Chapter II

REVIEW OF LITERATURE
2.1. Introduction

There are number of theoretical and empirical studies on the various aspects of production, marketing and export of agricultural commodities. In this chapter, the most relevant literature is presented keeping in view the objectives and methodology of the present study. The reviews of past studies are presented under the following heads.

> Studies related to growth rate analysis
> Studies related to costs and returns structure
> Studies related to marketing channels, marketing costs and margins
> Studies relating to market arrivals and prices and market integration
> Studies on export performance and changing pattern of exports
> Studies related to Problems related to production, marketing and export

2.2. Studies related to growth rate analysis

The studies pertaining to the contribution of area, production and their interaction effect towards production of a crop are reviewed hereunder.

Hazell (1982) employed variance decomposition model to investigate the sources of instability in cereal production in India. He reported that the variance of total cereal production increased by 342 per cent between 1954-65 and 1967-78 and 82 per cent of this variance was due to increase in co-variance of production between crops grown in different states. He pointed out that as continued growth in food grain production is of paramount importance to India, the most promising approach is to focus on maximizing growth and to offset the resulting effects of increased production instability through policies designed to stabilize consumption rather than production.
Ray (1983) used decomposition of variability techniques to find out the growth and instability. He indicated that major causes for change in the pattern of production were increases in the variability of rainfall and prices.

Sikka and Vaidya (1985) in their study revealed that most of the increase in output was brought by the positive contribution of area and productivity of different crops in Himachal Pradesh. However, area over-shadowed the productivity and emerged out as main contributor for the increased output. In the case of gram, area alone contributed to the greater extent (24.46%), while yield (15.17%) and cropping intensity (19.19%) were other major contributors. Among the interaction effects, area and yield showed a major contribution (11.33%), compared to yield and cropping pattern (8.89%), and area, yield and cropping pattern (6.63%).

Achoth et al. (1988) studied the growth and instability of pulses in Karnataka by employing variance decomposition model. They indicated that production of pulses in Karnataka had registered a significant increase during the decade following the green revolution period and this increase was mainly due to the increase in production in Gulbarga district. However, the districts growing minor pulses as a whole has increased in the decade after the green revolution and this instability contributed for the instability in production for the state. The instability induced by the change in the area variance was the main (single largest) component, which increased the instability of pulse production in Karnataka.

Sushila and Sharma (1989) conducted study on growth and instability in crop output in Uttar Pradesh by using variance decomposition model. They reported that the magnitudes of instability in the output of all the crops except maize declined
during second period (1949-50 to 1965-66) relative to first period (1891-92 to 1946-47) and fluctuations in yield of the crops was a major reason behind this instability. In the third period (1966-67 to 1985-86) also, yield fluctuations contributed most in the output fluctuations for all the crops. This study revealed that fluctuations in yield are the major cause for the fluctuations in output and hence the fluctuations in yield have to be controlled to bring stability in the output.

Pokharkar et al. (1994) studied the economics of production and marketing of onion in Western Maharashtra and found that per hectare profit over cost A was Rs. 6178.23 with cost of cultivation of Rs. 11134.94 at 10.38 quintals of yield.

Ramesh Kumar et al. (1993) in their study on economics of hybrid tomato production in Anekal taluk of Bangalore district reported that farmers obtained net returns of Rs. 95209 per ha out of gross returns of Rs. 154437 by incurring total cost of cultivation including marketing costs of Rs. 59228.00.

Nanja Reddy et al. (1990) in their study on economics of hybrids tomato in Bangalore district observed that the farmer by incurring Rs. 23464 and Rs. 7898 as the total cost of cultivation per acre on hybrids and local varieties, respectively obtained a commensurate net returns in hybrids (Rs. 22414/acre) and local (Rs. 1232/acre) varieties. The cost of production per quintal worked out to Rs. 89.92 for hybrids as against Rs. 99.48 for local varieties. However, rate of returns per rupee of investment was Rs. 1.96 for hybrids as against Rs. 1.12 for local varieties.

Karismomanagoudar (1990) in his study conducted in Gadag district on economics of production and marketing of onion found that the total cost of
cultivation of rainfed onion was lower (Rs. 2774.63/acre) in small farmers. Consequently, the net return obtained by small farmers was also lower (Rs. 3647.07/acre) when compared to large farmers (Rs. 5312.70/acre). The cost of production per quintal was Rs. 86.54 in the case of small farmers as against Rs. 96.78 in large farmers. Out of the total cost, human labour formed major component both in small (40.14%) and large (30.06%) farmers followed by cost on farmyard manure (16.28% and 29.97%).

Mundinamani (1993) in his study on production and marketing performance of oilseeds in Karnataka, estimated the contribution of area, yield and their interaction in affecting production of individual as well as total oilseeds. The results indicated that the area had negative impact on production of individual and total oilseeds in the study area except for Dharwad district during pre-green revolution period while it had positive impact in most of the locations of the study area during post-green revolution and overall periods. The yield and interaction effects recorded mixed results. He concluded that, increase in output of oilseeds in the study area was due to result of expansion of area rather than increments in the yield.

Singh and Mathur (1994) examined instability in potato production in India by employing co-efficient of variation technique and found that increase in area was the main source of growth in major potato growing states. Production of potato was unstable particularly in the state where the production increased due to adoption of new technology. In some states, the acreage under potato was more un-stable indicating responsiveness of potato to prices of its competing crops in the state.
Lai et al (1994) revealed that during pre-green revolution period (1951-52 to 1968-69), compound growth rates of area, production and productivity were positive and significant for rice, wheat and maize in Bihar. Whereas during post-green revolution period (1969-70 to 1987-88), wheat had shown significant improvement in area, production and productivity in Bihar. In contrast to the significant growth performance of maize in area, production and productivity during post-green revolution period, there has been non-significant growth in area, production and productivity during pre-green revolution period. Rice has shown continued positive and significant growth performance. For overall period, the growth rate of production was significant for rice, wheat and maize, which resulted due to increase in productivity. Contribution of area was non-significant for rice production.

Hiremath (1994) studied growth rates for dry chillies in Dharwad district and found that the growth rate with respect to area was higher (5.9%) which was closely followed by production (5.18%) and productivity (0.011%). All these parameters showed positive growth rate with respect to dry chillies in Dharwad district.

Vishweshwar (1994) in his study on economics of hybrid cotton with special reference to pest management in Malaprabha command area showed that in Naragund taluk, the area under cotton increased at the rate of 32.69 per cent, production at the rate of 18.60 per cent, while growth rate in productivity decreased at the rate of 1.69 per cent. In Navalgund taluk, there was an increase in area (21.33%) and production (15.54%) but decrease in productivity (5.22%).

