Indian agriculture is characterized by large scale inter-regional disparities in terms of its productivity and growth, which is attributed to inter-regional variations in agro-climatic conditions and resource endowment (Ghosh, 2006). One of the principal reasons for this is the regional variations in marketing structure and market performance in agricultural sector. The marketing environment is considered to be an important factor in determining the producer’s share in consumer rupee and in stimulating the farmers to produce increasingly for augmenting higher marketed surplus. A review of prior studies done on marketing behaviour and marketable(ed) surplus of agricultural produce will greatly help us to understand the problems related to generating higher volume of marketed surplus.

Therefore, before discussing the details about the background of study area, theoretical and conceptual underpinning, objectives, hypotheses, and methodology of the present study, it is pertinent here to draw our attention to the studies undertaken previously on marketable and marketed surplus as well as on other related fields. This is for the purpose of reviewing the earlier studies in brief which will help us to examine the specific findings of those studies.

A comprehensive review of earlier studies related to the present work would definitely lead us to perceive the problematic situation in a wider perspective and would reveal the gaps in understanding the problem, through which it is possible to examine the ignored and uncovered aspects in detail. Most of the empirical studies on marketable and marketed surplus of food grains and other
agricultural products conducted in different parts of India are confined to estimate the relationship between marketable(ed) surplus and farm sizes, their levels of income, prices, production and productivity. In view of this it is convenient to present the review of previous works on marketable(ed) surplus in two broad lines depending upon the nature and characteristics of their findings. The first line of studies is associated with the nature of relationship between marketable(ed) surplus and non-price factors, such as, output, productivity and other such variables. The second line relates to the study of the nature of association between marketable(ed) surplus and price movement. Further, the studies pertaining to the distribution of marketable(ed) surplus in relation to farm size can be classified into two groups. The first group of studies is based on indirect estimation covering the aggregate data for the country or region as a whole. The second group is based on direct estimation from the micro-level data showing disaggregate nature of the studies. So far the studies at the aggregative level on marketable and marketed surplus are found limited in number and are not available in recent times. Moreover, the aggregative studies may not reveal the specific factors influencing marketable(ed) surplus for a particular region or particular area of a region. Besides, the tendency of studies on marketable(ed) surplus on direct estimation at the disaggregate level shows a sharp deceleration for the recent period. It is in this context and in view of wider regional imbalance in agricultural productivity and growth and the involved role of higher marketed surplus in reducing such regional imbalance, our present study falls under the category of direct estimation and would mainly be based on cross-sectional farm data at the disaggregate level.

The prevalent practices of agricultural marketing in India are mostly unsatisfactory and exploitative in nature. The poor and illiterate farmers in large scale have to confront with the powerful and organized traders in the market who invariably exploit them in variety
of ways. As a result, farmers are unable to reap their genuine benefits from the marketing of crops which is true in both the cases of subsistence and cash crops. Consequently, the helpless farmers receive disincentives to marketise their produce in the market places and remain satisfied with door selling option. This in turn badly affects the marketable surplus of agricultural sector. Further market infrastructure such as storage and warehousing facilities, agencies involved in supplying market information, condition of roads connecting rural farms with the markets, transportation to the markets, and other related variables plays the key components in determining marketed surplus. It is therefore necessary to make a review of earlier studies done on marketing behavior of the agricultural crops and market infrastructure, which have a bearing on marketed surplus. This is also in order to acquire the knowledge about differentials in findings related to marketing problems with respect to crop varieties as well as location differences.

The phenomenon of marketed surplus is theoretically related with production, productivity and other variables. It is because of this reason a further review of earlier studies done on production, productivity, rural infrastructure and other related variables which have a direct and indirect bearing on marketed surplus, is indispensable to assess the nature of findings and the gaps prevailed in them.

Since many of the studies have the coverage of both subsistence as well as cash crops, the studies related to the cash crops have not been necessarily separated from the studies on subsistence crops. Moreover, the findings revealed in the studies on cash crops relating to the problems of marketing behaviour only, and not the marketed surplus and other aspects, are found to be almost similar in nature with the findings of studies done on subsistence crops.
In these perspectives, the entire review of earlier studies related to our present work can be categorized into three broad sections:

(i) Review of studies on marketable and marketed surplus of agricultural produce.
(ii) Review of studies on marketing behavior and market infrastructure, and
(iii) Review of studies on the production and productivity of agricultural crops.

Based on these, the present chapter is organized with four different sections. The first section deals with the introduction of the chapter followed by the second section which deals with review of studies on marketable and marketed surplus. The third section reviews the studies on marketing behaviour and market infrastructure. The chapter ends up with the last section presenting the review of studies on non-price determinants of marketed surplus.

Section – II.2: STUDIES ON MARKETABLE AND MARKETED SURPLUS

In his pioneering work on “Distribution of Marketed Surplus of Agricultural Produce by Size level of Holding in India” (Narain, 1961) Dharm Narain considered all the agricultural crops for the year 1950-51 and the rural economy of India as a whole. His study based on indirect estimation at the aggregative level, revealed interesting result that marketed surplus as a proportion of the value of output followed a U-shaped pattern with respect to the size class of holding. The surplus ratio (marketed surplus as a proportion of output) diminishes with the increase in farm size up to the size class of 10-15 acres and thereafter it rises steadily. Narain realized that small farmers of the size-class of 0-5 acres contributed 26.0 per cent and those who fall under the size class 5-10 acres shared 20.5 per cent of the total
marketed surplus of output. That is the small farmers belonging to the size-group 0-10 acres contributed 46.5 per cent showing nearly one-half of the total marketed surplus. His significant finding was that farms below the level of 10-15 acres size-group and those above it shows almost equal proportions of marketed surplus. Thus, only half of the marketed surplus was termed as commercial surplus while other half comprising the high share of small farmers was interpreted in terms of a pattern of distress sales. The unusually high share of small farmers was called distress sales because of the fact that their surplus was not found over their consumption, but was dictated by their immediate cash obligations.

Narain also confirmed the Mathur-Eizekiel thesis (Mathur and Ezekiel, 1961) of inverse relationship between marketed surplus and prices. It is reflected in his study (Narain, 1961) that marketed surplus as a proportion of output had a negative response to a rise in price. The small farmers who had fixed cash requirements would enable to reduce his distress sales with an increased price, because his consumption at source was far below the minimum requirements.

The second important study was conducted by Utsa Patnaik on “Contribution to the Output and Marketable Surplus of Agricultural Products by Cultivating Groups in India” (Patnaik, 1975) using the all India data related to 1960-61 and 1950-51. Her significant finding was that the behaviour of marketable surplus as a proportion of output according to size-group of holdings did not follow the U-shaped pattern, rather followed a positive linear relationship. The study found that the smallest group of farmers contributed smaller proportion while the medium and the large-sized farm groups contributed higher proportions to the total marketable surplus of all the groups. The share of the smallest group of 0-1 hectare and that of the largest group of 20 hectare and above were revealed as 20 percent and 63 percent respectively in the total marketed surplus, without any dip in
between. Patnaik therefore confirmed that the proportion of marketed surplus increases with the increase in size class exhibiting a positive linear relationship function. Her explanation in this regard was in terms of the concentration of economic resources in the hands of large farmers who are predominated not numerically but economically. This also implies the concentration of aggregate output and marketed surplus in the hands of large farmers. Farmers belonging to large-sized holdings do their investment on land to a greater extent and at a faster rate than small-sized holdings which results in their increased share in the generation of aggregate output and marketed surplus with a minority of farmers. Her finding implies that any redistribution of land in favour of small farmers would deteriorate the level of marketed surplus.

