CHAPTER II

REVIEW OF LITERATURE
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In this chapter a review of the related studies pertaining to the trend and growth analysis, economies of cultivation, resource productivity, costs and returns of various market intermediaries and price spread of certain crops have been presented. Such a review of the past literature provides a basis structure to the present study and makes it more comprehensive. Keeping in view of the objectives of the study the review is presented under the following heads.

2.1 (a) Trend and Growth Rates

(b) Instability

2.2 Cultivation aspects

2.3 Marketing and price spread

2.4 Opinion survey of potato farmers

2.5 Trade Direction in potato export

2.6 Behaviors of price

2.1.(a). TREND AND GROWTH RATES:

A study (1968) entitled, contribution of area and average yield to increase in production of potato, during second plan revealed that the annual production of potato during second plan period has increased from
1.78 million tonnes to 2.68 tonnes. Almost 75 percent of this increase is shared by three major producing states viz, West-Bengal, Bihar and Uttar Pradesh, their individual shares being 33.26 and 14 percent respectively. A detailed state wise analysis indicates that in case of West Bengal average yield per hectare has contributed more than area to the increased production. While in case of Bihar as well as Uttar Pradesh the situation is reverse, area has contributed more than average yield per hectare.

D. Naik and S.C. Pathack (1984) studied the impact of price changes on area, output and productivity of potato in Orissa during the period 1971 to 1981. The growth rates of area output and prices of potato are statistically significant but it was not for productivity. The study reveals that 82 percent of farmers sell their produce just after harvest. Therefore the harvest price has more explanatory significant in a study of price impact on area and output. The co-efficient of determination was 0.5162 for area and 0.7322 for production and 0.3299 for yield. It shows that very close association between harvest price and area output of potato. There is however no significance relationship between price and productivity. This study suggests a sound policy for procurement of potato.

A study of (1984) production and price of potato in Bangladesh reveals that 60 percent of growth in production was from area expansion with the growth rate of 3.13 percent, but henceforth it was difficult to increase area under potato in the absence of higher and stable prices better
marketing and better technology for the cereal crops. The analysis shows that after liberalization the growth rate in productivity is very low. The violent seasonal variation in prices was mainly due to seasonal fluctuations in the arrivals of potato in the market. Instability in potato price leads to income instability for the growers. This study suggests that more concentration to cereals is the better thing than potato crop.

A study of (1986), Trend and Growth analysis of potato in India during 1950–51 to 79–80 observed the increasing trend in area production in all the seven state, except Punjab and Himachal Pradesh. It was observed that growth rate of production was highest in Bihar (19.49%) followed by Madhya Pradesh (19.12%).

M.S. Jairth, (85–86) studied the trends of area production and productivity of sweet potato in India during 1985–86. The study reveals that the trend in area, production and yield and its effect of changes in area productivity and their interaction of production varied from state to state. However, the size of area and production of sweet potato in Orissa had increased with positive growth rates. These positive growth rates in area and production in this state have totally been offset by negative growth rate in Bihar and Uttar Pradesh, productivity has continued to be the main source of growth in sweet potato output. Area being of secondary importance.
A study, (1991) entitled, 'Dynamics of increasing potato acreage in Uttar Pradesh', find out the acreage under potato in the state as a whole and its sub regions are positively related with both price and yield variables. Usually taken for profitability or gross returns. It reveals that elasticity of potato acreage with respect to the four alternative concepts of price lies between 0.28 and 0.49 percent and it is also revealed that only those regions have recorded higher increase in the potato acreage which felt the positive impact of both price and yield variables.

A study of (1996) growth and trend analysis of potato production in West Bengal reveals that in spite of an increasing trend in area, production and yield, change in price of potato have been random path, co-efficient analysis indicates that present area under potato is directly associated with the previous years of production and market price.

A study (1987 - 1988) of oilseeds and pulses in Himachal Pradesh finds out the negative growth of pulses and oilseeds in this state during the period from 1978 - 79 to 1987 - 88. It was found that area, production and productivity of oilseeds shows negative growth of 0.10, 2.96 and 2.7 percent per annum. Given more importance to cereals and using more nitrogenous fertilizer in maize and wheat effects adversely the yields of intercropped pulses and oilseeds.

A study (1992) entitled, 'Area response of major commercial crops in Andhra Pradesh' reveals that area under commercial crops is determined
by the change in own crop price, competitor crop price, price risk and area sown in the previous years. This study suggests that the long inter crop price disparities should be minimized to maintain a balanced composition of output and provide farmers with stabilized incomes. Infrastructure and transportation facilities need to be improved.

A study entitled, (1984 – 1985), ‘Trends in area production and yield of commercial crops, special reference to oilseeds’ during 1949 / 1950 to 1984 / 1985 find out the growth rates of production of oilseed crops remained constant or declined in the post-green revolution period as compared to the pre-green revolution period except in the case of castor seed and sesame. Higher growth rates of area under these crops were responsible for higher growth rates of production in the post-green revolution period.

A study of Burley Tobacco (1983) finds out that India has stepped up its production by bringing larger area under cultivation and also marginally increasing average yield per hectare with the growth rate of 4.27 percent, 5.06 percent and 0.79 percent respectively for area production and yield.

Binod C.H, Mohanty and Dibular Naik (1988 – 89) studied the area production and productivity of groundnut in Orissa during the period 1988 – 1989. It was found that except Koraput the entire district showed a positive sight in area production and yield level in this state. It was
highest in Bulasore and lowest in Mayarbhari respectively for area and production.

A study entitled (1983), 'Trends in area, production and prices of jute' during the year 1971 – 1983 observed a fluctuation and cause for area under jute production and prices. It was observed that area under jute fluctuate within a range of 585 thousand hectares in 1975 and 941 thousand hectares in 1980. The raw jute production fallen in four years out of 13 years of the study. This study reveals that increase in the high raw jute price is the cause to this fluctuation.

Tripathy and Srinivasa Gowda, (1993) estimated the compound growth rate of area, production and productivity of groundnut in Orissa for the period of 20 years (1970 – 1971 to 1989 – 1990). They revealed that over the period of 20 years, groundnut production in Orissa recorded a significant increase at the rate of 10.29 percent per year which was primarily due to a significant expansion of area (10.35 percent). The per hectare yield of the crop declined at a slow rate of 0.06 percent year. All the districts except Koraput recorded a significant increase in area and output.

Forever, the productivity of groundnut was almost stagnant at both aggregate and disaggregates levels. The stagnancy of per hectare yield of groundnut in the state was attributable to low application of fertilizer and poor management practices.
2.1.(b). STUDIES ON INSTABILITY:

Hazell, (1982), examined instability in cereal production in India for two time periods viz., 1954 – 55 to 1964 – 65 and 1967 – 68 to 1981. He reported that variance of total cereal production for India increased by 34.2 percent between the two periods. Of this increase, only about 6 percent could be attributed to increase in the variance of individual crop yields measured at state level. The lion share of increase could be attributed to increase in the covariance of production between crops grown in the same and in different states. It was found that increase in inter crop and inter state yield covariance were the dominant sources of the increases in these production covariance. The study finds that simultaneous increase in the variability of the areas sown with individual crop as well as increase in the covariance between area sown and yield accounted for about 37 percent of the increase in the variance of total cereal production in India during the period under study.

Hazell (1984) compared the sources of increased instability in Indian and U.S. cereal production. The results of the study revealed that variance of total cereal production in Indian and the United States increased by 240 percent since the mid 1960's. Increase in the yield variance was an important source of this increase in production variability, primarily because of their contribution to increases in yield covariance between states and crops. He opined that increase in yield variance in India was due to wide spread adoption of improved seed fertilizer,
intensive technology, increased price variability, erratic rainfall patterns and fluctuating supplies of modern farm inputs.

Lalith et.al. (1986) have studied the components of production which have contributed to the increase in average production of natural rubber over two chosen time periods, one preceding the oil crisis of 1972-73 and the other which witnessed several increases in the price of oil. They found that Kerala contributed to the extent of 89.45 percent increase, Tamilnadu contributed 7.48 percent and Karnataka 1.99 percent to the growth in the production of natural rubber. In the above mentioned states, much of the increase was due to changes in area rather than changes in productivity. Interaction between area and yield contributed in a large measure to the change in production especially in Karnataka and Tamilnadu. The growth in rubber production in the country has been by and large area-led.

Raju and Rao (1988) studied the instability in agricultural production in Andhra Pradesh by studying the long-term year to year movements of outputs, from 1956-1957 to 1982-1983. They prepared the index numbers of food grains, non-food grains and for all commodities in Andhra Pradesh. The study revealed that the food grain production index reached its maximum during 1978-1979 (190.6) and none of the proceeding and succeeding years crossed this production figures. This same was the case with all commodities. The production of food grains fell by -6.02, -20.63, -18.90, -8.29, -21.15, -24.13 and -1.19 percent during

Singh et al (1989) attempted to study the effect of change in acreage of oilseeds and productivity levels on the differential production during a specific period. Contribution of change in acreage, productivity and their interaction in the differential production of mustard and groundnut during each period 1964-65 through 1969-70, 1970-71 to 1979-80 and 1980-81 to 1985-86 indicated that the situation of groundnut production has been worsened right from 1964-65 to 1985-86. The situation has improved a little after 1980-81 due to some increase in productivity but total differential production during 1980-81 to 1985-86 remained (-12.47 thousand tonnes) negative because considerable reduction in acreage and its interaction, with changes in productivity.

