in all districts except in Kamrup. The maximum seasonal index during sowing season was 103.05 in Karbi-Anglong district and the minimum was 99.78 in Kamrup district. Further, in harvesting and post-harvesting season the seasonal indices were indicative of downward price trend in the majority of the districts. However, from the above analysis, existence of seasonal variation to some extent in prices of potato cannot be overlooked.

4.4.3 Onion and Lentil:

From the seasonal price indices of onion and lentil presented in Table 4.33, it is observed that among the four seasons the pick period of price rise in onion was the sowing season (October – December) in all the districts other than Goalpara and the state as a whole. Also, it is observed that in the post-harvest period, the price of onion came down in all the districts and in the state. However, in Goalpara it was the pre-sowing and harvesting period that faced a price rise over the other two seasons. On the whole, sowing season may be identified as the period of price rise for onion.

Further, the seasonal price indices of lentil (Table 4.33) reveals that the depression of price prevailed in the market during the post-harvesting period (April–June) in almost all the districts. Further, it was the sowing and harvesting season when price of lentil rose slightly over the other two seasons in the districts other than Kamrup where price was slightly above that of post-harvesting season during pre-sowing to harvesting period. The highest seasonal index in harvesting season was 100.45 in Lakhimpur and lowest was 99.56 in post-harvesting season in Sivasagor. To sum up the over all picture on the state based on the seasonal price indices, it can be mentioned here that the seasonal price variation of lentil was very limited in different districts of the state, and sowing and harvesting period seem to be the period of price rise.

4.4.4 Green gram, Black gram and Sugar:

Table 4.34 presents the seasonal price indices of green gram , black gram and sugar. Comparing the indices for green gram in different districts it is found that in some districts seasonal variation existed to certain extent. In Cachar, Goalpara, N.C.Hills and Sivasagor district the price of green gram was almost similar in all the seasons. Darrang and Dibrugarh indicate price rise in harvesting and post-harvesting period. In Kamrup

TABLE - 4.33

SEASONAL PRICE INDICES OF ONION AND LENTIL DURING 1980 - 1999 IN DIFFERENT DISTRICTS AND ASSAM AS AWHOLE.

Season / District	Onion				Lentil			
	Pre-sowing	Sowing	Harvesting	Post-harvesting	Pre-sowing	Sowing	Harvesting	Post-harvesting
Cacher	99.85	102.54	100.01	96.65	99.87	100.10	100.16	99.82
Darrang	98.52	102.43	97.95	99.14	99.90	100.02	100.20	99.86
Dibrugarh	99.68	103.60	99.36	96.63	99.92	99.97	100.20	99.95
Goalpara	102.82	101.69	102.70	92.22	99.74	99.96	100.03	99.71
Kamrup	101.23	102.56	98.13	97.86	100.70	100.07	100.26	99.86
Karbi Anglong	98.86	102.41	99.52	97.83	99.96	100.27	99.86	99.80
Lakhimpur	100.13	102.12	100.32	97.09	99.90	100 14	100.45	99.60
Nagoan	99.00	100.41	100.35	99.57	99.88	100.24	100.17	99.82
N.C.Hills	99.14	103.18	100.19	97.47	99.59	99.78	99.76	99.62
Sivasagor	100.80	101.42	100.47	97.71	99.73	99.96	99.98	99.56
Assam	100.00	100.97	99.88	98.40	99.54	99.80	99.85	99.48

Pre-Sowing Season - July to September,
Sowing season - Oct to December,
Harvest season - January to March,
Post-harvest season - April to June,

TABLE - 4.34

SEASONAL PRICE INDICES OF GREEN GRAM , BLACK GRAM AND SUGAR DURING 1980 - 1993 IN DIFFERENT DISTRICTS AND ASSAM AS A WHOLE

District\Season	Green gram				Black gram				Sugar			
	Pre-sowing	Sowing	Harvesting	Post-harvesting	Pre-sowing	Sowing	Harvesting	Post-harvesting	Trasplanting	Post-transplating	Pre-harvesting	Harvesting
Cacher	99.71	98.91	98.84	99.15	100.12	100.05	100.12	100.05	100.15	100.06	100.20	99.67
Darrang	99.79	99.74	100.15	100.17	99.80	100.29	100.13	99.79	100.04	99.85	100.26	99.85
Dibrugarh	99.88	99.96	100.01	100.05	100.14	99.33	99.33	100.12	99.91	99.46	99.15	99.40
Goalpara	99.82	99.95	99.89	100.03	99.34	100.39	99.43	99.36	100.15	99.94	99.83	100.04
Kamrup	101.16	100.79	100.63	94.61	99.88	100.59	100.59	99.99	99.19	98.95	99.28	98.97
Karbi-Anglong	100.48	101.29	99.69	99.87	100.21	99.68	99.93	99.55	99.48	99.74	99.73	99.19
Lakhimpur	99.71	99.61	100.19	99.87	99.42	100.84	99.38	99.14	100.05	99.90	100.41	99.58
Nagaon	100.45	99.85	99.89	100.25	100.02	100.17	99.97	99.84	100.05	99.82	100.09	99.75
N.C.Hills	99.83	100.02	99.90	99.35	100.10	99.83	99.85	100.19	100.12	99.96	99.93	99.65
Sivasagar	99.67	99.69	99.39	99.68	100.27	98.89	98.88	100.73	100.24	99.90	99.89	99.79
Assam	99.83	99.84	99.49	99.80	99.88	99.75	99.72	99.84	100.09	99.89	100.01	99.7

For Green gram and Black gram - Pre-Sowing Season - April to June,
Sowing season - July to September,
Harvest season - October to December
Post-harvest season - January to March.

For sugar- Transplanting - March to May,
Post-trasplanting - June to August,
Pre-harvesting - September to November,
Harvesting - December to February,

and Karbi-Anglong, price reduction was observed in post-harvesting season only. However, considering the values of the indices in different seasons in different districts, it can be inferred that the prices of green gram did not show countable fluctuation between the seasons in the whole state during the year. In other words no particular season could show any influence on the price level of green gram, which may be due to the fact that the demand and market supply of this commodity, remains almost balanced in all the seasons.

Examining the seasonal indices for black gram (Table- 4.34) it is observed that a declining trend of price was in the market in post-harvesting season in majority of the districts other than Dibrugarh, N.C.Hills and Sivasagor where declining price was prevailing in the sowing and harvesting seasons. In Cachar district price level seemed to be almost equal in all the seasons, whereas it was pre-sowing season when the price of black gram was in a highest level in Dibrugarh and Karbi-Anglong. It reached the highest level in post-harvesting period in N.C.Hills and Sivasagor. In sowing season the districts where price level could reach maximum were Darrang, Goalpara, Kamrup, Lakhimpur and Nagaon. Amongst the districts the highest level of price was reached in Lakhimpur in sowing season followed by Sivasagor in post-harvesting period and Kamrup, Goalpara, Darrang in the sowing season. In summing up, it can be concluded that in major portion of the state the price of black gram remained high in the pre- sowing and sowing season of the crop (black gram) year.

For sugar we classified the whole year into four seasons i.e. transplanting, post-transplanting, pre-harvesting and harvesting, which are different to other commodities. It is because the duration of sugarcane from planting to harvesting is about ten to eleven months. Observing the seasonal indices of sugar it is found that there was a decreasing trend in the harvesting season (December to February) in the majority of the districts. And in transplanting season seasonal indices of price were highest in all the districts except Kamrup and Karbi-Anglong. In other two seasons no marked difference was reflected.