Kalpana Bardhan had undertaken her work on “Price and Output Response of Marketed Surplus of food grains” (Bardhan, 1970) in Punjab and Uttar Pradesh on direct estimation basis. Using the village level cross-section data in linear regression estimates of marketed surplus Bardhan found that regression co-efficient of marketed surplus as a proportion of grain output was positive and significant. From her finding she asserts that the volume of marketed surplus is a quadratic function (with positive second order derivative) of the average level of food grain production. This implies that the average food grain production has significant influence on marketed proportion of production indicating thereby that a rise in aggregate production leads to a corresponding increase in the quantum of marketed surplus. The second important finding of her study was that the regression co-efficient of marketed proportion of production on grain price was negative and significant throughout. Marketed surplus as a proportion of production as well as in absolute terms showed a negative response to changes in food grain price which is due to the net effect of changes in cultivator’s income from sources other than food grain production. In this connection, Bardhan puts her argument
that a change in price affects the marketed surplus both directly and through its effect on farmer's income. This is because of the fact that other things remaining the same, an increase in income due to higher grain price causes a corresponding rise in demand for retention of food grains by the farmers to outweigh the negative substitution effect on consumption. This led her to conclude that a decline in grain price as a result of food price regulations or import may not have adverse effect on marketed surplus during short period.

Asoke Hati in his study on "Non-linear Marketable Surplus Functions" (Hati, 1976) made estimation on the relationship between marketable surplus of paddy and farm-size, using the data related to 1970-71, 1971-72, and 1972-73, from the Hooghly district of West Bengal. Taking marketed surplus net of repurchases as marketable surplus Hati fitted two non-linear equations and grafted them into one. He presented an interesting result with the help of a graph which is plotted according to different size class of holdings, showing three different phases of movement of marketable surplus by the farm sizes. The first phase of the curve with the coverage of 0.66 hectare farm size or less is found at or below the zero line, indicating that farmers belonging to this group are obliged to sell their produce only out of distress. The second phase representing the size class between 0.66 and 1.98 hectares shows that the effect of farm size on marketable surplus function is practically nil, and the curve flattens at about 5 per cent of marketable surplus. By this finding Hati asserts that farm households belonging to the second category show a strong tendency to gear up their consumption rate along with the increase size class. The third phase is concerned about the farm size of 1.98 hectare and above showing that the proportion of marketable surplus rises at an increasing rate with respect to the increase in size group of holdings. This confirms the concentration of marketable surplus at the hands of large farmers and thereby reflecting their commercial character of farming. Hati's findings therefore give the conclusion that marketable
surplus with respect to farm size starts with negative value, rises sharply till it crosses the zero line, then flattens, and thereafter rises at an increasing rate.

An attempt had been made by Manabendu Chattopadhyay and Ipsita Sen in “Marketable Surplus and Size-Classes of Holdings” (Chattopadhyay- Sen, 1988) to estimate the relationship between marketable surplus and size-classes of holdings on the basis of data released by Farm Management studies for the states of West Bengal, Andhra Pradesh and Tamilnadu. The study revealed that per hectare marketable surplus increased with the increase in farm size, except smaller groups for which marketable surplus was negative. This was true in case of West Bengal and Andhra Pradesh. A similar relationship was found in case of per capita marketable surplus for West Bengal, but for Andhra Pradesh the per capita marketable surplus was negative even in case of larger groups. However, explanation revealed that such negative surplus by larger groups was not out of their distress, but to meet their cash requirements for purchasing superior foods.

For the case of Tamilnadu they found a decreasing tendency of marketable surplus with the increase in farm size without any incidence of negative marketable surplus for any size class of holdings. These results led them to conclude that a positive relationship between marketable surplus per hectare and holding sizes does not hold good for all regions of the country. Meanwhile, their realization of per capita marketable surplus increasing with the cropped area does hold true for the regions under study, which they treat as an important factor determining the marketable surplus of rice. This was substantiated by their further observation that per capita marketable surplus of rice per hectare was strongly dependent upon per capita land cultivated. Thus, the study of Chattopadhyay and Sen summarizes that marketable surplus of subsistence crop, like
paddy, depends on the per capita land availability under that crop, and not the gross or net cultivated area for all the crops.

Jagdish Prasad undertook an in-depth study on “Marketable Surplus and Market Performance-A study with special reference to Muzaffarpur Foodgrain Market in Bihar” (Prasad, 1989) taking rice, wheat and maize under consideration. He confirmed that the proportions of marketable and marketed surplus increased sharply with the increase in production as well as size classes of holdings. The increase was even more than proportionate increase in production in case of large farmers who are above the demarcation level (1.83 quintals per year per adult unit as minimum needs of food grain consumption). Prasad thus observed that the marketable and marketed surplus of all the three crops were relatively concentrated among the large farm sizes because of their higher share in area and production. His finding of negative gross marketed surplus for the farm sizes below the demarcation level reflected that small farmers sell their produce in spite of having no real surplus after satisfying their genuine consumption needs, which they have to purchase later. This indicates the case of distress sales. He also observed that higher levels of income per adult unit have naturally a positive impact on marketed surplus at higher levels of output for households above the demarcation. On the contrary, the negative impact of income at lower levels of output was found to exist in case of households below the demarcation, implying their increased purchase from the market with the rise in income.

Prasad’s analysis reveals further that the proportion of sales in the main market centers increases with the increase in farm size. He depicted the reality that a large portion of market business are handled by a relatively few marketing firms, creating wide inequality in the distribution of food grains in the market. The whole sellers in the market attain strong bargaining position which makes their
behaviour not so different from an oligopolistic dealing with producer-sellers. Above all, the significant finding of his study is that the output is a strong determinant of marketable and marketed surplus of food grains. Prasad’s suggested view was that an integrated market development policy comprising the availability of modern input varieties with stabilization of harvest price, improving market information, providing adequate infrastructure facilities, coupled with the reorientation of the regulatory measures in favour of rural markets is a must to improve the prevailing condition of market structure, conduct and performance and thereby marketed surplus.

In his investigation on “Marketable and Marketed Surplus in Agriculture – A study at Firm Land” (Upender, 1990) in Warrangal district of Telangana region in Andhra Pradesh, M. Upender realized that the area under paddy was positively and significantly related to price variations. This is explained by the fact that farmers at mere subsistence level increase the area with the objective of meeting food requirements, while the medium and large farmers increase the same to receive higher prices reflecting their commercial attitude. Further the lag year’s price and lag year’s yield had been found significant and highly correlated with the current year’s acreage. The average yields of paddy showed a declining trend with the increase in size class of holdings. The main finding of his study is that the proportions of marketable and gross marketed surplus to total production of the respective size groups are positively related with the farm size. Secondly, the proportion of retention for domestic consumption to their output decreases with the increase in farm size revealing an inverse relationship. Upender observed that the size of family members is the most important indicator of the quantity retained for domestic consumption. He found that in case of the first three size classes the net marketed surplus is greater than the marketable surplus, indicating the presence of distress sales. The extent of repurchases measuring the magnitude of distress sales declines as the
farm size increases. The marketed surplus per acre and per capita as well as the output per capita is also positively related to the farm size. Moreover, there exists a direct relationship between marketed surplus as percentage of total marketed surplus and size groups of holdings.