Jain et al (1991) studied the instability of pulse, production in Punjab for two periods from, 1964-65, to 1983-84 and from 1983-84 to 1990-91. They found that in 1964-65, 1965-66 and average production of gram fell by 63.57 percent from its level of its 719 thousand tonnes in period first to 262 thousand tonnes in period second. Its decomposition reflected fall in mean area was the sole factor responsible for its fall in production. For lentil, average production declined by 43.29 percent. Its decomposition reflected that the level of both average area and average yield have fallen during period II with share of fall in average area at 69
percent and average yield at 44 percent in production. Among the average production improved by 22 percent. Effect of decline in mean area has been more than compensated by the increase in average yield to the change in production in between the two periods.

Jayadevan (1991) studied the instability in wheat production in Madhya Pradesh for the period 1951-52 to 1964-65 (first period) and 1965-66 to 1986-87 (II period). He decomposed variance of production between periods first and second into ten components. He observed that a change in the yield variance was important in germinating instability in wheat production in all the regions of Madhya Pradesh except eastern inland Madhya Pradesh. In eastern inland Madhya Pradesh changes in the area variance of wheat production was mainly responsible for increase in the variance of wheat production. Changes in area-yield covariance also accounted for a major share in increase in the variance of wheat production in the Eastern inland M.P., Northern M.P.

Cauvery (1992) examined the extent of instability in groundnut production in Tamilnadu, with particular reference to four major groundnut growing district viz., North Arcot, South Arcot, Coimbatore and Salem. It revealed that the change in mean yield has a serious impact on the stability of the groundnut production. A destabilizing effect of change in mean area was relatively more conspicuous in South Arcot and Coimbatore districts.
Gupta and Athawale (1993) assessed the area, yield and their interaction effects through decomposition on output growth of Soya bean and Sunflower for the period from 1970 – 71 to 1989 – 90. They indicated that the production of Soya bean increased in all the major producing states due to increase in area. The contribution of yields and the effect of interaction components were negative in Madhya Pradesh, where as in other states they were positive. In the case of sunflower in Karnataka, the increase in production was mainly due to interaction effect (53.5 %), followed by area effect (45.3 %). The contribution of area was more, in all the states except in Karnataka where the interactions component dominated as a distinguished factor in the production of sunflower. On an overall basis, it may be concluded that the area was the dominant factor for the increase of production of these two oilseed crops.

Kaushik (1993) analyzed fluctuations in crop output for the two periods viz., 1968-69 to 1979-80 and 1980-81 to 1991-92. He found that the magnitude of instability in the output of all crops, except rice, groundnut and total oilseeds declined during the second period, relative to the first and fluctuations in the yield of crops registered the highest degree of instability and that of rice and food grains the lowest. During the period the synchronized movements in area and yield were responsible for increased instability in groundnut, rapeseed-mustard and total oilseed production. The increased tendency of yield instability in the case of oil
seeds can be attributed to the fact that oilseeds are grown mostly in the unirrigated areas and are dependent on rain.

2.2. CULTIVATION ASPECTS:

A study by Tripathi (1991) on the economics of potato cultivation in Tehri Garhwal hills indicated that cost of cultivation was the highest (Rs. 8716 per hectare) in large farm size group (>0.8 hectare) followed by small and marginal group (<0.4 hectare) being Rs.8087 per hectare. The small and marginal farmers earned the highest net returns of Rs.7279 per hectare. Due to the highest productivity of 76.92 quintals per hectare.

According to AERC (1981), the cost of cultivation of potato was Rs. 7011 per hectare in pahara area of Farrukhabad. The gross returns and net returns were Rs. 10089 and 3078/ha. receptivity resulting in an output input ratio of 1.44, in the following year. Singh et al (1984) examined the economics of early crop, late crop and main crop of potato in Farrukhabad. It was found that cost of cultivation was Rs. 6927, 5911 and 7258 per hectare respectively for potato for different seasons while the net returns were Rs.1706, 2041 and 2381 for the corresponding season. The output input ratio was 1.25, 1.35 and 1.33 respectively.

During 1983-84, Sanger et al (1985) showed that the cost of cultivation and gross returns in Chhibramau tehsil of Farrukhabad were Rs. 6192 and 5980/ha. The investment of one rupee gave a return of 96 paisa.
A joint study by CPRI, Shimla and IASRI, New Delhi in Farrukhabad showed that the cost of cultivation was Rs.11268 per hectare, on overall basis. The share of seed (40.4%) is highest in cost of cultivation followed by fertilizer and manure (18.2%), human labour (15.9), and bullock labour (5.1).

A case study of (1984-85) Pahara area of Farrukhabad showed that the cost of cultivation was Rs.9608/ha. The net returns, cost of production and output input ratio were Rs.2508 per hectare Rs. 48 per quintal and 1.26 respectively.

A study by Chowdhury and Sen (1981), shows the costs and returns from different types of seed potato in Birbhum District in Darjeeling. It was found that output-input ratio of Kufri Jyoti was 2.25, Kufri Chandramukhi 2.52. The study showed that potato cultivation sometimes resulted in 10 times more returns compared to wheat or Mustered and as such these crops were not competitive.

Baksi and Banerjee (1983), showed a definite relationship between the size of holdings and cost of cultivation in Hooghly District of West Bengal. In 1979-80, the economics of potato under traditional method and improved method of cultivation was worked out on farm trails under ORP. The cost of cultivation under the improved method was higher Rs.7216 per hectare. But increase in yield from 150 quintal per hectare, under traditional method to 280 quintals per hectare, under the improved method
resulted in the increase of the net returns from Rs.2360 to Rs.6784 per hectare. The output-input ratio under the respective method was 1.46 and 1.94 (Sharma – 1980).

Under the (83-84) comprehensive scheme for studying the cost of cultivation of principal crops in India (Government of India 1991), the cost of cultivation of potato during 1981-82, 1982-83 and 1983-84 was Rs. 8085, 8051 and 7512 per hectare respectively and the corresponding returns were Rs.2423, 2071 and 1662 per hectare.

Rangaswamy et al (1981) conducted a study in Hoshiarpur district in Punjab during 1980-81. Two clusters i.e., Hoshiarpur and Tanda were selected. The operational cost of cultivation of potato was computed to be Rs.6970 per hectare in Hoshiarpur area and Rs.5979 per hectare in Tanda area.

Singh and Choudhary (1997) showed that the cost of cultivation was the highest in Hisar (Rs. 7421 per hectare) followed by Panipat (Rs.6802), Karnal (Rs.6597), Sirsa (Rs.6425) and Ambala Rs.5714.

Lokamanya (1976) reported that the cost of cultivation, cost of production and return per rupee of investment in Dharwad Taluk of Karnataka were Rs.3936 per hectare, Rs. 150 per quintal and Rs. 1.71 respectively. The study stressed an upward revision of existing scale of crop loans for the purpose of improving returns from potato production.
A study by Johtl (1986) find out the economics of potato crop vis-à-vis competing crops in the Punjab District. It was found that variable cost was Rs.15029 per hectare for Potato, Rs.4845 per hectare for wheat and Rs.7051 per hectare for paddy. Considering the respective yield of 250, 50 and 75 quintal per hectare and product prices of Rs. 65, Rs.162 and Rs. 145 per quintal respectively.

In the Central region of U.P (1982) study was carried out on the economics of potato cultivation in sequential and intercropping systems by Rabhi and Singh. Potato-Moong, potato-wheat, potato-mustard-onion are the different combinations of seeds. Total cost and returns from this differ in these combinations. It was found that combinations of potato-onion would get the highest net profit than other combinations.

Comparative economics of five vegetables (1980) i.e., pear, potato, tomato, cauliflower and cabbage was worked out for the Nainital District (Sharma). The study showed that the cost of cultivation for these crop enterprises was Rs.1079, 6708, 3085, 2119 and 1905 per hectare respectively. Cauliflower cultivation resulted in the highest output input ratio of 1.58 followed by cabbage 1.54, tomato 1.41, potato 1.23 and pear 1.08. However, potato gave the highest net returns of Rs.3629 per hectare and lowest net returns of Rs.97 per hectare were obtained from the pear.

Costs and returns from commercial crops in Lahaul and Spiti as well as Solan District were worked out (Sharma and Thakur 1980). It was
found that the total cost, gross returns and the output-input ratio for potato in Lahaul valley were Rs. 19868 / ha, Rs.10971/ha. and 1.55 respectively. In the Saproon Valley (Solan District) hill capsicum, tomato and cauliflower brought higher net returns and output-input ratio than that of potato.

Economics of rainfed (1989) rice based crop sequences under upland conditions in the lower Bramhaputra Valley revealed that rice, black gram, potato gave the highest net returns and followed by rice sesame potato. Net returns, total investment were highest in rice sesame potato (Bhowmick and Guha).

A study of paddy production (1984-85) in Punjab finds out that the per hectare yield of paddy increased with an increase in cost of cultivation. The marginal productivity became negative with an addition use of resources. The economic optimum for paddy production was reached at a cost level of Rs.6412 per hectare with a corresponding yield level of 47.80 quintals per hectare during the year 1984-85. Majority of Punjab farmers (53.37%) seemed to have been guided by the objective of maximization of yields rather than economic calculus of optimization of returns.

B.S. Rathore and R.K. Patil (1961) studied the economies of Jowar crop in Pali District of Rajasthan. It was found that the total cost of cultivation per hectare of Jowar worked out Rs.140.50, where it is highest
in lowest size group and lower in highest size group. The total output per hectare was highest in lower size group. The farmers get a net benefit of Rs. 58.45 per hectare.