4.5 TO TEST THE VARIATION IN SEASONAL PRICES

In the preceding section seasonal indices for different commodities in different districts of the state have been presented and the behaviour of the seasonal prices of each commodity has also been discussed separately for each district. In this section an attempt has been made to test statistically the variation between seasonal prices of the commodities in the state as a whole by applying the technique of Analysis of Variance (Appendix – I) on the seasonal price indices of the commodity in different districts.

Table 4.35 shows the mean values of seasonal indices of price for different commodities under consideration along with the critical difference (C.D.) at 5 per cent probability level. From the table it is seen that for rice (common) and rice (fine) there was no significant difference between the seasonal indices of price within a year in the state as a whole. It indicates that the price of rice (common) and rice (fine) remain uniform during the year in the state.

For mustard when it was examined, a significant difference was found between the seasonal indices of price within the year. The mean difference of seasonal indices of price between the harvesting and post-harvesting and also between sowing and post-harvesting were 0.68 and 1.05 respectively, which were higher than the critical difference value. Thus a significant difference between the prices of harvesting and post-harvesting, and between sowing and post- harvesting period was indicated.

By analyzing the seasonal indices of price for potato it was found that there was a significant difference between the prices of sowing–pre-sowing, sowing - harvesting and sowing–post-harvesting seasons.

Similarly, significant seasonal price variation between pre-sowing – sowing, pre-sowing – post-harvesting, sowing – harvesting, sowing – post-harvesting and between harvesting and post-harvesting season could be observed in the case of onion also.

Among the three commodities lentil, green gram and black gram only in the case of lentil significant seasonal price variations was observed. Here, except between sowing and harvesting, the price variations between all the other three seasons were

TABLE- 4.35

MEAN SEASONAL INDICES OF PRICE FOR DIFFERENT COMMODITIES

Season / Commodity	Pre-sowing	Sowing	Harvesting	Post-harvesting	C.D. (5%)
Rice (common)	99.90	99.92	99.85	99.95	N.S.
Rice (fine)	99.94	99.74	99.80	99.92	N.S.
Mustard	*99.79* [a b]	*100.36* [a]	*99.99* [a]	*99.31* [b]	*0.60*
Potato	99.25 [a]	100.97 [b]	99.86 [a]	99.79 [a]	0.87
Onion	100.00 [a]	102.24 [b]	99.90 [a]	97.22 [c]	1.26
Lentil	99.92 [a]	100.05 [b]	100.11 [b]	99.76 [c]	0.13
Green gram	100.05	99.98	99.86	99.36	N.S.
Black gram	99.93	100.01	99.76	99.73	N.S.
Season / Commodity	**Transplanting**	**Post-transplanting**	**Pre-harvesting**	**Harvesting**	**C.D. (5%)**
Sugar	99.73	100.53	99.68	99.37	N.S.

C.D.- –Critical Difference, N.S.— Non- Significant.

Mean indices with common superscript have no significant difference betwee·i them and with different superscript has shows significant difference.

significantly different. For sugar no significant difference was shown in the mean seasonal indices.

4.6 CORRELATION BETWEEN PRICE AND COST OF CULTIVATION

To explore the relation between price and cost of production, correlation coefficients between price and cost of cultivation of the commodities are calculated and presented in Table 4.36. Due to non-availability of data on cost of cultivation of commodities other than rice and mustard the coefficient are calculated only for rice and mustard.

TABLE - 4.36

COEFFICIENT OF CORRELATION BETWEEN PRICE AND COST OF CULTIVATION.

Commodity	Rice (common)	Rice (fine)	Mustard
Coefficient of correlation (r)	0.99	0.99	0.94

In case of rice (common) and rice (fine) as observed in the Table 4.36 a significant correlation between the cost of cultivation and the price of both types of rice was found to exist. The coefficients of correlation were found to be 0.99 and 0.99, which indicates an almost perfect relation between prices and cost of cultivation of rice. Similarly, a strong relation as indicated by the correlation coefficient value 0.94 was found to be present between the cost of cultivation and the price of mustard also.

4.7 TO TEST SPATIAL VARIATION OF PRICE

To examine the influence of local production of a commodity in determining its market price, analysis of covariance was carried out on prices of different

TABLE - 4.37

STIMATED REGRESSION COEFFICENT (β) OF PRICE ON PRODUCTION
FOR
DIFFERENT COMMODITIES

Commodity	Estimated regression Coefficient ($\hat{\beta}$)	t value
Rice (common)	0.20	2.28
Rice (fine)	0.80	4.61
Mustard	2.95	1.04 (N.S)
Potato	-0.21	-1.09 (N.S.)
Onion	-43.34	-1.80 (N.S)
Lentil	3.58	0.63 (N.S.)
Green gram	-13.23	-2.24 (N.S.)
Black gram	3.40	0.37 (N.S.)
Sugar	-0.73	-0.62 (N.S.)

commodities taking total production of the commodity in the district as covariate. Table 4.37 shows the estimated values of regression coefficients (β) of price on production and the corresponding " t " values for test of significance of β. It was observed that, values of β for all commodities other than rice were non-significant. Hence, it can be concluded that the total production of the commodities in the district had no significant effect on prices of the commodities other than rice.

As the price of rice was found to be significantly affected by the total production of rice in the district, the mean prices of rice for each district during the period under study had been adjusted after eliminating the effect of total production of rice of the district on the price. The adjusted mean price along with the unadjusted ones are presented in the Table 4.38. Further, the analysis of covariance (Appendix - II) carried out on the mean prices of rice (both types) in different districts during the period has shown the existence of significant difference between adjusted mean prices of rice in different districts. Table 4.39 and 4.40 shows the differences between adjusted mean prices of rice (common) and rice (fine) respectively in different districts of Assam. However, comparison of the adjusted mean prices of different districts (Table 4.39) has shown that the prices of N.C. Hills during the period under study was significantly different from all districts other than Goalpara and Kamrup for rice (common) whereas it was significantly different from all other districts in case of rice (fine) (Table 4.40). Similarly, significant difference was observed between Darrang and Kamrup also for rice (common) but not for rice (fine). Significant differences were also observed between Darrang and districts like Dibrugarh, Goalpara, Karbi-Anglong, Lakhimpur, Nagaon and similar was the situation for the mean prices between Dibrugarh- Kamrup, Dibrugarh–Sivasagor, Goalpara–Kamrup, Goalpara–Sivasagor, Kamrup- Karbi-Anglong, Kamrup – Lakhimpur, Kamrup – Nagaon, Karbi-Anglong - Sivasagor, Lakhimpur –Sivasagor, Nagaon – Sivasagor for rice (fine). As a whole it may be concluded that spatial variation in prices of both type of rice during the period of study was present between the districts of Assam, while the production of the corresponding district was taken into account.

TABLE – 4.38

MEAN VALUE OF PRICE FROM 1980-1999 FOR RICE IN DIFFERENT DISTRICT

(Rupees per Quintal)

District	Rice (common)		Rice (fine)	
	Unadjusted price	Adjusted Price	Unadjusted price	Adjusted Price
Cacher	542.22	537.80	639.81	622.36
Darrang	461.91	453.71	560.77	528.41
Dibrugarh	511.31	527.29	643.54	706.61
Goalpara	558.63	544.48	710.94	655.10
Kamrup	619.24	580.36	711.33	557.84
Karbi-Anglong	512.24	540.65	578.16	690.31
Lakhimpur	513.89	532.05	617.50	689.18
Nagaon	511.03	499.48	773.62	688.53
N.C.Hills	482.24	638.23	699.34	920.35
Sivasagor	522.31	490.97	606.27	482.58
C.D 5%		93.96		78.56

C.D.- Critical Difference.