Upender also found that farmers of all the size groups generally market a large portion of their output during post harvest season, which is relatively much higher in case of small size class. His finding from regression analysis revealed that the change in price did not have significant impact on market arrivals of paddy during the period under study. A strong linear relationship between marketed surplus and output was found to exist in all the size groups, indicating that output is the most crucial determinant of marketed surplus. The minimum that is required is the intensive cultivation to enhance production along with the facilities provided to the farmers for storing and enabling them to borrow against the produce coupled with the rationalization of marketing costs and margins, where government concentration is a must according to Upender.

Prof. Keya Sengupta in her work on “Behavioural Pattern of Marketed Surplus in the Barak Valley of South Assam” (Sengupta, 1998) realized that marketed surplus as a proportion of gross output related positively with the size class of holdings, confirming a tendency to follow a linear relationship. She traces an interesting result that though smaller classes engage in distress sales, their net marketed surplus is not negative. Her finding goes against the common finding of studies conducted in other parts of India revealing that negative marketed surplus is a characteristic feature of smaller size classes. The study reveals that the amount of retention for domestic consumption is inversely related to the quantum of marketed surplus for each of the size classes, indicating that farm consumption at source is an important determinant of marketed surplus. The per capita consumption of the smallest group is found much lower than
the per capita annual consumption of other size classes, which led her to observe that any increase in production of the smallest class will fail to cause an instantaneous increase in marketed surplus but will increase farm consumption. This rejects Upender's confirmation that an increase in production has a positive impact on marketed surplus for all the size classes. Sengupta's examination reveals that family size or the number of members per family is directly related to consumption per household and hence the number of members per family is an important determinant of consumption and thereby marketed surplus. The retention as a proportion of gross output as well as the percentage of retention of the size group to total retention show a positive relationship with holding sizes, revealing that retention in each size class increases with the increase in farm size. This is true only in case of the retention for future sale at a better price by larger groups, which leaves the opportunity to raise current level of marketed surplus by reducing the quantity of such retention.

So far as production is concerned, Sengupta observed that the production per household and per capita as well as the share of the size class in total production relate positively with marketed surplus. This assures that production is a certain factor determining marketed surplus. She found that there is a direct relationship between marketed surplus and the profit margin received by the farmers, delineating that margin of profit is the lowest for the smallest class while it is the highest in case of the largest class. In view of these findings Sengupta suggests that besides upgrading the irrigation and institutional credit facilities, streamlining the entire system of agricultural marketing to ensure remunerative prices to all categories of farmers is imperative in escalating production and marketed surplus.

Another study was conducted by Praduman Kumar and Mruthyunjaya on “Price Policy and Marketed Surplus of Paddy and
Wheat in India" (Kumar-Mruthyunjaya, 1989) based on indirect estimation. They confirmed that the response of marketed surplus of paddy and wheat to their respective prices and outputs were positive. Further, they realized that the price response of marketed surplus of both the crops was more than double than the response to their output supply. Input prices have the higher negative effect on marketed surplus than on output supply, implying that if output increases with respect to the price change sales are expected to increase more than proportionate increase in output. They further realized that pure inflation has a strong positive impact on marketed surplus. For every 1 percent increase in pure inflation marketed surplus of paddy rises by 1.13 per cent and that of wheat rises by 1.23 per cent. The elasticity of crop income with respect to price change was found highly elastic. Their estimation also revealed that with every 1 per cent increase in productivity marketed surplus of paddy increased by 1.4 per cent. The non-price factors (irrigation, acreage, and productivity) showed their significant influence on marketed surplus of both the crops. Out of these factors the effect of productivity on marketed surplus of wheat was found quite high than that of paddy. Kumar and Mruthyunjaya presented their suggested view as to make necessary improvements in management of water and fertilizers, development of credit supply and infra-structure with technology transfer. Since the productivity of wheat is more than sufficient their suggestion is to divert the area under wheat to other crops which are short in supply, implying further to increase acreage under paddy for enhancing its productivity.

In their analysis on “Behaviour of Marketed Surplus of Some Major and Minor Food Crops in India” (Sen-Banerjee, 1995) Ipsita Sen and H.K. Banerjee have drawn the conclusion that per hectare marketable surplus for all the crops under study is positive even in case of smaller size classes in both the states of Punjab and Uttar Pradesh, except for wheat in Uttar Pradesh. They found a difference between
the required level of consumption and the actual average consumption of wheat in both the States, which is more pronounced in smaller size groups of Uttar Pradesh. It is also reflected that from the consumption of principal food crop, farmers of the smallest group do not receive even their minimum required nourishment. The study confirmed that the population pressure on land per hectare constitute a crucial factor determining per hectare marketable surplus, which is true for major subsistence crops. The response of marketable surplus per hectare for non-major crops, such as, barley, maize and rice is highly positive to their yields rates, reflecting the commercial nature of farming of these crops. All these findings led them to conclude that for major food crops population per hectare of land operated is a dominant factor determining marketable surplus especially in case of small and fragmented farm size in average. Whereas for minor food crops it is the yield rate which is an important determinant of marketable surplus.

G.P. Reddy, P.G. Chengappa and Lalith Achoth in their work on “Marketed Surplus Response of Millets: Some Policy Implications” (Reddy et al., 1995) observed that the output response of Jowar is positive to its price change, whereas the output response of ragi is negative to its own price in Karnataka. Similar kinds of relationships they observed in case of the marketed surplus exhibiting that marketed surplus of Jowar rises with the increase in its price while marketed surplus of ragi tended to decline with an increase in its price. With an escalation in the prices of inputs the quantum of marketed surplus tended to increase with the objective of covering the additional cost of production. For the same purpose the farmers reduce their consumption and release a larger quantity for sale in the market which causes a fall down in their net income. Further the elasticity of crop income with respect to the output prices is very high, showing that with every 1 per cent increase in prices results in 5.5 per cent rise in jowar income and 5.7 per cent rise in ragi income. It is
also revealed that pure inflation has a negative impact on the marketed surplus of ragi, witnessing a 2.74 per cent decline in marketed surplus for every 10 per cent price rise in both product and factor prices. This reflects the subsistence nature of ragi crops. They also realized that the effects of non-price factors on marketed surplus are significant for both jowar and ragi. Out of which the expansion of area under crop coupled with the increased use of capital input plays a significant role in escalating marketed surplus of jowar. However, in case of ragi the expansion of area under irrigation as well as area under crop results in raising the volume of marketed surplus. Interestingly, their finding reveals that productivity has a negligible contribution to affect marketed surplus. They argued that a mixed strategy for increasing productivity, irrigation and expansion of area under crop is required to meet the demand from ever growing population. Besides, the production of these crops would have to be made more remunerative through a breakthrough in technology for the purpose of achieving market orientation which could improve the efficiency in the use of resources.

