CHAPTER II

CONCEPTS AND REVIEW OF LITERATURE

This chapter presents a review of various concepts in production and market research developed in several past works as a basis for definition of concepts used in the present study. Such a review would be useful to develop comprehensive knowledge about the concepts and to delineate them for study. Further such an attempt would help the researcher to collect relevant information and subject them to statistical analysis for interpretation and comparison of results with the studies made earlier. In what follows, an attempt is made to review the past work done and specify appropriate concepts as relevant to the present study.

For better understanding and clarity, concepts and review have been organized under the following sub heads.

The concepts relating to

a) Production
b) Production function
c) Costs and returns
d) Efficiency measures
e) Market and marketing
f) Marketing cost
2.1 BRIEF REVIEW OF PAST STUDIES RELATED TO PRODUCTION AND MARKETING

a) Production

Smith (1934) defined production as the creation of utilities in commodities and services in order to gratify human wants\(^1\).

According to Jather and Beri (1969), production connotes the creation or addition of utilities or values\(^2\).

Nerin (1971) defined production as the application of land, labour, capital and enterprises to the creation of new wealth\(^3\).

Hansen (1972) defined production as the activities of changing the form of a good at any stage from the raw materials to the finished product, changing the situation of a good, changing the position of good in times and provision of some kind of services such as retailing, banking and entertaining.\(^4\)

Ritson (1978) defined production as a process of conversion of certain inputs or resources or factors of production into a consumable form\(^5\).

Jabackumar (1979) considered the transformation of inputs such as feed, labour and others into output like wool, mutton and manure as production in sheep farming\(^6\).

Donald and Malon (1981) described production as a process involving of the transformation of inputs into an output or products during a given period of time\(^7\).

Bach (1982) defined production as the creation of any service that people would be willing to pay for\(^8\).

Chopra (1982) defined production as a physical process in which quantities of raw material and labour were transformed into quantities of output\(^9\).


\(^6\)Jebakumar, Rathina, *A. Study on Economics of sheep production and marketing in the Nilgiris District, Tamil Nadu*, (Unpublished M.Sc. (Ag.) Thesis submitted to Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore, 1979), p.22.


According to Dewett (1986) production is defined as creation of utility or creation of want satisfying goods and services\(^\text{10}\).

Sadhu and Singh (1985) observed production as a process where in certain goods and services are used to create goods and services of different nature\(^\text{11}\).

According to Seth (1985) production would be the result of blending various factors of production namely, land, labour, capital and organization\(^\text{12}\).

Pande and Mithani (1990) defined production as the creation of output or goods and services and considered as essential means of transformation of one set of goods into another\(^\text{13}\).

According to Koutsoyiannis (1994) production would indicate the combination of factors needed for producing one unit of output\(^\text{14}\).

Johl and Kapoor (1996) pointed out that production is the transformation of certain resources or inputs, like land, labour, seeds, fertilizers and irrigation water into products like paddy, wheat and milk\(^\text{15}\).


According to Ahuja (1997) production in economics is not merely confined to effecting physical transformation but also covered the rendering of services such as transporting, financing, wholesaling and retailing\textsuperscript{16}.

In the present study, production is defined as the cultivation of banana under field condition with the aid of labour and capital and managed by individual farmer.

\textbf{b) Production Function}

According to Bishop and Toussaint (1972) production function is a mathematical relationship describing the way in which the quantity of particular produce depends upon the quantities of inputs used\textsuperscript{17}.

Klein (1973) referred production function to a technical or engineering relation between input and output and opined that as long as natural law remained unchanged, the production function also would remain unchanged\textsuperscript{18}.

Lipsey (1973) said that the relation between the factor services used as inputs in the production process and the quantity of output obtained could be expressed in functional form called as production function\textsuperscript{19}.

\begin{itemize}
  \item \textsuperscript{16}H.L.Ahuja, \textit{A Modern Micro Economics}, (New Delhi : S. Chand and company, 1997), p. 221 and 550.
  \item \textsuperscript{17}C.E.Bishop and W.D.Toussaint, \textit{Agricultural Economic Analysis}, (New york: John Wiley and Sons Inc., 1958), p.29.
  \item \textsuperscript{18}R.Klein, Lawrence, \textit{An Introduction to Econometrics}, (New Delhi: Prentice Hall of India Private Ltd., 1973), p. 84.
  \item \textsuperscript{19}G.Lipsey, Richard, \textit{An introduction to Positive Economics}, (Wiltshire:The English Language Book Society, 1979), p.45.
\end{itemize}
Samuelson (1973) defined production function as one which indicated the maximum amount of output capable of being produced by each and every set of specified inputs or factors of production at a given state of technical knowledge$^{20}$.

Singh and Kahlion (1973) used production function analysis to compare the productivity of resources between levels of technology in Punjab$^{21}$.

Sato (1975) defined production function as the global input – output relations either in an individual industry or even in an economy as a whole$^{22}$.

Singh (1978) in his study on resource allocation estimated the marginal productivity of inputs for selected individual crops by fitting the Cobb – Douglas production function$^{23}$.

Jebackumar (1979) in his study observed production function as the technical relationship between the labour employed, average value of an animal, average age of a ram and other costs and total output from sheep$^{24}$.


$^{24}$Rathina Jebackumar, *op. cit.*, p.32
Kalirajan and Flinn (1981) observed that the production function approach was preferred against linear programming when a crop was individually studied\(^{25}\).

Sadhu and Mahajan (1981) fitted Cobb–Douglas type of production function to test the production efficiency of individual input in aggregate enterprises. The gross output was taken as dependent variable and independent variables used more operational area, human labour, bullock labour, tractor hours, value of manures and fertilizers, working expenses and fixed capital\(^{26}\).

Ferguson (1982) defined production function as a schedule showing the maximum amount of output that can be produced from any specific set of inputs given the existing technology or stage or art. In short, the production function is a catalogue of output possibilities\(^{27}\).

Chezhian (1983) defined production function as the physical relationship between output and set of resources used to produce it with maximum efficiency possible, with the given arts of production\(^{28}\).


\(^{28}\)S. Chezhian, “A Study on Economics of Egg production in Vennandur Blrek, Salem District,” Unpublished M.Sc. (Ag.) Theses submitted to Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore, 1983) p.27.
Misra (1984) used the production function to determine the effects of irrigation on production and resource use in Mayurakshi Canal irrigated areas of Birbhum district of West Bengal. Alaruze et al. (1985) fitted a Cobb–Douglas production function taking butter production as output and number of milking cows, labour, amount of irrigation water used and rainfall as inputs.

Sharma et al. (1987) considered a Cobb–Douglas production function using value of average milk yield per animal as dependent variable and value of feed, value of labour and number of animals (stall size) as independent variables in economic evaluation of dairy units.

Battese (1992) defined production function in terms of the maximum output that can be produced from specified set of inputs given the existing technology available to the farms involved.

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Johl and Kapur (1996) defined production function as the technical and mathematical relationship describing the manner and extent to which a particular product depends upon the quantity of inputs or services of inputs used\(^{33}\).

According to Samuelson (1998), production function would indicate maximum amount of output capable of being produced by each and every set of specified input\(^{34}\).

In the present study, production function is defined as a mathematical relationship between the inputs used in the production of banana to the output produced.

c) Costs and Returns

Cost refers to the expenditure on all goods and services incurred in the production process. It could be broadly classified into fixed and variable cost.

(i) Fixed cost

Tandon and Dhondyal (1967) stated that fixed costs related to fixed resources and reckoned as overhead costs. They would remain the same irrespective of the yields obtained much or little. Rent, interest, depreciation, 

\(^{33}\) S.S.Johl and T.R.Kapur, *op. cit.*, p.73  
\(^{34}\) P.A.Samuelson, *op. cit.*, p.36
taxes and wages of permanent labourers and family labour cost would constitute fixed costs\textsuperscript{35}.

Vanaickle and Rogge (1968) observed fixed cost per time period as the sum of the costs of fixed inputs like the land, buildings, machinery and management.\textsuperscript{36}

Ahuja (1971) defined fixed costs as independent of output, that is, they would not change with the changes in output and fixed costs included charges such as contractual rent, insurance fee, maintenance costs, property taxes, interest on the capital invested and minimum administrative expenses\textsuperscript{37}.

Johl and Kapur (1971) defined cost as the total amount of funds used in production. They further classified the costs of production into cash costs and non-cash costs. Cash costs included the resources that were purchased and used immediately in the production process. In general, cash costs resulted while purchasing non-durable inputs like fertilizers, casual labour and fuel, which do not last more than one production period. Non-cash costs consisted of depreciation and payments to resources owned by the farmers\textsuperscript{38}.

\textsuperscript{37}H.L. Ahuja, \textit{op. cit}, p221
According to Kahlon and Sandhu (1971) fixed cost included the depreciation on the value of capital assets and interest on the value of capital investment. An additional item of rent paid or payable was also taken into account\(^\text{39}\).

According to Samulson (1971), fixed costs represented the total expenses that would be incurred even when no output is produced but production had been committed in. It is often called as overhead cost and usually included contractual commitments for rental, maintenance, depreciation, overhead, salaries and wages. It is a sunk cost because it is quite unaffected by any variation in the level of output, in the prescribed time period\(^\text{40}\).

Wykstra (1971) stated fixed cost as the cost which did not change with the quantity of output produced\(^\text{41}\).

Baumol (1973) defined fixed costs as the costs whose expenditure would not vary with the level of output at least within some range\(^\text{42}\).

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\(^{40}\)P.A.Samuelson, *op. cit.*, p.36


Mohan (1973) in his study on pepper has imputed the rental value of land equivalent to the interest amount of market value of rental land and the interest rate was charged at five percent per annum\textsuperscript{43}.

Gill and Gill (1975) considered interest on fixed capital, depreciation on the value of animals, cattle shed and equipments and rental value of land as components of fixed cost in dairying\textsuperscript{44}.

Rao (1980) included construction of shed, construction of brooder or grower house and cost of equipment and electrical fittings in poultry production under fixed cost\textsuperscript{45}.

Singh and Singh (1984) included depreciation on building and interest on fixed capital under fixed cost in their study on egg production\textsuperscript{46}.