Mundinamani et al (1995) employed exponential and decomposition technique to evaluate the growth performance of oilseeds in Karnataka during pre-green
revolution period (1955-56 to 1965-66) and post-green revolution period (1966-67 to 1989-90). The results of the study showed that the growth in production was achieved mainly due to expansion of acreage (except groundnut in Dharwad and Bijapur district) and to some extent the yield effect in recent years. The improvement in yield levels was observed in areas where irrigation facilities are extended.

Tripathy and Srinivasagowda (1995) employed Hazell's decomposition model to study the variability of food grain production in Orissa. The findings of the study suggested the need for area stabilising policies such as price policy for maize, ragi, millets and pulses with yield stabilising policies for rice, wheat, jowar and bajra. The dominance of coastal districts in increased production variability emphasised that yield stabilising measures have to be concentrated in these districts as they supply more than one-third of total food grains output of the state.

Veena (1996) studied the growth and instability of vegetables in Karnataka by employing Hazell's decomposition analysis. The findings of the study revealed that changes in mean yield were the major sources of increase in mean production of vegetables in the state during second period (1985-1994). However, increase in mean area accounted for larger share in brinjal (48.70%) and tomato (43.26%) crops. The use of high yielding varieties, increased irrigation facilities especially tube-well irrigation and increased use of chemical fertilisers have contributed to increased yield in the state. The components of change in variance of individual vegetable crops showed that change in yield variance has contributed more towards increased variability in the state followed by change in the mean area under these vegetables. This stresses the need for adoption of yield stabilising policies for vegetable crops in the state.
Kerur (1996) observed that the area and production of sunflower recorded significant and positive growth rate in Bijapur and Raichur districts whereas non-significant and negative growth rate in productivity was observed.

Singh et al (1997) studied regional variations in agricultural performance in India using secondary data for the period from 1960-61 to 1992-93. The data were analyzed to compute compound growth rate by fitting log-linear function. The results revealed that the national growth rate in cotton increased by 3.20 per cent in period II (1969-81) from 0.02 per cent in period I (1966-68) and finally slid down to 2.47 per cent in period III (1982-93) due to decrease in acreage growth.

Sawant (1997) in his study on the performance of Indian agriculture, used time series data for the period from 1967-68 to 1995-96. The data were analyzed by compound growth rate after fitting log linear function. It was found that, of the two cash crops, namely, cotton and sugarcane, the former moved to high growth range compound growth rate of its output expanding four per cent during 1981-82 to 1994-95, mainly due to significant advances in its seed technology and resultant high growth in the yield per hectare.

Gaddi et al (1998) studied growth rates in area, production and productivity of cotton for the major cotton producing countries and the state of Karnataka in India for the period from 1982-83 to 1996-97 in the former case and from 1970-71 to 1996-97 in the latter, using exponential function. The results showed that world cotton area declined by 0.33 per cent per annum due to the improvement in productivity. Similar results were reported at all India level, Karnataka state and in some of the traditional cotton growing districts. Production of cotton registered significant growth in all the
cases mainly due to the substantial growth in productivity. This study considered only one period growth analysis that made it incredible compared to the present study, which is comprehensive in its dimensional objective and the period accounted.

Tripathy et al (1998) conducted study on analysis of growth and instability of pulses production in Orissa. The study showed that during entire post-green revolution period, pulses production in the state registered a significant positive growth rate of 6.18 per cent per annum, while the area and productivity contributed 5.33 and 0.81 per cent per annum respectively.

Varghese et al (1998) computed compound growth rate to know the trends in production and arrivals of cereals in Rajasthan. They revealed that the compound growth rate of production and arrivals of major agricultural commodities in the state during the period 1974-75 to 1995-96 increased at the same compound rate of 2.85 per cent per annum. In case of total pulses, the production in the state over the years has been declining at the rate of 0.93 per cent per annum, whereas that of market arrivals has been declining at the rate of 0.3 per cent per annum. For oilseed crops, market arrivals has been at a lower rate of 10.11 per cent per annum as compared to production growth of 12.56 per cent per annum.

Vani and Krishnaiah (1998) reported that estimated growth in export of chillies in terms of quantity (20.16%) and value (38.42%) for a period of ten years between 1987-88 and 1996-97 were found significant. The increase in chilli export was attributed mainly to the increase in area and production.

Singh and Singh (1999) found that highest cost of cultivation was in potato (Rs. 20971/ha) followed by cauliflower (Rs. 14719.50/ha), tomato (Rs. 12296/ha),
chilli (Rs. 11970/ha) and Lauki (Rs. 10296/ha) in Varanasi district of Uttara Pradesh. However, per rupee of investment was maximum in chilli followed by lauki, tomato, brinjal, cauliflower, pea and potato.

Sain et al. (1999) in their study on economic analysis of tomato around Ludhiana city found that the farmers obtained a net return of Rs. 20509 per hectare out of gross returns of Rs. 43472 by incurring a total cost of cultivation including marketing cost of Rs. 22963. Among the different categories of farmers, medium farmers earned more profit (Rs. 21494/ha) than the small (Rs. 20184/ha) and large (Rs. 19775/ha) farmers.

Gaddi et al. (1999) conducted study on growth performance of oilseed crops in India. They used co-efficient of variation technique to measure the contribution of area and productivity towards increase in production of crops. The production instabilities were higher when compared to yield and area instabilities. The findings of the study revealed that area was the major contributor of output in the case of linseed (129.45%), sunflower (97.9%), soybean (82.56%) while it was productivity in sunflower (185.16%), sesamum (112.26%), niger seed (106.79%), castor seed (63.44%), groundnut (57.29%) and rape seed (34.09%). They pointed that provision of remunerative prices to farmers, supplying various inputs and provision of good marketing facilities as the most promising approach to achieve continued growth in oilseeds production.

The foregoing studies revealed that the contribution of area, yield and their interaction to the total production varies from region to region and from time to time. Most of the studies revealed that the increased output was due to positive contribution
of area and yield. However, the area over-shadowed the yield and emerged as main
ccontributor for increased output.

Balappa Shivaraya et al (1999) attempted to analyze the growth performance
of red gram in Gulbarga district and Karnataka state as a whole over the period 1980
to 1994. The quadratic growth function was fitted for the estimation of growth rate in
area and cubic function for production and productivity. The study showed that area
under red gram declined significantly by 10 per cent and 9 per cent per annum
respectively during 1980-81 to 1994-95 in Gulbarga district and Karnataka state as a
whole. The productivity has increased significantly by 11 per cent in Karnataka state.
The analysis concluded that even though the area had declined significantly, the
production did not decline due to the significant increase in its productivity for the
state as a whole.

Ashalatha (2000) analysed the growth rate of Indian cashew industry in two
periods, Period-I, covering 1956-57 to 1970-71 and period-II, covering 1971-72 to
1998-99. It was observed that the growth rate of area, production, productivity, kernel
export, raw cashew import, cashewnut shell liquid – unit value of export showed
positive trend but the cashew nut shell liquid quantity exported showed negative and
non-significant growth due to the fact that reduction in the import of raw nuts (-
0.75%) and also decrease in prices for Indian cashew in the world market during

Legesse (2000) found that during eighties wheat area showed a declining
growth rate i.e., 3.94 per cent per annum but production and productivity showed a
negative growth rate. During nineties the Karnataka state recorded a significant
positive growth rate of 3.47 per cent in area while in production the state recorded a mild growth, but productivity showed a negative growth rate.

Angles (2001) assessed the growth performance of turmeric in important south Indian states over the period from 1979-80 to 1998-99, by using the exponential growth function of the form $Y_t = ab^t$. They reported that the growth rates in area, production and productivity of turmeric in Andhra Pradesh, Tamil Nadu, and Karnataka registered positive and a significant growth. While growth rate of area was negative (-0.02%) in Kerala but production and productivity of turmeric were recorded positive and a significant growth. The growth rates in area (2.07%), production (6.57%) and productivity (3.78%) of turmeric in India registered positive and a significant growth. A negative growth rate of area was found (-0.02%) in Kerala as the production of turmeric is undertaken in small patches, where the plantations crops such as rubber, coconut etc. dominated and they were more profitable than turmeric. The other main problem was the labour requirement, wherein around 50 per cent of the cost of cultivation was spent on labour in turmeric production. But the labour availability was scarce and labour wage was very high. Hence, the farmers opted for plantation crops where there was no need of more labour throughout the year. As a consequence, the area under turmeric was reducing year after year.

Kaur et al (2002) computed compound growth rate to examine the trends in area, production and productivity of pulses. The study revealed that growth rates in production and productivity of total pulses in India were found to be significant and positive.
Navadkar (2003) revealed that the area, production and productivity of cotton in India during 2001-2002 were increased by 48.81, 22.71 and 15.00 percent change over 1950-51 respectively. It means that the production increased rapidly than once due to increased productivity by 2.5 times over 1950-51.

Tejaswi (2004) observed that the supply of coffee has steadily increased both at global and national levels. But demand was not as elastic as that of supply. He observed that there was a violent price fluctuation in coffee, i.e., which was as high as 134.45 US cents for each pound during 1994-95 in the global market, reached the rock bottom of just 45.60 US cents per pound in a span of just seven years. In case of different domestic markets, the coffee price averaged at Rs. 84.45 per kg in 1994-95, slumped to Rs. 45.19 per kg in 2001-02.

Bhullar (2005) studied the trends in production of dry chillies in India and found that Andhra Pradesh, Karnataka, Maharashtra and Orissa put together account for 75.00 per cent of the total Indian production. Punjab state occupied 3.10 per cent of area and was ranked eighth during 1974-77, which decreased substantially to only 0.46 per cent in 1998-2001. Production-wise, Punjab accounted for 4.61 per cent of production during 1974-77, which fell to 0.74 per cent during 1998-2001. There has been significant improvement in the productivity of chillies at 1945 kg per ha, followed by Punjab at 1688 kg per ha Rajasthan at 1064 kg per ha and Arunachal Pradesh at 1272.7 kg per ha and Gujarat 786 kg per ha.

2.3. Studies related to costs and returns structure

Hiremath et al. (1984) found higher profits on irrigated farms of Sorapur taluk (Karnataka) than in non-irrigated farms in the cultivation of sorghum, groundnut,
safflower and wheat. The profit per acre worked out to be maximum for groundnut (Rs. 5559) followed by sorghum (Rs. 390), wheat (Rs. 348), safflower (Rs. 311) and sunflower (Rs. 136).

Dhongade and Dangal (1985) studied the cost and income structure of farm business on Sina command area (Maharashtra). The per hectare cost of irrigated *kharif* hybrid sorghum worked out to Rs. 4334.90. The average per hectare yield was 23.75 quintals. The gross value of produce was Rs. 6327.87 and the profit at cost C was Rs. 2024.47. The per hectare total cost of cultivation of irrigated *rabi* sorghum was Rs. 2144.10, the yield of grain was Rs. 8.15 quintals and the profit at cost C were Rs. 586.05. The per hectare total cost of cultivation of wheat worked out to Rs. 2778.61 and the yield was 15.28 quintals, the per hectare profit at cost C being Rs. 153.69. The total cost of cultivation of groundnut was Rs. 3139.00 and the per hectare profit at cost C worked out to Rs. 1501.10.

Reddy and Hiremath (1986) found cotton is the most important crop in Sindhanur and Raichur taluks (Karnataka), consisting about 37.2 and 45.16 per cent of the gross cropped area, respectively. Higher proportion of area was devoted to DCH-32 cotton, wherever assured irrigation was available. The nature and extent of crops grown on large farms were based on profitability of other alternative crops.

Singh and Grover (1992) in their study worked out the economics of wheat crop which followed by rice, maize, potato and cotton, by collecting data from farmers selected from different agro-climatic areas of Punjab state. Variable cost of wheat per acre worked out to Rs. 2503, Rs. 2002, Rs. 2027 and Rs. 1887, when the crop was followed by potato, maize, cotton and rice, respectively. The returns over
variable cost were the highest (Rs. 2023/acre) for wheat and maize fields followed by Rs. 1823 on wheat fields, Rs. 1248 on cotton fields and Rs. 857 on potato fields.

Koppad (1993) studied the comparative profitability of different crops in Malaprabha command area in Karnataka state. The gross income from cotton was higher in head reach and mid reach than the gross income from maize and wheat system, but it was almost the same in the tail reach. Cotton was found to be the most important commercial crop and farmers realized better prices than maize and wheat. The study also revealed that on large farms, cotton was the most remunerative crop with net income of Rs. 18714.37 per hectare followed by maize-wheat system (Rs. 13565.18/ha). The *rabi* sorghum was the least profitable crop with net income of Rs. 4368.46 per ha. In case of small farmers also, cotton was the most profitable crop (Rs. 17343.80/ha) and it was higher by Rs. 5988.40 compared to maize-wheat system. The benefit: cost ratio was highest in cotton on both large and small farms than any other cropping systems.

Hiremath (1994) analysed the cost and returns of dry chillies in Dharwad district. The total cost of cultivation of chilli per acre was Rs. 5942.64, while cost A was Rs. 3865.90 and cost B was Rs. 5110.39. The value of gross output was Rs. 5531.72. The farm business income was Rs. 1466.08 per acre and family labour income was Rs. 221.33 per acre.

