Chapter-2

Review of Literature,
Hypothesis
CHAPTER-II
REVIEW OF LITERATURE

This chapter presents the Review of work done by the past research workers on the problem under study. On the basis of main objectives, the literature has broadly been reviewed under the following heads and presented as below:

(i) Economics of Production of Potato
(ii) Marketing of Potato

Economics of Production:

*Chatha and Kaul (1979)* reported that Punjab State has witnessed rapid increase in area and production of potato during the last decade. The area has almost doubled whereas production has gone up four times. The increased production is mainly due to expansion in area that increased at the rate of 7.26 per cent, whereas the rate of growth of yield was only 3.3 per cent.

*Chatha and Sidhu (1980)* in a study on “Production and marketing of potato in Punjab State” examined that the compound growth rate (C.G.R.) of area was 8.36 per cent per annum and that of productivity 3.96 per cent indicating thereby the faster rate of increase in area than productivity.
Chowdhary and Sen (1981) in a study on “Economics of potato production and marketing in West Bengal (Hooghly and Birbhum)" observed that in Hooghly farms, cost per acre was Rs.2914.00 and in Birbhum farms, it was Rs.2212.00. Seed and fertilizer accounted for the major portion of the costs. Costs on pesticides and irrigation were also significant particularly in Hooghly farms where the modern practices were adopted in the potato cultivation. Consequently, Hooghly farms economized on labour costs, human and bullock labour on ploughing largely replaced by power tillers. The comparison of costs within the size groups showed that the smallest farms in Hooghly had to incur the highest cost but it was quite different in Birbhum farms where potato cultivation was mainly dependent on human and bullock labour. The cost incurred on the smaller farms was lesser in comparison to large farms.

Study also disclosed that in terms of yield high cost Hooghly farms had a much larger yield than the Birbhum farms. As amongst the different size-groups in both the villages, the larger farms had the largest yield. In Birbhum village the variation in yield amongst big and small farms was more significant than the farms in highest size group obtaining double the yield than the smallest size farms. In terms of net returns the variations between the larger and smaller farms were more significant in Hooghly farms.
Singh et al. (1982) reported that Farrukhabad district is the most important area in the plains of U.P. State where potato culture has been practiced for a long time. They concluded that percentage area under potato was the highest on the large size group of farms, because of their better economic position as they could afford higher expenditure on cash inputs required in the production of potato crops. The average intensity of cropping come to 260.49 per cent which showed arising trend with the rise in the size of farms.

Mruthyunjaya and Srinivasan (1983) reported that potato is one of the important vegetable occupying nearly 11.00 per cent of the total area under vegetables in Karnataka State from 1955-56 to 1973-74. Production of potato in the state has increased by 3.90 per cent per year. An account of growth in area (3.20 per cent) and growth in productivity (0.70 per cent) were also seen. With rise in income and population in the state, the demand for potato is expected to increase in the coming years.

Bakshi and Banerjee (1984) in “Economics of potato cultivation in district Burdwan (W.B.) observed that the size of holding was directly related to the per hectare cost of production, productivity and output ratio irrespective of irrigation facility. Cost per quintal gave a decreasing trend with the increase in the size of holdings.
Singh (1985) concluded that the cost of cultivation of potato per hectare, in the Farrukhabad district of U.P., decreases with the increase in the size of holding being Rs. 6694.46 for below 0-1 hectare size group, Rs. 6296.97 for 1-2 hectare size group and Rs. 5613.87 for above 2.0 hectare size group farms.

Nayar (1989) reported that the India’s population is expected to be around 1000.00 million by 2000.00 AD. There will be production requirement of 30.0 million tonnes of potato annually. To achieve the target, an increase in area of upto 1.5 hectares in potato has been suggested. This requires that a yield level of 20 tonnes per hectare against the present 15.0 tonnes per hectare has to be achieved.

Doval (1990) reported that in the past four decades, potato production has increased 7.0 fold and the area under its cultivation has trebled. However, expenditure on research was only Rs. 3.8 crores in 1989 just 0.23 per cent of the value of potatoes produced.