Sumita (1984) included interest on capital and depreciation on building and equipments in fixed cost in broiler farm\textsuperscript{47}.

Gopalakrishnan and Lal (1985) identified interest on investment and on working capital, insurance cost, depreciation on shed and miscellaneous expenses in fixed cost while working out the economics of feeder pigs\(^{48}\).

Marimuthu and Subbarajalu (1985) included cost of ram and eve and insurance charges per annum under fixed investment in sheep farming\(^{49}\).

Sharma and Babu (1986) considered labour, veterinary and electricity charges, depreciation on buildings, depreciation on animals, repair and maintenance of building under fixed cost in buffalo production\(^{50}\).

Singh and Ram (1987) included depreciation on building and equipment and interest on fixed capital under fixed cost. The depreciation on goat was not taken into account because of high salvage value\(^{51}\).

Varma and Agarwal (1992) defined fixed costs as those costs that would remain constant in total regardless of changes in volume of production and sales upto certain level of output\(^{52}\).


Jacob (1995) analyzed the economics of production of natural rubber and he classified the total cost into fixed and variable cost. The fixed cost included cost of preparatory operation, terracing, lining and pitting, planting material and planting, manures and manurial application, pruning and plant protection, establishment of cover crops, plat-forming, trenching and fencing\textsuperscript{53}.

Prasher et al. (1996) opined that fixed cost would include land revenue, depreciation on machineries and implements, interest on fixed capital and rental value of owned land\textsuperscript{54}.

Ahuja (1997) identified fixed costs as those which were incurred in hiring the fixed factors of production whose amount would not be altered in the short run\textsuperscript{55}.

According to Saini and Sharma (1997) fixed cost would include depreciation on equipment excluding land and interest on fixed capital\textsuperscript{56}.


\textsuperscript{55}H.L.Ahuja, \textit{op. cit.}, p.550

Maheswarappa et al., (1998) referred fixed cost in terms of land revenue and rental value of owned land\textsuperscript{57}.

Samuelson and Nordhans (1998) referred fixed costs as those costs which do not vary with the output in the short run. They were often called over head costs and committed for rental, maintenance, depreciation, overheads, salaries and wages.\textsuperscript{58}

Dewett and Chand (2001) stated that fixed cost as one which does not vary with the level of output. Fixed costs are those which have to be paid even though production has been stopped temporarily. It included the rent on building, interest on capital invested on machinery and salaries of the permanently employed staff\textsuperscript{59}.

For the present study, fixed cost is conceptualized as the sum of costs of fixed inputs such as land, buildings, pumpsets and machineries for a specific time period.

ii) Variable Cost

Hansen (1968) stated that variable costs as those that are variable in the short period. Vanickle and Rogge (1968) stated that variable cost as the sum of expenditure per time period on variable inputs such as labour and raw materials.

According to Tandon and Dhondyal (1971) variable cost would otherwise be known as prime cost and these costs were related to the variable resources and they would change with the level of output.

According to Nicholson (1972) variable costs are those which would change in response to the changes in the level of output being produced by a farm.

Mittal and Saxena (1974) defined variable cost in agriculture as those cost which would vary with the level of production.

Seth (1974) observed that variable costs correspond to those factors of production whose supply was variable in the short period.

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Dewett (1975) defined variable cost as one which would vary with the level of output. It included cost of raw materials used, costs incurred in marketing of commodity as well as the cost of daily labour employed. It would be incurred only when the firm is at work.\textsuperscript{66}

According to Johl and Kapur (1977) variable cost referred to the cost of using variable input and they would vary with the level of production.\textsuperscript{67}

Ahuja (1979) defined variable costs as those costs which were incurred on the employment of variable factors of production whose amount could be altered in the short run.\textsuperscript{68}

Ramalingam (1980) had taken feed cost, labour charges, supervision charges, veterinary charges and miscellaneous expenditure under variable cost in calculating the economics of dairy units of Tamil Nadu Agricultural University.\textsuperscript{69}

Boone and Kurz (1982) defined variable cost as those cost that would change with the level of production such as labour and raw materials.\textsuperscript{70}

\textsuperscript{66}K.K.Dewett, \textit{op. cit.}, p.196
\textsuperscript{67}S.S.Johl and T.R.Kapur, \textit{op. cit.}, p.76.
\textsuperscript{68}H.L.Ahuja, \textit{op. cit.}, pp. 27-29
\textsuperscript{69}K.Ramalingam, \textit{A Study on Cost and Return of the Dairy units of Tamil Nadu Agricultural University}, (Unpublished M.Sc. (Ag.) Theses Submitted to Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore, 1980), p.27.
Snodgrass and Wallace (1982) defined variable costs as those that would be directly related to production output\textsuperscript{71}.

Bhandari (1984) has included cost of broiler chicks, feed, brooding electricity, medicines, litters and other miscellaneous expenditure as recurring expenditure\textsuperscript{72}.

Rahamathulla et al., (1984) covered cost of broiler, litter material, feed, medicine, electricity and labour charges under variable cost in calculating the economics of a broiler farm\textsuperscript{73}.

According to Wonnacott and Wonnacott (1984) variable costs were those which would increase as output increase\textsuperscript{74}.

Singh et al., (1987) included cost of day old chicks, feed cost, medicines cost, cost of equipments and electricity charges under recurring cost in working out economics of broiler chicks\textsuperscript{75}.


\textsuperscript{75}Bhim Sigh,, V.P. Sharma and S.P. Dhiman, “Performance of Broilers under Field Conditions – A Case Study.”, \textit{Poultry Guide}. 24(2) : 44, 1987
Singh and Singh (1987) included fodder cost, labour cost and miscellaneous costs in variable costs in their study on economics of milch animals\(^7^6\).

Varma and Agarwal (1992) defined variable cost as those cost which would vary proportionately with the increase or decrease in the sales or output\(^7^7\).

Jacob (1995) defined variable cost as maintenance cost after tapping is started for matured rubber plantations. It included the cost of manures and manuring, weeding, pruning, plant protection, tapping charges and other miscellaneous expenditures\(^7^8\).

Prasher et al., (1996) opined that variable cost would include costs involved on labour, manures and fertilizers, plant protection chemical and interest on working capital\(^7^9\).

According to Saini and Sharma (1997) variable cost would include variable capital and interest on variable capital\(^^8^0\).

Maheswarappa et al., (1998) refereed to variable cost in terms of human labour, bullock labour, tractor power, seed, manures and fertilizers, plant


\(^{77}\)M.M. Varma and R.K. Agarwal, op. cit., p. 319

\(^{78}\)C. Jacob Thomas, op. cit., pp. 411 – 421.


protection chemicals, irrigation, repair and maintenance cost and interest on working capital.  

In the present study, variable cost refers to costs of suckers, labour charges, manures and fertilizers, plant protection chemicals, interest on working capital, depreciation on buildings and implements involved in the production of banana and which would vary proportionately with the increase and decrease of the output of banana.

Returns

The cash from farm income is referred to as farm returns and returns of farm income are measured by gross income or net income or farm business income.

i) Gross returns

Shukla and Pandey (1969) defined gross income as the value of the crops produced as well as the value of their byproducts whether sold, consumed or stocked.

Tandon and Dhondyal (1971) defined gross return as the difference between the total money income which a farmer would receive from the sale of the produce and the total expenses incurred in producing it.

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Kahlon et al., (1972) defined gross income as income from farm and non-farm sources and also borrowings from institutional and non-institutional resources\textsuperscript{84}.

Chauhan et al., (1972) referred gross farm income to the value at prevailing prices of retained as well as marketed crop output and also the income contributed by the allied activities such as dairying, rearing of cattle, sheep, goat and poultry\textsuperscript{85}.

Singh (1975) defined gross income as the gross value of output (main plus by product) of crops evaluated at harvest price in the reference year irrespective of being consumed or sold or maintained in the stock less the value of seed\textsuperscript{86}.

Herdt (1978) defined gross family income as income received by the operator and it was calculated as the residual after making actual payments for all expenditures incurred for production, excluding unpaid returns to family owned


resources (land, labour or capital). In other words, gross family income would equal total returns minus paid out costs\textsuperscript{87}.

According to Kannan (1981) gross farm income included on farm income, off farm income such as hiring out of labour, bullock pairs, machinery and equipment and income from profession, and shop keeping from all members of the family\textsuperscript{88}.

Sadhu and Mahajan (1981) defined gross output as the value of output (main and byproduct) in rupees of different crops grown on the farms\textsuperscript{89}.

Reddy et al (1984) referred to gross income as the gross value of output sold\textsuperscript{90}.

Murugadass (1990) defined gross income as the income realization made by the sale of produce, both main and byproducts\textsuperscript{91}.


\textsuperscript{89}A.N.Sadhu, and R.K. Mahajan, “Economic Efficiency of Agricultural Resources – An Inter regional Analysis”, \textit{Agricultural situation in India}, 36 (2) : 98-104, 1981.


\textsuperscript{91}O.R.Murugadass, \textit{Economics of Marine Fishing in Mandapam Block of Ramanathapuram District}, (Unpublished M.Sc. (Ag.) Theses submitted to Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore, 1990), p 54.
Varma and Agarwal (1992) defined gross return as the difference between total revenue and total explicit cost incurred in the production process.\textsuperscript{92} 

Johl and Kapur (1996) stated that total production minus price would give the gross return.\textsuperscript{93} 

According to Pandey (1996) gross income included value of main products plus value of the byproducts.\textsuperscript{94} 

In the present study, gross income is defined as the total value of banana in the concerned season taking into account the market price as received by the farmers in the village.

\textbf{ii) Net Return}

Mandal (1966) arrived at the net return by deducting from the output all costs with the exception of family labour imputed at the market wage.\textsuperscript{95} 

Tandon and Dhondyal (1971) defined net income as gross income minus total expenses on cost of seed, manures, irrigation charges, wages of fixed /

\textsuperscript{92} M.M.Varma and R.K.Agarwal, \textit{op. cit.} p.76. 
\textsuperscript{94} Pandey, \textit{op. cit.} p. 75. 
permanent labour, imputed values of family labour, depreciation, rent, interest on fixed and variable cost and marketing cost
defined net income as either net profit or net loss to the operator of the land after making provision for the depreciation charges, land rent, interest on capital and imputed wage on family labour from the total income of the farm.