Venkataraman and Gowda (1996) while studying the economics of tomato production on Kolar district of Karnataka computed the cost and returns of tomato production. The results revealed that the total cost of production was Rs. 36611.51 of which variable costs were Rs. 15648.26, fixed costs Rs. 2556.48 and marketing costs
Rs. 18406.77. Though, the net return obtained was high compared to many other costs, the high cost of production along with some other factors discouraged farmers from increasing tomato production.

Kerur et al. (1997), while studying the economics of sunflower production in Northern Karnataka viewed that the per hectare cost of production of sunflower was Rs. 5652.55, Rs. 5693.11 and Rs. 5587.73 for small, medium and large farmers, respectively. The average yield obtained for the overall sample was 8.99 quintal per hectare. The benefit: cost ratio was found to be 1.88 indicating sunflower production was a profitable enterprise.

Mishra et al. (1999) studied the production and marketing cost of chillis and found that the total cost incurred by the marginal farmers was Rs. 22782.63 per ha, while it was Rs. 18488.90 in the case of medium farmers. Of the total cost, expenditure on manure and fertilizer and human labour accounted for 28.19 per cent and 16.56 per cent, respectively. However, there were no substantial differences in the yield between marginal and medium farmers.

Rajendra Prasad et al. (2001) conducted study on costs and returns in cotton production vis-a-vis its competing crops in Guntur district and revealed that the per hectare expenditure on PPC on cotton was Rs. 11331.37. This was very high compared to Rs. 4217.92 in soybean-bengalgram cropping system, Rs. 4379.81 in soybean-redgram and Rs. 1334.00 in soybean-jowar cropping systems. The PPC in total operational cost was highest in cotton (Rs. 29884.77) compared to soybean-bengalgram (Rs. 27802.84), soybean-redgram (Rs. 29171.42) and soybean-jowar (Rs.
2954.78), whereas net returns were very low in cotton compared to other cropping systems.

Mahantesh (2002) analysed costs and returns structure of cotton in Belgaum district. The total cost of cultivation was found to be Rs. 30058.77 per hectare. The gross returns realized from the sale of output amounted to Rs. 33147.75 per ha and thus the net returns obtained per hectare were Rs. 3088.98.

Anonymous (2002) a comparison of per hectare cost and returns from moong, gram, maize, wheat, mustard and cotton on sample farms revealed that pulse crops were less favourable in terms of net returns. Whereas, wheat followed by cotton have maximum net returns per hectare. Among pulses, moong yielded significantly higher returns than that of gram.

2.4. Studies related to marketing channels, marketing costs and margins

Chata and Kaul (1982) examined the marketing costs and margins of potato in Punjab and found that out of the total cost of marketing incurred by producers (9.83% of retail price), packing cost had the highest share (6.25%) of the retail price followed by commission charges (2.48%) and transportation cost (2.50%). However, the total marketing cost incurred by the market functionaries accounted for 10.72 percent of the consumer’s price, of which retailer (6.0%) had higher share followed by primary wholesaler (4.22%) and secondary wholesaler (0.5%). In the case of margins obtained, retailers (19.00%) realized higher share in the total marketing margin (27.28%) followed by primary wholesaler (4.5%) and secondary wholesaler (3.78%). It was concluded that the margins of primary wholesaler was justified since he borne the risk of investing more capital, time and labour to create time, place and possession
utilities to the commodities unlike secondary wholesalers who obtained higher share without much risk.

Subramanyam (1982) studied the efficiency of different channels in marketing of vegetables in Madurai district of Tamil Nadu and observed that 77.97 percent of the producers disposed their cabbage to pre-harvest contractors, followed by carrot (50%), as against 22.03 and 30.00 per cent of cabbage and carrot sold through wholesalers at the field. However, majority of the producers (93.10%) sold cauliflower directly to the retailers.

Hugar and Hiremath (1984) studied the efficiency of alternative channels in marketing of vegetables in Belgaum city of Karnataka state, found that the price spread in the case of cabbage (48.31%) and brinjal (52.79%) were lower when sold through co-operative society, as compared to 50.29 and 24.74 per cent, respectively when sold through commission agents. Thus, it was obvious, that the net price received by the producer was observed to be higher from cabbage (57.69%) and brinjal (47.21%) when sold through the co-operative society as compared to 49.72 and 45.26 per cent, respectively when sold through the commission agents.

Kiresur (1987) in his study on marketing of vegetables in Dharwad and Hubli vegetable market identified the existence of two channels namely, Channel-I: Producer-seller _ Commission agent _ Wholesaler _ Retailer _ Consumer and Channel II: Producer _ Seller _ Village merchant _ Commission agent cum wholesaler _ Retailer _ Consumer. Of these two main channels identified, channel-I was found to be more efficient in terms of the net price received by the producer-seller and the
price spread. Channel-I was found to be more popular than the Channel–II in terms of number of farmers and quantity sold.

Sharma and Pant (1988) in their study on marketing of vegetables in south Saurashtra zone of Gujarat found that the total marketing cost incurred by the producer was the highest in highly perishable vegetables, namely tomato (Rs. 108.04/q) followed by chillies (Rs. 101.84/q), brinjal (Rs. 61.75/q.), cabbage (Rs.50.44/q) and bottlegourd (Rs.45.74/q). The commission charge paid to the commission agent formed the major component of total marketing cost. At the retailers level, the total expenditure incurred was also the highest in the case of tomato (Rs.139.76/q) followed by chillies (Rs. 65.98/q), brinjal (Rs. 61.12/q), cabbage (Rs. 45.82/q) and bottle gourd (Rs.33.32/q). Among the different items of expenditure at retail level, the spoilage cost formed major component of total retail cost in all the vegetables. However, producer’s share in consumer’s rupee was found to be lower in brinjal (56.87%) and tomato (56.89%) compared to cabbage (62.30%), chillies (61.01%) and bottlegourd (59.65%).

Subrahmanyam (1988) identified three channels for marketing of vegetables in Karnataka namely, Producer—Commission agent at the market (channel-I), Producer—Preharvest contractor (Channel-II) and Producer—Retailer (Channel-III). The commission charge paid was found to be the major cost constituting 44 to 66 percents of the total marketing cost incurred in all the vegetables, namely cauliflower (Rs 23.75/q), french beans (Rs.21.46/q), carrot (Rs. 20.36/q), brinjal (Rs. 19.79/q) and bhendi (Rs. 18.16/q). This was followed by cost on transportation, loading and unloading, packing and marketing fee.
Chahal et al. (1997) in their study on marketing of tomato in Amritsar market of Punjab identified the following two major channels:

**Channel – I: Producer _ Wholesaler _ Retailer _ Consumer**

**Channel – II: Producer _ Retailer _ Consumer**

The price received by the producer was found to be higher in channel – II (Rs.145.26/q) over channel – I (Rs.117.91/q) in summer season. Similar trend was observed in winter season also.