TABLE - 4.39

DIFFERENCE BETWEEN ADJUSTED MEAN PRICES IN DIFFERENT DISTRICTS OF ASSAM FOR RICE (COMMON).

District	Cacher	Darrang	Dibrugarh	Goalpara	Kamrup	K.Anglong	Lakhimpur	Nagaon	N.C.Hills	Sivasagor
Cacher	0.00	84.09	10.51	6.68	42.56	2.85	5.75	48.32	100.43	46.83
Darrang		0.00	73.58	90.77	126.65	86.94	78.34	35.77	184.52	37.26
Dibrugarh			0.00	17.19	53.07	13.36	4.76	37.81	110.94	36.32
Goalpara				0.00	35.88	3.82	12.43	55.00	93.75	53.51
Kamrup					0.00	39.71	48.31	90.88	57.87	89.39
K-Anglong						0.00	8.60	51.17	97.58	49.68
Lakhimpur							0.00	42.57	106.18	41.08
Nagaon								0.00	148.75	1.49
N.C.Hills									0.00	147.26
Sivasagor										0.00
C.D.(5%)	93.96									

TABLE - 4.40

DIFFERENCE BETWEEN ADJUSTED MEAN PRICES IN DIFFERENT DISTRICTS OF ASSAM FOR RICE (FINE).

District	Cacher	Darrang	Dibrugarh	Goalpara	Kamrup	K.Anglong	Lakhimpur	Nagaon	N.C.Hills	Sivasagor
Cacher	0.00	93.95	84.25	32.74	64.52	67.95	66.82	66.17	297.99	139.78
Darrang		0.00	178.20	126.69	29.43	161.90	160.77	160.12	391.94	45.83
Dibrugarh			0.00	51.51	148.77	16.30	17.43	18.08	213.74	224.03
Goalpara				0.00	97.26	35.21	34.08	33.43	265.25	172.52
Kamrup					0.00	132.47	131.34	130.69	362.51	75.26
K-Anglong						0.00	1.13	1.78	230.04	207.73
Lakhimpur							0.00	0.65	231.17	206.60
Nagaon								0.00	231.82	205.95
N.C.Hills									0.00	437.77
Sivasagor										0.00
C.D.(5%)	78.56									

4.8 STABILITY INDEX

The prices of different commodities are most likely to fluctuate over the years and over the months within a year due to various factors. Applying analysis of covariance technique in the preceding section the spatial variation of the prices over the districts of the state has been studied and discussed. In order to measure the nature of fluctuation as stable or non stable, stability indices as discussed in the section 4.8, are calculated from the price indices of the commodities for the period 1980--1999

4.8.1 Stability of price over the year:

Table 4.41 shows the stability indices of different commodities under consideration. Analyzing the indices it was found that for rice (common) in all the districts of Assam the stability indices were above 1(one), which indicates that the price of rice (common) was more stable over the years. Similar situation was seen for rice (fine) in all the districts other than Nagaon, where, as indicated by the index value 0.86, the price was less stable. In case of mustard and sugar, price was stable in all districts over the years. For potato the stability indices of price were above one in all the districts except in Darrang, which implies a stability of price over time in district other than Darrang. For onion, other than Nagaon where stability index was 1.09, in all the districts it was below one indicating that prices of onion were unstable over the years in the districts other than Nagaon where it was more stable.

Referring to pulses like lentil, green gram and black gram the stability indices for these three type of pulses are found to be below one in the districts except for green gram in Darrang and Kamrup where the indices are found to be 1.01 and 1.05 respectively for this commodity. Thus it may be concluded that although for green gram, the prices were more or less stable in Darrang and Kamrup over the years, the price of pulses in general suffered from instability in the different districts over the years. Further, it was observed that the prices of black gram remained most unstable in all the districts during the period. Similarly, most unstable was onion in Cachar, Darrang, Goalpara, Kamrup, Karbi-Anglong, Lakhimpur, N.C.Hills; lentil in Cachar, Dibrugarh, Karbi-Anglong, Nagaon; green gram in Cachar and Sivasagor.

TABLE - 4.41

STABILITY INDEX OF PRICE OVER THE YEARS FOR DIFFERENT COMMODITIES IN DIFFERENT DISTRICTS OF ASSAM.

Commodity / District	Rice (common)	Rice (fine)	Mustard	Potato	Onion	Lentil	Green gram	Black gram	Sugar
Cacher	1.24	1.24	1.74	1.11	0.58	0.60	0.43	0.55	2.23
Darrang	1.58	1.40	1.31	0.98	0.51	0.93	1.01	0.69	2.43
Dibrugarh	1.28	1.27	1.93	1.31	0.75	0.72	0.75	0.65	1.76
Goalpara	1.19	1.15	1.78	1.36	0.61	0.84	0.96	0.60	2.32
Kamrup	1.05	1.28	1.59	1.76	0.54	0.88	1.05	0.57	2.59
Karbi-Anglong	1.06	1.25	1.54	1.29	0.68	0.73	0.87	0.66	1.85
Lakhimpur	1.20	1.07	1.85	1.31	0.69	0.81	0.84	0.63	2.08
Nagaon	1.21	0.86	1.60	1.70	1.09	0.67	0.84	0.58	2.17
N.C.Hills	1.27	1.16	1.58	1.23	0.71	0.76	0.89	0.66	1.83
Sivasagor	1.27	1.28	2.58	1.05	0.81	0.76	0.74	0.62	1.68

TABLE - 4.42

STABILITY INDEX OF PRICES DURING A YEAR (AVERAGE OVER THE YEARS) FOR DIFFERENT COMMODITIES IN DIFFERENT DISTRICTS OF ASSAM.

Commodity / District	Rice (common)	Rice (fine)	Mustard	Potato	Onion	Lentil	Green gram	Black gram	Sugar
Cachar	2.28	2.86	1.45	0.31	0.42	1.94	3.38	1.57	2.50
Darrang	1.16	1.28	0.78	0.31	0.81	2.37	5.25	1.02	3.37
Dibrugarh	1.38	2.25	4.04	0.37	0.35	1.94	2.91	1.27	2.14
Goalpara	1.70	3.76	0.89	0.39	0.74	1.23	1.79	0.97	1.39
Kamrup	1.25	1.05	0.84	0.34	1.27	1.35	2.30	1.45	2.61
Karbi-Anglong	1.22	1.58	1.43	0.34	0.56	1.82	2.05	1.13	3.42
Lakhimpur	1.40	1.68	0.86	0.38	0.56	1.57	3.07	1.53	2.36
Nagaon	1.53	1.27	0.99	0.37	0.50	1.84	5.66	1.27	2.44
N.C.Hills	2.12	2.02	0.85	0.46	0.47	1.89	1.58	1.20	1.58
Sivasagar	1.38	1.46	1.43	0.30	0.59	1.99	2.34	1.94	1.85

4.8.2 Stability of price over months during a year:

Table 4.42 shows the stability indices of price during a year for different commodities in different districts of Assam. Observing the stability indices for rice (common) and rice (fine) it is found that in all the districts of Assam the stability indices were above one, which shows a stability in price of both types of rice during the year.

In case of mustard the stability indices were below one in majority of the districts other than Cacher, Dibrugarh, Karbi-Anglong and Sivasagor, where it were 1.45, 4.04, 1.43 and 1.43 respectively. This shows that during a year the prices of mustard remain unstable in the districts other than Cacher, Dibrugarh, Karbi-Anglong and Sivasagor.