Forster (1973) defined net income of the farm as gross income less variable cost of the farm business as a whole.

Singh (1973) calculated the net income by deducting the variable cost from the gross income.

Singh and Jha (1973) defined net income of the farm, as the gross income less variable cost of the farm business as a whole.

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Mishra and Gupta (1975) defined net farm income as the income from all the enterprises after making deduction for cultivation, maintenance and other expenses which were paid by the family in cash and kind in raising the various enterprises of farm.

According to Dahiya (1976) net return could be arrived by deducting the cash and kind expenses (variable cost) incurred in the cultivation of all crops in that year from the gross income realized by the farmer from his produce (both the main and by products)\textsuperscript{101}.

Shukla and Mishra (1979) defined net income as the gross income minus total cost. Farm management income equaled gross income minus cost A1 in owner operated farms and gross income minus cost A2 in tenant operated farms\textsuperscript{102}.

According to Varma and Agarwal (1992) net return would indicate the income received by the organizer after all the factors of production are paid off\textsuperscript{103}.

According to Maurya et al., (1996), the net income would indicate the difference between the input – output cost\textsuperscript{104}.


\textsuperscript{103}Varma and Agarwal, \textit{op. cit.}, p. 64

Singh et al., (1996) pointed out that the net income would include the difference between the cost of production and total value of the products\textsuperscript{105}.

Singh et al., (2000) stated that the net income was the return pertaining to all factors of production over and above all charges for such factors in the cost analysis\textsuperscript{106}.

For the present study net income is conceptualized as the gross income minus total cost incurred in banana production. The total cost included both fixed and variable costs.

d) Efficiency Measures

Resource use efficiency measures are the indicators of the soundness of farm planning. It can be measured using marginal productivity which is the measure of change in total product with the addition of one unit of a particular resource above its mean level while other resources are kept constant at their respective mean levels.


Heady (1957) defined resource use efficiency only in terms of a choice indicator. He used price ratio as the efficiency measure by which decision could be made. He set down the necessary condition for use of variable resources to a fixed factor as equality of the factor / product price ratio to the marginal productivity of the resources\textsuperscript{107}.

Khusro (1964) measured the farm efficiency in terms of output per unit of single input (acreage) or as output per unit cost of all inputs\textsuperscript{108}.

Saini (1969) considered the coordination and utilization of resources or factors of production so as to yield the highest returns as an important objective of a production unit\textsuperscript{109}.

Johl and Kapur (1971) opined that efficiency would be related to (i) the operation of the farm business as a whole (ii) any individual phase of the business, line of production or enterprises (iii) the use of various factors of production on resources (land, labour, capital) or (iv) to any single input (fertilizer, feed, machine etc)\textsuperscript{110}.

\textsuperscript{110}S.S.Johl and T.R.Kapur, \textit{op. cit.}, p. 95
Salikram (1979) opined that the marginal productivity of resource was more valid and most widely used by economists than average productivity. The marginal productivity is the measure of increase in total product with an addition of one unit of particular resource above its mean level, while all other resources are kept constant at their mean level\textsuperscript{111}.

Rajendran (1978) employed the concept of return to capital invested and labour earning per manday employed as the measures of efficiency\textsuperscript{112}.

According to Subramanian (1982), a firm or farm was said to be efficient than others, if it consistently attained larger output from the same quantities of measurable inputs, which referred to the natural shift in production across farms\textsuperscript{113}.

According to Tyagi (1984) economic efficiency dealt with the cost – price relationship of input and output. The farm with higher profits within a certain specified range of output and input prices can be considered to be economically


\textsuperscript{112}G.Rajendran, A Study on the Economics of Production and Resource use Efficiency in Chillies Farms of Sattur Taluk, Ramanadhapuram District, (Unpublished M.Sc. (Ag.) Thesis submitted to Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore, 1978) p.36.

more efficient within that range of prices. Price or allocative efficiency can be measured in terms of the marginal value of each variable inputs and its price\textsuperscript{114}.

According to Kalirajan (1990) economic efficiency enlists technical efficiency as the greatest output that could be obtained from any given set of inputs in a technical production function and price efficiency could be defined as the equality between the marginal value product and opportunity cost. His study attempted to measure the gains and consequences of rice production from the evaluation and introduction of location specific high yielding variety\textsuperscript{115}.

Mishra (1991) measured the efficiency in rice production by fitting Cobb–Douglas production function separately to the farms which used fertilizers and those which did not use the fertilizers. He compared the marginal returns with the marginal cost and concluded that much difference was not observed in the efficiency of resources between users and non users\textsuperscript{116}.

According to Jayaram et al., (1992), by a better organization of resources, about 30 per cent resource conservation per hectare can be accomplished\textsuperscript{117}.

Sunandhini et al., (1993) studied the input use efficiency of rice farms in west Godawari district of Andhra Pradesh using Cobb – Douglas production. They used marginal value product to factor cost ratio as the measure of resource use efficiency and found that marginal value product to factor cost was higher than unity for both small and large farmers\textsuperscript{118}.

Singh and Agarwal (1994) studied economic efficiency of rice production in Punjab in three selected zones and found that the yield per hectare increased with an increase in the cost of cultivation in all the three agro climatic zones of the state. They found that the positive relationship between cost and productivity held upto a point only\textsuperscript{119}.

Thakur et al., (1996) estimated the efficiency of resource use of inputs on different size of farms by fitting Cobb – Douglas production function. Gross farm returns, input – output ratios and return to scale were found to be increased with the size of farms. They found that efficiency of production increases with the size of farms and the marginal value productivity of farm inputs significantly differed from one farm to another\textsuperscript{120}.


Mohandas and Thomas (1997) studied the economics of rice production in the Kuttanad areas of Kerala. The Cobb – Douglas production function was used to estimate the resource use efficiency of farms under question. Marginal value product of machine labour was found to be the highest in large farms (Rs. 5.56) followed by small and marginal farms in that order. In the case of human labour, the productivity was found to be similar for all size groups as against for the fertilizer which was found to be maximum for large farms followed by marginal and small farms\textsuperscript{121}.

Nagaraj et al., (1998) evaluated the resource use efficiency in the cultivation of various crops under different cropping systems in Tungabhadra command area using Cobb – Douglas type of production function. They found that there was an excessive use of manures and fertilizers and bullock labour by the paddy growers. Land, seed and bullock labour were under utilized in sunflower – maize cropping system and in sunflower – groundnut cropping system all the inputs with the exception of land were over utilized\textsuperscript{122}.

Jabar et al., (2000) measured and compared resource use efficiency and land productivity within the tenure groups on the basis of fixed farm size. By

\textsuperscript{121}K.Mohandas, and E.K. Thomas, “Economic Analysis of Rice Production in Listed Areas of Kerala”, \textit{Agricultural Situation in India}, 24 (9) : 555- 560,1997

\textsuperscript{122}T.Nagaraj, H.S.S. Khan and N.N. Karnoal, “Resource use Efficiency in various crops under different cropping systems in Tungabhadra command Area (Karnataka)”, \textit{Agricultural Situation in India}, 25 (3): 135 – 139,1998.
using Cobb-Douglas production function, they suggested that most of the independent variables had significant impact on the farmer’s return\textsuperscript{123}.

In the present study, the resource use efficiency is measured by using Cobb–Douglas production function. The elasticities obtained are used to estimate the ratio between the value of marginal product and price of input.

e) Marketing

Jevens (1930) defined marketing as any body of persons who were in intimate business relations and carry on extensive transactions in any commodity\textsuperscript{124}.

Bastels (1962) viewed marketing as a set of activities in sequence involved in transforming the produce or an act of exchanging goods and services. It is that part of economics which deals with the creation of time, place, form and possession utilities\textsuperscript{125}.

\textsuperscript{125}Bartels Robert, \textit{The Development of Marketing Thoughts}, (Homewood: III Rivard D. Irwin 1962), p.36.
Mathews (1964) defined marketing as the performance of business activities that would direct the flow of goods and services from primary producer to ultimate consumer\textsuperscript{126}.

According to Stanton (1964) marketing is a total system of interacting business activities designed to plan prices, promotion, distribution, want satisfying products and services to present and potential consumers\textsuperscript{127}.

Buzzel and Mathews (1964) defined marketing as a phase of business activity through which human wants are satisfied by the exchange of goods and services for some valuable contribution and performance of business activities that would direct the flow of goods and services to consumer or user\textsuperscript{128}.

Bell (1966) defined marketing as a management task of strategically planning, directing and controlling the application of enterprise effort to profit making process which would provide customer satisfaction, a task which would involve the integration of business activities including finance and sales into a fixed system of action\textsuperscript{129}.

Khols (1967) defined marketing as the performance of all business activities involved in the flow of goods and services from the point of initial agricultural production until they were in the hands of ultimate consumer\textsuperscript{130}.

According to Warrier (1968), the functions which would meet the current needs of the consumer as well as the anticipated demand irrespective of existence of profit or not, could be defined as marketing\textsuperscript{131}.

According to John and Savitt (1971) marketing would mean all activities, both pre – purchase and post purchase, in any way related to transaction of ownership or use rights to any factor, goods and service\textsuperscript{132}.

Westing and Album (1971) considered marketing as the identification or creation of customer need and thereby filling those needs with benefits to buyers and sellers\textsuperscript{133}.

Law et al., (1971) said that marketing as a comprehensive term which included those processes involved in converting a raw product into a valuable commodity. It might be a change in place or form or time or appearance\textsuperscript{134}.

Sen (1971) observed that markets were not created by God, nature or economic forces but by businessmen. The marketing man would convert a want felt or unfelt or even non existent into an effective demand. Thus, marketing would indicate the whole set of business from customer’s point of view\textsuperscript{135}.

Gill (1972) defined marketing as the one that would include all intermediaries and functions which happen to fall in the channel to move the farm produce from the farms to the consumer\textsuperscript{136}.

According to Thambi (1973) marketing would imply not mere selling or distribution but it covered all activities that would begin with ascertaining the needs of the consumer and the market opportunity, setting up the production to meet the anticipated demand, pricing, distribution, advertising and sale of product\textsuperscript{137}.