A study of (2001), production and marketing of wheat in Kanpur District of U.P. found that net income and input-output ratio was the highest on small farmer being Rs.3453.0 and Rs.1.232 respectively. While input cost and cost of production per quintal was the highest on large farmers being Rs.17169.6 and Rs.469.4 respectively. A positive correlation was observed in the marketable surplus and size of holdings. There was an increase in marketing cost and margins with the increase in length of marketing channel while producer's share in consumer's rupee decreases with increase in length of marketing channels.

A study of sunflower cultivation (1994) in Punjab find out profitability of sunflower cultivation over late sown wheat in the cotton and potato belts, but it does not compete favourably with timely sown wheat. The returns per rupee invested in sunflower cropping average Rs.2.29, 2.31 and 2.13 in Mansa, Jalandhar and Ludhiana Districts, respectively in 1991-92.

A study entitled (1995-96), ‘Economics of Groundnut Production in Central India’ finds out the cost of cultivation, net returns earned by different sizes of farmers during 1995-96. It reveals that the overall cost of cultivation per hectare of groundnut was Rs.9837. The share of seeds in
total production is more than other costs. The cost of cultivation in large farm is significantly higher than the other two groups. Small and medium farmers gain more profit than the other two categories.

B.O. Maheshwarappa, and L.B. Kunnal (1993-94) studied the sugarcane production and marketing in Karnataka especially in Belgaum and Bijapur during 1993-94. They found that farmers who sold raw cane to factory got higher profit than who prepare jaggery and sold it to market. The study reveals that the total cost of farmers who sold raw cane to factory was Rs. 40,266.57 per hectare. The net benefit earned by these farmers was 44,395.51 per hectare. In case of farmers who prepare jaggery the total cost was Rs.453.85 and they got nearly Rs.2008 net benefit per hectare.

Basavaraj (1980) studied the economics of production of hybrid and local tomato varieties in Bangalore District. The total cost of cultivation per hectare for hybrid tomato was twice that of local tomato. Labour was a major item of input accounting for 29 percent and 37 percent of the cost respectively for hybrid and local tomato. The gross returns and net return over the cost for hybrid tomato was 2.5 times greater than that of local tomato indicating higher profitability of hybrid tomato over the local tomato.

A study of production and marketing (1978-79) of green chilly in Ghazipur district of U.P finds out the cost of cultivation, net return of
chilly during 1978-79. It was found that per hectare cost of cultivation is Rs. 6488.90, whereas it is Rs. 107.20 for per quintal. The net return per hectare was Rs. 2586.10. The marketing cost is worked out at Rs.12.40 per quintal. The producers’ share in consumer’s rupees was 68.80 percent.

A study (1999-2000) of Brinjal production and marketing in Karnataka finds out the cost and return structure of Brinjal. It was worked out that the total cost of cultivation per hectare was Rs.70435.41. Human labour is the major component in total cost. The per hectare net returns was found out to be Rs.76891.82. Raichur district obtained marginally higher net returns as compared to other districts. The total marketing cost was worked out Rs. 48.10 per quintal. The producer’s share is highest in Hubli market and lowest in Bijapur market.

S.C. Mahapatra (1996-97) studied the production and marketing of onion in Bolangir District of Orissa. It was found that the cost of cultivation per hectare was Rs.17949 and Rs.97 for per quintal. Among the various components cost of human labour accounted more than 30% of the total cost. The producer received the maximum share of consumer’s rupee in channel –I (97.97%) followed by channel – II (72.02%). The producer was get higher returns when they sold through channel – II. A total cost in marketing of onion per quintal incurred by village merchant was Rs.34 per quintal. Out of there major items, transportation cost (64.76%) was followed by package cost (21.78%). The cost incurred by commission agent was very low because he was not involved in grading.
A study (1974 – 75) of production and utilization of potato in Farrukhabad District of UP during 1974 – 75 found the direct relationship between size of holdings and yield, where the average per hectare production of potato on small, medium and large, categories of farmers were 98, 87, 99.05 and 108.18 quintals respectively. It was also found that the seed potato for seed purpose was positively correlated with the size of holdings.

A study (1984 – 85) which conducted in Deesa Taluk of Gujarat State compared the pattern of input use, production cost and returns of riverbed and field potato production. Potato cultivation in riverbed was found to be more profitable and produced higher yields than field cultivation. The preparation of the seedbed in riverbed is more labour intensive. It also requires high investment in tractor charges which small farmers find it difficult to meet.

A study of feasibility of (1985 – 86) seed potato production in Karnataka finds out time period to grow seed potato in the state. It was found that during 1985 – 89 the effective aphid free flow period was November to January in Dharwad, Hassan and K.R. Hills. The rapid population in Bangalore, Belgaum and Kolar were during entire monsoon and rabi season. It is also found that healthy seed, potato can safely multiplied in Dharwad, Hassan, and in K.R.Hills.
Rizvi S M A, Singh R (1985 - 86) studied the production and marketing of potato in Allahabad during 1985 – 86. They found that per hectare production of potato increase with farm size, it was higher on large farmers followed by small farmers. The average per household marketable surplus of potato was 225.36 quintals, Marketing efficiency in terms of producer’s share in the consumer’s rupee was, potato growers disposing of potato in the field is 77 percent, farmers disposing of their potato in mandi is 76 percent and farmers storing potatoes in cold storage before selling is 78 percent.

Potato cultivation (1989 – 90) in hill areas of Himachal Pradesh formed that farmers earned net returns of Rs.2998 and the output-input ratio was 1.16. The market structure was competitive in mandi market but oligopolistic in Shimla market.

Khuran S M P (et al) (1989 – 92) studied the profitability of potato based cropping in north western plains during 1989 – 92. The study reveals that the Rice – Potato – sunflower sequence gave the highest net income of Rs. 35260 per hectare followed by Potato – Mentha of Rs.18840 per hectare per year and Rice – Potato – Wheat of Rs.17880 per hectare per year. Production efficiency was highest for Rice – Potato – Sunflower 71 per kg per hectare per day.

A study of production (1990 – 91) and price behaviour of potato in Nilgiris District of Tamil Nadu found that the magnitude of oscillations
was high both in terms and prices during the period 1961–62 to 1990–91. However in latter years, due to technological advances and an improvement in marketing techniques this feature of the data series became less marketed.

A study (1991) entitled entrepreneurial behaviour of small and marginal potato growers in Shimla hills find out the positive and significant relationship with 12 independent variables viz. self education, annual income, use of communication sources and potato yield level.

Potato intercropping study (1991–93) in Agricultural Research station Chindwara (M.P) found out the efficiency of potato crop with onion. It was found that the highest average yield for sole potato is 290.8 quintal per hectare lowest yield was 227.6 quintals per hectare. When potato intercropped with onion the highest yield was 367.7 quintal per hectare and it was lowest with fennel sole crop i.e., 130.5 quintal per hectare.

Deka N C, Dutta T C (1995), studied the production potentials and economics of potato and rapeseed based multiple cropping systems in plains of Assam. The study reveals that the highest net returns and cost benefit cost ratio were given to potatoes summer green gram, transplanted Karif rice. The cropping system based on rape was the least profitable.

K P Aswatha Reddy, C Nanja Reddy and Lalith Achuth, (1990) studied the production and marketing of irrigated potato in Chikkaballapur
Taluk of Karnataka during 1990 - 91. It was found that 95 percent of farmers were faced the problem of non-availability of quality seed at reasonable price. In marketing aspects the major problems faced were fear of price fluctuation, spoilages and immediate need for cash.

The study conducted (1995 - 98) in N W plains of Punjab during 1995 - 98 found out the efficiency of potato with groundnut and onion. It was found that groundnut - potato - onion was the best crop sequence with the potato equivalent yield of 996 quintal per hectare followed by black gram - potato - radish (810 quintals per hectare) groundnut - potato - onion system had higher land use efficiency (90%) where as black gram - potato - radish had highest biological and production efficiency of 313 and 316 kg per hectare per day respectively.

A study of (1996 - 97) seed potato production in Meerut District of Western Uttar Pradesh during 1996 - 97 reveals that the seed potato production is a profitable enterprise for the seed potato farmers of Western Uttar Pradesh. It also indicates that on an average seed potato farmers were using more fertilizers than recommended for seed potato crop in the area. A need of strength extension services about the recommended package of practices and seed plot technique is suggested to increase resource use efficiency of scare agricultural resources and improve the income of seed potato farmers and production of potato in the region.
Amarasinghe S T C, Weeraheqa J (1999) studied the technical efficiency of potato production in Badulla District of Sri Lanka during 1999. The technical efficiency was regressed as a function of age of the farmers, education level and farm assets. The study reveals that the average level of technical efficiency of farmers was found to be 72 percent indicating that the production would increase by 28% if all the farmers achieved the technical efficiency level of the best farmer. The results of the model for the inefficiency effects indicate that educated farmers tend to be more efficient than the others.

The study of potato production (2001) in Tari Belt of Uttaranchal found out the efficiency of potato crop with cowpea and maize. The results showed that potato cowpea – maize was the best crop sequence with the potato equivalent yield of 525.15 quintal hectare followed by Potato – Maize – Cowpea (490.89 quintals per hectare). Economic analysis showed that potato cowpea maize sequence gave the highest net returns of Rs. 57,246 per hectare year, followed by Potato – Maize – Cowpea sequence (Rs. 54856 hectare per year).

A study (1973 – 74) of potato cultivation in Rohru District of Shimla and Babugarh District of Meerut found out the cost and net benefit earned by farmers during the period 1973 – 74. It was found that the cost of cultivation per hectare was Rs.6165 in Rohru and Rs.6147 in Babugarh District. The net profit per hectare is Rs.2776 for Rohru District and Rs.6704 for Babugarh District. The study reveals that the use of improved
seeds in Babugarh is response to increase the yield (99.35 quintals per hectare). This study also recommended to use qualitative seed in Rohru District.