Bandyopadhyay (1991) reported that the West Bengal has emerged, in recent years, as a major potato producing state in country. The combination of certain new seed varieties, fertilizers, pesticides and assured water supply, timely availability of inputs, cold storage facility and marketing net work play a crucial role in potato cultivation.
Nayar (1991) reported that the major tuber crops under cultivation are potato, cassava (Tapioca), sweet potato, yams, aroids and a number of other minor tuber crops which are under exploited or unexploited. Among these the major share comes from potato, both in area and production followed by cassava and sweet potato.

Singwan (1991) reported that the elasticities of potato acreage with respect to its price are not only positive for U.P. but also higher than those of important food crops like wheat, maize and rice. It is revealed that the adjustment to desired change of potato acreage with higher in those sub—regions which has less acreage under the crop in the initial period of study and were also backed by the improving infrastructure over time. Hence, increasing the level of yield and strengthening of marketing facilities especially in the eastern part of the state emerge as policy suggestions for achieving higher growth rate of potato supply as well as more balanced dispersal of potato in the state.

Ramphal (1991) reported that the production in the plains has been responsible for this all times high output. Inspite of the fact that Uttar Pradesh, the leading potato growing state, suffered yield losses of 3 to 4 per cent due to late blight in some areas. Estimates indicate that the area declined by about 3 per cent in Uttar Pradesh and 14 per cent in West -Bengal.
Dahiya and Srinivas (1994) reported that the cost of production of Kufri Chandramukhi and Kufri Sinduri in Punjab was only Rs.601 and 504 per tonnes and was much lower than the average export price. In Uttar Pradesh, a principal potato grower state, the production cost was Rs. 502 per tonnes showing that it also had the economic feasibility for exports.

Hess (1994) reported that the potato is a nutritious, high yielding. short season crop, rich in calories and vitamins B and C. Eventually, India’s undernourished will benefit from greater availability at lower prices of this nutrition food.

Over the past four decades potato production in India has increased by 881.0 per cent, to about 18 kg. per person per year. By using True Potato Seed, Indian farmers may double potato production to 30 million tonnes annually by the year 2000 A.D. and Increase productivity to 20 tonnes per hectare.

Nayar (1995) reported that the potato crop is raised in the Northern Plains, under irrigated conditions, in alluvial soils. The national yield level of over 16 tonnes per hectare is only marginally higher than the world level (about 15 tonnes per hectare). But this is a creditable performance considering the fact that the potato growing period in Indian
is only 85-120 days, which is 30-70 days less than that of the Northern temperate countries of Europe and North America. At the same time, the yields in Uttar Pradesh, West Bengal, Gujarat and Tamil Nadu, accounting for about 60 per cent of the area, exceed or at least approach 20 tonnes per hectare.

The productivity of potato in Germany, Netherland, United Kingdom and the United State, the four front line growing countries, ranges 32-40 tonnes per hectare. Such yields were obtained in numerous field experiments conducted in research station and elsewhere. But, it is apparent that attainment of such yields under field conditions requires considerable skills in management of the various inputs.

Malhotra and Naveen Kumar (1995) reported that the compatibility of different vegetable crops with potato for maximizing production and income of inter-cropping system under dry-temperate conditions. The yield of all the crops was the highest in sole stand than in intercropping system. Pure crop of potato gave the highest tube yield of 128.1 and 127.1 Quintal per hectare during 1991 and 1992 respectively. Maximum reduction in potato yield was noted in potato turnip. Sole crop of cabbage gave the highest net return of Rs. 87520 and Rs.66665 per hectare. Intercropping of potato + cabbage was more productive (225.1
quintal per hectare potato equivalent yield) and more remunerative (Net return of Rs. 48319 and 44570 and 201 per cent higher than net return under sole potato respectively. The highest land equivalent ratio of 1.31 was in potato + radish, followed by potato + cabbage.