In regards to potato and onion the stability indices are found to be below one in all the districts except Kamrup for onion. This indicates that except onion in Kamrup district, the prices of potato and onion remained unstable during the year in general in the districts.

Similarly, better stability in prices of lentil, green gram and black gram was observed in all the districts as the stability index for all these was found to more than one except for black gram in Goalpara where it was almost equal to one (0.97). Similar situation was observed during the year for sugar also. However, considering all the commodities it was found that the prices of potato, for which stability indices were found to be much lower than one, remained much unstable in all the districts during a year. Similar situation was observed for onion in Cacher, Dibrugarh, Karbi-Anglong, Lakhimpur, Nagaon, N.C.Hills and Sivasagor.

CHAPTER – V

SUMMARY AND CONCLUSION

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SUMMARY AND CONCLUSION

Prices of agricultural commodities in a certain place mainly depend on its production and the prevailing supply and demand situation for the commodities on the place. Further, the demand for any agricultural commodities is not confined to the place where it is produced. Its demand may come from any far off places where its availability is adversely affected because of insufficient production, improper storing facilities, absence of proper marketing system etc . Perishability of commodities is another matter of concern for the farmers because it compels the farmers to sell their produces without having a controlling grip over the price of the commodities. Under such circumstances it is obvious that without a proper marketing arrangement and price mechanism in the line of industrial products, fluctuation of prices in agricultural commodities is a common phenomenon and in certain situations this leads to uncompensatry loss to the farmers. Moreover, the unscrupulous agents find a proper role to play in aggravating the situation when a proper marketing channel and price mechanism are found absent to have a control over the situation. In a state like Assam where people have to depend mainly on imports from other states for a good number of agricultural commodities price fluctuation is a common phenomenon due to insufficient production and improper marketing mechanism.

The principal food crop of the state is rice, which occupies nearly 70.00 per cent of the cropped area of the state. However, other crops like mustard, potato, onion, lentil, black gram, green gram, sugarcane etc. are also grown, but the production of these crops are not sufficient to meet the demand of its population. This leads to the imports of these commodities from other states whenever situation demands. Under such situations, the gap between the demand and supply becomes a concerning factor for influencing the price of these commodities. Furthermore, the agro-climatic conditions of the different regions of the state of Assam are not similar and hence not suitable for cultivating each crop in all the regions or districts of the state in equal terms, since different crops need different types of agronomic and cultural practices and climatic conditions. In addition to these there exists wide variations between the districts in terms of cultivable area, area

under different crops. irrigation facility, application of improved agricultural technology etc.. Variations in these factors lead to imbalances in production between the districts which consequently reflect its impact on the movement of prices of different commodities in different places.

Seasonal variations in supply and demand more particularly seasons coinciding with the people's festivals or with socio-cultural activities of the people influence the prices of some commodities. It is observed that under such situations demand and supply position of such commodities is so created by the traders that it becomes congenial for price fluctuation. Under these circumstances, an analytical study on the behaviour of prices of agricultural commodities in the state would be of immense help for the policy makers and management community in general and producers, distributors and consumers in particular.

In the light of the circumstances as described above the present study has been carried out with the following objectives.

1. - to construct the monthly price index of each commodity for each district and the state as a whole,

2. - to study the trend in prices of each commodity for each district and for the state as a whole and to examine the relation between the cost of production and the price of different commodities,

3. – to test the spatial variation of prices using analysis of co-variance technique with yearly production as the covariate,

4. – to test the seasonal variation of prices by analysis of Variance technique and

5. – to study the consistency of price variation of different commodities over time and space by calculating stability index.

5.1 COLLECTION OF DATA

In conducting the present study following points were taken into consideration.

Though, during the period 1980-1999 the number of the districts of the state had been increased to 24,the study had been kept confined to those original 10 districts for which data required for the study were available. However, the places under the new districts are covered under these 10 districts.

The reference period of the present study was 20 years from 1980-1999.

The study is entirely based on secondary data. Time series data on wholesale prices of nine principal food items viz. rice (both common and fine), mustard, potato, onion, lentil, green gram, black gram, and sugar were considered.

To explore the relation between price and cost of cultivation data were collected from "Cost of Cultivation of Principal Crops in India" published by the Government of India.

To examine the effect of production on price, production data for the sample commodities were collected for the period from the Basic Agricultural Statistics published by the Directorate of Agriculture, Statistical Wing, Government of Assam.

5.2 ANALYTICAL TECHNIQUE

To meet the objectives of the study following analytical procedures were adopted.

5.2.1 Index Number: Commoditywise and districtwise price indices were calculated for different months of the year and for different years of the study period with the help of Chain Index.

5.2.2 Coefficient of Variation: To compare the variation of prices between the districts over the years and over the months during a year, coefficient of variations were calculated.

5.2.3 Curve Fitting: To analyze the price trend following functional forms were used.

(a) Linear: $Y = a + b\,x$

(b) Power curve: $Y = ax^{b}$

(c) Exponential curve: $Y = ae^{bx}$

Where, y is dependent variable (price) and x (time) is independent variable.

The functional form having the highest value of coefficient of determination *was used for fitting the trend price for each commodity districtwise.*

5.2.4 Seasonal Price Indices: To examine the seasonal price behaviour multiplicative *model of time series analysis was adopted for the seasonal wholesale price of* commodities.

In calculating seasonal indices for the period, ratio to trend method was used. Here, the year was divided into four seasons viz. pre-sowing, sowing, harvesting and post-harvesting season. Again to get the price of each season, the prices of three months including in the season were averaged.

5.2.5 Analysis of Variance: To judge the significance of difference in seasonal price variation of each commodity analysis of variance test was done

5.2.6 Coefficient of correlations: To examine the relation between cost of cultivation and prices of commodities for different years the coefficient of co-relations was calculated.

5.2.7 Analysis of Covariance: Spatial variation in prices of different commodities is usually influenced by the amount (quantum) of local production of the commodity during the year. Taking this into consideration the variation of prices between places are tested with the help of analysis of covariance, taking the production of a commodity of the place as covariate.

5.2.8 Stability Index: To test the stability of price of a commodity over the years/ months stability index of price for each commodity was also calculated.

5.3 SUMMERY OF THE RESULTS AND DISCUSSION

Data collected from secondary sources relating to prices of selected agricultural commodities during the period (1980-1999) under study were put to statistical analysis keeping in view the objectives of the study. The summary of the analysis and the objectivewise discussion of the results are presented under different sections as follow

5.3.1 Index Number on Monthly Average Prices During the Period:

From districtwise index numbers of monthly average price of rice (common) it was observed that the maximum rise was 22.21 per cent in October in Karbi-Anglong and minimum was 9.13 per cent in September in N.C.Hills over that of January. Further, for rice (common) the period of highest price rise was observed to be post-monsoon period (September – November). However, the coefficients of variation of the monthly price indices, was found to be below 7.00 per cent in different districts of the state. Hence, the price variation over the months of a year was found to be less for different districts and the variation was more or less of same order over the districts.

Similarly, from the index number of rice (fine) it was observed that the maximum price rise was in the month of November in the districts other than Cacher, Darrang, Dibrugarh and Lakhimpur. The highest rise of price was 20.94 per cent in Darrang district in September followed by 20.72 per cent in Kamrup in November and lowest rise was 9.37 per cent in Dibrugarh in December over that of January. Further, the coefficients of variation of monthly price indices, which was found to lie between 2.24 and 6.99 per cent, indicated that the price of rice (fine) did not vary much during the months of the year and was uniform to a great extent over the districts.