Dahiya and Sharma (1975) have studied the economics of potato cultivation during 1971 – 72 to 75 – 76 in some states of India. It was found that per hectare cost of production of potato at Farrukhabad (U.P) in 1971 – 72 was Rs. 5,073.90. It was Rs. 6475 in Haryana during 1975-76, the per hectare cost of production was Rs.6751.57, where in Hosaiarpur it was Rs. 7824.15 in 1976 – 77 and in Bihar it was Rs. 5140. The net returns per hectare was Rs. 1525, Rs. 1843.01, Rs. 1569.9 and Rs. 2360 in Farrukhabad, Haryana, Hosaiarpur, Bihar respectively during the period 1971 – 72. It was observed that the major cost components are seed manures and fertilizers, which accounted for 70 to 90 percent of the total cost of cultivation.

A study of (1983) potato production and marketing in Farrukhabad District of U.P during 1971 – 72 to 1980 – 81 find out the cost of cultivation net returns in different years. It was found that cost of cultivation during 1971 – 72 was Rs. 5070.99 per hectare which rose to Rs. 8761.53 during 1980 – 81. But the net returns decrease during these year where it was Rs. 1842 – 01 in 1971-72 decrease to Rs. 1024.97 during 1980 – 81. The study also shows the decreasing trend in producer’s share, it was 69.30 during 1975 – 76 and decreased to 64.66 percent during 1980 - 81.
A study entitled (1987) ‘Economics of potato production in Dharwad Taluk’ shows the increasing production during the year. It was Rs.6835 per hectare during 1980 – 81 increased to Rs.12802.4 during 1985 – 86. But the net return per hectare remaining more or less same. It was Rs.3.264.62 during 1980 – 81 and Rs.3401.78 during 1985 – 86. The study also reveals that the producer’s share in consumer’s rupee was 50 percent in 1980 – 81, 37.71 percent in 1985 – 86 and 64 percent during 1986 – 87.

R.S. Tripathi (1991) studied the economics of potato cultivation in high hills of Uttar Pradesh. The study reveals that the returns from potato planting in March can be made more profitable through increasing exist inputs in existing level of production technology in this area. The average cost was Rs. 4639.17, Rs. 5112.17 and Rs. 7726.77 per hectare for A.B.C. costs. The share of seed is highest in operational cost (53.68%) followed by Bullock Labour, Fertilizer and Manure. The average net returns over costs A, B and C were Rs. 8364.83, Rs. 7891.93 and Rs. 5277.63 per hectare, respectively. These returns were highest on the smallest size group of farmers.

A study entitled (1991) ‘Economic analysis of potato cultivation in the Eastern Uttar Pradesh’ reveals that high per hectare cost of each cost component on each size groups of adopter farms compared to that of the corresponding matching size groups of non adopter farm with the only exception of bullock power cost where reverse holds true. The per
hectare cost of individual cost components varied directly with the farm size classes on the adopter and non adopter farms as well. It was found that the cost A, cost B and cost C, on per hectare basis were Rs.7108.28 Rs. 7845.43 and Rs.8243.16 respectively on the adopter farms and Rs.5250.17, Rs.5983.04 and 6381.34 respectively on non adopter farms. The overall average per hectare returns was Rs.12573.83 on adopter farm and Rs. 8980.80 on the non adopter farms.

Dilarski S (1991) studied the production costs of selected fodder crops in private farms of Poland. The results indicated that the labour costs associated with potato cultivation and also best production was several times higher than those linked to cereals. However activities had the highest labour requirements where all the studied folder crops were concerned. Production costs calculated per hectare, and cereal and feed units were much higher for potato and folder beets than for cereals.

A study of potato (1991 – 92) production and marketing in Indore District of Madhya Pradesh during 1991 – 92 find out the total cost and net returns. It was found that per hectare cost of cultivation was Rs. 18625. The net returns were worked out Rs.12005.60 per hectare. From the total cost the share of seed is highest 37.58 percent followed by human labour 23.09 percent and manures and fertilizer 17.3%. It was also worked out producer’s share in consumer’s rupee was 67.22 percent. The study suggests to improve the marketing system and develop processing units village level.
A study of potato (1992) production in Himachal Pradesh found out the area and productivity of potato has declined and growers have gradually started shifting to other high pay-off crops. Farmers in the state due to their location, invest large amounts in marketing costs. A direct relationship is observed between the size of holding and cost of cultivation.

Bajawa K A, Delobel T, Farooq K (1995) studied the cost and benefit differences of potato production in various potato growing areas of Pakistan. The study reveals that there is a clear pattern of higher unit production costs in the hills for the summer crop as compared to the autumn crop in the plains. This is mainly explained by lower yield levels in the hills. Potato prices are higher in the summer season in the plains due to supply and demand factors. Consequently potato growers in the hills recorded higher returns than those in the plain despite lower yields.

2.3 MARKETING COST AND PRICE SPREAD:

B.D. Shukla (1968) studied the marketing of potato in Varanasi during the period 1968 – 70. It was worked out that the average cost of cultivation per acre of potato was Rs.687.67, while value of produce was Rs.1740. Producer got net benefit of Rs.1052.38 per area, with the traditional mode of cultivation. The storage cost per quintal was Rs. 70.77 for 4 months. The producer’s share in consumer’s rupee was 77.39 percent at village level and 79.42 percent in the market.
A study (1978) of co-operation marketing in Nilgiri Districts finds out the Rule of co-operation market of potato in this District. It was found that co-operative agencies have to face and manage stiff competition from private traders. Yet the organization tries with the confidence of producers through effective and healthy trade practices. Co-operatives own the confidence of small and marginal farmers more than that of big farmers.

A study of potato marketing in Punjab found out the marketing cost, marketing pattern during the year 1978 – 79. The study reveals that selling potato at farm was more economical than in local market. It was worked out that during the month of November the sale of potato in Delhi market was more economical and earned a net benefit of Rs. 9.03 per quintal, while sale of potato in city market loss Rs.1.96 per quintal.

Singh P K, Kakadia B H, Patel V M studied the potato marketing in Gujarat during the period 1984 – 85. The results indicate that the area has potential for increasing potato production and farm income. Marketing costs borne by producer’s are high, particularly the trader’s commission. In order to increase the producer’s margin the marketing system needs to be more efficient by means of enforcing market regulations and strengthening co-operative marketing in order that it can compete effectively with traders.
A study entitled (1987 – 88), ‘The role of cold storage in the marketing of potato in West Bengal’, shows that the average marketable surplus of potato in West Bengal was 68 to 70 percent of total production. Of this 53 percent is sold during post harvest period, 47 percent kept in cold storage. Private cold stores play a vital role in potato market mechanism having 92 percent of cold store capacity. By delaying the opening of stores until after harvest primary markets become saturated and price drops rapidly. Delaying tactics serve the interests of connected with the stores and the collusion of interests has resulted in the formation of a storage group of potato traders.

Arya A (1990) studied the potato marketing in Gujarat during the period 1987– 90. It was found that producer’s share has fluctuated over the period. The increasing co-efficient of variation in retail price has lowered consumer welfare. Producer’s share and retail price are positively correlated, but the rise or fall in the producer’s share is less than proportionate to the rate rise or fall in retail price.

A study of (1992) potato marketing in Kottevalli Thana of Naogaon District of Bangladesh shows that average potato production is positively related to the size of farm under potato cultivation. The perform sale was highest (152 quintals) for large farmers and the lowest (42 quintals) for small farmers and the largest volume of sale (69%) was made at the market. The major elements of marketing cost of farmers are transport, storage and wastage. Most potatoes (26%) kept for table use was stored at
home, while most potatoes (33%) used for seed were stored in cold storage. The findings indicate an inverse relationship between farmer’s net share and the length of marketing channel i.e., the largest the marketing channel, the lower the farmer’s net share.

The study (1993) of potato marketing in Hoogly District of West Bengal find out the marketing costs and margin, price spread in different channels. It was found that the cost of marketing of potato per quintal is highest in channel – B followed by channel C, D and A. The highest marketing cost in channel B is due to the longer chain of intermediaries. The percentage of total marketing cost per quintal of potato incurred by the producer is maximum in channel D (68.89%) and minimum in channel B (64.17%). It was also found that producer’s share in consumer’s price is highest (64.69%) in Channel D, where producer’s sell their produce directly to the whole sellers. The greatest ills in potato marketing in this district was distress sale by the marginal and small farmers.

A study of marketing problems (1993 – 94) of potato in Dharwad District of Karnataka during the period 1993 – 94 found that 80 percent of the farmers faced the problem of price fluctuation, 42 percent of farmers did not get good transportation facility, only 55 percent of farmers have storage facility remaining 45 percent were sold their produce just after the harvest. The study suggests that transport, storage, market information are some of the areas need urgent attention to improve the efficiency of potato marketing.
A study of potato (1993 – 94) marketing in Muzaffarpur District of Bihar during 1980 – 81 and 1993 – 94 found that resources should be shifted from human labour and bullock labour to modern farm inputs to reach the state in the global markets and improvement of farmer’s agricultural economy. It was found that marketing cost per quintal of potato during 1980 – 81 was Rs.7.30 and it increased more than two times in 1993 – 94 (Rs. 19.80). Producer’s share in consumer’s rupee decreased during this period, where it was 59.62 percent in 1980 – 81 and 51.10 percent in 1993 –94.

Marketing of potato (1994) in West Bengal shows that one of the worst problems in potato marketing is distress sales by small and marginal farmers. It is therefore suggested that the Government should lay down rules to make cold stores, pay advances to those farmers who keep their potatoes in cold stores or issue a negotiable instrument on the basis of which farmers can obtain advances from bank.