Maniram and Singh (1995) conducted a study on "Inter crop potato with Palmarosa". They reported that the paired-row arrangement of planting both palmarosa and the potato produced significantly higher essential oil yield while the potato intercrop yielded 5.53 tonnes per hectare of the potato tuber.

The economic analysis of intercropping system showed that palmarosa in paired-row method of planting gave higher profit per rupee invested (Rs. 6.04). It gave a gross profit of Rs. 54340 per hectare per year, whereas double and single-row methods of planting potato with palmarosa gave a gross profit of Rs. 50000 and Rs. 48685.

Marketing of Potato:

Agrawal (1949) reported that in Uttar Pradesh the producer’s share in consumer’s rupee was only 57.20 per cent in case of potatoes. Wholesaler’s and retailer’s margin were 6.0 per cent and 8.0 per cent respectively whereas the handling, cartage and marketing charges accounted for 20.0 per cent and 8.80 per cent respectively.
Kahlon and Singh (1971) in a study reported the state-wise trends in acreage and production and also examined the seasonal and cyclical fluctuations in potato prices. They reported that UP, West Bengal, Bihar and Orissa accounted for about 73.30 per cent of the total acreage and about 77.0 per cent of potato in India. U.P. alone accounted for more than 34.33 per cent of the increase in acreage and 36.0 per cent of the increase in the production. The present share of Punjab in total production increased only marginally from 3.90 percent (1958-59) to 5.50 percent (1967-68).

Garg et al. (1973) reported that the progressive and modern methods of production, storage and marketing of potatoes assures a higher income to growers. They concluded that the input and output per hectare was higher on progressive farms as compared to less progressive farms, because of higher investment on improved seed, manures and fertilizers and plant protection measure resulting in higher yields per hectare. The producer’s share in consumer’s price was low due to higher marketing charges. The higher marketing charges were due to non-regulation of potato mandi.

Bais (1974) found that the transport cost per quintal of potato varies from place to place depending on the distance covered and type of
means of transport used. In case of bullock carts it was found to be 6-8 paisa per quintal per kilometer whereas in case of truck it was 4.50 paisa per quintal per kilometer only.

The analysis of price spread revealed that the total charges paid by the producer and seller was Rs.4.95 per quintal accounting for 9.80 per cent of the consumer’s price. The marketing charges incurred by wholesaler and retailer accounted for Rs.4.08 per cent and 3.60 per cent of the price paid by consumer respectively, whereas the middlemen’s margin of the retailer was found to be significantly higher being 8.48 per cent as compared to the margin of wholesaler being 3.92 per cent of the consumer’s price. The producer received only Rs.35.05 per quintal out of the price of Rs.50.0 per quintal paid by consumer representing 70.10 per cent of the later price.

Islam et al. (1974) reported that income elasticity for potato was less than one, indicating thereby the potato as an essential food item. It was further observed from the analysis of prices and gross price elasticities that potato consumption was mostly responsive to its own prices and no on the prices of its close substitutes, when income was held constant. The price elasticity of potato was estimated to be around one.
Rieger et al. (1974) reported that the "Leipzig Potatoes", co-operative association play an important role in post-harvest handling of potatoes. These plants work jointly by several member farms of the co-operative association and are also partners in the co-operative association. They takeover sorting, packing, intermediary storage and delivery of potatoes, which are produced in the member farms of the co-operative association. The steady supply of potatoes through these units results in a reduction in the storage in Leipzig and increasing demands for 5.0 Kg. bags. On the other side the existence of the plants cause the setting up of large, specialized production units by potato producers.