Dahl and Hammond (1974) viewed marketing as a sequential series of steps or stages of functions that were needed to be performed as the input or product moved from its point of primary production to ultimate consumption. It

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was also viewed in terms of firms and agencies performing those functions or in
terms of how these institutions were inter related\textsuperscript{138}.

According to Ramamoorthy and Srinivasan (1974) marketing would cover
the activities of the middlemen\textsuperscript{139}.

Thomas (1975) defined marketing as the total function of bringing goods
and services from the producer in usable finished state to the ultimate
consumer\textsuperscript{140}.

According to Davar (1979) marketing was the primary management
function which organized and directed the aggregate of business activities
involved in converting customer purchasing power into effective demand for a
specific product or service so as to achieve the company objectives\textsuperscript{141}.

According to Chowdhury (1982) marketing would imply an ongoing
process of discovering and translating consumer needs and desires into products

\textsuperscript{138}C.Dahl., Dale and Jerome N. Hammand, \textit{Market and Price Analysis} – The
\textsuperscript{139}K.Ramamoorthy, and N. Srinivasan, \textit{An Economic Enquiry into Problems of
Production and Marketing of Tomato in Coimbatore Taluk,}” (Unpublished Project
Report, Department of Agricultural Economics, Tamil Nadu Agricultural University,
\textsuperscript{140}K.T.Thomas, “ Marketing Concepts”, \textit{Marketing Management}, 7 (3) : 44–43,
1975.
\textsuperscript{141}Raston, S. Davar, \textit{Modern Marketing Management}, (Bombay; Progressive
Corporation Private Ltd., 1979), p.5
and services, serving the consumer demand with the help of marketing channels and in turn expanding the market even in the face of keen competitions.\textsuperscript{142}

Yadav (1995) viewed marketing as a system of inter related activities designed to develop price, promote and distribute goods and services to groups of consumers.\textsuperscript{143}

Sarawat and Vaidya (1995) in their study defined marketing system as the mix of activities in the transfer of produce from growers to final consumers.\textsuperscript{144}

Kumar et al., (1997) viewed marketing system as the chain of various functions performed by the market functionaries in order to transfer the produce from producer to ultimate consumer. The system included picking, assembling, grading, packing and transporting functions.\textsuperscript{145}

Star et al., (1997) defined marketing as the process through which a business institution, enterprise or organization would select target customers or

constituents, assess the needs or wants of such target consumers and manage its resources to satisfy those customers’ needs or wants\textsuperscript{146}.

According to Chinnappa (1998) marketing would connote different stages at which farmers would convert their hard labour, sacrifice and other inputs into cash. It would start with decision making to produce a particular crop and would involve all operations in moving the produce from producer to consumer\textsuperscript{147}.

Kotler (1998) defined marketing as a social and managerial process by which individuals and groups would obtain what they need and want through creating and exchanging the products and value with others\textsuperscript{148}.

In the present study marketing of banana is defined as all the business activities performed by producers and intermediaries, namely pre-harvest contractors wholesalers and retailers to facilitate the transfer from the producers to the ultimate consumers.


f) **Marketing Cost**

According to Kulkarni (1964) marketing cost included handling charges and local taxes, assembling charges, transport charges, handling by wholesalers and retailing charges to consumers\(^{149}\).

Schmitz (1964) described marketing costs as the difference between the final price paid by the consumer for a commodity and the price received by the grower of crops or the primary producer\(^{150}\).

Jain (1971) defined marketing cost as the actual expenses required in bringing goods and services from the producer to the consumer\(^{151}\).

Dhull and Gangwar (1973) defined marketing cost as a sum of all costs incurred by each agency involved in the marketing channel for performing their functions. This included transportation, loading and unloading, weighing, clearing, octroi, market fee, commission, sales tax, processing cost and wastage\(^{152}\).


According to Moore et al., (1973) marketing cost would denote the actual expenses incurred in marketing process. They included not only the cost of performing various marketing functions, but also the taxes and assessments as well\textsuperscript{153}.

Singh et al., (1974) were of the view that marketing cost included the cost of transportation, labour including weighing, taxes such as octroi, market fee and sales tax, commission and brokerage and deduction and other storage, transport and insect damage\textsuperscript{154}.

Naik and Patnaik (1983) defined marketing cost as the actual expenses incurred by the producers and other intermediaries in bringing goods and services to the consumer\textsuperscript{155}.

According to Easwaran (1985) marketing cost was the cost involved in transportation, processing, storage and all other expenses incurred in bringing the produce from the producer to the ultimate consumer and in this sense it was the price spread less the margin earned by all the intermediaries\textsuperscript{156}.


\textsuperscript{156}K.Easwaran, \textit{A Study on Marketing of Turmeric in Erode Block of Periyar District}, (Unpublished M.Sc. (Ag.) Thesis submitted to Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore, 1985).P.24.
Acharya and Agarwal (1987) defined marketing cost as the cost involved in moving the product from the point of production to the point of consumption, namely the cost of performing the various market functions and of operating various agencies.\textsuperscript{157}

Sumathi (1992) considered marketing cost as the cost involved in packing, transportation and commission charges and all other expenses in bringing grapes from the grower to the ultimate consumer\textsuperscript{158}.

According to Singh et al., (1994) marketing cost would indicate the difference between the price received by its producer and price paid by the final consumer in a more or less perfect market. It included the cost of transportation, labour, taxes such as octroi, market fee, sales tax, commission and brokerage deductions and other storage and insect damages\textsuperscript{159}.

\textsuperscript{158}P. Sumathi, \textit{An Economic Analysis of Production and Marketing of Grapes in Thondamuthur block, Coimbatore District},” (Unpublished M.Sc. (Ag.) Thesis submitted to Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore, 1992), p.31.
According to Nawadkar et al., (1995) marketing cost constituted the expenses on items like packing, transportation, hamali, weighing charges, commission, market rent and postage.\textsuperscript{160}

According to Sivakumar (1996) marketing cost would include all those expenditure incurred by farmers and all intermediates in bringing out the produce from farm gate to the exporters. It included commission charges, transport, storage cost, loading and unloading, weighing and establishment charges\textsuperscript{161}.

According to Mukherjee and Shajahan (1998) the marketing cost included market tax, transport, wastage and rent.\textsuperscript{162}

In the present study, marketing cost is defined as the actual expenses incurred by farmers and other agencies such as pre – harvest contractors, wholesalers and retailers in the movement of banana from the farmers to the final users.

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g) Marketing Margin

Thomson (1951) referred to marketing margin as the difference between the values of physical quantity equivalent at different levels of marketing. This is essentially the same as the difference between the prices paid and received by any specific marketing agency\textsuperscript{163}.

According to Shah (1965), since marketing involved an element of time, the price prevailing at the time of first purchase and the price prevailing at the time of last sale of a particular lot or the entire supply would provide the proper basis for the measurement of marketing margin. Another method of estimating marketing margin is to calculate the difference in price between two markets on a vertical scale, the primary and terminal markets at a given point of time\textsuperscript{164}.

According to Singh and Kahlon (1969) marketing margin referred to the difference between values of physical quantity equivalent at different levels of marketing represented by the spread between the prices paid and received by any specific marketing agency.

Moore et al., (1973) were of the view that marketing margins are the actual amounts received by the marketing agencies in the marketing process. In


competitive markets, marketing costs (including normal profits) and margins were the same in the long run. In the short period, marketing costs might be greater or lesser than marketing margin depending upon how well traders anticipated price change\textsuperscript{165}.

Ramamoorthy and Srinivasan (1975) argued that marketing margin represented the income to the marketing agencies that might themselves pay out most of their margin to cover their own costs, the price they paid for labour and equipment and relatively small proportions as a reward for management’s expertise and risk bearing\textsuperscript{166}.

Thakur (1975) viewed that the marketing margin would include marketing cost as well as profit margin of the intermediaries in the channel\textsuperscript{167}.

According to Sinha et al., (1979), the marketing margin included all costs of assembling, processing, storage, transportation, handling, wholesaling and retailing in the whole process of marketing, namely moving the produce from the farmer to the ultimate consumer\textsuperscript{168}.

\textsuperscript{165} John R.Moore, Johl.S.Sardar and M.Kushro Ali, \textit{op. cit.}, p.195
\textsuperscript{166} K.Ramamoorthy and N.Srinivasan, \textit{op.cit.}, p.24.
Khol and Uhl (1880) defined marketing margin as the difference between the amount consumer paid for the final products and the amount producer received and all the marketing costs\textsuperscript{169}.

Dhondyal (1981) stated that the marketing margin covered all the expenses and profits of the marketing agencies or functionaries\textsuperscript{170}.

Tomilyao and Adekany (1982) opined that marketing margin would usually refer to net margin indicating the difference between the price paid and marketing cost\textsuperscript{171}.

Swarup et. al., (1985) defined marketing margin as the difference between price paid by the ultimate consumers and that received by the farmers. Marketing margin included all costs of assembling, grading, packing, transportation, handling, processing, storage, wholesaling and retailing in the whole process of marketing\textsuperscript{172}.

According to Saraswat and Vaidya (1995) the marketing margin would include all the costs of picking, assembling, grading, packing, transport, processing, storage, wholesaling and retailing\textsuperscript{173}.

According to Kerur et al., (1998) marketing margin would measure the gap between the net price received by the cultivator and the price paid by the consumer\textsuperscript{174}.

In the present study, marketing margin has been defined as the amount received by the different marketing agencies to perform their stipulated functions.

\textbf{Price spread}

According to Microbandani and Faruqui (1965), price spread meant the difference between the price paid by the consumers and the price received by the producers. It involved not only the ascertainment of actual prices at various stages of marketing channels, but also the costs incurred in the process of movement of the produce from the farm to the consumer and the margins of various intermediaries\textsuperscript{175}.

\textsuperscript{173}S.P.Sarawat and C.S.Vaidya, \textit{op. cit.}, pp.141-200


Bell (1966) conceptualized price spread as the difference between the two values of the products at the farm and retail levels\textsuperscript{176}.

Krishnaswamy et al., (1968) remarked that the price spread would include various costs incurred and margins of intermediaries in the marketing processes such as those of assembling, processing, storage, transport, wholesaling and retailing\textsuperscript{177}.

Singh and George (1970) defined price spread as the difference between the price received by the producers and the price paid for it by the consumer. It would include marketing costs incurred and marketing margins earned or lost in the movement of the produce from primary source to the ultimate consumer\textsuperscript{178}.

According to Jain (1971), price spread was a term applied, sometimes, to an absolute margin, particularly one representing the combined margins of several types of dealers. Thus the ‘farm retail price spread’ would refer to the difference between the retail price and the price received by the farmers for an equivalent quantity of farm produce. The breakdown of consumers’ rupee would indicate a series of figures representing the average absolute margins of different type of middlemen or assignable to different marketing functions divided by the retail

\textsuperscript{177} L.Krishnaswamy, Harinarain and Vijayakumar, “A Study on Price Spread in Wheat in Rajasthan”, \textit{Agricultural Situation in India}, 23(4): 317-324, 1968.
price and the breakdown could give an idea of over all margin or price spread from one agency to another and when added up it would take the form of marketing cost\textsuperscript{179}.

George (1972) defined price spread as the cost incurred and profit gained by the agencies involved. The charges included payments for services like assembling, storage, transportation, wholesaling and retailing\textsuperscript{180}.

Krishnamoorthy et al., (1972) viewed that price spread would be a composite of various costs incurred and margin of intermediaries in the various processes such as those of assembling, processing, storage, transport and retailing\textsuperscript{181}.

Ram and Swarup (1974) considered that farm – consumer spread as the difference between the price received by the farm producer and that paid by the consumer. The spread thus included costs incurred and margins earned or lost in the process of bringing the produce from grower to consumer\textsuperscript{182}.

According to Arora and Patel (1976) price spread indicated the difference between the two prices ie., one paid by the consumer and the one received by the

\textsuperscript{179}S.C.Jain, \textit{op. cit.}, 36.
\textsuperscript{180}P.S.George, “Role of Price spreads in determining Agricultural Price Policy”, \textit{Agricultural Situation in India}, 27 (9) : 617 – 619, 1972.
\textsuperscript{182}Gowri Shankar Ram and B.Swarup, “Marketing Cost, Margin and Efficiency in Regulated Market”, \textit{Agricultural Marketing}, 17(2):12, 1974.
producer. The study of price spread involved ascertaining actual prices at various stages of marketing channels and costs incurred in the process of movement of produce to the consumer and the margin of various intermediates\textsuperscript{183}.

Ranghubhanashi and Gupta (1979) referred to price spread as the difference between the price paid by the consumers and the price received by the producers\textsuperscript{184}.

Sidhu and Rangi (1979) defined price spread as the difference between the price paid by the consumer and price received by the producer for an equivalent quantity of farm produce. The spread consisted of marketing and incidental costs and margins of the intermediaries, which ultimately determined the overall effectiveness of marketing system\textsuperscript{185}.

According to Singh and Balister (1981), the price spread referred to the difference between the prices received by the producer for an equivalent quantity of farm products. This spread or margin included all types of costs of moving the produce from the point of production to the place of consumption\textsuperscript{186}.

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According to Desai (1984), price spread would be a broad spectrum, which disclosed the properties of the various components of marketing cost of the produce and thus explained the variance between the price paid by the consumer and the price received by the producer\(^{187}\).

Acharya and Agarwal (1994) defined price spread as the gross margin of marketing in the marketing of the commodities and would be measured as absolute or percentage differences in the price paid by the consumer and the price received by the farmer\(^{188}\).

Sharma and Tewari (1995) described price spread in relation to the agricultural commodities as the difference between the price paid by the ultimate consumer and price received by the grower for an equivalent amount of farm produce. This spread would consist of marketing cost and marketing margin of intermediaries\(^ {189}\).

\(^{188}\)S.S.Acharya and N.L.Agarwal, op. cit., p.54.
According to Bhatia (1996) price spread of a commodity would be the magnitude of difference between the price paid by the ultimate consumer and price received by the primary producer\(^{190}\).

According to Venkataramana and Gowda (1996) price spread is one of the important measures of marketing efficiency, which would indicate the share of the producer in the consumer’s rupee. It would also indicate the shares of various market intermediaries in the consumer’s rupee for the services rendered by them in channeling the commodity from the producer to the consumer\(^{191}\).

According to Kumar et al., (1997) the price spread would refer to the difference between the price paid by the consumer and the price received by the producer per unit of a commodity\(^{192}\).

Maheswarappa et al., (1998) described price spread as the difference between the price paid by the ultimate consumer and price received by the grower for an equivalent quantity of farm produce\(^{193}\).


\(^{193}\)B.O.Maheswarappa, L.B.Kunnal and S.M.Patil, op. cit., p.23
In the present study, price spread is defined as the difference between price paid by the ultimate consumer and the price received by the banana grower. It included the costs and margins of different agencies. The costs would comprise the costs of assembling, transportation, handling, packing, commission charges, taxes and market fee. The margin would include the returns to the pre harvest contractors, wholesalers, retailers and others for the performance of their functions.

i) Marketing Efficiency

Clark (1954) defined marketing efficiency as one having the following three components\(^{194}\).

(i) The effectiveness with which a marketing service would be performed;
(ii) The effect at which the service would be performed; and
(iii) The effect of the cost and method of performing the service on the production and consumption.

Of the three components, the last two are the most important because the satisfaction of the consumer at the lowest possible cost must go hand in hand with the maintenance of high volume of farm output.

Shepherd (1962) defined marketing efficiency as the ratio of total costs to total volume of the products (in percentage terms). The lower the ratio, the higher would be the efficiency and vice versa\textsuperscript{195}.

Jasdanwalla (1966) defined marketing efficiency as the effectiveness or competence with which a market structure would perform its designated functions\textsuperscript{196}.

Jain (1971) defined marketing efficiency as the maximization of consumers satisfaction with the least cost incurred in providing satisfaction through the system of marketing\textsuperscript{197}.

According to Moore et al., (1975), for maximizing efficiency in the performance of a farm / firm involves fulfilling the following conditions\textsuperscript{198}:

i. using the least cost combination of factors in the various business activities. At this point, the return from the last rupee spent on each production factor would be the same.

ii. Using the most efficient production techniques and most satisfactory methods of administrative organization available.

iii. Operating the farms / firms at ‘normal’ levels of profit.

\textsuperscript{197}S.C.Jain, \textit{op. cit.}, p.72
\textsuperscript{198}John R.Moore, Johl.S.Sardar and M.Khusro Ali, \textit{op. cit.}, p.197
Bhatia and Ram (1977) related marketing efficiency through the analysis of structure, conduct and performance of market\textsuperscript{199}.

Desai (1984) assessed the efficacy or efficiency of marketing of agricultural products by the size of the share which the producer obtains in the ultimate price paid by the consumer\textsuperscript{200}.

Khols and Uhl (1980) defined marketing efficiency as the ratio of market output (satisfaction) to the marketing input (cost resources). An increase in this ratio would represent improved efficiency and vice – versa. A reduction in the cost for the same level of satisfaction or an increase in satisfaction at a given cost would result in an improvement of efficiency\textsuperscript{201}.

Ramamoorthy (1982) opined that marketing efficiency must be determined by the marketing margin received by each intermediary and their proportion to the consumer’s price\textsuperscript{202}.

Jaya Anand (1991) in her study defined marketing efficiency as the maximization of consumer satisfaction with the least cost incurred in providing the satisfaction. She indicated that the cooperative marketing societies should take

\textsuperscript{201}R.L.Khols and Jose P.N.Uhl, \textit{op. cit.}, p.29.
\textsuperscript{202}K.Ramamoorthy, \textit{op. cit.}, p.23
the advantage of price fluctuation in order to give better price to the producer and stressed the need for revising the selling policy of cooperatives so as to earn more profit and pay the producers remunerative price\textsuperscript{203}.

According to Kumar et al., (1997) marketing efficiency would be referred in terms of average price received as well as the share in consumer’s price\textsuperscript{204}.

Bilonikar et al., (1998) defined marketing efficiency as effectiveness of the marketing system with which it operates\textsuperscript{205}.

In the present study, the effectiveness of market to perform various functions is reckoned as marketing efficiency.

\textbf{2.2 BRIEF REVIEW OF PAST STUDIES}

\textbf{i) Production Aspects}

Adhinayana (1968) took up a study on production and marketing of chillies in Bapatla block of Andhrapradesh. He found that land and human labours were positively related with yield and found to contribute significantly.

\textsuperscript{204}P.Awadesh Kumar, P.Dubey and Ashok Kumar, \textit{op. cit.}, p.426.
He concluded that the negative response of yield to plant protection might be due to indiscriminate use of pesticides.\footnote{L.Adhinarayanan, \textit{A Study on Production and Marketing of Chillies in Bapatla Block of Andhra Pradesh}, (Unpublished M.Sc. (Ag.) Thesis submitted to Department of Agricultural Economics, University of Madras 1968).p.23.}

Saini (1969) evaluated the efficiency with which the farmers used their resources to achieve the highest net return in production. A resource or input factor was considered to be used most effectively if its marginal value product was just sufficient to offset its cost. Equality of marginal value product to factor cost was therefore the basic condition that must be satisfied to obtain efficient resource use.\footnote{G.R.Saini, “Resource Use Efficiency in Agriculture,” \textit{Indian Journal of Agricultural Economics}, 24(2) : 1-8, 1969.}

Jayaprakasam (1973) took up a study on the production and marketing of chillies in Oddanchatram block of Madurai district and concluded that human labour influenced the yield significantly in dry chillies and in general the farms have exhibited constant returns to scale.\footnote{S.Jayaprakasam, \textit{Study on the Production and Marketing of chillies in Oddanchatram Block of Madurai District – Tamil Nadu}, (Unpublished M.Sc. (Ag.) Thesis submitted to Department of Agricultural Economics, Tamil Nadu Agricultural University, Coimbatore, 1973).p.36.}

Peter (1974) analysed input–output relationship in banana plantation in Kanyakumari district. He estimated the ratio of marginal value productivities and
marginal costs of inputs and found that output was highly responsive to manures and fertilizers\textsuperscript{209}.

Singh and Patel (1974) studied the resource productivity and allocation efficiency in western Uttar Pradesh and concluded that in small farmers, fertilizers and human labour had significant influence on gross return per standard hectare\textsuperscript{210}.