For mustard the maximum rise in price was observed during November / December in all the districts other than Goalpara where it was in October. The highest rise (17.83 per cent) was in Lakhimpur in the month of November and the lowest (2.00 per cent) was in Nagaon in November. The variation in price as reflected from the coefficients of variation of index numbers was also low (below 11.00 Per cent) in the districts and all the districts suffered equally from the price variation.

The index number on monthly average price of potato reveals that the price rise generally started from the month of May in all the districts other than Nagaon and N.C.Hills. Further, making a comparison among the districts, two districts– Darrang and Sivasagor were found to have higher price rise than the other districts in major parts of the years. These two districts experienced the highest price rise up to 98.14 per cent and 83.06 per cent respectively. While the N.C.Hills had the lowest price rise of 23.09 per cent, the state as a whole had it up to 40.35 per cent over that of January. As regards the variation in prices during the year, it may be mentioned that in majority of the districts

the coefficient of variation was around 20.00 per cent, which indicates some amount of volatility in the price of potato in all the districts and the state during the year.

In the case of onion the highest price rise was observed during November/ December. It was the Darrang district with highest price rise of 46.03 per cent followed by Dibrugarh with 41.59 per cent price rise both in the month of November. Further, the coefficients of variation, which were between 20–27 per cent for districts like Cacher, Dibrugarh, Darrang Lakhimpur and Sivasagor and between 10–20 per cent for the remaining districts reveal that the price of onion in different districts and the state as a whole suffered from inconsistency to a larger extent, in the districts like Cacher, Dibrugarh, Darrang, Lakhimpur, and Sivasagor than the remaining ones.

As reflected by the index numbers, the price of lentil was found to be lower than that of January during the period from February to June in almost all the districts and started rising from July onwards. However, the rise of price in lentil may not be considered much prominent since the highest rise in this case was found to be 14.68 per cent to that of January price. The coefficient of variation was also found to be below 7.00 per cent in all the districts. Thus the price of lentil during a year for all the districts and the state as a whole may be considered uniform over months in the districts

In case of green gram the highest rise of price was 13.85 per cent in the month of November in Kamrup and the lowest rise was 7.35 per cent in Darrang in the month of October. Further, in all the districts the price during the year was above the price of January but for one or two months. It was also evident that the price rise, which was gradual towards the later part of the year, did not show any marked difference from that of January in all the districts and it remained almost uniform during the months of the year in all the districts and in the state by and large.

For black gram the highest price rise was 20.81 per cent in Lakhimpur and lowest was 10.95 per cent in Sivasagor in October and December respectively. In the month of February and March the price was below the price of January in the majority of the districts. Also, the price remained almost uniform during the months of the year without showing marked differences from district to district.

Observing the monthly price index of sugar it was found that price rise in sugar was highest (19.29 per cent) in Goalpara. A similar type of situation was observed in Karbi-Anglong and N.C.Hills also, though the maximum rise was to the extent of 6.85 per cent, which was much below the rise in Goalpara. For the state as a whole also price-rise was gradual from February to November. However, as disclosed by the coefficients of variation for different districts, the price of sugar to a great extent was uniform during the year in the state over the districts.

5.3.2 Index Numbers of Yearly Average Price:

Index numbers of yearly average prices of rice (common) for different districts indicates that the highest increase in price, which was more than 400 per cent above the minimum in 1981 was in Dibrugarh district, and similar price behavior was observed in Kamrup district also. The lowest rise, which was nearly 300 per cent above that of 1981was observed in two districts Karbi-Anglong and Darrang. In the remaining districts namely, Cachar, Goalpara, Lakhimpur, Nagaon, N.C.Hills and Sivasagor the rise was between 300–400 per cent above the minimum. In the state as a whole, the maximum rise in 1999 was about 400 per cent above the minimum in 1981 and it was generally upwards over the years. Further, a comparison among the coefficients of variation of the index numbers of the districts reveals that the price variation was more in all the plain districts than in the two hills districts– Karbi-Anglong and N.C.Hills. However, a comparison between the range of price indices for the two break-up periods 1980–89 and 1990–1999 reveals that the price change was highest during 1980–89 in Dibrugarh (152.79 per cent) and above 100 per cent only in Cachar, Kamrup and Sivasagor whereas during 1990–99, in all the districts it was between 200–300 per cent. For the state as a whole during 1980–89 it was below 100 per cent but in 1990–99 it was above 200 per cent.

Analyzing the index number of yearly average prices of rice (fine) for different districts of Assam and the state as a whole it was found that in Nagaon district the increase of price was highest and was more than 500 per cent above the minimum in 1980. The lowest rise of price, which was about 300 per cent above the minimum, was observed in the district of Karbi-Anglong. In the state as a whole the maximum rise of price in 1999 was more than 300 per cent above that of 1980. A comparison among the

coefficients of variation of the index numbers of different districts reveals that the price variation was highest (57.46 per cent) in Nagaon, although variations in price in other districts also were not less (above 40.00 per cent in each district). However, a comparison among the range of price indices for the decade 1980–89 and 1990–99 reveals that the price change was highest during 1980–89 in Dibrugarh (187.30 per cent) and above 100 per cent only in Cacher, N.C.Hills and Sivasagor whereas during 1990–99 in all the district it was between 200 per cent and 500 per cent except in Cacher and N.C.Hills. For the state as a whole it was below 100 percent in 1980–89 and above 200 per cent during 1990–99.

For mustard during 1980–1999 the price rise was highest in Darrang, which was about 436.72 per cent and the lowest was about 192.64 per cent in Sivasagor district. Next to Darrang, Dibrugarh district experienced a rise up to about 365 per cent above that of 1980. In all other districts the rise remained in between 200 – 270 per cent of the price of 1980, which was also identical to that of the whole state. However, as indicated by the coefficients of variation, the price of mustard varied less in districts like Cacher, Karbi-Anglong, Lakhimpur, Nagaon, N.C.Hills and Sivasagor than Darrang, Dibrugarh, Goalpara and Kamrup and also in the state as a whole. Dibrugarh faced the maximum variation during the period as indicated by the highest value (58.29 per cent) of coefficient of variation. However, observing the range of price index in the two break-up periods 1980–89 and 1990–99, it can be mentioned that the variation in price of mustard was sharper during 1990–99

For potato the price rise was highest (about 590 per cent) in Sivasagor and lowest (about 220 per cent) in Nagaon districts when compared with that of that of 1980. The extent of rise was between 400–500 per cent in Cacher, Darrang, and Dibrugarh and between 300–400 per cent in Goalpara, Karbi-Anglong, Lakhimpur, and N.C.Hills. The situation was similar for the whole state also where the maximum rise of price was within 400 per cent of the price of 1980. The values of coefficients of variation for different districts and the state as a whole further reflect that the variation in price of potato was large during the study period and the extent of variation was almost of same order in different districts. In districts like Cacher, Goalpara, Lakhimpur and N.C.Hills the price variation was less and below 100 per cent during 1980–89. Similarly, in Darrang,

Dibrugarh, Kamrup, Nagaon and Sivasagor also it was between 100–150 per cent. However, in Karbi-Anglong it was above 300 per cent indicating that in this district the price variation was largest during 1980–89. During 1990–99 also the situation was similar in this district whereas the situation in all other districts and the state as a whole changed markedly with range of variation lying between 300–500 per cent except in Goalpara, Kamrup and Nagaon where it was between 175–300 per cent.