D.H. Mhranewar K C Gummagalmath (1993 – 95) studied the marketing cost, margins and price spread of potato in Northern Karnataka during the year 1993 – 94 and 1994 – 95. It was found that total marketing cost is Rs.20.55 per quintals, gross returns is Rs. 60.00 per quintals and farmers get net returns Rs.39.55 per quintal which was highest in case of retails in Belgaum market compared to Hubli market. The difference between price received and price paid by the ultimate consumers for potato was higher under Channel – I (Rs. 17.94 and Rs.
20.02) than that under Channel – II in both markets. The price spread was however comparatively higher, where the sale was through commission agent cum wholesalers of both the market areas. But it was higher in Belgaum area than in Hubli.

A study of (1993) potato marketing and cold storage finds out the scarcity of potato storage facility during this period. The study reveals that potato production increased at an annual growth rate of 0.29 percent but the availability of storage were only growing at annual growth rate of 0.10 percent. It was required to grow at 0.15 percent. Because of scarcity in this cold storage marginal and small farmers sold their product just after harvest with low price. The study reveals that cold storage would help to get more profit. It started accruing from May (Rs.42 per quintals) with upward trend until a maximum was reached in October (Rs. 262 per quintal). So they suggest government to makes adequate cold stores availability.

Kerur N M, Gumgolmath K C (1995) studied costs and returns of potato marketing in Dharwad District of Karnataka during 1995. They formed that many farmers sold their produce to village merchants with low prices due to perishability and the risk involved. The producer’s share in the consumer’s rupee was greater in Channel – I (producer-wholesaler-retailer-consumer) with a low marketing margin compared to Channel – II. Thus, Channel – I was found to be the most efficient in the study area.
A study (1995) of seed potato marketing in Himachal Pradesh find out the producer’s share in consumer price was considerably higher in Lahaul market. The major item of total marketing cost was transportation cost followed by packing cost.

A study entitled (1996), ‘Factors affecting the marketing of UK potatoes’ finds out that most farmers (64%) sold their produce on the spot market, only 26 percent of farmers sold potatoes on contract and where contracting did occur. It was usually supplemented by other means of selling. About 19 percent of growers sold their potatoes by verbal agreement, with an average, just one merchant. The demise of the Potato Marketing Board may well result in greater price instability on the spot market in future. However the advantages of a secure outlet providing a more stable in the long run, have to be set against disadvantages of rendered stable returns in the long run have to be against the disadvantages of reduced flexibility and the costs associated with producing a crop to specific standard.

A study of (1995 – 96) potato marketing in Agra District of Uttar Pradesh finds out the marketing costs and margins during 1995 – 96. It was found that per hectare marketed surplus is directly related to the size of farm while the farm utilization is negative in its relation to farm size in the farm of consumption. Storage and marketing cost of potato is directly related to the size of holdings. Large farmers were getting advantage of price rise over time and pace on account of marketing cost.
Auadesh Kumar, Dubey P P. and Ashok Kumar (1992) studied the marketing efficiency of potato in Allahabad District of Uttar Pradesh and finds out the inter channel comparison of marketing costs. Profit margin, net price received by the producers and his share in consumer’s rupee. They found that Channel – II is efficient to farmer. It was worked out that marketing cost varied between 12.05 percent in Channel – II (a) and 24.20 percent in Channel – III (b). The producer’s share in consumer’s rupee was highest 69.38 percent in Channel II (a) and lowest in II(b). So the farmer who sold his product to village merchant would got more benefit.

Balappa Shivaraya and Hugar L B (1998 – 99) studied the integration of market for onion and potato in Karnataka state during the period 1979 – 80 to 1998 – 99 and found that the variations in arrivals as well as prices over the years were found relatively higher. Similarly, the variations in the arrivals and prices were found to be higher in potato in general except in Hubli market. The co-efficient of variation in prices of onion was found to be higher in Bijapur (148.64%), Hubli (140.79%) and Raichur (109.75%), where it was highest in Gulbarga (125.88%) followed by Bijapur (108.33%), Dharwad (83.35%) for onion arrivals. But incase of potato, arrivals was higher than prices in Belgaum and Dharwad markets. This indicates that although there was a study increase in the arrivals and prices their fluctuations from year to year were high. The correlation co-efficient between wholesale prices of selected markets was found to be
higher than 0.93 indicate greater integration among Belgaum, Dharwad and Hubli markets.

N K Pandey (ed) (2001 - 02), studied the lack of integration of major potato markets in India. They found that October and December were the crucial months when most of the market i.e., Delhi, Ahmedabad and Jalandhar markets showed many opportunities where trade could have earned very good profits by transporting potatoes either from or to Delhi. During December 2001 there was possibility to earn profit of Rs. 13482 and during December 2002 Rs.12312 after transporting potatoes from Delhi to Ahmedabad. During October Jalandhar can get profit 24 percent in 2001 and 15 percent 2002 by transport to Delhi market. This clearly indicates non-integration of markets due to transport bottleneck. The correlation co-efficients of potato prices showed that the markets were not integrated even at shorter distance when there was a high risk of spoilage.

A study of (2002 - 03) potato production and marketing in West Bengal finds out the problems faced by potato growers in West Bengal during the year 2002 - 03. The major problems identified were lack of availability of sufficient good quality seed well in time, un-remunerative market price which faced by 44 percent of farmers. As related to marketing biggest problem faced by potato growers was unrenumurate market prices, 30 percent of the farmers faced this problem. The producing share in consumer's rupee was very low only 40 percent. The study
suggests supplying sufficient seed by Government agencies and also establishes more cold stores.

2.4 OPINION SURVEY OF POTATO FARMERS:

Patil et al. (1969) revealed that the growth of horticultural plantation in Maharashtra had been hindered by a variety of economic problems. They listed the reasons as uneconomic size of plantations, improper selection of lands for the fruit crops, selection of inferior varieties, faulty growth of trees, insufficient maturing, inadequate irrigation, non-availability of markets for efficient and prompt disposal of the produce, irregular and heavy seasonal supplies, heavy marketing costs, perishable nature of the products, absence of organized marketing services, lack of market intelligence, price fluctuations, absence of inadequate facilities of storage and processing. Because of these complex problems the cultivators did not get economic returns and as a result, in many cases, the growers were forced to uproot their horticultural plantations.

Subramanyam and Mrunjaya (1978), based on their study of marketing of fruits and vegetables in Bangalore suggested for: (1) regulation of marketing of fruits and vegetables with (a) proper dialogue with the concerned people in the trade, to fix reasonable commission, so that the commission is neither too low as suggested in the Act nor too high as at present, and (b) strict supervision, (2) creation of vegetable
marketing organization units with (a) assembling centers located at growing areas, (b) arrangement for payment of loans advances and supply of inputs, and (c) arrangement for transportation and packing of the produce, (3) creation of commodity marketing boards to individual or group of fruits and vegetables to take care of both supply and marketing, (4) establishment of retail outlets to protect the interest of the consumers, (5) providing cold storage facilities, and (6) disseminator of market intelligence through all possible means of communication for improving the marketing efficiency of fruits and vegetables.

Nagaraj et al. (1985) in their study on market appraisal of fruits and vegetables documented, the problems of vegetable producers and intermediaries wherein about 100 per cent of the farmers reported that intermediaries refused to accept the produce of graded vegetables tomato, brinjal, cabbage and beans. The other problems felt were lack of storage facilities and delay in getting sale proceeds from the intermediaries, high rate of commission, improper weighment, wide fluctuation in prices and high unloading charges at the market. However, commission agents and the retailers complained about congestion in market-yard, which made it difficult to transact the heavy market arrival is received throughout the year. Therefore, the measures suggested by them for the above problems were: (i) regulation of markets and equipping with a network of infrastructural facilities ranging from scientific storage to transportation and processing, (ii) regulation of future trading, (iii) spreading of the tentacles
of co-operative marketing and reducing their procedural formalities encourage producers, (iv) financing of marketing of perishables by providing loans for purchase of well ventilated vehicles for transport of fruits and vegetables.

Singh et al. (1988) reported that lack of adequate supply of inputs, high transportation cost, strategic of railway wagons, low prices, lack of industrial uses of potato, large surplus and distress sales were the major problems in potato marketing and storage in Farrukhabad district of Uttar Pradesh.

Pamer et al, (1994) reported that spoilage was the major problem (68.46%) during marketing of vegetables in south Gujarat followed by malpractices in weighment (49.4 1%), lack of credit facilities (24.40%) and inadequate transportation facilities (23.81%).

Thakur et al, (1994) identified the problems encountered by the farmers in marketing of vegetables. They were (1) unorganized marketing and low prices paid to farmers, (2) lack of mechanical grading, packing and proper storage facilities, (3) malpractices, high and undue marketing margins and costs in the 'markets, (4) lack of village roads; lack of sufficient and low cost transportation facilities, (5) lack of market information and market news, and (6) lack of processing units and co-operative societies,
Sharma et al. (1995) in their study on marketing of vegetables in Himachal Pradesh reported that costly wooden boxes, time consuming manual grading, distant markets, high transportation charges, malpractices in the market and lack of market information were the major problems faced by growers in storage, transportation and marketing of vegetables.

Bonny (1996) surveyed the constraints in commercial production of vegetables in Pandichery and Puthur, Kerala and reported that increased cost of plant protection chemicals was perceived as the most important factor by the respondents. This was followed by adequate marketing facilities, poor storage and other post harvest facilities, insufficient capital and high labour costs.

Jairath (1997) in his study on operational efficiency in fruits and vegetable market in Jaipur examined the effect of operational efficiency on marketing efficiency. The study revealed that though the system of sale was by way of open action, yet a very small portion of produce was sold by this method mainly because of non-participation of sufficient number of traders in the auction and lack of adequate space for display and handling of the produce. The traders were still deducting unauthorized charges and payments of sale proceeds which were not realized by the farmers on the same day.

Patel et al. (1997) in their study on marketing efficiency of Anand vegetable market in Gujarat reported that lack of storage facilities, delay
in payment of sale proceeds, high cold storage charges, monopoly of a few middlemen and need of timely disposal of these perishable products etc., were the major problems faced by the cabbage and cauliflower growers.

Narappanavar and Bavur (1998) examined the problems in Storage, transportation and dissemination of market information in potato marketing in Dharwad, Karnataka found that farmers were facing several problems in transportation because of large number of tractors in the villages. Similarly, farmers were making suitable arrangements for storage of potato on the farm itself. However, about 35 per cent of, the farmers complained of illegal deductions while selling the produce at the market in the form of weighment charges. The other problems noticed were lack of grading facilities, arbitrary hamali charges, low and variations in output prices and high commission charges. Therefore, it is suggested that there is need for ensuring improved storage facilities and purchase of potato at the local market by the government at the time of heavy arrivals to assure the remunerative returns to the potato growers.

Anilkumar and Arora (1999) in their study on post-harvest management of vegetables in Uttar Pradesh hills found that non-availability of cold storages, highly perishable nature of the vegetables, low market demand for the produce at the time of storage are the major problems as perceived by farmers in vegetable storage. Farmers have also reported the reasons for selling through particular buyers/commission agents as: i) accessibility of buyers, ii) remunerative price, iii) less market
surplus, iv) convenience in sales, v) receipt of advances, vi) minimum cost on transportation and vii) frequency in selling below low.

2.5 TRADE DIRECTION IN POTATO EXPORT:

Edward (1985) applied Markov analysis study to the changing distribution of farmers. They had applied the models to longitudinal data set for 1978-82. The results indicated that the projected distribution of farms by acres per farm would remain the same based on the previous distribitional trend.

Chavas and Magand (1988) developed a time-varying Markov process of the aggregate size distribution of farms in the industry. This was used to specify and estimate an economic model of the regional evolution of the number and size of U.S. dairy farms. The results provided evidence that economics of size, sunk, and the market prices played a role in the evolution the size distribution of dairy farms. It was found that farmers having less than 50 cows were not efficient as their number declined in all regions. The analysis also suggested that a higher output price had a negative impact on the growth of a farm. In general, higher milk prices were found to increase the number of farms in all size categories.

Gemtessa (1991) analyzed the direction of trade using Markov chain model. The share of Ethiopian coffee experts in U.S.A. drastically declined during 1979 to 1989. However, West German market was
indicated to be the potential market for Ethiopian coffee. Further, the loss in the market share of Ethiopian coffee in the USA, France, USSR, and other countries was diverted to West Germany's market. It was interesting to note that the Ethiopian coffee exports to Japan, France and Italy had moderately increased. But the share of Saudi Arabia remained stagnant. It was also projected that the market shares of Ethiopia coffee exports to West Germany would increase to 32 percent by 2000 A.D. mainly because of West Germans' preference for Ethiopian mild coffee.

Atkin and Blandford (1982) studied structural changes in import market shares for apples in U.K. The changes in composition of U.K. apple imports during the period 1963-74 were analyzed using a first order Markov model. The study indicated that changes in market share had been systematic, stable and of long duration. The estimated transitional probability matrix could explain the nature of change by indicating the relative competitive strength of different exporters. The large increase in market share of France was examined and estimate derived on the effect of U.K membership of the E.C for the year 1978-79. The results showed that E.C membership increased French market share in the U.K market by more than 26 percent points and decrease the share of Australia and South Africa by 18 and 10 percent points respectively.

Buckwell et al. (1983) examined the changes in the size structure of the dairy industry in Scottish Milk Marketing Board (SMMB) area. The projected sex distribution of dairy herds was combined with sample
projections of average herd size and yield, which indicated the outlook of milk production during 1980s. This suggested that secular increases in SMMB milk production might be slowing down and could even come to an end during next few years.

Erthridge et al. (1983) studied the changes in the structure of Texas high plains cotton ginning -industry using Markov chain procedures. Future industry structures were made under conditions of transition probabilities. All projections showed declining number of active ginning firms with large decline in number of small firms and increasing number of large firms.

Filoar (1985) analyzed the market share of Ghanaian cocoa exports for period of 1951 - 1981 using the Markov model. He decomposed the total change in export into the overall market share effect, the direction of effect and the individual market effect. It was observed that there was an overall contraction in Ghana's cocoa exports during this period to tune of about 38,000 tonnes. Even though there was an expansion in exports due to increase in the overall market share effect as a consequence of increased world demand to the extent about 2, 26,000 tonnes and another 15,000 tonnes due to the direction of trade effect; yet the loss through the individual market share effect was large, 2,78,000 tonnes and resulted in the contraction of Ghana's export.

Srivastava and Ahmed (1986) analyzed the direction of exports from
India for the period 1960-61 to 1983-84. The countries such as U.S.A., former U.S.S.R., U.K., Japan and erstwhile West-Germany had greater share in India's export and import trade. India's exports to the above mentioned five major trading countries declined over the period of study. The U.K. more remained as the principal destination of Indian trade as it was in the pre-independence period. In 1983-84, USA. emerged as one of our major trading partners.

Durhum and Lee (1987) analyzed the changes in exporter market share in the Kuwait's poultry import market over the period 1971-81 by three modelling procedures. Two traditional approaches, a first order constant transition probability Markov model, and a set of market share equations were found to be of only limited use. As an alternative, a multinational logic model of market share behaviour was estimated. The empirical results indicated that, in addition to relative price changes, domestic policy inducement for Britain and European community exports were important in determining market share changes.

Wilson et al. (1990) studied importer loyalty in the international, wheat market. The result's revealed that, in general, the United States of America had relatively strong importer loyalty, compared to other exporters such as Canada and the European community.

Gemtessa (1991) analyzed the direction of coffee trade using a Markov Chain model. The share of Ethiopian coffee export to the U S had
drastically declined during the years 1979 to 1989. The loss in the export share of Ethiopian coffee to US, France, USSR and other countries were directed to erstwhile West Germany. The study revealed that the Ethiopian coffee exports to Japan, France and Italy had moderately increased while the share to Saudi Arabia remained stagnant. It was predicted that the market share of Ethiopian coffee exports to West Germany would increase to 32 per cent by 2000 AD, mainly because of their preference for Ethiopian coffee.

Veena (1992) analyzed the direction of Indian coffee exports in terms of importing country shares over the period (1965-91) using Markov Chain analysis. The projections indicated a declining trend in India. Coffee exports to the USA, Yugoslavia, Netherlands and other importing countries. The increased market shares of the erstwhile USSR in the 1970s and 1980s were subsequently threatened by economic and political upheavals in the region.

Jeromi und Ramanathan (1993) noticed significant changes in the direction of pepper exports from India for the period 1975-90. It was observed nearly 44 per cent of India's pepper exports were directed to the former USSR, which constituted about eighty two percent of the total pepper imports of that country. On the other hand, India has not only failed to increase its exports to USA in tune with increased consumption in that country but also could not sustain the quantity exported during the earlier years. Instability was low in case of exports to former USSR,
Italy and Canada, and higher for Poland, USA and Czechoslovakia.

Laxminarayana (1993) studied the direction of Indian silk exports by following first-order Markov process. The major importing countries considered for the analysis were USA, West Germany, UK, France, Italy and Japan. The exports to USA were stable and would remain highly loyal to Indian silk. The probability of export to the UK, West Germany and Japan switching over to USA was unity implying that entire quantity of exports to these countries would drift to USA over a period of time.

Jalajakshi (1994) study showed the changing pattern of Indian shrimp exports between two periods. Period-I covering the years 1970-80 and Period-II covering the years 1980-90. The study indicated that during Period-I, India could not retain its previous market share in the EEC countries. Nearly, 90 per cent of Indian share was diverted to Japan and seven per cent was diverted to UK. However, in Period-II, India could retain 11 per cent of its previous market share in the EEC countries due to the gradual acceptance of tropical shrimps in these countries.

Veena et al. (1994) examined the changing directions of Indian coffee exports in terms of importing country shares over the period 1965 to 1990 using Markov chain analysis. It was observed that India could not retain its previous market share to USA, Netherlands, Yugoslavia and other importers. However, the actual quantity exported to all these countries has increased which was due to increased quantity of Indian
coffee exports. India retained its market share to former West Germany, erstwhile USSR and Italy. The increased market share of USSR in the 1970s and 1980s was then threatened by the economic and political upheaval in the region.

Diana (1997) used non-stationary Markov chain analysis to explore the linkages between sector specific polity and sector employment in Oregon, USA. Application of the technique to Oregon's forestry sector and national forest policy demonstrates that macroeconomic forces had statistically important effects on employment while national forest policy, measured as timber sold or timber cut does not. This result raises question about forest policy impact analysis and assumption of inherent in national forest policy implementation.

Nagaraja (1997) analyzed the direction of trade of the Indian horticultural commodities exports by employing a first order Markov process which helped in identifying the gains and losses in export value. It revealed that the other fresh fruits, vegetables and processed fruits and vegetables exports retained their share of 56.7 percent and obtained 68.5 percent and 24 per cent of onion and garlic respectively. Where as grapes, onion and mango juice sustained their original share of 59.8 percent, 19.4 per cent and 49 per cent respectively.