Patel et al. (1997) in their study on marketing efficiency of vegetables in Anand market, Gujarat found the concentration of market power with 10 big firms in the case of both the cabbage (28%) and potato (20%). About 28 percent of the marketing firms performed two or three marketing functions indicating their vertical integration. However, 12 firms were having horizontal integration. They concluded that even though market was regulated since long, some malpractices were still existed.

Chauhan et al. (1998) reported that for the marketing of vegetables in Azamgarh district of Uttar Pradesh; three channels were patronized by the vegetable growers for disposal of their vegetables. The channel involving commission agent and retailer was found to be the most important and adopted by majority of the farmers. However, the producer’s share in consumer’s rupee was maximum (90 to 94 %) in direct sale of vegetables to consumers whereas, it ranged between 85 and 89 percent when sold through commission agent. Further, in the most predominant channel, which included producer, commission agent, retailer and consumer, the net price received by the producer (60.63%) was found to be the lowest. Thus, there is a need
of the most popular channel which would to be efficient, cost effective and producer-friendly, by regulating the substantial trade margins taken by the traders.

**Channel-II: Producer -> Retailer -> Consumer, and**

**Channel-III: Producer->Wholesaler->Retailer->Consumer.**

The share of the producer's in consumer's rupee was found to be higher in channel-I (89% to 96%) as compared to channel-II (68.50% to 83.60%) and III (62.70% to 73.15%). However, channel-II was found to be popular among the farmers than the other two channels in terms of quantity disposed.

Singh *et al.* (1999) studied the marketing of tomato in Hoshiarpur district of Punjab and observed that the net price received by the farmers was higher (Rs.172.50) when sold in local market as compared to the processing units. Similarly, per acre net returns obtained by farmers was also higher when the produce was sold through local market (Rs.24, 150/acre) than those sold to Pepsi foods Rs.20, 808/acre) and Nijjar Agro Foods, even though the marketing costs were, higher in local markets.

Vasudev and Chowdry (1999) identified two marketing channels which were predominant in marketing of tomato in all the three regions of Andhra Pradesh, viz.,

**Channel – I:** Producer _ Commission Agent _ Secondary Wholesaler _ Retailer _ Consumer,

**Channel – II:** Producer _ Commission Agent _ Primary Wholesaler _ Retailer _ Consumer.

The producer's share in consumer's rupee was found to be substantially higher in channel-I over channel-II in all the regions (coastal Andhra, Rayalseema and Telangana) of Andhra Pradesh, indicating better efficiency of channel-I over channel-II.
2.5. Studies relating to market arrivals and prices and market integration

Natarajan (1973) revealed that the arrivals of kapas in Hubli and Gadag markets were highest in the month of February, March and April whereas, March, April, May and June were the peak months for lint arrivals. The seasonal indices for arrivals of kapas were highest in March (506.50) followed by April (434.14), May (98.24) and February (84.70) in Hubli market. In case of lint in Hubli market, the seasonal indices for arrivals was the lowest in the month of November (8.55) followed by December (10.62) and January (14.93). Arrivals of lint started in the month of February and reached its peak in April. The seasonal indices for prices indicate that the price variation of Jayadhar cotton in Hubli market was the lowest in June followed by May. The price variation for Jayadhar lint in Hubli market was the lowest in January and highest in February. Seasonal price variation of Laxmi kapas in Gadag market was the lowest in the month of June and the highest in the month of February. The seasonal price of Laxmi lint in Gadag market was the lowest in the month of January and highest in the month of March.

Hosamani and Hiremath (1984) revealed that the proportion of arrivals of cotton in the peak period (December to February) in Soundatti market was more than 70 per cent. For the peak period (March to May) in Bailhongal market, the percentage of market arrivals of cotton exceeded 95%.

Narasimhareddy (1986) revealed that the annual growth in market arrivals in Raichur and Sindhanur markets were found to be 16.42 per cent and 33.40 per cent, respectively. During the months of January, February, March and April, the per cent of market arrivals worked out to 83.33 and 94.10 for Raichur and Sindhanur markets,
respectively. During the lean months, the percent of market arrivals came down to 16.67 per cent and 5.84 per cent for Raichur and Sindhanur markets respectively.

Kainth and Mehra (1988) while studying seasonality pattern of market arrivals and prices of potatoes in Amritsar (Punjab) found that marketing season began with the arrivals of fresh potatoes in the month of December and ended in the month of March (peak season). April and May as well as November month formed the midseason. However, lean period started from June and ended in October month. Potato prices were much higher (Rs.137.58/q.) in the lean season as compared to peak season (Rs. 74.60/q.). The regression analysis indicated that there was significant negative ($r^2 = -0.8595$) relationship between arrivals and prices as expected.

Parthasarathy et al. (1988) analysed the price behaviour of vegetables in Hyderabad market from 1980 to 1987 and found that an increase in arrivals, in general, did not declined the prices. Further, price variations were not of uniform magnitude in the same month in different years in case of both tomato and brinjal. The regression analysis of prices over a period of seven years showed a slight upward movement in prices.

Dinakar (1990) assessed the extent of price integration between the markets by using coefficient of variation technique. He noticed a poor integration between the village markets and secondary markets and it was demonstrated by significant differences in the co-efficient of variation of prices.

Arya (1991) analysed the spatial integration of four markets in Gujarath using zero order price series correlation analysis. She noticed significant and high
correlations in the price movements between the markets and concluded that the markets under consideration were integrated in terms of price movements.

Mundinamani (1993) employed orthogonal polynomial regression technique to see the trend in arrivals and prices of oilseeds in Karnataka. In Bijapur and Talikoti markets, mild fluctuations in the initial years in groundnut arrivals developed into a tremendous growth in later years. A continuous decline in safflower arrivals was observed in all the markets. Similarly, sesame arrivals showed a declining trend in all the markets except Gadag and Gangavati. In the case of sunflower, with a few exceptions in initial years, a continuous steep rise in arrivals and prices were noticed in Gangavati and Raichur markets. As far as price trend is concerned, a continuous upward movement was observed in all the markets for all the crops.