In their Study on “Determinants of Regional Marketed Surplus of Agricultural Commodities” (Kumar-Mishra, 1985) Binod Kumar and S.K. Mishra attempted to identify the direct and indirect factors affecting marketed surplus of five major crops, viz., rice, wheat, maize, gram and potato in Gaya district of Bihar. Based on the secondary data related to 1980-81 they estimated the structural co-efficients using the method of Two-Stage Least Squares. The study finds that only two variables, viz., the area under cultivation of a particular crop, and the index of accessibility to the market centers play significant role while determining the marketed surplus of a particular crop. The bulk of marketed surplus of the crops under study are significantly explained by these two factors only. While searching for indirect determinants of marketed surplus, Kumar and Mishra found that urban-rural population ratio and irrigation intensity are the two
factors affecting the area devoted to cultivation of different crops. Besides finding a pervasive effect of urban-rural population ratio on the cropping pattern they observe that irrigation intensity has a favourable impact on the cultivation of rice and wheat, and an adverse effect on the cultivation of maize, gram and potato.

D.S. Thakur, Harbans Lal, D.R. Thakur, K.D. Sharma and A.S. Saini had undertaken a study on "Market Supply Response and Marketing Problems of Farmers in the Hills" (Thakur, et al., 1997) in Kangra and Mandi districts of Himachal Pradesh during 1992-93. Their significant finding is that the elasticity of marketed surplus with respect to output is positive and greater than unity in the case of all categories of farmers for all the crops. The value of marketed surplus elasticity is found higher in the case of small farmers compared to the large farmers, indicating that the responsiveness of marketed surplus to output variation is higher for the small farmers. This is more so in case of subsistence food grains than the vegetable crops. Their study also reveals that price elasticities of marketed surplus for maize and wheat are positive for all categories of farmers confirming that the farmers belonging to all farm sizes respond positively to the price change. The small farmers are more responsive to price change particularly in case of maize and wheat. But in case of paddy the price elasticity of marketed surplus is negative for small farmers reflecting their opposite reaction to change in price. However, there exist a positive relationship between price and marketed surplus of paddy for large farmers. The study further finds that the main problems of marketing in hills are generally similar in the cases of both foodgrains and vegetables. The observed problems are low prices mostly suffered by the small farmers, lack of procurement, lack of co-operative marketing, monopoly of few traders, malpractices, high cost of transportation, lack of functioning of the regulated markets and lack of storage and refrigerated transport facilities for vegetables. Insurance of remunerative prices with efficient marketing facilities and
provision of technical inputs, technical know-hows, irrigation facilities, scientific development of agricultural marketing are the need of the hour for significant enhancement of production and marketed surplus according to their suggestion.

S.C. Gupta and A. Majid in their enquiry on "Producer's Response to Changes in Prices and Marketing Policies – A Case Study of Sugarcane and Paddy in Eastern Uttar Pradesh" (Gupta-Majid, 1965) found that the proportion of sales to total output with respect to the size class of holdings does not follow either increasing or decreasing tendency, but exhibits more or less the same for all size groups. The net value of sugarcane output per acre is more than four times than that of paddy and so the disposal of sugarcane constitutes the principal source of cash income of the farmers. The paddy cultivation is carried out mainly for their domestic consumption and not for sale reflecting the subsistence nature of the crop. Their finding reveals that the proportion of purchases for family consumption to the total output of paddy declines with the increase in farm size. This indicates a much lesser extent of dependence of the large farmers on market supplies than the small farmers. Sales of paddy does not appear as a source of cash income even for larger farm sizes because of the reason that paddy output is not sufficient to meet their consumption requirements. Interestingly the study traces that with the increase in farm sizes farmers like to grow paddy more for their consumption purposes rather than purchase from the market. Another finding of their study is that there has been a steadily rising trend in acreage under sugarcane over the period under consideration. This is explained by the superiority of sugarcane over paddy which is more effective on acreage than the variations in their relative prices.

This can also be substantiated by the findings of D.S. Tyagi in his "Farmers Response to Agricultural Prices in India – A Study in Decision Making" (Tyagi, 1974). His important finding is that the
acreage under the crop changes at a significant rate with changes in the relative expected price of the crop, revealing that farmers are highly price responsive. However, he also realized that the acreage under cash crop responds more significantly compared to the acreage under a subsistence crop of the area. This proves that the superiority of cash crop over subsistence crop acts as a key component in influencing acreage than their relative price variations.

The review makes it clear that most of the studies focused their attention to assess the nature of functional relationship between marketable(ed) surplus and the size class of holdings. All the studies concentrated on identification of the direct and indirect factors affecting marketable(ed) surplus. Some studies cover both the subsistence as well as cash crops with the objective of identifying the relative weightage of the factors influencing the marketed surplus of a particular nature of crop. It is revealed that some crops which are subsistence in nature for a particular region become commercial for other region depending upon the variability of consumption habits of the farmers from region to region.

The pioneering work of Dharm Narain confirms the U-pattern relationship while Asoke Hati traces a curvi relationship between marketable(ed) surplus and farm sizes. Both the works are similar in finding the non-linear relationship between marketable(ed) surplus and size class of holdings. The study of S.C. Gupta and A. Majid may also be considered in this direction by focusing its finding of non-linear relationship. But this study is different for its discovery of non-linear relationship between marketed surplus and farm size in respect of cash crop. Both the studies of Narain and Hati present the existence of distress sales in case of smaller size classes. Only the theme which makes Narain's study different is that it confirms the negative response of marketed surplus to the price change especially in case of small farmers. The same negative response is also confirmed
by Kalpana Bardhan which is, however, due to rise in income of the farmers from non-farm sector. Similarly, the works of G.P. Reddy, et al. and D.S. Thakur, et al. reveal the negative response of marketed surplus to the price movement, which is true for the small farmers in case of subsistence crop. The specificity of these studies is that they trace the negative response of marketed surplus towards price change only in case of the subsistence crop. However, for the cash crop the studies conducted by Kumar-Mruthyunjaya, G.P. Reddy, et al. (in case of cash crop) and D.S. Thakur, et al. (in case of cash crop) reveal a positive response of marketed surplus to the price change. But the main drawback of their findings is that they did not specify whether the same positive price elasticity of marketed surplus prevail in case of small farmers or not.

The linear positive relationship between marketable(ed) surplus and size class of holdings has been realized by the studies of Utsa Patnaik, Chattopadhyay-Sen, Keya Sengupta, Jagdish Prasad and M. Upender. In this connection, the study of Chattopadhyay-Sen is somewhat different from other studies only because of his finding of the linear negative relationship between marketable surplus and farm size for Tamilnadu, along with the realization of positive relationship in other States. The works undertaken by M. Upender and K. Sengupta follow convergence in terms of their extended finding of the inverse relationship between retention for domestic consumption and marketed surplus with respect to the size class of holdings. The size of family is the crucial determinant of farm consumption according to their studies. To Professor Sengupta it is the farm consumption which plays crucial part in determining the marketed surplus of a subsistence crop. Distress sales and negative marketed surplus, are found common among the small and marginal farmers almost by all the studies. But Sengupta traces the most challenging reality that though the farmers belonging to the smallest class engage in distress sales yet their net marketed surplus is not negative. This has been
found uncommon by the studies conducted in other parts of India which makes her study somewhat different. Again Jagdish Prasad and M. Upender recognized output as a strong determinant of marketed surplus. Prof. Sengupta also found output as a determinant factor of marketed surplus except for the smallest class which fails Upender's hypothesis of positive relationship between marketed surplus and output for all size classes. However, according to the study of Chattopadhyay–Sen, it is the per capita availability of land which is an important determinant of marketable surplus. It is thus observed that no studies related to the finding of linear relationship between marketable surplus and size classes focused their attention on price responsiveness of marketed surplus.