Ajjan et al. (1998) analyzed the direction of trade of Senna and Periwinkle in India using Markov Chain analysis. The probability of
Germany and U.S.A. retaining their import shares in the years (Senna) to come were estimated to be 0.8258 and 0.8188, which clearly indicated that these two countries would retain their important share in the same position at 1977. For periwinkle, France had a high retention of the export share (probability of 0.8826) while Germany and others had as low as 0.2644 and 0.0543, respectively. This clearly indicated that the chances of maintaining export share to France was 88.26 per cent and in the other two cases the chances of maintaining the export share was practically low or nil for the year 1996.

Mandanna et al. (1998) analyzed structural change in India tobacco exports for the period 1980-81, 1994-95 using Markov Chain analysis. The study reveals that the USSR, the largest market for Indian unmanufactured tobacco, showed a high degree of loyalty for Indian tobacco during the period 1980/81-1985/86, but this diminished substantially during the period 1985-86, 1994-95. The markets of Western Europe; Asia and the Middle East have taken the place of the USSR. Among the manufactured products, only cigarettes had a dominant presence in the export basket. The diversification of export markets is clearly evident, necessitating efforts in the direction of brand building for Indian tobacco. The Tobacco Board of India can initiate this exercise. Measures should also be initiated to improve the export competitiveness of Indian tobacco in the world market.

Srinivasamurthy and Subramanyam (1999) analyzed the direction of
onion trade by using Markov chain model during the year 1980-81 to 1994-95. The major gainer among importers of Indian onion over a period of time was Malaysia which had a transfer probability of 0.6459 from Saudi Arabia and 0.3488 from UAE, Sri Lanka, in addition to having high probability of retention of its own share, was also likely to gain from Saudi Arabia with a moderate probability and gain of 0.3488. On the other hand, Saudi Arabia which had zero probability of retention of own share of exports of fresh onion was likely to gain to some extent from Bangladesh and other countries.

Murthy and Subramanayan (1999) measured the dynamics of changes in the exports of Onion from India to different countries with the help of a Markov Chain model. From one step transitional probabilities the model was extended to n-step for future forecasting. The results have shown that Malaysia, UAE and Singapore had high probability of retention and would well continue to be the major importers in the future also. As revealed by the low values of probability of retention, Saudi Arabia and others were unstable importers of Indian onion. In the next decade, Sri Lanka and Bangladesh were likely to increase their imports from India though it would come at the cost of exports to the UAE.

Balappa and Shivaraya (2000) studied the changes in trade directions or export of selected vegetables using Markov chain analysis. The results of the study revealed that UAE and Malaysia were the loyal markets for Indian onion. In case of potato, Sri Lanka and Nepal were found to be the
most loyal markets; whereas Bangladesh and Nepal were the most stable importers of Indian fresh tomatoes.

Mahesh (2000) analyzed the structural changes in Indian tea exports by employing the first order Markov model. The transitional probability matrix indicated that the countries like United Kingdom, USSR, Iran, U.A.E. Saudi Arabia and other importing countries retained their previous shares of Indian tea while rest of the countries like Germany, Poland and U.S.A. could not retain their previous shares of Indian tea.

Angles et al. (2001) used Markov Chain model for assessing the direction of trade and destination for Indian turmeric. The results of Markov Chain analysis showed that previous export share retention or Indian turmeric was high in UK (42.99 per cent) and countries pooled under others category (58.77 per cent). The countries such as USA, Iran, Japan and UAE were not stable importers of Indian turmeric. The plans for export may be oriented towards these two and also plans should be formulated for stabilizing the export to other countries.

Desai (2001) used Markov chain model to analyze the trade direction of export of Indian fresh mango and mango products. Japan was one of the most stable countries, among major importers of Indian fresh mango as reflected by its high probability of retention (1.00). In the case of mango pulp, other countries had the highest probability of retention (42.90%) followed by Saudi Arabia (24.00%) while, Netherlands, UK, Kuwait and
UAE were unable to retain their share as reflected by their probability of retention of zero. The transitional probabilities estimated for mango slices in Brine showed that UK was the most stable country among major importers of Indian mango slices in Brine as reflected by its high probability of retention (0.782).

Jayesh (2001) used Markov chain analysis to study the direction of trade and changing pattern of pepper and cardamom exports from India. The results of Markov chain analysis indicated that our exports of pepper are likely to be concentrated in USA and Russia. Similarly cardamom export is likely to be concentrated in, Japan and Saudi Arabia. A high dependence on one or two export markets would increase the trade risk in the long run. Hence appropriate export promotion strategies are to be evolved to diversify the geographical concentration. Especially in case of cardamom exports, steps should be taken to enhance our exports to other countries of Middle East along with Saudi Arabia, since this region is the major consumer of cardamom in the world.

2.6 BEHAVIOUR OF PRICES:

A study of (1975 – 76) potato prices and arrivals of Karnataka find out the effects of seasonal fluctuation of potato prices and arrivals during the period 1968 – 69 to 1975 – 76. It was found that the prices of potato were relatively low when the arrivals were high and it is high when the
arrivals decreased. The seasonal effect however was more in case of arrivals than prices.

G.D Diwakar (1975 – 76) studied the prices and arrivals of potato in Farrukahbad (U.P) during the period 1968 – 76. It was observed that the prices of military and ON 1645 varieties were low considerably in January, February and March. It is observed in all the selected markets. Prices started rising, slightly from April onwards when arrivals declined and continuously rose in the lean period of potato arrivals. The average prices in all the markets were fund higher in the lean period of potato arrivals i.e., August to early December in comparison to post harvest period of potato. It was found that large seasonal functions in all the markets. The potato arrivals and prices were found inversely related. The results of all the markets indicated that mostly changes in arrivals of potato had corresponding effect on prices in opposite direction. Most of these variations were explained by potato arrivals in all markets except Kannuj market. This variation is due to lack of storage facilities. So the study suggests the government to establish cold storage.

The study on (1977 – 78) price and arrival trends of potatoes in Punjab showed that a positive relationship between prices and arrivals. It was found that the seasonal index was maximum in the month of December (Rs.279) and minimum in the month of July (Rs. 46.15) correspondingly the prices were lowest in January (Rs. 64.74) and highest in the month of October (Rs. 139.95). The seasonal price variation is Rs. 12 per quintal
between peak and mid, Rs.16 between mid and lean and Rs.28 between peak and lean seasons. This study reveals that the price differential between the markets did not exceed the cost of transportation and handling chargers which are the preconditions of market integration of potato markets. The study also brought out that about 26 percent of the consumer's rupee was observed in the marketing channels.

Dibakar Naik and S.C. Patneit (1986) studied the price policy of potato in Orissa during 1980-81. This study reveals that existing price policy for potato in Orissa is unfavorable to potato growers. The cost of cultivation in this state is more than price received by farmers. These findings suggest the need for provide incentive to producers and ensure reasonable price to consumer.

Lundhal and Peterson (1982) studied the market integration for major food grains during the period 1969 to 1974. The number of markets considered was nineteen for rice, eight for grain millet, for grain corn, eleven for ground corn and fifty for seed beans. Monthly price series were determinates and the residuals were correlated. The results of the study revealed that there was no higher correlation between the residuals.

Brorsen et al. (1984) illustrated the use of univariate and multivariate time series analysis in the investigation of dynamic relationship among selected weekly import prices of rice of the European community. EC imported rice from the United States, Thailand and Argentina. The
results showed that Argentinean and United States prices moved together. These two prices were influenced by the European market and react quickly to changes in Thailand prices. Thailand price responded slowly to US and Argentinean prices.

Bhatta and Bhat (1988) analyzed the extent of price relationship for areca nut between selected markets of Sirsi and Mangalore using the correlation coefficient method. The results revealed that the Mangalore market was more efficient than the Sirsi market. The commercial nature of the crop and its varied market behaviour was clear from the fact that there was a direct relationship between supply and price.

Indira (1988) estimated the extent of price relationship for coffee between three pool sale centers Bangalore, Coimbatore and Vijayawada. The results revealed that Bangalore prices have shown positive relationship with both Coimbatore and Vijayawada prices. Coimbatore and Vijayawada prices have also shown positive relationship with each other. However, there was relatively lower influence of Bangalore prices on Coimbatore prices than on Vijayawada prices.

Prabhakar (1988) studied the market integration of silk cocoon markets of Ramanagaram and Vijayapura in Karnataka. The association between the two markets was studied using tile bivariate correlation analysis. The correlation coefficient was found to be 0.947 and was highly
significant at 1 per cent level of significance, indicating that the two markets were highly correlated.

Gemtessa (1991) analyzed the integration of Ethiopian coffee prices with the world prices using the correlation co-efficient. The correlation co-efficient of the monthly average prices secures at domestic and world markets for 12 months lag were calculated. The bivariate correlation co-efficient between the two market prices of coffee revealed that they moved together in the same direction. The lagged cross-correlations of domestic prices and world prices of coffee also revealed that they moved together in the same direction. The lagged cross-correlations of domestic prices and world prices of coffee for the period 1979-80 to 1987-88 indicated that the world prices of coffee had a stronger influence on the domestic prices, than that of domestic price influence on world prices of coffee.

Ahmad Zubaidi and Muzafar Shah (1994) examined the price efficiency in pepper markets in Malaysia. Co-integration tests of spatial price relationships were applied to weekly black pepper and white pepper prices at 6 regional markets in Sarawak, Malaysia using data for the period 1986 to 1991. The results revealed that the regional pepper markets in Sarawak were highly integrated. Price changes are, fully and immediately passed on to the other markets. The low transportation costs and risk associated with transportation may explain the degree of co-integration observed.
Saikat and Nair (1994) studied whether the movements in the International prices of Indian pepper had reflected the variations in prices of other exporting countries during the 1980s and also whether the domestic prices of pepper had moved synchronously with international price. The results revealed that due to the open trade status for pepper, the prices have moved synchronously indicating the integration of prices in the world pepper market.