Upendra and Manohara Chary (1996), while analyzing market arrivals and prices of paddy in regulated markets, pointed out that in the three markets selected for the study, the maximum quantity of arrivals of paddy were observed during the peak market period probably because the farmers who were economically not sound, sold their produce soon after harvest to meet their financial obligations. The trend values of arrivals of paddy exhibited not only an increasing trend over the years but also significant in the three agricultural markets, viz., Karimnagar, Jammikunta and Vemulawada in Andhra Pradesh over time as a result of increasing productivity and production of paddy. The extent of variability in the market arrivals was found to be higher than in the prices of paddy in all markets selected for the study particularly, in Jammikunta and Vemulawada agricultural markets, the price elasticities of market arrivals of paddy were not only positive but also more than unity indicating that price response was very high. On the contrary, in Karimnagar market, the price elasticity of
market arrivals was positive but less than unity showing price response was poor. The positive price elasticity of market arrivals reflects the price consciousness of farmers. With a rise in the prices of agricultural products, farmers were tempted to dispose off more and retain less and as a result, the quantity of arrivals was more in regulated markets.

Sharma and Sharma (1996) made an attempt to study the variation in wholesale prices of selected vegetables in India. They found that coefficient of variation in monthly wholesale prices of potato, tomato and onion were 30, 36 and 42 per cent, respectively in Culcutta. However, price variation in Delhi and Calcutta were more than that in Mumbai and Chennai in the case of potato as against high price variation in Mumbai for onion and Calcutta for tomato. Potato prices were less variable relative to onion and tomato prices. The wholesale prices were low during February-March for potato and tomato whereas onion prices were low in February-March.

Mitrannavar and Gummagolmath (1998) attempted to analyze the seasonal indices of arrivals and prices of potato in regulated markets of northern Karnataka. The long run trends in arrivals and prices of potato for the selected Belguam and Hubli markets were analyzed using three years moving average method. The study concluded that arrivals were highest in the month of November in both the markets indicating glut during harvesting season. However, price did not decrease during glut season as the majority of the traders purchased potato at that time in Belguam market, while there was a negative relationship between arrivals and prices in Hubli market.
Nahatkar et al (1998) revealed that seasonal index of cotton prices was minimum in the second quarter (January to March) and maximum in the third quarter (April to June). The coefficient of price variation showed price rise which was higher during first quarter (October to December). Buyers tend to attract more cotton growers to sell their produce at lower prices. The data on cyclical variations showed that after every three years the cycle of cotton prices changes irrespective of the variations in price in the three quarterly periods revealing that within a year there is no sudden shortfall or boom of cotton arrivals in the market. The variation in arrivals of cotton was found to be higher than that of variations in prices.

Mali et al. (1999) analysed the trend in arrivals and prices of vegetables (tomato and lady's finger) in Pune regulated market during the period from 1978-79 to 1996-97. The coefficient of variation of arrivals (56% to 80%) and prices (40% to 80%) of tomato were higher than the variations in arrivals (27% to 60%) and prices (49% to 75%) of lady's finger. The compound growth rate of arrivals (2.11%) and prices (1.02%) of both the vegetables were significant during the same period and prices of both vegetables showed increasing trend indicating the good integration of Pune regulated/vegetable market.

Nawadkar et al. (1999) reported that co-efficient of variation of arrivals (22% to 79%) and prices (30% to 55%) of cabbage in Pune regulated market from 1978 -79 to 1996-97 was found to be higher. Similar trend in arrivals (31% to 69%) and prices (24% to 54%) was observed in cauliflower. The compound growth rates of arrivals and prices (2.20%) of the cole crops were significant in the same period. The seasonal indices of prices and arrivals of both the vegetables were inversely related and prices
of both the vegetables showed an increasing trend indicating good market integration for these vegetables.

The reviews of the above studies indicated that different techniques were used to assess the nature and magnitude of competition in vegetable marketing. The views of the various researchers were found to be contrasting with respect to market integration, which varied from crop to crop and over location and time. However, most of the studies reported a near competitiveness for most of the vegetable markets.

Patel (2000) revealed that all markets have around 40 to 75 per cent of the total market arrivals of rapeseed-mustard in peak marketing season. Whereas prices were lower by Rs. 20 to 60 per quintal over mid and lean marketing season in Mehasana district of Gujarat.

Hosamani et al (2001) observed that seasonal index of prices and arrivals of cotton were higher during October to February as this period is the peak harvest season.

Blyn (1973) estimated the degree of market integration by computing the correlation coefficients for de-trended and de-seasonalised prices from eight wheat markets of Punjab and Delhi. Thus, totally nine detrended price series for 12 monthly prices were arranged and correlated. The results showed that the overall average for 12 months was $r = 0.68$. He reported that the average ‘r’ was equal to the ‘r’ between Delhi and other markets indicating the dependence of Delhi market prices on the prices at all other collecting markets.
Lundahl and Peterson (1982) studied the market integration for major food grains during the period 1969 to 1974. The number of markets considered were nineteen for rice, eight for grain millet, twenty for grain corn, eleven for ground corn and fifty for seed beans. Monthly price series were detrended and the residuals were correlated. The results of the study revealed that there was higher correlation between residuals.

Mamle Desai and Hiremath (1984) computed coefficient of variation to find out the market integration between Gulbarga, Chittapur and Sedam markets for tur. The study revealed that the three markets were more or less integrated so far as price variations were concerned.

Bhatta and Bhat (1988) studied the extent of price relationship for arecanut between selected markets of Mangalore and Sirsi, using the correlation coefficient. The commercial nature of the crop and its diversified market conduct was clear from the fact that there was a direct relationship between supply and price.

Saikat and Nair (1994) studied whether the movements in the international prices of Indian pepper had reflected the variations in prices in 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.

Baharumshah and Habibullah (1994) employed the co-integration technique to analyze the long run relationship between pepper prices in six different markets in
Malaysia. The co-integration technique was applied to weekly pepper prices for the period 1986-91. The empirical findings of the study indicated that regional pepper markets in Malaysia were highly co-integrated and the prices of pepper tended to move uniformly across spatial markets indicating competitive pricing behaviour.

Sundaresan and Menon (1994) used correlation method to study the market integration. The study revealed that there was a high level of integration between Calcutta, Cochin, Coonoor and Amritsar markets for tea marketing.

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 from 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) 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.

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.

Girish (1995) in his study “An econometric analysis of arrivals and prices of potato in major markets of Karnataka has used the co-integration approach to test the market integration between Bangalore and Belgaum markets, Bangalore and Hubli and Belgaum and Hubli. With regard to Bangalore – Hubli, there was a two-way significant interdependence, which was true of Belgaum-Hubli also. This is a clear indication of Hubli acting as a transit market between Bangalore and Belgaum. The influence of Hubli prices on Bangalore prices was more when compared to the influence of Bangalore prices on Hubli prices. Even between Belgaum and Hubli, the influence of Hubli prices on Belgaum prices was more than the influence of Belgaum prices on Hubli prices.