Further, Kalpana Bardhan, Kumar-Mruthyunjaya and D.S. Thakur, et al. realized that output is a strong determinant of marketed surplus. However, Kumar-Mruthyunjaya’s study reveals that it is the price which is stronger than output while determining marketed surplus. Following price and output irrigation, acreage and productivity are significant in influencing the marketed surplus. The area under crop has been found as an important determinant of marketed surplus by the studies of Gupta-Majid, Kumar-Mishra, Kumar-Mruthyunjaya and G.P. Reddy et al. However, according to the study of Ipsita Sen and H.K. Banerjee the pressure of population on land and the yield rate determine marketable surplus significantly for the major and the minor crops respectively.

Section – II.3: STUDIES ON MARKETING BEHAVIOUR AND MARKET INFRASTRUCTURE

N. Venkata Rao made an attempt in his “Production Trends and Marketing of Pineapple in Meghalaya” (Rao, 1992) to assess the marketing behaviour of pineapple in Meghalaya. His study reveals that
as much as 90 per cent of pineapple produce is considered as marketable surplus in the region showing highly commercial nature of the crop. The compound annual growth rates of area, production and yield per hectare of pineapple were revealed as 0.95 per cent, 4.55 per cent, and 3.57 per cent respectively exhibiting a higher growth rate in production with a relatively lower rate of increment in area and productivity. Rao found that the factor influencing production is the yield per hectare in East Khasi and Jaintia Hills, while for East Garo, West Garo and West Khasi Hills it is the expansion of area under the crop. His analysis on marketing behaviour of pineapple reflects a disquieting feature of price-spread showing a very low net rate of producer’s share of 23 per cent in consumer rupee. The high margin received by various intermediaries involved in the crop marketing is the main reason for having such a meager share in consumer rupee which causes disincentive to the pineapple producers. The source of market information to the farmers is fellow farmers and they have no access to market information through mass media. The fear of perishability, lack of storage facilities and immediate cash needs led almost all the farmers to dispose off their produce just after the harvest accounting 96 per cent of the total farmers. Maximum farmers utilize both head and backload while others utilize trucks and buses as their mode of transportation to the market depending upon the quantity sold. Rao’s suggested view was that the incentive received by the farmers from the stable and remunerative prices would encourage both intensive and extensive cultivation, which in turn would maximize production and productivity.

In his study “Rice Economy of Bangladesh—Progress and Prospects” (Ahmed, 2004) R. Ahmed realized that intensification of modern inputs played crucial role in raising the production despite deceleration of area under cultivation and real price of rice on the one hand, and increasing labour cost of production on the other. His study observes that input market liberalization had minimized the
irrigation cost sharply and attracted companies to produce and import seeds. It is due to the liberalization of input markets private participation has been increased which resulted in accelerated use of modern inputs in rice cultivation. His extended analysis on the development of rice market and its contribution towards increasing rice production acknowledges the growing and competitive role of the private sector in food grain marketing. The extent of long period retention reduced considerably because of the continuous harvesting of rice all round the year. Ahmed also found that small farmers diverted their attention from the subsistence nature of cultivation to the commercial production. In view of these strengthening the role of the private sector in input markets besides expanded allocations of public funds for agricultural research and water resource development is imperative according to Ahmed.

In an attempt “Determinants of Paddy Sales by Farmers on the Official Market in Sri Lanka” (Gunawardana-Quilkey, 1993) P.J. Gunawardana and J.J. Quilkey employed regression techniques in identifying the relative strength of the factors influencing supply of paddy in the official markets by the farmers in Sri Lanka. The significant finding of their study is that higher guaranteed prices lead to larger quantities of paddy production and higher volumes of rice (converted form of paddy) purchases by the consumers in the concessional market results in larger quantities of marketed surplus in the official market. They also realized that with 10 per cent increase in total domestic paddy output the quantity of paddy sold to the government would increase by about 12 per cent. Another significant finding of their study is that a higher open market prices is responsible for lowering down the volumes of paddy being sold to the government and vice-versa. This indicates that marketed surplus with respect to price changes in the open market is positively elastic, showing the rise in quantity of marketed surplus in the open market due to an escalation of prices higher than official market which, in
turn, reduce the quantity of paddy being sold to the government. Gunawardana and Quilkey thus confirmed that total domestic output of paddy, guaranteed price and quantity of rice purchased in the concessional market influence the marketed surplus of paddy positively in the official market. While open market price has a negative impact on the volume of paddy being sold in the official market. To them the guaranteed price of paddy and the sales of rice in the concessional market play the key role in determining the farmer's supply of paddy in the official market.

T. Satyanarayana conducted a study to assess the effectiveness of the storage units in the regulated markets in Andhra Pradesh in order to examine the functional deficiencies of this component of market infrastructure which contributes largely in augmenting marketed surplus. In his "Analysis of Storage Function for Successful Marketing of Farm Produce" (Satyanarayana, 2000) he observed that most of the farmer-sellers do not prefer to store their produce in the market owned storages. The commission agents often impress upon the farmers to keep the produce with them instead of storing in the market owned storage units, for the purpose of earning their commission which is more than the storage costs. The study reveals that these commission agents use most of the space of market owned storages in the name of farmers. As a result it is not the farmers but the commission agents who are the actual beneficiaries of such storage facilities in most of the markets. His findings make it clear that commission agents are enjoying farmers' facilities, earning profits on farmers' commodities and suppressing the role of marketing authorities in the development of a conducive market environment. To overcome these defects Satyanarayana suggests in favour of launching competition more efficiently by the marketing authorities with the commission agents in rendering services to the farmers and to impress upon them is important in building the storage function more effective and thereby the market structure.
An enquiry on “Communication Linkage between Farm and Market” made by Manuhar Lal and Y.L. Das (Lal-Das, 1995) on the marketing of paddy, wheat, maize and vegetables in rural Bihar reveals that farmers have been able to receive better price for their produce in market centers as a result of easy and cheap transport facility available after road improvement. Consequently they got stimuli to generate more agricultural surplus. However the study found that major sales of different agricultural produces were made just after harvesting the crop. Traders appeared to be the most prominent as buyers of the agricultural commodities. This indicates the absence of intermediaries who are responsible for reducing the share of producers in consumer rupee. Transport and communication being the important determinant of actual sales in the market revealed in their study.