Mamatha (1995) used the co-integration analysis for examining the market integration of selected species of India and New York prices. The results indicated that the co-efficient were found to be negative and significantly different from zero in case of Indian and New York prices of pepper, chilies, turmeric and ginger confirming the seasonality of the series. It also indicated that both the Indian and New York price series for selected spices had the same order of integration.

Debdutt Behura and Durga Charan Pradhan (1998) analyze the relationship between prices of marine fishes for six markets in Orissa by using co-integration model. The results revealed that out of all the six markets, the price series between Cuttack and Paradip were co-integrated due to good communication facilities.

Hudson (1998) analyzed the changes in the price behaviour in US catfish industry. Using monthly catfish price data, a co-integration analysis of subsets of prices showed that price behaviour has changed
through time with catfish prices becoming integrated as the number of processors has increased. The results may have implications for the examination of market price behaviour in developing or emerging markets.

Thorsen (1998) studied the spatial integration in Nordic timber market. The degree of spatial integration was tested through a co-integration analysis and a complete identification of the statistical models for long-run structure. When the results were interpreted in terms of factor price equalization and efficient commodity arbitrages, the Nordic timber markets were found to be strongly integrated.

Bassolet and Lutz (1999) analyzed the integration of cereal markets in Burkina Faso which were liberalized in 1992. At the same time a market information service (SIM) was created to collect and disseminate weekly cereal prices of regional markets by radio. The study evaluated up to that extent the existence of this service contributed to the integration of the market using co-integration analysis. A comparison of results of the whole period under study (1990 to 1995) with the results of the period after SIM (1992 to 1995) showed that the impact of the diffusion of prices on market integration is moderate, Khedhiri (1999) in his study on the agricultural market integration in Tunisia found that the degree of wholesale market integration is low, particularly for the strategic products. It also showed that the distance between markets and the volume of transactions cannot explain this lack of linkage between the markets.
Olani Wirtu Wakjra (1999) studied the long-run relationship between international price (New York) and producer’s price of coffee in Rwanda. The results indicated that both the price series were stationary and were integrated due to better infra-structural facilities.

Samarajeeva and Gunatilake (1999) studied the demand function for coconut using co-integration analysis. The study made use of 20 years SriLankan time series data (1978 to 1997) to estimate the demand function for coconut oil incorporating own price, 3 substitute prices and income. The results of Dickey fuller and augmented Dickey fuller tests revealed that the quantity consumed and prices of palm oil are integrated to the order zero while prices of coconut oil and Soya oil and income are integrated to the order one.

Zanias (1999) analyzed the seasonality and spatial integration in agricultural (product) markets especially the soft wheat market of five European Union member states (France, Italy, Belgium, Germany and UK). Co-integration analysis was made use of by incorporating the seasonal components of the agricultural price series in the testing procedure. The results showed that some of the markets turn out to be integrated while in some cases a unified market cannot be assumed. These results differ in some cases from those obtained by co-integration tests which ignore seasonal unit roots.
Balappa Shivaraya (2000) used zero order correlation matrixes to study the potato and onion markets in North Karnataka. He observed a strong integration among all the selected markets both in onion and potato except Bijapur in onion. In case of potato, the correlation co-efficient between wholesale prices of selected markets was found to be higher than 0.93 indicating greater integration among Belgaum, Dharwad and Hubli markets.

Mahesh (2000) studied the relationship between domestic (Calcutta.) and international (London) market price series of tea using the co-integration analysis. The results revealed that the tendency of the rice series of both domestic and international market for tea move in unison in the long-run confirming the law of one price (LOP).

Jayesh (2001) studied market integration for spices. Using correlation coefficient. The zero order correlation matrixes of prices showed a strong integration among the selected markets of Kerala, Karnataka and Tamil Nadu for both pepper and cardamom.

Diwakar and Murlidharan (1990) conducted a study of spatial and temporal pricing efficiency of three markets of U.P. i.e. Farrukhabad, Meerut, Kanpur and one market of Tamil Nadu i.e., Mettupalyam for 1959 – 73. It was found that the markets were integrated within the region but no integration of Mettapalayam markets with the producing markets.
Sangawan (1991) found the potato acreage in U.P. followed a three yearly repetitive cycle and profitability was the deciding factor in land allocation under this crop. The study also revealed that if production in the normal peak was boosted with exogenous policy factors.

Another study in Farrukhabad (Diwakar, 1987) showed a large seasonal fluctuation in all the four markets of Farukhabad. The result of all markets indicated that mostly changes in arrivals of potato had corresponding effect on prices in opposite direction, excepting the Knnaly market.

In H.P. Dahya et al. (1990) found that the market structure was oligopolistic in Shimla market. The Shimla and Theog markets were not integrated and competitive since the price differential were more than Rs.6.28 per quintal. The cost of transportation and handling, during the entire marketing season.

In Tamilnadu, Balakrishna et al. (1981) analyzed the potato prices and arrivals in Mettupalayam market and their interrelationship from 1962 – 1977. It was found that 51.67 percent arrivals were registered during June to September, 28.28 percent during October to December and 20.5 percent during January to May. The glut period in up country markets coincided with the lean period in Mettupalayam market.

Dahiya and Sharma (1980) studied the price fluctuation in principal markets located in producing areas i.e. Jalandhar, Farrukhabad, Karnal and
Delhi, Bombay, Calcutta, Mettupalayam. The prices at Bombay, Mettupalayam and Calcutta were more than 50 percent higher during the peak arrival period as well as during the lean period during 1972 - 72. The price differentials shot up to 80 percent during November and December.

In U.P. Bhalarao et al. (1981). Observed producers share of 68.50 and 67.04 percent in two markets in Varanasi in the producer wholesaler retailer channel. The producers’ net share in the consumer’s rupee represents the amount of money a producer receiver after deducting the costs incurred by him in selling his produce for the first time. AEPC (1981) study revealed that the share of the producer had increased to 73.98 percent in the consumer’s rupee. Probably because of enforcement of the market regulations, while Diwakar and Murlidharan (1981) showed that the producer’s share ranged from 51.35 to 74.55 percent.

In the Punjab, Chatha and Kaul (1974) observed a definite cycle of three year period and noticed a wide margin of 45.3 percent in Jalandhar market. However, single and Sandhu (1980) confirmed this for Jalandhar, Amritsar, Hoshiarpur and Ludhian markets. It was profitable to sell the potatoes after cold storage even when the producer’s share was 60 percent.

Mruthuunjaya V R Srinivasan (1998) studied the demand for potato in Karnataka during the period 1983 and 1988. They found that the income elasticity of demand for potato is 0.5442 and this demand will
grow at a rate of 0.2 percent per year. Demand supply imbalance in this period was the deficiency of potato in 1983 was 100 thousand tones and 165 thousand tonnes in 1988. So the authors suggest some alternatives in potato policy to meet this deficit. It was suggested that the increase local production through area expansion under potato through inter cropping with cereals and increase the yield level through irrigation supply, good quality seeds and fertilizer.

A study of (1996 – 97) price spread and marketing problems of potato in Basti district of U.P during 1996 – 97 find out that marginal farmers were selling higher produce i.e., 61.94 percent of total sale to consumer and retailers while small and other farmers were found to be selling 34.57 percent and 93.84 percent respectively to the wholesaler. However producer’s, share in consumer rupee was recorded as 56.35 percent when only one intermediary was in valued in marketing process. When two intermediaries were involved, the producer’s share was 44/10%. The major marketing problem identified were lack of storage, transportation and marketing knowledge.

N R Kumar, N K Pandey and R K Runa (2001) studied the price behaviour of potatoes in Meerut market and found that trend for both arrivals and prices positive and increasing with 935 tonnes and Rs. 10.2 per quintal per year. The seasonal indices for arrivals and prices of potato in this market found to be highly fluctuate. Seasonality components were found to be significant in the series and fluctuation in arrivals play an
important role in causing high function in price. This study suggests to take efforts to reduce the fluctuation in arrivals by orderly marketing efforts.

A study (2002 – 03) of price spread analysis of potato marketing in Shimla find out the price spread and market intermediaries share in consumer price during the period 2002 – 03. It was found that the producer’s share in consumer rupee was 73 percent. The retailer and commission agent earned profit of about 3.5 and 8 percent of the consumer’s rupee. The price spread and marketing efficiency was found to be about 27 percent and 3 percent respectively.

The economic (1998) performance of winter maize under rainfed conditions was examined in Dhaka District of Bangladesh. The result revealed that per hectare cost of production of maize was Rs.25845 and Rs.17973 on full cost and cash cost basis per hectare net returns were 8662 and 16533. Comparative analysis shows that winter maize was more profitable than wheat, but less profitable that potato. However there was no statistical significant difference between the per hectare profit of maize and potato.

The review of literature attempted above shows many studies conducted at global and national level. It is an indication of its importance. Some studies have also been conducted in our state and also in major growing district of Hassan. But these are related purely either
rainfed or irrigated potato and its competitive one. No study so far conducted to know the economic performance of both rainfed and irrigated potato in that place. Hence this study has been taken to know the economic performance of both rainfed and irrigated potato in Hassan District. Because Hassan is a leading producer of potato in rainfed condition but now a days it is moving towards irrigated condition, because of scanty rainfall over the years. Therefore the emphasis is focused on the relative economics of both rainfed and irrigated crop in this District.