In the case of onion the price rise was vary high in almost all the districts and in the state as a whole. The rise was to the extent of 900 per cent and more in Cacher, Darrang, Dibrugarh, Kamrup and Sivasagor and more than 700 per cent in Karbi-Anglong, Lakhimpur, N.C.Hills and in the state as a whole. Only in Nagaon district the rise was within 500 per cent, which was least also. Barring Nagaon district all other districts of the state suffered from large variation in prices of onion during the period under study. The district, which suffered most from unstable prices, was Karbi-Anglong. The least suffered district was Nagaon (C.V. = 45.38 per cent). Again, it was the decade of nineties that experienced much higher price variation in all the districts other than Goalpara and Kamrup.

For lentil the two districts Dibrugarh and Sivasagor experienced the maximum change, which was more than 600 per cent above that of 1980 during the period from1980–1999. Next to these two districts, Cacher, Goalpara, Kamrup, and Nagaon had the extent of change up to about 500 per cent during the period. The remaining districts namely Darrang, Karbi-Anglong, Lakhimpur, N.C.Hills and the state as a whole also experienced the extent of price change exceeding 400 per cent, during the period. The extent of price change was much higher during 1990–99 than that was in the period 1980–89. Further, a higher order of variation in prices in all the districts and state as a whole was indicated by the coefficient of variation value between 50 – 70 per cent.

For green gram it is observed that the rise in yearly average price was highest (nearly 700 per cent) in 1998 in Sivasagor from a minimum in 1980 and was followed by Dibrugarh with a rise of 614.09 per cent. In the state as a whole this was just above 450.00 per cent during the whole period. Again considering the high values of coefficients of variations (from 52.34 per cent to 64.60 per cent) it can be inferred that all the districts as well as the state as a whole suffered largely from variation in prices of

green gram during the whole period although the extent of variation between the districts was more or less of same order.

It is observed that the maximum change of price index of black gram, which was above 700 per cent of 1980, was in Kamrup and Dibrugarh district during the period 1980–1999. Similarly, in Cacher, Goalpara, Lakhimpur and Nagaon, Sivasagor and the state as a whole the maximum change was between 600–700 per cent of the price of 1980. For three districts viz. Darrang, Karbi-Anglong and N.C.Hills it was between 500–600 per cent. The extent of price change was much higher in 1990–99 than in 1980–89. Although the variation in price of black gram may be considered uniform in all the districts, it was much higher in all the districts as indicated by coefficient of variation values between 54 – 65 per cent.

The price of sugar came below the level of 1980 in the early years of eighties in most of the districts and in the state as a whole. Further, the price escalation during 1980–89 was lower than that of 1990–99. The highest range of price escalation in both the decades were in Sivasagor districts as indicated by range of index numbers 94.60 and 169.01 respectively. As compared to the other commodities, price escalation in both the periods was much less for sugar. However, with coefficient of variation between 39.00–46.51 per cent, presence of certain amount of variation of price over the years in all districts and Assam as a whole cannot be denied.

5.3.3 Trend in Price of Agricultural Commodities:

Of the three trend curves namely linear, power and exponential tried for studying the trend of the prices of the commodities, the exponential one was found best to explain the trend of prices.

A comparison of the behavior of observed and trend values of prices in different districts further revealed that the districts can be placed into two distinct groups showing similar type of behavior in prices of rice (common) among the districts of the groups

Group I – Cacher, Darrang, Kamrup, Karbi-Anglong, Lakhimpur, Nagaon, N.C.Hills, and Sivasagor, with random occurrence of trend price above the observed ones.

Group II -- Dibrugarh and Goalpara, with trend price above the observed price during mid eighties to mid nineties.

The situation of the state as a whole was also similar to that of Dibrugarh and Goalpara.

For mustard it were Dibrugarh and Lakhimpur that the observed prices were below the trend prices from middle of eighties to the middle of nineties.

Comparing the observed and trend prices of potato, it is found that from the later part of eighties the observed prices were below the trend prices in most of the years in districts like Cacher, Dibrugarh, Karbi-Anglong, Lakhimpur, Nagaon, N.C.Hills, Sivasagor and Assam as a whole. However, no such characteristics between observed and trend prices were noticeable for commodities like onion, pulses and sugar.

5.3.4 Seasonal Variation of Average Price:

Considering the different agro-economic and social factors, which are assumed to be associated with price behaviour of the commodities, the seasons for the present studies have been termed as pre-sowing, sowing, harvesting and post harvesting.

Based on the values of the seasonal indices, it can be concluded that by and large the price of rice (common) remained slightly in higher side during the pre-sowing and sowing season in majority of the districts and the state as a whole. Important observation was that in the sowing season the prices of rice (fine) was lower in most of the districts

When the price indices of all the districts were compared among different seasons it was observed that in Sivasagor district the price remained more or less uniform in all the four seasons. Similarly, in Dibrugarh and Lakhimpur although the price rise was noticeable in harvesting period, it was not much different from that of other three periods. As a whole, the general conclusion that may be made is that for mustard sowing to harvesting period is the period of price rise.

The seasonal indices for potato indicated a downward trend from harvesting to post-harvesting season in the majority of the districts. Further, from the above analysis existence of seasonal variation to some extent in prices of potato cannot be overlooked.

It is observed that among the four seasons the pick period of price rise in onion was the sowing season (October - December) in all the districts other than Goalpara and in the state as a whole. Also, it is observed that in the post-harvest period the price of onion came down in all districts and in the state. On the whole, sowing season may be identified as the period of price rise for onion.

Further, the seasonal price indices of lentil reveals that depression of price prevailed in the market during the post-harvesting period (April–June) in almost all the districts. Further, it was the sowing and harvesting season when price of lentil rose slightly over the other two seasons in the districts other than Kamrup. To sum up the over all picture on the state based on the seasonal price indices, it can be mentioned here that the seasonal price variation of lentil was very limited in different districts of the state, and sowing and harvesting period seem to be the period of price rise.

The price of green gram did not show noticeable fluctuation between the seasons in the whole state during the year. In other words no particular season could show any influence on the price level of green gram, which may be due to the fact that the demand and market supply of this commodity, remains almost balanced in all the seasons.

Examining the seasonal indices for black gram it is observed that a declining trend of price was in the market in post harvesting season in majority of the districts other than Dibrugarh, N.C.Hills and Sivasagor. It can be concluded that in major portion of the state the price of black gram remained high in the pre- sowing and sowing season of the crop (black gram) year.

Observing the seasonal indices of sugar it is found that there was a decreasing trend in the harvesting season (December to February) in the majority of the districts. And in transplanting season seasonal indices of price were highest in all the districts except Kamrup and Karbi-Anglong. In other two seasons no marked difference was reflected.

5.3.5 To Test the *Variation in Seasonal Prices:*

An attempt was made to test statistically the variation between seasonal prices of the commodities in the state as a whole by applying the technique of Analysis of Variance on the seasonal price indices of the commodity in different districts.

It was seen that for rice (common) and rice (fine) there was no significant differences between the seasonal prices within a year in the state as a whole. Further, the price of rice (common) and rice (fine) remained uniform during the year in the state.

For mustard when it was examined, a significant difference was found between the seasonal prices within the year. A significant difference between the prices of harvesting and post-harvesting, and between sowing and post-harvesting period was indicated.

By analyzing the seasonal indices of price for potato it was found that there was a significant difference between the prices of sowing - pre-sowing, sowing – harvesting and sowing – post-harvesting seasons.

Similarly, significant seasonal price variation between pre-sowing – sowing, pre-sowing – post-harvesting, sowing – harvesting, sowing – post-harvesting and between harvesting and post-harvesting season were observed in the case of onion also.

Among the three commodities– lentil, green gram and black gram, only in the case of lentil significant seasonal price variations was observed. Here except between sowing and harvesting, the price variations between all the other three seasons were significantly different. For sugar no significant difference was shown in the mean seasonal indices.

5.3.6 Correlation Between Price and Cost of Cultivation:

To explore the relation between price and cost of production, correlation coefficients between price and cost of cultivation of the commodities are calculated. Due to non-availability of data on cost of cultivation on commodities other than rice and mustard the coefficient were calculated only for rice and mustard.

In case of rice (common) and rice (fine) as observed, a significant correlation between the cost of cultivation and the price of both types of rice was found to exist. The

coefficients of correlation were found to be 0.99 and 0.99, which indicates an almost perfect correlation between price and cost of cultivation of rice. Similarly, a strong association as indicated by the correlation coefficient value 0.94 was found to be present between the cost of cultivation and the price of mustard also.

5.3.7 To Test the Spatial Variation of Price:

To examine the influence of local production of a commodity in determining its market price, analysis of covariance was carried out on prices of different commodities taking total production of the commodity in the district as covariate. The estimated values of regression coefficients (β) of price on production and the corresponding " t " values for test of significance of β were calculated. It was observed that, values of β for all commodities other than rice were non-significant. Hence, it can be concluded that only in case of rice total production in the district had significant effect on its prices.

As the price of rice was found significantly affected by the total production of rice in the districts, the mean prices of rice for each district during the period under study had been adjusted after eliminating the effect of total production of rice of the districts on the price. The analysis of covariance carried out on the mean prices of rice (both types) in different districts during the period had shown the existence of significant difference between adjusted mean prices of rice in different districts. As a whole it may be concluded that spatial variation in prices of both type of rice during the period of study was present between the districts of Assam, while the production of the corresponding district was taken into account.

5.3.8 Stability Index:

The prices of different commodities are most likely to fluctuate over the years and over the months within a year due to various factors. In order to classify the nature of fluctuation as stable or non stable, stability indices were calculated from the price indices of the commodities for the period 1980-1999

Stability of price over the years:

Analyzing the stability indices of nine commodities under consideration it was found that for rice (common) in all the districts of Assam the stability indices were

above 1(one), which indicates that the price of rice (common) was more stable over the years. Similar situation was seen for rice (fine) in all the districts other than Nagaon, where as indicated by the index value 0.86, it was less stable. In case of mustard and sugar, price was stable in all districts over the years. For potato except Darrang the stability indices of price were above one in all the districts, which implies a stability of price over time. For onion, other than Nagaon where stability index was 1.09, in all the districts it was below one indicating that prices of onion were unstable over the years in the districts other than Nagaon where it was more stable.

Referring to pulses like lentil, green gram and black gram, the stability indices for these three type of pulses are found to be below one in all the districts except for green gram in Darrang and Kamrup where the indices are found to be 1.01 and 1.05 respectively for this commodity. Thus it may be concluded that although for green gram, the prices were more or less stable in Darrang and Kamrup over the years, the price of pulses in general suffered from instability in the different districts over the years.

Stability of price over months during a year:

Observing the stability indices for rice (common) and rice (fine) it is found that in all the districts of Assam the stability indices were above one, which shows stability in price of both types of rice over the months during the year.

In case of mustard the stability indices were below one in the districts other than Cacher, Dibrugarh, Karbi-Anglong and Sivasagor, where it were 1.45, 4.04, 1.43, and 1.43 respectively. This shows that over the months of a year the prices of mustard remain unstable in the districts other than Cacher, Dibrugarh, Karbi-Anglong and Sivasagor.

In regard to potato and onion the stability indices were found to be below one in all the districts except in Kamrup for onion. This indicates that except for onion in Kamrup district, the prices of potato and onion remained unstable during the year in general in different districts.

Similarly, better stability in prices of lentil, green gram and black gram was observed in all the districts as the stability indices for all these were found to be more than one except for black gram in Goalpara where it was almost equal to one (0.97).

Similar situation was observed during the year for sugar also. However, considering all the commodities it was found that the prices of potato, for which stability indices were found to he much lower than one, remained much unstable in all the districts during a year. Similar situation was observed for onion in Cachcr, Dibrugarh, Karbi-Anglong, *Lakhimpur, Nagaon, N.C.Hills and Sivasagor.*

5.4 CONCLUSION

The present study on the spatial and seasonal variation in prices of some selected agricultural commodities has led to the following conclusion

Except potato, mustard and onion, the prices of all other commodities do not *vary much over* the months of a year and none of the commodities had a price rise of more than 100 per cent over that of January.

During the period 1980 1999, sugar and onion were the only commodities that suffered least and most respectively from price variation in the state.

When compared with that in the period 1980–1989 price variation was more during the period *1990–99* for the commodities in general in different *districts and in the* state as a whole.

The price of the commodities over the years followed the exponential trend *and the extent of* variation of observed prices over the trend prices varied from district to district.

For commodities like rice (common), mustard, potato, onion, lentil and black gram, sowing season was the period of price rise. For green gram no particular season could show any influence on price.

Significant difference between the seasonal *variations in price was observed* only in the case of potato, onion, mustard and lentil.

Almost a perfect correlation between price and cost of cultivation of rice (both *types*) and of mustard was found to exist.

Only in the case of rice the total production in the districts had significant effect on its price. Also, spatial variation in prices of rice (common) and rice (fine) during

the period of study was found to exist between the districts of Assam when the effect of local production was eliminated.

The prices of rice (both types) potato, mustard and sugar remained stable over the years while that of onion, lentil, green gram and black gram were unstable. However, over the months within the year the prices of rice (both types), pulses, sugar were stable while that of onion, potato and mustard were unstable by and large.

5.5 LIMITATION OF THE STUDY

(a) The study is a cross sectional study of price, due to lack of manpower, time and resource only secondary data were considered.

(b) To explore the price movement, only 20 years were taken into consideration for the lack of organized data facility. It would have been of greater significance if it had been possible to cover for longer period.

(c) The data utilized in the study are secondary data and are collected from the different district head quarters and Directorate of Economics and Statistics, Assam and Agricultural Marketing wing of Directorate of Agriculture, Government of Assam.

(d) In the study only wholesale data of ten districts were considered available during 1980.

(e) Only major crops like rice, potato, onion, mustard, pulses, sugar etc. were considered in the present study.

5.6 FUTURE RECOMMENDATION

A detail up-to-date data base study on the behaviour of retail prices of all types of agricultural commodities consumed by the people of the state in relation to their wholesale prices including the study on the spread of wholesale prices between producers' level and distributors' level and of the spread between the price at distributors' level and at consumers' level may be made to have a complete idea on the behaviour of the price movement of the agricultural commodities in different places and seasons of the state.

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APPENDICES

APPENDIX - 1

ANALYSIS OF VARIANCE TABLE FOR DIFFERENT COMMODITIES.

ANOVA for Rice (common)

Source of Variation	D.F.	S.S.	M.S.	F Value
District	9	0.5322	0.0591	1.7106
Season	3	0.0487	0.0162	0.4700(N.S.)
Error	27	0.9333	0.0346	
Total	39	1.5142		

ANOVA for Rice (fine)

Source of Variation	D.F.	S.S.	M.S.	F Value
District	9	1.8787	0.2087	3.4724
Season	3	0.2695	0.0898	1.4946(N.S.)
Error	27	1.6231	0.0601	
Total	39	3.7713		

ANOVA for Mustard

Source of Variation	D.F.	S.S.	M.S.	F Value
District	9	0.5023	0.0558	0.0888
Season	3	5.761	1.9203	3.0555 *
Error	27	16.9689	0.6285	
Total	39	23.2322		

ANOVA for Potato

Source of Variation	D.F.	S.S.	M.S.	F Value
District	9	2.8083	0.312	0.2398
Season	3	15.6187	5.2062	4.0005 *
Error	27	35.1379	1.3014	
Total	39	53.5649		

ANOVA for Onion.

Source of Variation	D.F.	S.S.	M.S.	F Value
District	9	1.0331	0.1148	0.042
Season	3	126.5111	42.1704	15.4352 **
Error	27	73.7666	2.7321	
Total	39	201.3108		

ANOVA for Lentil

Source of Variation	D.F.	S.S.	M.S.	F Value
District	9	0.758	0.0842	3.0430
Season	3	0.7157	0.2386	8.6188 **
Error	27	0.7473	0.0277	
Total	39	2.2211		

ANOVA for Green gram

Source of Variation	D.F.	S.S.	M.S.	F Value
District	9	4.7118	0.5235	0.4824
Season	3	2.8925	0.9642	0.8884(N.S.)
Error	27	29.3039	1.0853	
Total	39	36.9083		

ANOVA for Black gram

Source of Variation	D.F.	S.S.	M.S.	F Value
District	9	0.9808	0.1089	0.3688
Season	3	0.5158	0.1719	0.5819(N.S.)
Error	27	7.9777	0.2955	
Total	39	9.4743		

ANOVA for Sugar

Source of Variation	D.F.	S.S.	M.S.	F Value
District	9	3.0529	0.3392	0.1397
Season	3	7.3257	2.4419	1.0058(N.S.)
Error	27	65.5481	2.4277	
Total	39	75.9267		

APPENDIX - II

ANALYSIS OF COVARIANCE TABLE FOR DIFFERENT COMMODITIES.

Analysis of covariance table for Rice (common)

Source of Variation	D.F.	SS_{xx}	SP_{xy}	SS_{yy}	Estimate of β	Adjusted SS_{yy}	D.F.	F Value
Year SS	19	417260.60	2004965.00	12036097.00				
DistrictSS	9	3791610.00	88097.44	350386.00				
ErrorSS	171	317083.30	64206.80	440933.00	0.20	427931.60	170	
TotalSS	199	4525954.00	2157269.00	12827416.00				
District + Error	180	4108693.00	152304.20	791319.00	0.04	785673.30	179	
(Dist+Error) - Error						357741.6	9	15.79 **

Analysis of covariance table for Rice (fine)

Source of Variation	D.F.	SS_{xx}	SP_{xy}	SS_{yy}	Estimate of β	Adjusted SS_{yy}	D.F.	F Value
Year SS	19	417260.60	2428419.00	18184908.00				
DistrictSS	9	3791610.00	369079.20	825127.40				
ErrorSS	171	317083.30	253433.40	1867738.00	0.80	1665178.00	170	
TotalSS	199	4525954.00	3050932.00	20877773.00				
District + Error	180	4108693.00	622512.50	2692865.00	0.15		179	
(Dist+Error) - Error						933370.1	9	10.59 **

Analysis of covariance table for Mustard

Source of Variation	D.F.	SS_{xx}	SP_{xy}	SS_{yy}	Estimate of β	Adjusted SS_{yy}	D.F.	F Value
Year SS	19	7726277.00	32668.06	23928371.00				
DistrictSS	9	11746.59	-48964.80	939884.10				
ErrorSS	171	3041.35	8960.81	4179490.00	2.95	4153088.00	170	
TotalSS	199	15500.57	-7335.91	29047745.00				
District + Error	180	14787.94	-40004.00	5119374.00	2.71		179	
(Dist+Error) - Error						858067.80	9	3.90

Analysis of covariance table for Potato

Source of Variation	D.F	SS_{xx}	SP_{xy}	SS_{yy}	Estimate of β	Adjusted SS_{yy}	D.F	F Value
Year SS	19	43531.18	407085.90	5095076.00				
DistrictSS	9	298655.20	-109221.00	165914.20				
ErrorSS	171	133852.60	-27465.90	819139.20	-0.21	813503.30	170	
TotalSS	199	476039.00	270399.20	6080130.00				
District + Error	180	432507.80	-136687.00	985053.40	-0.32	94.19	179	
(Dist+Error) - Error						128352.6	9	2.98

Analysis of covariance table for Onion

Source of Variation	D.F.	SS_{xx}	SP_{xy}	SS_{yy}	Estimate of β	Adjusted SS_{yy}	D.F.	F Value
Year SS	19	20.24	18171.21	22004484.00				
DistrictSS	9	215.43	3355.27	2281822.00				
ErrorSS	171	60.45	-2620.02	6054042.00	-43.34	5940487.00	170	
TotalSS	199	296.12	18906.46	30340348.00				
District + Error	180	275.88	736.25	8335864.00	2.65	8333904.00	179	
(Dist+Error) - Error						2393417	9	7.61

Analysis of covariance table for Lentil

Source of Variation	D.F.	SS_{xx}	SP_{xy}	SS_{yy}	Estimate of β	Adjusted SS_{yy}	D.F.	F Value
Year SS	19	91.82	59573.90	84695683.00				
DistrictSS	9	3871.40	-11207.80	488868.80				
ErrorSS	171	377.20	1350.68	2066974.00	3.58	2062138.00	170	
TotalSS	199	4340.43	49716.81	82251526.00				
District + Error	180	4248.60	-9867.09	2555843.00	-2.32	2532974.00	179	
(Dist+Error) - Error						470836.10	9	4.31

Analysis of covariance table for Green gram

Source of Variation	D.F.	SS_{xx}	SP_{xy}	SS_{yy}	Estimate of β	Adjusted SS_{yy}	D.F	F Value
Year SS	19	91.83	68293.99	1.05				
DistrictSS	9	3871.40	-22128.20	579173.40				
ErrorSS	171	377.20	-4989.17	2293248.00	-13.23	2227258.00	170	
TotalSS	199	4340.43	41176.58	1.07				
District + Error	180	4248.60	-27117.40	2872422.00	-6.38	2699340.00	179	
(Dist+Error) - Error						472082.7	9	4.00

Analysis of covariance table for Black gram

Source of Variation	D.F.	SS_{xx}	SP_{xy}	SS_{yy}	Estimate of β	Adjusted SS_{yy}	D.F	F Value
Year SS	19	91.82	49079.37	57971399.00				
DistrictSS	9	3871.40	-11930.90	1525013.00				
ErrorSS	171	377.20	1280.77	5399688.00	3.40	5395339.00	170	
TotalSS	199	4340.43	38429.25	64896100.00				
District + Error	180	4248.60	-10650.10	6924701.00	-2.51	6898004.00	179	
(Dist+Error) - Error						1502665.00	9	5.26

Analysis of covariance table for Sugar

Source of Variation	D.F.	SSxx	SPxy	SSyy	Estimate of β	Adjusted SSyy	D.F.	F Value
Year SS	19	1925.33	-232560.00	33240840.00				
DistrictSS	9	47102.98	-47089.20	289728.90				
ErrorSS	171	4805.11	-3494.87	1035359.00	-0.73	1032817.00	170	
TotalSS	199	53833.42	-284144.00	34565927.00				
District + Error	180	51908.09	-50584.10	1325088.00	-0.97	1275794.00	179	
(Dist+Error) - Error						242976.9	9	4.44