A. Sivarama Prasad had undertaken a modest attempt to examine the working of regulated markets in facilitating an orderly marketing of agricultural produce in Andhra Pradesh. In his “Agricultural Marketing in India - Case Study of Selected Regulated Markets in Andhra Pradesh” (Prasad, 1985) interestingly he learnt that though the market yards were set up under regulated markets yet the farmers did not want to sell their produce in the market centers. Rather they preferred to sell to the middlemen for the sake of easiness in selling. Despite the availability of a large quantum of marketable surplus of paddy and chilies, these commodities were not actually dealt in the market yards. This was due to the non-cooperation on the part of traders, millers as well as the producer-sellers. The open auction system was the most common and popular method of selling the produce. Majority of grower-sellers and traders were facing the problem of transportation due to the non-availability of adequate number of carts, lorries and wagons at the required times according to his finding.
A.C. Gangwar made an investigation on “Developing an Efficient Marketing System” (Gangwar, 1995) with special reference to Haryana based on the studies conducted by the Department of Agricultural Economics. His work reveals that as marketing channel size increases due to the presence of intermediaries and processing of paddy into rice the producer's share in consumer rupee declines. This implies that benefits are not shared proportionately between intermediaries and producers and thus discouraging farmer's interest to produce more for sale. However infrastructural development like setting up of market yards, purchase centers, and pucca link roads by the Haryana State Agricultural Marketing Board has made the farmers enable to dispose of their produce in the market centers. Efficient marketing system is an important indicator of generating surplus in agricultural sector. It has a dynamic role to play in stimulating output and consumption the essentials of economic development according to Gangwar.

In their work on “Production and Marketing of Groundnut in Tamil Nadu” (Balaji-Raveendran-Kumar, 2003) P. Balaji, N. Raveendran and D. Suresh Kumar found that it is the low production which results in lower marketed surplus and appears as the prime problem in marketing. Collusion among the traders, malpractice in weights, and delayed payment for the produce to intermediaries were the problems hampering the generation of marketed surplus. It is evident that pest and diseases, drought, etc. are the major constraints that limit production. The non-availability of improved seeds, fertilizers and plant protection chemicals in time and marketing problems were some of the major stumble blocks faced by most of the farmers as reflected in their work.

A. K. Singhal in his study on “Agricultural Marketing in India” (Singhal, 1989) in selected markets in Uttar Pradesh realized that
small farmers retained one-third while the medium and large farmers retained just about one-fourth of their total production. This indicates that farm level consumption of the crop on an average is very less since it is a cash crop. Almost all the sample farmers used to sell their produce to the petty traders and do not like to carry them to the market centers for sale. This might be because of the fact that prices received by the farmers were not very different from the prevailing market price after adjusting for possible transport and marketing costs. This implies that the villagers are fairly informed about market condition and averse to bringing the produce in the market centers to avoid the costs and troubles of marketing. The large farmers appeared to receive a somewhat higher price from the traders than the medium and similarly the medium compared to the small farmers. The study also observed that the prices received by the farmers varied with the period of sale as well as the quality of the produce.

In their investigation on "Production and Marketing of Apples" (Swarup-Sikka, 1987) in Himachal Pradesh R. Swarup and B. K. Sikka found that often the product is not graded properly which ultimately brings lower returns. There is the need for standardization of grades and proper grading. The rise or fall in producer's share is disproportionate to rise or fall in actual prices because several cost components are not based on the value. The sellers face the transportation problems while selling the produce in the market. The problems they observed are like non-availability of trucks in time, high freight rates, roads blocked by landslides, limited market intelligence and malpractices in the markets. Net returns from apple cultivation can further be increased if the marketing problems are taken care of ensuring efficient marketing according to the investigators.

Further C. P. Yadav in his work on "Role of Agricultural Market in Disposal, Price-Spread and Economic Development" (Yadav, 1995) in Darbhanga district of Bihar realized that producer's share in
consumer rupee in case of paddy is lower compared to cash crops. This is due to the processing of paddy into rice which involves money, time and labour use at a higher level. However the share of producers in consumer rupee was found higher when the cultivators sold their produce in the market places themselves. Off season sales had also higher share in comparison to peak season sales in the villages. Transport cost was higher in most of the time except flood season indicating poor transport and communication facility. Moreover his significant finding reveals that price-spread moved in favour of producers over time but still it was lower which could be improved upon only through improvement in transport system.

It is thus revealed that most of the studies reviewed above have focused attention on the problems related to market infrastructure which has a definite impact on generating marketed surplus. Some studies drew attention to examining the marketing behaviour of the farmers of subsistence and/or cash crops besides analyzing the factors determining production. Studies undertaken by N. Venkata Rao, T. Satyanarayana, M. Lal and Y. L. Das, Sivarama Prasad, A.C. Gangwar, R. Swarup and B.K. Sikka, and C.P. Yadav can be arranged in similar line based upon the nature of their findings related to market infrastructure. However both Satyanarayana and Prasad confined their studies to regulated markets and realized that the facilities meant for the farmers are not enjoyed by the farmers themselves and in case of storage facility it is the commission agents who are actual beneficiaries.

Again the works done by Rao and Gangwar focus attention to the producer's share in consumer rupee, the expansion of which causes disincentive to the farmers while generating marketed surplus. According to Rao less accessibility of farmers to market information and inadequate market infrastructure are responsible for receiving lower returns by the farmers. Gangwar however argued that the
setting up of market yards, purchase centers and pucca link roads enabled the farmer-sellers to sell their produce in the market centers. The nature of his findings goes against the findings drawn by S. Prasad and Satyanarayana. The work of Swarup-Sikka has drawn the uncommon aspect of marketing problems by observing the fact of unstandard and improper grading of the products which ultimately brings lower returns. But like other studies their work also recognized the common problems of transportation, limited market intelligence and malpractices in the market. Further the study of C.P. Yadav traces the usual character of subsistence crop marketing as the price spread, wherein he realized that producer's share in consumer rupee is higher when they sell the produce in the market centers. However his study takes a different direction from the studies of Rao and Gangwar with the finding that price spread moved in favour producers over time, though it was lower which could be improved upon by improvement in transportation system.

The studies undertaken by R. Ahmed, Balaji-Raveendran-Kumar, and A.K. Singhal, however, did not focus to the problems related to market infrastructure but had paid due attention to analyze the marketing behaviour of the crops. The work of Balaji, Raveendran and Kumar recognized the marketing problems like collusion among the traders, malpractice in weightage and transportation problems besides finding low production as a factor responsible for lower volume of marketed surplus. Singhal has drawn the interesting conclusion that farmers averse to selling their produce in market centers because of the reason that the price received from middlemen are not much different from the prevailing market price after adjusting for possible transport and marketing costs. Moreover Ahmed's realization is something different from others finding which expresses that input market liberalization results in accelerated use of modern inputs. Due to such liberalization the increasing competition among the private entrepreneurs in food grain marketing played significant role in
improving the condition of rice marketing which, in turn, contributes towards production according to Ahmed. The attention given by Gunawardana and Quilky in their study is basically on the determinants of marketed surplus in official market which again shows a different picture. The basic observation of their work is that open market price (higher than official market) has a negative impact while guaranteed price has a positive impact on the marketed surplus in official market.

All these make it clear that though the studies undertaken by the above mentioned authors constitute a similar feature by emphasizing the marketing problems and market infrastructure, yet their studies take different shapes on the basis of contradictory and uncommon natures of finding.