Singh (1978) studied resource allocation in the farms in eastern Uttar Pradesh on the basis of competitive market criteria. The allocative efficiency was tested by calculating the mean difference between the marginal value products and factor costs. It was found that factors were not most economically allocated as the mean difference between the marginal value products and factor cost was significantly different. In order to promote the allocative efficiency of resources in farm, he suggested better irrigation facility and education of farmers to introduce new technology\textsuperscript{211}.

Vaidyanathan (1980) expressed the non-significant contribution of rainfall towards yield. He estimated the growth rates yield of cereals in Tamil Nadu relating rainfall, inputs and time in the double log form and found that a major

\textsuperscript{209}D.Peter, “Input-Output relations of Banana plantations in Kanyakumari District, Tamil Nadu”, \textit{Indian Journal of Agricultural Economics}, 34 (4) : 211, 1979.


part of the explained variables was attributed to time, while inputs and rainfall accounted for a relatively small fraction of variation in yield\textsuperscript{212}.

Sadhu and Mahajan (1981) fitted Cobb-Douglas production function to test production efficiency of individual input in aggregate enterprise. The gross output was taken as dependent variable and the independent variables used were operational area, human labour, bullock labour, tractor hours, value of manures and fertilizers, working expenses and fixed capital\textsuperscript{213}.

Mahatkar and Pant (1984) conducted a study on farm profitability and resource productivity in cultivation of chillies in Chhinndwara district of Madhya Pradesh and observed that area under chillies, plough unit (in days), expenditure on manures and fertilizers, irrigation and pesticides were significantly influencing the gross income from chillies\textsuperscript{214}.

Banarjee (1985) assessed the exact relationship between farm size and productivity in India from the point of view of both average and total output. Classification on the basis of value of output per hectare, however, revealed a clear inverse relationship between farm size and productivity. Cropping intensity,

\textsuperscript{213}A.N. Sadhu, and R.K. Mahajan,” Economic Efficiency of Agricultural Resources - An Inter Regional Analysis”, Agricultural Situation in India, 36(2) : 98 – 104, 198.
fertilizer used per hectare, paid out cost and percentage of area irrigated to gross cropped area were the factors responsible for the inverse relationship between farm size and productivity. It was also observed that marginal and small farmers were the most efficient in using the variable resource\textsuperscript{215}.

Das (1988) analysed production separately for high yielding and locally improved rice varieties in Sambalpur district of Orissa. The significant values of elasticity for fertilizer in both the equations suggested that fertilizer exerted greater influences on output of the varieties under question\textsuperscript{216}.

Ali and Flinn (1989) conducted a study in Pakistan’s Punjab and concluded that the profit of rice farmers could be increased by 28 per cent through improved efficiency, which was positively related to education and time lieu of input use\textsuperscript{217}.

Joginder and Joginder (1990) fitted linear and Cobb–Douglas production function and found that the use of fertilizers was the most important factor for providing inputs to crop productivity in the state of Punjab. Next to fertilizers, area under high yielding varieties contributed significantly to productivity.


Though the input use of tractor showed positive sign, the same was not statistically significant\textsuperscript{218}.

Sharma et al (1992) analysed the economic efficiency in bullock and tractor operated farms of Aligarh district of Uttar Pradesh. They showed that the net income earned from crop production activity on tractor farms was higher than that of bullock operated farms by 16 and 39 percent respectively in medium and large farms. Tractor farms registered higher marginal value products for resources like human labour, manures and fertilizers, irrigation and land\textsuperscript{219}.

Shanmugam and Palanisami (1993) discussed the methodological approach applying frontier production function to measure the economic efficiency, since it was free of effects due to outliers. The production function was first estimated by ordinary least squares (OLS) method. Then it was transformed into deterministic frontier production function. The probabilistic function coefficients used in estimating efficiency were obtained after deleting outliers observation until the estimate coefficients were stabilized. The study implied that the rice output of average farmer could be increased by 26 per cent by adopting the technology


followed by the ‘best practice’ farmers. By optimum resource allocation, there existed a scope to raise output by five percent\textsuperscript{220}.

ii) Technical Efficiency

Technical efficiency refers to the proper choice of production function among all those actively in use by farms.

Farrel (1997) used the concept of efficient production frontier, which was defined as the locus of minimum combination of inputs that could produce one amount of output given a level of technology. He employed a deterministic approach in which cost frontier was estimated by using linear programming enquiring all observation to lie on or above the frontier\textsuperscript{221}.

Timmer (1971) circumvented the problems by using a probabilistic frontier function. His approach suggested decision of better observation, one at a time, to avoid spurious errors due to extreme observation until the resulting coefficients stabilize. Timmer’s approach yielded a frontier, which was probabilistic rather than deterministic or stochastic\textsuperscript{222}.

Schmidt and Lovell (1979) explained technical inefficiency as the inability to produce the maximum output from given inputs and a allocative efficiency as the inability to combine inputs in optimum proportion given the input price. Brock et al., (1980) had indicated that the key question when defining the frontier function concept is whether to allow actual observation to the above frontier or otherwise. The frontier is called deterministic, if all the observation are on or below the frontier and stochastic if observation are above the frontier then it was due to random events.

Kutaula (1983) analysed the efficiency of farmers who had cultivated wheat in reclaimed soil by applying frontier technique. The technical efficiency was estimated to be 0.7636 and hence the concluded that the yield could be increased upto 23.64 per cent by adopting technically efficient production plan. This increase in production could be achieved without involving additional cost.

According to Tyagi (1984), the farm with higher profits within a certain specified range of output and input prices would be considered to be economically more efficient within that range of prices. Alternative efficiency would be

\[^{225}\text{S.S.Kutaula, ”Application of Frontier Technology to Wheat Crop Growth on Reclaimed Soils”: Indian Journal of Agricultural Economics, 48 (2) : 226 – 236.1993.}\]
measured in terms of value of marginal production of each variable input and its prices.\textsuperscript{226}

Ureta and Rieger (1990) indicated that the key feature of the stochastic production frontier is that the disturbance term is composed of two parts viz., a symmetric and one-sided component. The symmetric component captures the random effects outside the control of the decision maker including the statistical noise contained in every empirical relationship. The one sided component captures derivations from the frontier due to inefficiency. They also said that the biggest advantage of the stochastic production frontier model is the introduction of a disturbance term representing noise, measurement error and exogenous shocks beyond the control of the production unit in addition to the efficiency component.\textsuperscript{227}

Battese (1992) defined technical efficiency of the given farm as the factor by which the level of production for the firm is less than the frontier output.\textsuperscript{228}

Jayaraman et al., (1992) referred technical efficiency as the maximum possible yield achievable with a given level of input use. They analyzed the

technical efficiency among the rice-growing farmers in Mandya district of Karnataka by using the frontier production function. The study revealed that there existed overuse of resources in the production of rice and it was found to be highly inefficient. The large farmers were found to be more efficient than small farmers. The highly inefficient use of resources particularly in the case of small farmers suggested improper pricing of resources such as fertilizer and irrigation leading to wastage.229

Shanmugam and Palanisami (1993) discussed the methodological approach applying frontier production function to measure the economic efficiency of rice farmers in Kamaraj district of Tamil Nadu. Timmer’s probabilistic frontier function was used for estimating efficiency measure, since it was free of effects due to outlier. The production function was first estimated by OLS method. Then it was transformed into deterministic frontier production function. The probabilistic function coefficients used in estimating efficiencies were obtained after deleting outlier observation until the estimated coefficients were stabilized. The OLS estimates implied that fertilizers, irrigation and plant protection were significant factors of production in rice farms. It might be due to underuse of resources by the average farmers. The OLS function portrayed the response of the average farmer while the frontier function reflected the response of the “best

practice farmers”. The study implied that the rice output of “average farmer” could be increased by 26 percent by adopting the technology followed by the “best practice farmers”. By optimum allocation of resources there existed a scope to raise output by five percent. The economic efficiency revealed that the production could be raised by 28.7 percent if technology gaps between average and best practice farmers were narrowed and also by optimum resource allocation in all farms\(^{230}\).

Battese and Tessema (1993) used stochastic frontier production function with time varying technical efficiencies using panel data from ICRISAT’s village level studies in three Indian villages. The variables used were total value of output in rupees as dependent variable and total land under irrigated and unirrigated under production, labourers used in hours and bullock labour used in hours as independent variables\(^{231}\).

Sasmal (1993) used generalized stochastic formulation for production function estimation. The production functions were estimated empirically for high yielding Paddy variety by a field survey in 14 villages in Midnapore district of West Bengal. It was found that the marginal effects of inputs on mean output and variance of output were independent i.e., an input, which had positive


marginal effect on mean production, need not have similar effect on the risk of products. The inputs like fertilizers, pesticides and labour had significant impact on mean output of paddy both in rainy and dry seasons. Mean output was higher and variance of output was lower in the dry season than in the rainy season because the physical environment and the weather conditions in the dry season were more appreciate for the cultivation of high yielding variety paddy.

Banik (1994) used Cobb–Douglas form of stochastic frontier model with cross sectional data of 99 paddy farms in Bangladesh to estimate the technical efficiency of individual farms. The variables included in the analysis were value of output per acre as the dependent variable and human labour as labours hours per acre, total expenditure per acre on attached human labour etc., as independent variables. Maximum livelihood estimates was used to estimate the parameters. An interesting finding of the study was that ten out of 13 most efficient farms belonged to the category of small farms. It was also observed that the average technical efficiency of owner - tenant farms was higher than that of owner farms.

Latha (1994) used stochastic frontier function to evaluate the comparative economic efficiency of different categories of irrigated farms pertaining to

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coconut and areca nut in order to highlight the comparative advantage of each for improving technical as well as allocative efficiencies by adopting optional resource allocation. Frontier production functions were estimated using Corrected Ordinary Least Squares (COLS) methods by first estimating Cobb – Douglas production function and then by correcting the constant term by a correction factor worked out from the moments of the residuals. The variables included in the analysis were labour measured in mandays, fertilizer cost in rupees per hectare, manures cost in rupees per hectare and irrigation measured in M$^3$ per hectare per annum$^{234}$.

Kumbhakar (1994) defined the production frontier as the locus of maximum possible outputs for each level of input use. A producer is said to be technically efficient, if the observed output was maximum, given the input quantities and a failure on the part of farm to produce the frontier levels of output, given the input quantities is attributed o technical inefficiency$^{235}$.

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Belen and Manuel (1997) referred technical efficiency as the achievement of the maximum potential output from a given quantity of inputs, taking into account physical production relationships\textsuperscript{236}.

Kalirajan and Shand (1997) measured technical efficiency as the ratio of observed output to potential output. Although there is no a priori theoretical reasoning in the stochastic framework of measuring technical efficiency, the potential output is defined as the natural shift from the observed output\textsuperscript{237}.

Rajasekharan and Krishnamoorthy (1998) measured the technical efficiency and analyzed pesticide use in rice production in the Thrissur Kole lands of Kerala. The technical efficiency in production was estimated by using the Cobb – Douglass form of stochastic frontier production function. The estimation of stochastic production function made it possible to find out whether the deviation in technical efficiencies from the frontier output was due to farm specific factors or due to external random factors. The variance ratio showed that the farm specific variability contributed more to the variation in yield among farmers. They concluded that 88 percent of the differences between the observed and the maximum production frontier outputs were due to differences in farmers’


\textsuperscript{237}K.P. Kalirajan and R.T. Shand, \textit{op. cit.}, p.27.
level of technical efficiency and not related to random variability. The individual technical efficiencies varied between 0.49 and 0.92\(^{238}\).

Singh and Naresh kumar (1998) analysed the efficiency of farmers in rice crop in Punjab, using frontier production function. The levels of technical efficiency achieved by the individual farmers were worked out using Timmer’s indices. Technical efficiency was very high in Ludhiana, district and the least in Hoshiarpur district. The results showed that 20 percent of the farmers had technical efficiency below 60 per cent and 40 per cent had 60 to 70 percent efficiency and the same proportion had 70 to 80 percent efficiency in Hoshiarpur. In Ludhiana, 94 per cent of the farmers showed technical efficiency of 80 to 90 per cent and the remaining six percent had technical efficiency ranged from 90 to 100 percent. There was considerable diversity in technical efficiency within the groups of small, medium and large farmers. The average technical efficiency for medium and large farmers was 78 per cent as compared to 73 per cent for small farmers\(^{239}\).

Hazarika and Subramanian (1999) analyzed the technical efficiency of tea industry in Assam using the stochastic frontier production model. It was found that 29.41 per cent of the total farms operated large estates belonged to the most efficient category (96 to 99 percent) and 8.82 percent in the least efficient group.


(64 to 70 percent). It was also observed that the technical efficiency varied between 0.64 and 0.89 with mean technical efficiency of 0.88.\textsuperscript{240}

Mythili and Shanmugam (2000) estimated the technical efficiency of individual farmers using an unbalanced panel data of 234 rice farms in Tamil Nadu. The maximum likelihood estimate showed that the technical efficiency varied widely from 46.5 to 96.7 per cent across the sample farms and it was time invariant. The mean technical efficiency was found to be 82 per cent indicating that, on an average, the realized output could be increased by 18 per cent without involving additional resources.\textsuperscript{241}

Renuka (2001) estimated the level of technical efficiency using stochastic frontier model. Her study focused on the role of input utilization in paddy cultivation in the eighties and the early nineties in West Bengal and Orissa. The study revealed that input productivity has indeed played an important role in the growth performance in the 1980’s and early 1990s while growth in inputs and total factor productivity together contributed significantly to the output growth in both the states and the performance in West Bengal was found to be better than that of Orissa. The improvement in the input productivity in West Bengal was


brought about both by efficiency and technology in the presence of variations across seasons and seed varieties\(^{242}\).

Jayachandran (2002) estimated the level of technical efficiency in maize cultivation in Dindigul district of Tamil Nadu. The maximum likelihood estimate for irrigated and rainfed maize were found to be 0.89 and 0.90 respectively indicating that actual maize yield was 11 and 10 per cent less than the maximum possible output and as such there existed greater scope for increasing the production at the exciting level of inputs of inputs use in the study area\(^{243}\).

Sijesh (2003) estimated the mean technical efficiency of rubber farms in Kerala as 74.96 per cent, which indicated that the yield of rubber could still be increased by 25.04 per cent through the adoption of technically efficient plant. The allocative and economic efficiency of rubber farms was found to be 77.60 and 58.70 per cent respectively\(^{244}\).


From the forgoing review, it is evident that there exists scope to take up efficiency analysis in banana cultivation. In the present study, stochastic frontier production function is used to study the technical efficiency of banana farmers.

iii) Marketing Aspects

Abeysekara and Senanayaka (1974) studied vegetable production and marketing in four villages in Palugana of Srilanka. According to them, the price gap between the producers and consumers can be reduced by alternative marketing channels and establishing village level purchasing centres.

Gupta and Ram (1979) studied the behaviour of marketing margins and cost of vegetables in Delhi. Their analysis showed that the producers received a very low share (58 per cent) in the consumer price whereas the relative margin and marketing costs were quite substantial each appropriating one – fourth of the consumers rupee. Location played an important role in influencing retail margin. Transport, packing and labour expenses were the other major components of marketing cost.

Prasad (1979) in his study on selected vegetables in Bangalore city found the wider price spread. The producer’s share in the consumer’s rupee was as low


as 58.90 percent for beans, 55.20 percent for cabbage and 58.47 percent for brinjal. Since commission agents were making huge profits he emphasized the need for reducing the commission fee in order to narrow down the price spread and increase the producer’s share in the consumer’s rupee²⁴⁷.

Pandey et al (1979) studied the price spread for paddy, potato and wheat and concluded that the producer’s share in consumer’s price for paddy, potato and wheat were of 49, 58 ad 80 percent respectively. The net price received by the farmers had a negative and significant relationship with the marketed surplus²⁴⁸.

Sha and Rao (1979) in their study on price spread in groundnut marketing concluded that by forming Integrated Oil Seeds Cooperative, a higher share of value added could be transferred to the farmers²⁴⁹.

In their study on price spread of important food grains in two agricultural markets of Bihar. Sinha et al (1979) adopted two methods - concurrent margins and lagged margins and observed that the producer’s share in the consumer’s price in different food grains at Muzzafarpur market varied between 76.13 and


81.68 per cent whereas at Chalukia market, the variation was between 79. 96 and 91.93 per cent.\textsuperscript{250}

Prasad (1980) in his study on price spread for paddy and wheat found that the producer’s share in consumer’s price was low due to the presence of a large number of middlemen and among the different items of costs, the share of transportation was the highest.\textsuperscript{251}

Shete et al., (1980) in their study on measurement of price spread in tomatoes concluded that among marketing costs, transport, grading and labour costs and payment of cess were the major items. Besides the share of intermediaries was also considerably high.\textsuperscript{252}

Nagi and Thakur (1981) found that 60 percent of the consumer’s price formed costs and margins and producers got only about 40 per cent in the marketing of plums in Himachal Pradesh.\textsuperscript{253}

Concurrent margin approach of price spread was used to estimate the price spread of bhendi by Ramasamy (1981) in his studies on problems in production and marketing of vegetables in Coimbatore district. The share of the producer in

\textsuperscript{250}S.P.Sinha, Ajay kumar, Jagadish Prasad and P.C.pandey, op. cit., p. 64.

\textsuperscript{251}A.Prasad, “Price spread for paddy and wheat in Allahabad District”, \textit{Agricultural Marketing}, 23 (2) : 5 – 7 , 1980.


the consumer’s rupee was only 38 per cent. The wholesaler’s margin was estimated to be 25 percent of consumer’s rupee. The retailer’s margin varied between 12 and 14 percent and the margin retained by commission agent varied from 3.37 to 5.41 per cent\textsuperscript{254}.

Sharma and Sharma (1981) studied the marketing channels and price spread in temperate fruits in Almora and found that producer’s share in consumer’s rupee was the highest because of direct dealing between producers and consumer\textsuperscript{255}.

Aiyasamy (1983) in his study on marketing of tomato in Thyagi kumaran market of Coimbatore concluded that the height of the price depended on the extent of market services and also found that pricing in the market was inefficient due to concentration of market power by a few large traders\textsuperscript{256}.

Naik and Patnaik (1983) studied the marketing costs and price spread between different agencies in Orissa and the study revealed that the marketing of potato resulted in the participation of a number of middlemen between the

\textsuperscript{254}\textsuperscript{C.Ramasamy, Problems in Production and Marketing of Major Vegetables in Coimbatore District – (ii). Bhendi (Research Report, Centre for Agricultural and Rural Department Studies, Tamil Nadu Agricultural University, Coimbatore, 1981), p.13.}

\textsuperscript{255}\textsuperscript{A.N. Sharma and V.K. Sharma, “Marketing Channels and Price Spread in Temperature fruits in Almora”, Indian Farmers Digest, 14 (5) :30 – 34, 1981.}

\textsuperscript{256}\textsuperscript{P.K.Aiyasamy, Efficiency in Agricultural Marketing, Paper presented at the Seminar on Changing Structure of Agricultural Marketing in India, At the Institute of Development studies, Mysore, May 1983.p.5.}
producers and ultimate consumers. Marketing costs and profit margins received by the intermediaries were found to be unduly high\textsuperscript{257}.

Sen (1984) studied the problems of potato marketing in West Bengal and observed that the major benefits went to the private traders at the cost of the growers. The traders and cold storage owners purchased the potatoes for getting higher price at lean season. His findings revealed that cold storage had provided the middlemen and traders an opportunity to manipulate prices in the lean months\textsuperscript{258}.

Srivastava (1984) in his study on the price spread of vegetables observed that the retailer’s share increased with an increase in consumer’s price, whereas the producer’s share decreased with an increase in consumer’s price. He concluded that the benefit derived from an increase in the consumers price did not reach the producer since it was absorbed only by the retailers\textsuperscript{259}.