Acharya and Ahmed (1975) in a study on the "Marketing of potato in J & K" concluded that on an average, 62.0 per cent of the produce was marketed through wholesalers, 30.0 per cent through retailers and 6.0 per cent was sold directly to the consumers. Remaining 2.0 per cent of the produce was sold by the small farmers to the State Government (Agriculture Department). Percentage of the produce sold to wholesalers increases with the increase in farm size. They further observed that retailers accounted for the major share (59.0 per cent) of the sales by small farmers whereas wholesalers were main buyers for medium (60.0 per cent) and large (94.0 per cent) farmers. Nearly 84.0 per
cent of the produce was sold at the farm itself and only 16.0 per cent was
taken to the mandies by the producers. Total marketing cost varied from
Rs.7.37 to 21.22 per quintal. Whenever, wholesalers or Government was
involved, the marketing cost was higher. When wholesalers/retailers
purchased the produce from farms, the costs was lower. The wholesaler’s
margin varied from 7.42 to 8.30 per cent of the consumer’s price whereas
retailer’s margin varied from 7.90 to 18.70 per cent. The margins of
intermediaries were higher, when the produce was purchased from the
farm.

The producer’s share in the consumer’s price was 84.0 per cent
when no any intermediary was involved. When retailers and wholesalers
were involved in the marketing of potato, the producer’s share ranged
from 61.0 to 65.0 per cent. The prices received by the farmers (not of
marketing costs) were higher than cost of cultivation for all the size
groups of farms. Potato growing left sufficient margin with the farmers
after meeting all the costs of cultivation.

Singh and Malik (1975) in a study on “Marketing of potato in
Ambala (Haryana)” found that producers sold their produce through
commission agent Local traders appeared between producer and
commission agents. The producer’s share in consumer’s rupee was 64.08
per cent and 56.25 per cent through these two channels respectively. Thus, in the second channel a margin of 7.83 per cent of the total prices paid by the consumers went in the pocket of the local traders.

Singh (1977) reported that high cost was incurred on the production of potato. The farmers were unable to retain the produce for long duration for their family and farm requirements. Therefore, adequate provision for credit facility against the stored potato and other vegetables was very essential.

Swaminathan (1978) in a study on “Potato has great potential in India” reported that with rise in income and population in the state, the demand for potato is expected to increase in the coming years. He also observed the importance of potato crop due to very high food value (Calorie-Protein) per unit of area.

Chatha and Kaul (1979) in a study on “Price spread of potato crop in Jullundhur (Punjab)” reported that there was a wide margin between retail and wholesale prices to the extent of 45.13 per cent. Marketing costs and margins were further examined for their feasibility. It was observed that the spread could be narrowed down without affecting the efficiency of marketing and in the process both the producer’s and consumer’s surplus could be raised.
Singh et al. (1979) reported that the price spread varied from Rs. 21.82 to Rs. 29.65 per quintal, the optimal time of sale being November. whereas producers get Rs. 15.35 per quintal above the storage cost, as compared to immediate sales after the harvest in January. Transport costs were the major item in this price spread. The study indicated that sale in the field was economically preferable to sale in the local market but sale in the big consuming markets particularly Bombay and Madras were still more advantageous to producers.

Chatha (1980) reported that the farmers marketed 51.0 per cent of their produce in their very fields 13.82 per cent in the potato markets within the Punjab state, 23.40 per cent in the big consuming markets outside the state and 11.78 per cent on the cold storage premises. The study further indicated that there was a wide gap (45.13 per cent) between the prices received by the producers and prices paid by the consumers in chandramukhi variety of potato.

Chowdhary and Sen (1981) reported that Hooghly farmers sold 71.0 per cent and Birbhuni farmers 60.0 per cent of their total receipts, in the market. In both the villages more than 95.0 per cent of the marketed product were disposed of immediately after harvest.
Diwakar and Murlidharan (1982) in a study on "An analysis of price efficiency of potato in Farrukhabad district of UP." observed that the correlation coefficients of potato prices were found to be very high and significant in producing and consuming markets.

Kaul and Jam (1982) in a study on "Dynamics of potato market in Punjab" concluded that relative profitability was not significant although the coefficient had the expected (Negative) sign, Analyzing the short run and long run supply elasticity with respect to relative profitability and risk, the coefficient to adjustment (0.4645) was fairly high. The supply elasticity with respect to relative profitability was negative both in the long and short run.

Singh et al. (1982) reported that the higher marketing cost of potato in Farrukhabad district was due to transport charges 55.95 per cent followed by bardana charges 23.08 per cent loading and unloading charges 11.19 per cent commission 5.59 per cent and mandi charges 4.19 per cent The producer’s share in consumer’s rupee at Farrukhabad potato mandi came to 66.92 per cent during 1980-81 As against 69.30 per cent during 1975-76.

Chauhan (1983) in a study on “Economics of storage and marketing of potato in district Kanpur (UP)” observed that marketing
Improvement aims at increasing the share of producer in the consumer's money by way of reducing the costs and margins which constitute the major components of price spread of a commodity. They reported that the producer's share in consumer's rupee decreased with the increase in the number of middlemen and the percentage of marketing charges were less in case when they were transported in bulk than in small quantity.

Naik and Patnaik (1983) in a study on "Marketing costs and price spread of potato in Orissa" examined three channels of distribution i.e. producer-village trader-wholesaler-retailer-consumer, Producer-wholesaler-retailer-consumer; and Producer to consumer. They further reported that, on an average, in Orissa markets, the producer received Rs.98.37 (60.51 per cent) share. The marketing costs accounted for Rs.29.07 (17.88 per cent) and marketing margin nearly Rs.35.14 (21.61 per cent), while the consumers pay on an average, Rs.162.58 (100.00 per cent) per quintal of potato in the market channel having three middlemen.

In the marketing channel, having two middlemen, the producer's net share on an average came to Rs.98.42 (60.54 per cent), marketing costs Rs.32.76 (20.15 per cent) and the margins of intermediaries Rs 31.41(19.31 per cent) while the consumer pays Rs.162.58 (100.0 per cent) for one quintal of potato. This indicates that margins are less than
that of marketing costs due to absence of one middlemen in this channel. In case of direct selling, in Orissa primary markets the producer received on an average Rs 115.77 (81.67 per cent) and paid marketing costs for Rs 25.98 (18.33 per cent) per quintal of potato. This indicates that the producer was benefited by Rs. 17.35 to Rs.17.40 by selling directly to the consumer in primary markets, whereas the consumer's price of Rs.12.0 in secondary markets.

Singh (1984) in a study on "Economic analysis of potato production and marketing in Faizabad district of U.P." reported that on an average 18.33 per cent of the produce was marketed through wholesalers while 34.17 per cent through retailers and 47.50 per cent was sold directly to the consumers. The percentage of produce sold to consumer increases with decrease in farm size. It was also observed that the price spread shows an increasing trend 'with an increase in the size of holding. The overall price spread of potato per quintal was observed highest for large size group i.e. Rs.24.61 followed by medium Rs. 15.42, small Rs. 11.93 and marginal group for Rs.7.70.

Kalyankar and Rajniani (1987) reported that the producer's share in consumer's rupee in potato was 65.71 per cent i.e. Rs.110.40 in Rs.167.99 per quintal paid by the consumer, the remaining 34.29 per cent
being spread over on different marketing agencies. The study emphasized the need to stabilize price during peak harvesting periods by providing cold storage facilities in the producing centers and establishing wholesale and retail markets in the potato producing areas to minimize the marketing cost of potatoes.

**Naik and Patnaik (1987)** concluded that both the monthly and annual wholesale prices of potato vary significantly in different districts as well as at the state level. This may be due to varying supply and demand for potato during the study period. Another factor may be due to increase in income with the consumers during the period or decrease in per capita availability of potato in the state which tends to raise the price. However, there is further scope to study for identifying the factors including elasticity of demand and supply in a dis-aggregative framework and their relative influence on price of potato.

**Nayar (1990)** reported that peninsular India accounts for only about 10.0 per cent of the total potato production and its prices are 100-250.0 per cent higher than those prevailing in the Gangetic plains. He also reported that at the country level, price spread should be and must be reduced in potato. It can be done through active co-operative societies.
Anil Kumar and V.P.S. Arora (1999) in their paper entitled, 'Post-harvest management of vegetables in U.P. Hills', concluded that Post-harvest management of U.P. hills needs a lot of improvement on various front including grading, packaging, storage, transportation and marketing of the produce. Agricultural extensions system should be integrated with marketing extension system to transfer post-harvest technology to the vegetable growers.

Singh, Ranveer et al. (2000), in their paper entitled, 'Technological changes in Marketing of Hill Farm Products', concluded that the main thrust of technological change should be on introducing road network, development of time saving and cost effective transport facilities would stimulate more production and marketable surpluses. There is also need to improve grading and packing facilities.

Yadav, Rajendra Kumar et al. (2000) in their paper, 'Price spread and Marketing problems of Potato in Basti district, U.P.', found that the marginal farmers were selling higher produce i.e. 61.94 per cent of the total sale of consumers and retailers while small and big farmers were selling up to 84.57 per cent and 93.84 per cent respectively to the wholesalers. The producer’s share in consumer’s price was recorded 56.35 per cent when only one intermediary was involved in marketing
process, while it was 44.10 per cent when two intermediaries were involved. Storage was found to be the most important marketing function. The major marketing problems identified were lack of storage, transportation and marketing knowledge.

Arun Pandit et al. (2003) in a study of Problem of 'Potato Marketing in India' reported that price fluctuations, problems in storage, Transportation bottlenecks, Market imperfections, etc. were the main problems faced by the potato growers in marketing of potato crop. They suggested the role of cold storage facilities, support price policy for stabilization of prices. To increase producer's share Regulation of markets and strengthening of cooperative societies were suggested.

Hatai, L.D. and M.A.A. Bag (2007) in their study on “Economics of Production and Marketing Strategies of Potato in Orissa”, concluded that the increase in farm size is accompanied by higher productivity and remunerative price fetched by large farmers as compared to other categories of potato growers. Total cost of cultivation was highest on large farms due to more use of inputs. Gross returns & net income was also higher on big farms. On the marketing front, the potato growers did not get remunerative market price. The potato growers experienced high infestation of pest and diseases, high input cost, storage of fertilizers etc.
Kumar, Nalini Ranjan et al. (2008), in a study on ‘Production and Marketing of Potato in Banaskantha district of Gujrat’, reported that out of total production, about 4.36 percent of total produce was used as seed for next crop season on their own farms, about 0.33 percent was kept at home for family consumption and 0.22 percent given in kind to labourers. The rest about 95 percent of produce was sold by the farmers (marketable surplus). They suggested that for making Potato cultivation more remunerative, bottlenecks in its cultivation and marketing should be removed.

In summarizing the above Review of Literature, it may be concluded that in production of Potato a high cost was involved. The scientist report that seed and fertilizers accounted for the major portion of the cost. The cost incurred on the marginal and small farms was lesser in comparison to large farms. They also reported that size of holding was directly related to hectare cost of production, productivity and output ratio. Cost per quintal gave a decreasing trend with the increase in size of holdings.

The scientist reported that producer’s share in consumer’s price was low due to higher marketing charges and margin of profits charged by intermediaries. The higher marketing charges were also due to non-regulation of potato mandi and presence of large chain of middlemen in
marketing channels. According to scientists, the producer's share in the price paid by consumer varied from 56 percent to 65 percent and even 84 percent, when no intermediary was involved. The larger the chain of middlemen, the lower was the producer's share.

Some of the scientist reported that marketable surplus of potato was as high as 95 percent. It varied with the size of farm business. A high marketable surplus was due to cash requirements of the farmers poor retention power due to shortage of cold storage facilities etc.

Keeping in view the above Review Literature and objectives given in Chapter-I, the following hypothesis are developed for the present study:

(i) The income and production of Potato growers vary with the use of input resources.

(ii) The producer's share in consumer's rupee is higher in short channels of marketing in comparison to long channels.

(iii) The marketable surplus and marketed surplus of Potato vary with size group of farms.

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