*Section II.4: STUDIES ON THE PRODUCTION AND PRODUCTIVITY AND MARKETED SURPLUS*

From the findings of previous studies related to marketable and marketed surplus it is observed that in most cases production and productivity of an agricultural produce are the direct as well as important determinants of marketed surplus of that produce. The factors which influence the level of production and productivity are considered as indirect determinants of marketed surplus. The earlier studies done on the determinants of production and productivity would reflect the relative strength of the factors in affecting the volume of production and the level of productivity which in turn determines the quantum of marketed surplus. It is in this connection a review of previous studies on production and productivity especially of the subsistence crops is attempted in this section to obtain necessary
ideas regarding the pattern of crop output and productivity, and its nature of association with various independent variables.

In a major study on “Growth of Labour Productivity in Indian Agriculture - Regional Dimensions” (Dev, 1986) S. Mahendra Dev examined the growth of labour productivity in agriculture over the period between the triennium 1962-65 and 1975-78 taking as many as 56 agro-climatic regions under consideration. The study found that during the period from 1962-65 to 1970-73 the aggregate labour productivity in the country was positive but at a low rate of growth. However a significant increase in the growth of labour productivity was observed by the study after extending the above period to 1975-78. Dev also realized that despite the existence of negative growth in land-worker ratio in most of the regions labour productivity in agriculture increased due to the growth rates in yield and multiple cropping over the period 1962-65 to 1975-78. Interestingly he observed the positive impacts of lower pressure on land, rapid growth in land productivity and multiple cropping on the growth of labour productivity in high growth regions. Contrary to this a relatively high growth in work force and low growth in yield and multiple cropping were traced in the low and negative growth regions. Further he realized that there had been a significant negative association between labour productivity in agriculture and rural poverty since early 1970’s. However a considerable regional imbalance was observed across the country in spite of the rise in labour productivity accompanied with decline in rural poverty. Over different points of time there had been increasing inter-state variation in cases of both labour productivity and rural poverty. Finally the investigator confirmed the indication of having weak relationship between agricultural growth and density of work force on land in India.

N. Chandrasekhar Rao in his attempt on “Aggregate Agricultural Supply Response in Andhra Pradesh” (Rao, 2004) traced the reality
that non-price factors contributed significantly in determining aggregate supply than the price related factors in Andhra Pradesh. The study reveals that the efficiency level of the farms between technologically backward villages and technologically advanced villages does not show much variation. Moreover the use of high technological inputs in agriculture is not so contributory in developing the efficiency level of the farms. This indicates that there is wide possibility to produce the maximum level of output from a given set of inputs for a farm operating in technologically backward area, indicating that the farm has the best practice relationship between inputs and outputs. The study also concludes that the proportion of efficient farms increases with the increase in farm size considering all sizes of farm in both the types of villages except the lowest farm size.

The attempt made by A.R. Reddy and C. Sen on “Technical Inefficiency in Rice Production and Its Relationship with Farm-Specific Socio-Economic Characteristics” (Reddy-Sen, 2004) reveals that if the existing technical inefficiency is minimized the productivity of rice can be increased considerably without raising the level of inputs. The study found that with the rise in farm size accompanied with increase in farmer’s education, experience, extension contacts and proportion of good land, the technical inefficiency in the production of rice declines. There exist a positive relationship between technical inefficiency and fragmentation of land, implying that technical inefficiency increases with higher degree of land fragmentation. However the location of the farm in canal command area and the caste of the farmer do not have any bearing on the inefficiency. The study also found that no relationship exists between the number of workers in the farm family and inefficiency. In view of reducing inefficiency in the production of rice and wheat Reddy and Sen suggested that measures should be taken up in encouraging co-operative farming and land consolidation, strengthening extension services, increasing
literacy rate and providing alternative employment opportunities in the Sone Canal Command area of Bihar.

An analysis was undertaken by K. Goswami and B. Chatterji on “Decomposition of Growth in Total Value of Output of Paddy in Assam” (Goswami—Chatterji, 2003) separately for the two different periods from 1967-68 to 1984-85 and from 1985-86 to 1995-96. It was revealed that the farm harvest price and the total cropped area made a significant impact on the average growth in total value of output of both kharif and rabi paddy during the first period. But in the second period significant role played by farm harvest price followed by yield rate while contributing to the average growth in total output value of kharif paddy. In case of rabi paddy the contributory factors identified were the cropping pattern followed by the farm harvest price. Thus it is observed that the strength of the factors affecting the average growth in total value of output differs between periods under study as well as from season to season. According to their findings the total value of output growth of a particular crop can be decomposed into the growths in yield, area under the crop, farm harvest price as well as the growth in total cropped area.

Another study on “Agri-Infrastructure and Modern Farm Practices - Their Impact on Agricultural Productivity” was conducted by Rudra Prakash Pradhan (Pradhan, 2003). He found that both agri-infrastructure and adoption of modern farm practices have significantly a positive relationship with the level of agricultural productivity in Orissa. However in comparison with agri-infrastructure it is the adoption of modern farm practices which exposes a more significant effect on agricultural productivity. The study further reveals that there exist a strong association between agri-infrastructure and modern farm practices by the farmers. This indicates that modern farm practices bears a significant contribution towards agricultural productivity if and only if agri-infrastructure is
all set to play the supportive role in adopting the same practices. The author's suggested view is that a suitable policy with deliberate biasness towards the rural and disadvantaged regions of the economy must be undertaken in view of the inadequacy and inconsistency faced by the economy.

In their investigation on "Factors Affecting Cropping Intensity and Use of Fertilizers and High-Yielding Variety Seeds in Barak Valley" (Bezbaruah-Roy, 2002) M.P. Bezbaruah and Niranjan Roy found that smaller farmer brings a larger proportion of cultivated area under HYV having a tendency to cultivate the net sown area intensively than the larger farmer. Further the per hectare consumption of fertilizers do not vary significantly with the variation of farm size. These findings led them to conclude that relatively small holding sizes do not act as a barrier to the application of HYV seeds, fertilizers and multiple cropping in the valley. However it is the existing system of tenancy which blocks the possibility of extensive use of HYV seed and fertilizers and increasing cropping intensity. The study also observes that though the application of HYV seed is almost common among the farmers even without any assured irrigation and access to the extension service, it is impossible for the farmers to support the use of HYV by sufficient application of fertilizers in the absence of irrigation and extension service facilities. Based on these findings the investigators confirmed that the poor state of irrigation and extension service acts as a constraint for increasing the levels of agricultural productivity in the valley. In order to support fuller exploitation of HYV seed-fertilizer technology in the Barak Valley the study calls for an urgent necessity for making the programs for effective improvement in the existing structure of irrigation. For this a substantial dose of public investment is needed and the resulted irrigation potential will be utilized by the farmers through their private investments with the help of credit support policies according to Roy and Bezbaruah.
Madhusudan Gosh in his “Regional Convergence in Indian Agriculture” (Gosh, 2006) traced the reality that after introduction of HYV technology though the regional imbalances in land productivity declined, the same has increased in case of the labour productivity and output per capita significantly during the period under consideration. From his key findings he realizes that there is a positive and significant affect of human capital, physical capital, and rural infrastructure on the growth and steady state levels of the measures of agricultural development. These factors are therefore found very crucial in maximizing the growth rates and steady state levels of agricultural output and productivity. It is because of the inter-state differences in the steady state levels of land and labour productivity as well as output per capita there have been persistent regional inequalities in agricultural performance. To Gosh the initiatives by the less developed states for higher investment in education and irrigation can facilitate in achieving maximum rates of agricultural growth and minimizing the inter-regional gaps in agricultural development.