Kerur (1996) computed coefficient of variation to study the extent of integration between different markets. The study revealed that the coefficient of variation of market arrivals of sunflower was found to be higher in Talikot market (88.48) compared to Raichur market (59.12) and Bijapur market (41.81). The coefficient of variation of sunflower prices revealed that the coefficient of variation in prices in Bijapur market was more (26.93) compared to Raichur (23.76) and Talikot market (20.24). These coefficients suggested that there was a considerable integration between the three markets over a period in case of price but not in case of arrivals.

Rane (1998) used correlation coefficient to know the degree of integration for paddy markets in Maharashtra state. Most of the selected paddy regulated markets within the state and from outside the state were well integrated except Pen market.
Correlation coefficients between paddy prices of the selected markets were quite high except Pen market of Raigad district.

Hegde (1998) observed that the D-F test statistics for the residuals was found higher than its critical value at the 10 per cent level for all cases during the whole period. Thus, no co-integration was observed between export and growth indicators for any combination for the whole period. Only export and industrial output are found to be co-integrated during the heavy protection period. He concluded that there was a weak evidence for co-integration between manufacture and industrial output during both the sub-periods.

Samarajeeva and Gunatilake (1999) employed Dickey Fuller and augmented Dickey Fuller tests and the results 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.

Patel (2000) used SND test (Standard Normal Distribution) to judge the existence of perfect market integration. The test revealed that all rapeseed-mustard market pairs were well integrated in Mehasana district of Gujarat with respect to price movement.

Ashalatha (2000) employed the co-integration technique to analyze the theoretical long run equilibrium relation between economic time series. Here she used the model to examine whether the domestic market was integrated with the international market for cashew kernel. The results amply proved that there was a long run equilibrium of the prices of cashew kernel. This explains the tendency of
domestic cashew prices to move in unison with the international market prices in the long run confirming the law of one price (LOP).

Arvind Kumar (2000) studied on performance of India’s rice exports used co-integration approach to test the extent of integration between Indian Domestic Rice Market (New Delhi) and the major world rice markets (Bangkok and Houston). The results clearly indicated that the domestic rice market was not integrated, in the long run with the major rice markets of the world i.e., Bangkok and Houston. This is inferred from the fact that ‘b’ coefficients of the price series integration were less than their respective Dickey Fuller critical values.

Birukal (2001) used zero order correlation coefficient to ascertain the integration of markets between Dharwad, Raichur and Soundatti regulated markets in north Karnataka for the unadjusted and adjusted price series. The study reveals that all the three markets were well integrated in case of unadjusted price series. For adjusted price also there was a good integration among the selected markets, but extent of integration is low as compared to unadjusted price data. Adjusted price data indicated that Soundatti and Dharwad markets were well integrated.

Jyotish and Dinda (2003) observed that the highest values of ‘r’ for wholesale as well as retail price have been found strongly correlated. It was found that the test statistic obtained from all the pair-wise markets are seen to be greater than the critical value at one per cent level of significance. All the market pairs in Hooghly district in terms of both wholesale and retail price were shown to be co-integrated. So, this was mainly attributed to close proximity, good communication facilities and good infrastructure availabilities among the market centres in Hooghly district. The high
degree of market integration showed that potato markets in the states are competitive and efficient at the wholesale level.

Amit Kar et al. (2004) indicated that Chennai, Delhi and Bombay markets were well integrated indicating the existence of price dependency among various markets. It was pointed out that the values of ADF test were all significant at 10 per cent level of significance.

Dalawai (2004) analysed the relationship between the prices in major six domestic cotton markets and also at international market (New York) using the cointegration technique. The results clearly indicated that all the price series in major four DCH cotton markets and two Jayadhar cotton markets in the state were assumed to be stationary at order of integration one. The DF test statistics obtained for all the markets including international market were found to be more than the asymptotic critical value even at 10 per cent level. Thus, the major cotton markets in the state were found to be integrated and hence quite competitive pricing behaviour.

2.6. Studies on export performance and changing pattern of exports

Jeromi and Ramanathan (1993), while analysing the world pepper market and India’s share, reported that there was a significant change in the direction of pepper exports from India during the period 1975 to 1990. It was observed that nearly 44 per cent of India’s pepper exports were directed to former USSR that constituted about 82 per cent of the total pepper import of that country. On the other hand, India not only failed to increase its exports to USA in tandem with increased consumption in that country, but also could not sustain the quality exported in the past years. Instability of
exports was lower in case of USSR, Italy and Canada and higher for Poland, USA and Czechoslovakia.

Gulati et al. (1994) concluded that the commodities like rice, banana, grapes, sapota, leeches, onion, tomato and mushroom were highly competitive with NPC less than 0.75, while wheat, mango, potato and tomato paste were moderately competitive with NPC ranging between 0.75 to 1.00.

Mamatha (1996) calculated the Nominal Protection Coefficient's (NPC) for Indian coffee by taking United States coffee price as the reference price. The NPC of coffee types namely plantation, Arabica and Robusta under the exportable hypothesis were 1.3, 1.3, and 1.85 respectively in 1995, indicating that Indian coffee exports were not competitive and it was not efficient exportable commodity.

Ravi and Govinda Reddy (1998) used nominal protection coefficient technique to work out the export competitiveness of jowar, maize, groundnut, sunflower, cotton and coffee from Karnataka under the importable and exportable hypothesis for a period of eleven years from 1984-85 to 1994-95. The results revealed that among the six commodities, Karnataka lacked comparative advantage in most of the crops except cotton. The export potential of jowar, maize, groundnut and sunflower was found to be significantly low.

Balappa Shivaraya (2000) studied the export competitiveness of Indian fresh vegetables using nominal protection coefficient technique. The results of the study revealed that all the vegetables viz., onion, potato and tomato were competitive for
their export to other countries, since the nominal protection coefficient values were less for all.

Balappa Shivaraya (2000) studied the changes in trade directions of 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) indicated that under importable hypothesis, the NPC and DRC were 0.71 and 0.66, respectively and under exportable hypothesis, the NPC and DRC were 0.98 and 0.93 respectively, implying that Indian tea exports were competitive and good import substitute.

Jayesh (2001) used the nominal protection coefficient technique for the export competitiveness of Indian pepper. Under the exportable hypothesis, the nominal protection coefficient value were found to be lesser than unity (0.849) in Calicut and (0.817) in Sirsi markets, indicating that the Indian pepper is competitive in the international market and which is an efficient export oriented commodity.

Desai (2001) examined the export potentialities of mango from India by using nominal protection coefficients for the period 1990-1998, which is the ratio of domestic price to the border price. The findings of the study indicated that on an average, the nominal protection coefficients value in fresh mango (0.89), and mango slices (0.45) were lower than one indicating their competitiveness in international market.
Jayesh (2001) indicated that Russia (64%) and USA (59%) were the stable and loyal markets for Indian pepper as revealed from the values of probability retention that Japan (0.2530) is the most reliable and stable markets for Indian cardamom. It was predicted that the market share of Indian pepper exports to Russia and USA would increase to 24.95 and 34.96 per cent, respectively by 2009-2010. The study further revealed that the market share of Indian cardamom export to Japan would increase to 47.25 per cent during 2009-10 mainly because of their preference for Indian spices.

Angles (2001) noticed that the UK had the highest (42.99%) probability retention index of loyalty to Indian turmeric compared to other importing countries, such as UAE (1.38%) and others (72.02%).

Ramesh Chand (2002) observed that the pepper export from India have average NPC value of 0.92, indicating its marginal competitiveness of pepper.

Mruthyunjaya and Chauhan (2003) indicated that the average NPC of cashew kernel export from India was found to be less than unity (0.79), which indicated that the cashew kernels export from India were marginally competitive.

Tejaswi (2004) employed of the Marko Chain Model and the results indicated that USA was one of the most reliable and loyalty index with probability of retention of 80 per cent than any other importing countries, followed by other countries (51%) and Russian federation (36%) etc.

Sidhu (2005) analysed the export performance of chilli that India exports only 5 to 8 per cent of its output due to high domestic consumption and low international
demand for our chillies in the developed countries such as North America and European countries. Despite being low, exports of chilli were also highly fluctuating from year to year. During 1999-2002, the average yearly exports were estimated as 58653 tonnes against 4096 tonnes by 1975-78. The export grew at the rate of 12.0 per cent per annum during 1975-76 to 2001-02.

2.7. Studies related to Problems of production, marketing and export

Kantharaju (1989) reported that the incidence of pest and diseases, failure of rainfall and poor planting material were the problems. The problems related to the credit were insufficient time for repayment of loan, non-availability of credit in time and inadequate amount of credit, high rate of taxes, large transportation cost and lack of transportation were the main marketing problems.

Gulati et al. (1994) observed that the canalization of onion through National Cooperative Marketing Federation (NAFED) has led to loss of share in export market because of intervention of NAFED, whenever there is escalation of price in the domestic market, the infrastructure for storage, transport, internal as well as international was largely inadequate. The interest on export finance was high (13%) and it should be brought down to nine per cent per annum. Institutions such as farmers-exporters co-operatives like Maha grapes and Maha mango were considered most useful in the export promotion of fruits and vegetables. This is essential to ensure good quality product as well as remunerative returns to the farmers.

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 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 cooperative societies.

Ramamoorthy (1995) studied the main production constraints in rainfed cotton in Coimbatore. The production constraints were identified through rank analysis. Accordingly inadequate credit was ranked first, poor quality of inputs stood at second rank, pest menace and marketing ranked third and fourth, respectively.

Nasurudeen and Balakrishnan (1996) identified the problems of agricultural exports in India. The major constraints were high tariff, qualities restrictions, quota, strict hygienic standards package standards, and labeling requirements. They reported that the most important problem in export of agricultural commodities was inadequate surplus. Adopting modern technology should enhance the productivity. Most of the technological advancement was coupled with capital intensity but the availability of capital was less and also the capital formation in agricultural sector was meagre with 2.2 per cent only.

Ramamoorthy (1996) studied the major socio-economic constraints in cotton production and management. The constraints were identified and ranked through rank analysis. The study identified the major production constraints as poor quality input supply, inadequate credit supply and high production risk and the marketing constraints as price fluctuation, storage problems under weighment and poor market development.
Bonny (1996) surveyed the constraints on commercial production of vegetable in Pananchery and Duthur, Kerala and reported that increased cost of plant protection chemicals was perceived as the most important factor by the respondents followed by inadequate market facilities, poor storage and other post-harvest facilities, insufficient capital and high labour costs.

Kunal (1997) while explaining the importance of organic farming to meet twin challenges of producing sufficient foodgrains for growing population and prevention of environmental degradation, opined that combined use of chemical fertilizers with FYM, vermicompost, green manures and biofertilizers will help to attain higher yields as well as to improve soil health and to minimize environmental degradation. Research efforts through these angles should be initiated in the country so as to save the country from further disasters.

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 few middlemen and need of timely display of these perceptive 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 and found that farmers were not 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 on 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 prices and variations in output price and high commission charges. Therefore, it is suggested that there is need for ensuring improved storage to cities 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.

Vivekananda (1999) made an attempt to study the problems and prospects of agricultural development in Karnataka and opined that agricultural development in the state was hindered by the problems such as weak input research, weak extension network, regional imbalances, stagnation in the area under HYV’s etc. He suggested the measures for development of agriculture in the state.

Nagaraja et al. (1999) identified the most important constraints in production and marketing of potato in Kolar district of Karnataka by assigning the ranks. In production, high cost of seed material and diseases (Rank-I) were the major constraints followed by frequent power failure (Rank-II), high cost of fertilizers and plant protection chemicals (Rank-III), scarcity and high cost of labourers (Rank-IV) and non-availability of good seed material on time (Rank-V). The frequent fluctuations in price (Rank-I) involvement of too many middlemen (Rank-II), delayed payment (Rank-III), insufficient storage facilities (Rank-IV), low output prices (Rank-V) and high market charges (Rank-VI) were the main constraints in marketing.

From the review of literature discussed above on the subject of the present study, it is clear that the studies on chilli production, marketing and exports are meager and the studies in the efficiency of chilli growing farmers are scanty. Hence,
the present study has been undertaken, to determine the level of efficiency of the chillies growing farmers in Kurnool district of Andhra Pradesh. The following chapter would discuss the profile of the study area, i.e., Kurnool district, which highlights the agricultural background of the district and the study area.
2.8. REFERENCES


ANONYMOUS, 2002, Comparison of cost and returns per hectare moong, gram, maize, wheat, mustard and cotton. Agricultural Situation in India, 24(2): 73-78.


DHONGADE, M. P. AND DANGAT, S. B., 1985, Socio-economic benchmark survey of the Sina medium irrigation project command area in Maharashtra, Mahatma Phule Agricultural University, Rahuri, Maharashtra.


KOPPAD, M. B., 1993, Economics of cropping systems in Malaprabha command area (Karnataka state). *M. Sc. (Agri.) Thesis*, University of Agricultural Sciences, Dharwad.


VISHWESHWAR, S. P., 1994, Economics of hybrid cotton with special reference to pest management in Malaprabha command area. *M. Sc. (Agri.) Thesis*, University of Agricultural Sciences, Dharwad