Nagaraj et al (1985) in their market appraisal for a few fruits and vegetables worked out the share of consumer rupee at different stages of marketing. The share of producer in the consumer’s rupee ranged from 37 to 68

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\textsuperscript{257}D.Naik and D.C.Patnaik, \textit{op. cit.}, p.12.
\textsuperscript{258}Anandamoy Sen, ”The problems of Potato Marketing – A case study in West Bengal”, \textit{Indian Journal of Agricultural Economics} 39 (3) : 239, 1984.
\end{flushright}
percent. The share for vegetables was found to be higher than fruits and out of total marketing cost, the retailers appropriate the major share \(^{260}\).

Meenakshisundaram and Sundaresan (1987) in their study on betelvine found that the producers were able to receive only 64.96 per cent of the consumer’s rupee. The farmers incurred 10.19 per cent of consumer’s rupee towards marketing cost which seemed to be high \(^{261}\).

Narayanan (1991) identified two marketing channels for the cut flowers produced in Bangalore. The price spread in marketing of cut flowers through one channel revealed that producers received a maximum of 59.26 per cent in tuberose and a minimum of 40.00 per cent in rose as their share out of consumer’s rupee. In the second channel, the share of producers ranged from 18.76 percent in rose to 31.78 percent in tuberose \(^{262}\).

Senthilkumar (1991) studied the economics of different varieties of banana in Tiruchirapalli district. The cost of production of poovan banana per bunch was


Rs. 13.53 and the net income realised per bunch was Rs. 14.47. The price spread in the marketing channel I. (namely, Farmer - Commission agent – primary wholesaler – secondary wholesaler – retailer) was 23.87 per cent and in channel II (Farmer – pre harvest contractor – commission agent – primary wholesaler – secondary wholesaler – retailers), the price spread was 20.72 per cent\textsuperscript{263}.

Pawar (1996) analysed the marketing cost and margins and observed that marketing costs and margin varied depending upon the marketing channels. The results showed that one of the marketing channels has more efficient in groundnut marketing, because the producer’s share in consumer’s rupee was 98.33 per cent. The study concluded that the distress sale was found in small farmers due to immediate need of cash and received less price as compared to medium and large farmers\textsuperscript{264}.

(iv) Marketing Efficiency

Jasdenwalla (1973) in the study on marketing efficiency in Indian agriculture found out that factor influencing prices of groundnut and the marketing pattern and information. She concluded that there existed coordination in prices over the entire market area showing the efficiency and perfect ness of the


market. She confirmed the existence of market perfection because of the significant reduction in seasonal variation in groundnut prices\textsuperscript{265}.

Ram and Swarup (1974) found that marketing costs, margin and transportation costs were high because of the bulkiness of the agricultural products studied by them. A comparison between the regulated and non-regulated market showed no marked improvement in marketing efficiency between the two\textsuperscript{266}.

Thakur (1977) studied food grain marketing efficiency in Gujarat. He studied the operational efficiency through partial budgeting and pricing efficiency by analyzing price trends, market integration and price spread. He concluded that the existing marketing system was inefficient\textsuperscript{267}.

Bhatia and Ram (1977) studied marketing efficiency in retail vegetable markets in Delhi through marketing costs and margins, consumer prices, availability of physical marketing facilities and market competition. They found that the retailing margins accounted for about 50 percent of consumer’s price and the consumers were to pay high price due to the perishability and bulkiness of the

\textsuperscript{266}Gowri Shankar Ram and A.Swarup, \textit{op. cit.}, p.12.
\textsuperscript{267}P.S.Thakur, \textit{op. cit.}, p.170
product. Among the different classes of retailers, pavement sellers got the lowest average percentage of net retail margins\textsuperscript{268}.

Arora and Jayaprakash (1979) in their study on comparative efficiency of alternative marketing agencies of groundnut in Tamil Nadu found that 38 percent of the marginal farmers and 28 percent of the small farmers had chosen private mandis whereas only four percent of the large farmers approached the private mandis. The marketing cost incurred by the farmers in the private mandis was 77 per cent than that incurred in the regulated market\textsuperscript{269}.

Arshad (1983) evaluated the efficiency of coconut marketing system by small holders in Malaysia and observed that efficiency suffered from various ineffectiveness in the form of imperfection that existed in market structure, practices and performances. Farm level constraints and lack of marketing facilities had resulted in low quality produce which in turn induced the middlemen to indulge in unethical trading practices\textsuperscript{270}.

Huger and Hiremath (1984) estimated the price spread by using mode method. They also evaluated the efficiency of alternative channels by way of


evaluating economic efficiency. For evaluating economic efficiency, marketing margin, price received by the producer, cost of marketing and profit share were taken into consideration.\(^{271}\)

Nadwadkar (1991) in his analysis on marketing efficiency and price spread found that marketing cost incurred were grading, packing materials and charges, transport, weighing, commission and miscellaneous expenses. Higher proportion of intermediaries’ profits was considered as the indicator of inefficiency of the marketing system.\(^{272}\)

Shah (1995) in his study on coconut marketing in Orissa identified two marketing channels. For working out the marketing efficiency of two channels, the Shepherd’s formula was used. The marketing efficiency was calculated to be 1.65 and 2.18 for the regulated and unregulated markets respectively. This was due to the higher number of intermediaries, higher marketing costs and higher marketing margin in the unregulated market. However on the whole, marketing efficiency was found to be low in both the markets due to higher market margin.\(^{273}\)

Jeyachandran (2002) in his study on economics of production and marketing of Maize in Dindigul district identified two major channels for


\(^{272}\)D.S. Nadwadkar, *op. cit.*, p.163.

marketing of maize viz., regulated market and village merchants. The marketing efficiency was worked out using Acharya and Agarwal’s method, Calkin’s Index and composite index. The marketing efficiency was found to 1.75 and 1.25 for the village merchant and regulated markets respectively. Thus the marketing of maize through regulated market was found to be efficient since it had the lowest index, lowest Calkin index and low Acharya and Agarwal’s value\textsuperscript{274}.

Chauhan and Amit Chhabra (2005) conducted a study on the production, marketed surplus, disposable channels, margins and price spread for maize in the Hanispur district of Himachal Pradesh. Much of the marketable surplus of maize (66.92 per cent) was disposed of by a majority of farmer (74.56 per cent) during the first quarter (October – December). Producer – local trader – wholesaler / commission agent – processor – consumer has been found as the main channel in the marketing of maize. The producer’s share in consumer’s rupee has been estimated at 78.01 per cent in this channel\textsuperscript{275}.

Alagumani (2005) conducted a study on economic analysis of tissue cultured banana and sucker propagated banana in Theni district of Tamil Nadu State. The cost of production per bunch was Rs.52.31 and Rs. 46.78 in tissue cultured banana and sucker-propagated banana respectively. The study showed

\textsuperscript{274} R.Jeyachandran, \textit{op. cit.}, pp. 98-101.
that tissue cultured banana was more profitable than sucker propagated banana. Through probit model analysis, it has been found that gross income and bunch weight were the major factors influencing the adoption of tissue-cultured banana.\textsuperscript{276}

Venkatasa Palanichamy et al., (2006) in their study on “Production and Marketing of Alfalfa: An Economic Analysis” found that the cost of production of Alfalfa per hectare worked out to be Rs.24,428 in which variable cost and fixed cost accounted for Rs.19,386 and Rs.5,042 respectively. Among the components of variable costs, human labour accounted for 45.85 per cent of the total variable costs followed by interest on working capital, seeds, plant protection, chemicals, fertilizers, farm yard manure, bullock labour and other costs. Among the various components in the total fixed cost, the rental value of owned land alone worked out to Rs.4,066.31 accordingly for 16.55 per cent of the total cost of production which was due to higher land value reflected by fertile nature of land. The interest on fixed capital, depreciation and land revenue accounted for 2.04, 1.73 and 0.21 per cent respectively to the total cost of the production.\textsuperscript{277}


\textsuperscript{277}N. Venkatesa Palanichamy, N. Srinivasan and D. Suresh Kumar, “Production and Marketing of Alfalfa: An Economic Analysis”, \textit{Agricultural Banker}, October-December, 2006, pp. 34-39.
Junankar analysed the profit maximisation behaviour and competitive behaviour using Cobb-Douglas profit function with input demand equation. The study was conducted in Tanjore district of Tamilnadu during 1969-70 farm management studies data were used. The study revealed the non-profit maximising behaviour of Indian farmers under competitive conditions. Both small and large farmers were not found to operate in the same market.\textsuperscript{278}

Hiremath et al., applied the Cobb-Douglas type of production function. The regression coefficient for land was 0.71 in medium and 1.57 in large orchards which were statistically significant at one per cent level. The regression coefficient of land for small orchard was 0.31 but non-significant. The regression coefficient of labour was non-significant in small and large orchards whereas in medium orchards it was 0.66 and significant at 5 per cent level. There was no scope for increasing the production of lime by increasing plant protection chemicals in small sized group and by increasing farm yard manure in large sized group.\textsuperscript{279}

Olekar et al., in their study, found the variables included in Cobb-Douglas production function were able to explain the variations in yield of sunflower to the


extent of 91 per cent and 86 per cent for small and large farms respectively. The output elasticities of human labour, bullock labour and farm yard manure were found to be significant indicating that there was scope to increase sunflower production further by the increased use of these inputs.280

Venkataramana and Srinivasa Gowda in their study on “Productivity and Resource-use Efficiency in Tomato Cultivation – An Econometric Analysis”, found that regression coefficients of the land area under the crop (0.2881) and staking materials (0.2076) were significant at 5 per cent level while those for fertilizers (0.2049) were significant at both 1 per cent and 5 per cent levels. In the case of large farmers, the coefficients of fertilizers (0.3010) and human labour (0.5135) and animal labour (0.1419) were significant at 5 per cent. The sum of elasticities were 1.0434 and 1.0712 for small and large farms respectively. The ratio between marginal value product to factor cost was used as a measure of resource-use efficiency. The output could be increased by increasing the area of land in case of small farmers but there was no scope for additional area under tomato production for the large farms.281

2.3 RESEARCH GAP

The present work makes an attempt to analyze and evaluate the factors and trends in production and marketing of banana in Tirunelveli district in the past decade. Necessary methodology and tools of analysis have been duly employed. Adequate light is thrown on many vital aspects.

The problem of production and marketing has already been researched by a number of scholars at several levels. Many books and articles on this problem also have been published. Still, certain gap seems to continue to remain.

This humble but useful study is expected to fill in such research gap found so far to a great extent.