In his attempt on “Farmers’ Education and Productivity of Crops” (Narayanmurthy, 2000) A. Narayanmurthy undertook his study through multivariate analysis with five alternative specifications. He has taken into account the average years of schooling of participating family members in agricultural activities, holding size of land, irrigation hours, fertilizer use, use of pesticide, labour-man days and resource position as the basic variables while evaluating the impact of education on crop productivity. This is because since changes in yield is possible due to the changes in these variables. Narayamurthy realized that there was an insignificant relationship between education and productivity levels, which was revealed as positive for one season and largely negative for other seasons. Therefore his finding fails to confirm the Schultz’s hypothesis that education is a significant variable influencing the levels of productivity.
However the study undertaken by S. Mittal and P. Kumar on “Literacy, Technology Adoption, Factor Demand and Productivity” (Mittal-Kumar, 2000) reveals a contradictory result to Narayanmurthy’s study. They found that there exist positive and significant relationship between literacy and crop productivity. The study also traces that farmers’ literacy acts as an important source of growth in the adoption of technology and use of modern inputs like fertilizers, machinery, etc. The share of literacy in adoption of HYVs for rice increased from 22 per cent during 1973-90 to 74 per cent during 1990-95. The contribution of literacy in technology adoption in case of wheat went up from 42 per cent in 1973-90 to 90 per cent in 1990-95. The study also found that literacy contribution increased marginally from 5.9 per cent to 7.7 per cent in case of the growth of input, and for output growth it accounted for 18 to 22 per cent over the period under consideration. Finally the study observed that the growth in fertilizer use had largely been contributed by literacy in case of rice, whereas for wheat a decelerating contribution was observed during the period of trade liberalization.

S. H. Siddiqui and Mumtaz Ahmed in their inquiry on “Levels of Agricultural Development in Uttaranchal” (Siddiqui—Ahmed, 2004) made an attempt to asses the levels of agricultural development in Uttaranchal for the period 2000-01. They confirm that high literacy rates exist in the high development area in which maximum area is put under HYV seeds along with the high rate of fertilizer consumption. This indicates that literacy rate is positively related with the use of HYV seeds and fertilizers in high development area. However the areas which are characterized as low levels of agriculture development are due to the poor supply of irrigation facilities and fertilizers. Changes in the prevailing pattern of infrastructural facilities coupled with timely supply of agricultural loans giving due weightage to the less developed regions can accelerate the pace of agricultural development according to the investigators.
Further in his work on “An Analysis of Inter-Regional and Temporal Variations of Costs, Productivity and Sources of Growth of Paddy in Andhra Pradesh” (Reddy, 1997) P. Prudhvikar Reddy made an attempt to assess the inter-regional variations in the performance of paddy crop among different group of farmers in Andhra Pradesh during the period 1981-82 to 1991-92. His significant finding was that the farmers under study enabled to obtain higher yields at lower costs due to the adoption of modern inputs at relatively lower prices. The lower prices of modern inputs, such as, fertilizers and tractors in relation to traditional inputs like manures and bullock labour which are partly because of subsidies, made the farmers possible to substitute modern inputs for traditional inputs. Another important finding of his study was that the farm size had no relationship with costs and productivity, as well as with the spread of HYV technology across the regions. It was also revealed that all categories of farmers brought convergence with respect to costs and productivity. Finally Reddy realized that public investment in agricultural infrastructure like power, market, etc. had made significant contribution in improving the total factor productivity.

It is revealed that all the studies summarized above are confined mainly to the production and productivity of the agricultural crops and their determinants. Hence the direction of these works is basically similar in nature with little variations in methodology adopted and conclusions drawn.

The studies of Dev and Ghosh bear some identical features by focusing their attention on the non-price determinants of productivity and regional imbalances. Both of them concluded that a persistent regional inequality in Indian agricultural performance was observed because of inter-state variation in agricultural productivities. However, they are differed in identifying the factors having positive and
significant effects on productivity. The studies done by Pradhan, Bezbaruah-Roy and Rao reflect their utmost attention on the non-price determinants of productivity. It is only the study of Goswami and Chatterjee which tried to differentiate itself from other studies by giving due concentration on both the price and non-price determinants of productivity. Their principal finding is that the farm-harvest price and the total cropped area made a significant contribution on the average growth in total value of output of both kharif and rabi paddy. The findings drawn by Bezbaruah and Roy can be considered as very relevant for our present work. According to them it is the poor system of irrigation and extension service which acts as a constraint in increasing the levels of agricultural productivity in the Barak Valley of Assam. Though the studies of Pradhan, P. Reddy and Rao can be put in similar line due to their consideration of the adoption of modern farm practices by the farmers as an influential variable on productivity, their findings are contradictory. While Pradhan and Reddy realized that the adoption of modern farm practices has significantly a positive relationship with the level of agricultural productivity, Rao's conclusion is that the use of high technological inputs is not so contributory in raising the efficiency level of the farm.

Notwithstanding, Narayanmurthy, Reddy-Sen, Mittal-Kumar, Siddiqui-Ahmed and Gosh through their analysis tried to fit the relationship between farmers' education and agricultural productivity. Reddy and Sen realized that technical inefficiency declines with the increase in farm size accompanied with the increase in farmers' education, experience, extension contacts and proportion of good land. Similarly the studies of Mittal-Kumar, Siddiqui-Ahmed and Gosh reveal the positive and significant relationship between literacy and crop productivity, and confirm that farmers' literacy acts as an important source of growth in the adoption of technology and use of modern inputs. In fact it is the study of Narayanmurthy which proves
that there is an insignificant relationship between farmers' education and productivity levels, which keeps his study a somewhat different from other studies in this line. However the main ideas of these studies are almost the same and will form the basis of our work.

The foregoing review of the earlier studies done in various states of India, on marketed surplus and marketing behaviour of different agricultural commodities, clears that most of the research works were confined only to a few states. Research works undertaken on the same issues related to Assam and more particularly to Barak Valley of Assam is very scanty. Most of the researchers studied with utmost attention on the selling behaviour of the farmers overlooking their consumption behaviour in respect of a particular agricultural produce. Like sales pattern consumption pattern of self-produced commodity by the farmers also influences the augmentation of surplus. But this dimension has been neglected in almost all the studies except a few though not in great detail.

Although a few of the studies reflect the relationship between consumption and marketed surplus yet they sidetracked the issue of factors responsible for consumption being the important determinant of marketed surplus. All these reflect that no complete study was conducted on the consumption, sales behaviour and marketed surplus of subsistence crops in general and particularly in the Barak Valley of South Assam. This adds more importance to the present work. Therefore the present study attempts to undertake a holistic approach of enquiring the relationship between consumption, sales behaviour and marketed surplus in South Assam.

References:


