REVIEW OF LITERATURE

Various studies have been conducted by the researchers to examine the economic conditions of farmers in rural areas in general and marginal and small farmers in particular. The available literature having direct or indirect relationship with the current research study is reviewed in chronological order. The studies reviewed are categories into three broad issues relevant to marginal and small farmers as:

I. Income, income inequality, consumption expenditure and poverty
II. Socio-economic characteristics, indebtedness and suicide
III. Sustainability prospective of marginal and small farmers

I. Income, income inequality, consumption expenditure and poverty among marginal and small farmers

The brief findings of the studies related on income, income inequality, viability of marginal and small farmers, poverty issues, the impact of new technology on farmers’ income and income distribution are presented here.

Lal (1969) in his study of Ahmednagar district of Maharashtra observed that the widened gap between rich and the poor farmers was attributed to the introduction of HYV technology. He indicated that there was a difference in attitude towards acceptance of new technology between the larger and the smaller farmers due to a better purchasing power. The bigger farmers were likely to be in a better position to adopt innovations in agricultural production faster than the smaller farmers, with consequently a greater impact on production because they could arrange regular water supply, which was necessary for the adoption of new technology.

Vyas et al. (1969) attempted to examine the viability of small and medium farmers in Gujarat. The authors pointed out that for small farms, the introduction of new agricultural technology could hardly increment the income due to prior inability to meet the customary household expenditure. Non- adopter of agricultural technology, the medium farms were, as per this criterion, also non-viable. According
to them, non-viable farm-owners are those who were not in a position to earn enough farm business income to meet their customary household consumption requirements (Rs 225) and, consequently, were compelled to deplete their resources i.e. either sell out assets or incur fresh debts. Thus, the study highlighted that the new technology would not make all the farmers viable.

Ray (1970) concluded from his analysis of Burdwan district of West Bengal that it was the land distribution and the rate of utilization of resources in different size groups of households that determined the agricultural income distribution in a dynamic rural economy. The study of income distribution pattern of the region showed that in most villages (about 77 per cent cases), the disparity in income distribution is higher than that in land distribution. Around 64 per cent of the cases highlighted that a high concentration of income was associated with a higher fertilizer use. The study further indicated that bigger farmers were using higher rate of resources, resulting in further disparity in yield and income.

Aggarwal (1971) examined the impact of green revolution on landless labour. The author observed that with the aid of government agencies, banks and cooperative societies, the large farmers were becoming more prosperous with the advent of green revolution. They were investing in capital intensive equipments in order to enhance their direct control over agriculture. The small cultivators and the landless labourers, on the other hand, were losing out in several ways because demand for their traditional services had decreased, availability of land on crop sharing basis was reduced and alternate employment opportunities had lagged behind the requirements. Consequently, the two classes were becoming polarized and increasingly antagonistic to each other.

Singh (1974) in his book, entitled, “The Green Revolution in India- How green it is?”, discussed the limitations of new agricultural technology and HYV seeds. The author underlined that it is the intensity of capital requirement that served as the major road block in universally spreading its effectiveness. The landlords and the rich peasants had access to capital or could get it from the institutional sources. Hence, they were the only ones to adopt HYVs. Poverty-stricken peasants, however, failed or scarcely participated in the process of the green revolution. Besides, the
author made the claim that the poverty-stricken small farmers were unable to capitalize on the scientific advancements made in the field of agriculture. In fact, many of them were sliding down on the economic ladder and were actually becoming landless. Therefore, land and capital reforms were necessary for making the green revolution a success.

Saini (1976) found that in the pre-green revolution period, the small farmers were able to reduce the inequalities in income arising out of the unequal distribution of land among cultivating households to a limited extent. But with the influx of HYV technology, the advantage of productivity per acre seemed to have shifted in favour of the big farmers because they had a relatively easy access to new technology, and could make rational use of it due to the favourable farm size. Thus, the technological innovations had augmented the gap between the rich and the poor.

Luxminarayan (1979) studied relative importance of livestock for different farm sizes based on NSS data. The importance of livestock for small holdings was unabatedly much higher than the other farm size holdings because small farmers tried to keep their own draught animals for the purpose of cultivation. Therefore, importance of livestock decreased with an increase in the size of holdings; on the other hand importance of agricultural machinery increased with increase in the size of holdings. The author further concluded from the data that assets held were more evenly distributed in relation to land area cultivated only in the case of medium farmers while it was unevenly distributed in the case of small and large farmers.

Aggarwal (1980) conducted study in rural Punjab and analysed the impact of agriculture development in terms of per family and per capita income among all categories of farmers as well as agricultural labourers. He found that the highly developed areas gained more than their counterparts in the less developed areas. However, the income gap between the rich and the poor in the rural society was more in the more developed areas than in the less developed area. Thus, the higher rates of agricultural development had resulted in widening the income gap between the rich and the poor. The study also revealed that the consumption expenditure of the marginal farmers and agricultural labourers was more than their income besides having comparison to the lower per capita total consumption expenditure than the
small, medium and large farmers. It is an indication of poor economic condition of marginal farmers and agricultural labourers. They were probably living under constant debt to make both ends meet.

Bhalla and Chaddha (1981) analyzed the issue of the impact of green revolution on small farmers in Punjab and established that the gains of green revolution were distributed more or less in proportion to size of land holdings. The inequality in the distribution of gains was more in the more developed areas and vice versa. The authors elucidated that the marginal and small farmers had lost their traditional edge of higher overall yields rate, presumably because of the introduction of the new agricultural technology in which the marginal and small farmers were not yet at par with the higher farm categories. It was observed that the gains of technological advancement were mainly appropriated by large farmers while on the other hand, the marginal and small farmer were unable to meet their consumption needs out of their current income. The study also indicates that one-third of the marginal farmers and one-fourth of the small farmers in Punjab, were living below the poverty line and were unable to earn two square meals a day.

Mundle (1983) conducted a study in rural areas of Bihar and Punjab-Haryana from 1963-64 to 1973-74. He gauged the effect of agricultural production and prices on the incidence of rural poverty. The author classified the factors that determine the magnitude of rural poverty into broad categories, i.e. distribution of land; rural wage rates and wage employment; and agricultural prices and production. The rural poor had been classified into two broad strata. i.e. the class of agricultural labourers and cultivators. The study concluded that in absolute terms, an increase in agricultural production had increased purchasing power of the cultivators and rural labour households but there is an adverse effect of rising prices on wage dependent households.

Singh (1988) examined various economic, social and political factors responsible for perpetuate poverty in India. The author observed that the fundamental objective of Indian planning was to raise the standard of living and remove poverty. Various five-year plans like Integrated Rural Development Programme (IRDP), National Rural Employment Programme (NREP), Rural
Landless Employment Guarantee Programme (RLEGP) and so on had failed miserably to uproot poverty on the mass scale. Failure of percolation theory, slow implementation of land reform measures, unemployment and over population were the most important causes of persisting poverty. It was suggested in the study that economic, social and political powers should be decentralised for initiating fight against poverty.

Haque (1990) studied the viability and sustainability of small and marginal farmers in India and observed that in irrigated areas farming by small and marginal farmers was quite viable in terms of both efficiency and income levels. But in dry regions, these farmers could not generate even the minimum necessary income. Sustainable development and viability of small and marginal farmers was a remote possibility unless there was a sufficient breakthrough in dry farming technology or a shift from traditional cereal crops to high value crops including fruits, vegetable and sericulture along with animal husbandry. The analysis clearly brought out that, by and large, marginal and small farmers could not earn a viable level of income from crop farming alone. This was particularly true for crop farming under dry and rain fed conditions. The smaller farms needed a little more care and nourishment in terms of availability of appropriate technology, credit market, storage and insurance.

Rao et al. (1992) in a comprehensive study reported the negative implications of advancements in technology upon creating income inequalities between different regions, land owners, landless labourers and between small and large farmers. In absolute terms, however, the gains from technological change were shared by all sections as indicated by the rise in real wages, employment and income of small farmers in regions experiencing technological change. The favourable terms of trade for agriculture had also contributed to rise in the real incomes of even small and medium farmers, though proportionately less than for big farmers. The author further claimed from his findings that despite better access to resources, output per acre among large farms under the traditional labour-intensive technology was lower than that among small farms as the cost of hired labour was higher for them than that for small family farms. Technological changes created new production possibilities for large farms which could now increasingly substitute capital for labour by adopting biological as well as mechanical techniques, and produce output at a faster
rate than small farms. The study inferred that the inverse relationship between farm size and output per acre found under traditional technology no longer holds true with the adoption of new technology.

Singh (1993) studied the income and expenditure pattern of farmers and agricultural labourers in Punjab. He highlighted that the consumption expenditure of small and marginal farmers exceeded their income. Consequently, in 1990-91 more than one third of marginal farmers and about 10 per cent small farmers were below the poverty line. The study further revealed that the conditions of marginal farmers were worse than that of agricultural labourers in Punjab state, both in terms of per capita income as well as consumption.

Vaidya and Singh (1993) examined the viability of small and marginal farmers in agricultural hills of Himachal Pradesh. The viability study envisaged that the small and marginal farmers passed the viability test only on the paid-out cost parameter, but failed badly when tested on the parameters of actual consumption expenditure and food-intake standards. All the marginal and small farmers in the state were found to be financially viable as they had been able to repay the paid-out costs. However, when viability was analysed in the light of actual consumption expenditure, some of the farming families of both the categories of farmers turned out to be non-viable and finally when the food-intake was raised to the levels as recommended by the Indian Council of Medical Research in respect of workers, non-worker females etc. none of the marginal and small farming family in the state could be termed as viable. This indicated the seriousness of the matter and called for certain steps to be taken for alleviating such classes from poverty. The broad recommendations of study emphasized on crop diversification in favour of cash crops like potato, ginger, off-season vegetables and vegetable seeds, improved oilseeds and pluses, proper management of orchards, improved crop production technology, infrastructural development, livestock development and adoption of allied activities such as mushroom cultivation, apiculture, rabbit husbandry, fisheries and agro-based processing industries, etc.

Gill (1994) conducted a study on the economic development and structural change in Punjab, and indicated towards the growing tendency of capitalistic mode
of production. There was decline in number of marginal and small holdings and increase in the number of medium and large holdings during 1970-71. However, the reversal of this phenomenon was observed during 1980-90. The author further stressed that there was an indication of reverse tenancy where small and marginal owners of land were leasing out land to medium and large farmers. The small and marginal farmers were not getting absorbed in the other sectors due to unfavourable nature and structure of these sectors.

Ashokan and Singh (2001) made an attempt to examine the problems of small farmers in India. The study revealed that there was an increasing division of landholdings, making them smaller and smaller. In the last ten years, the process had continued and if the trend persisted, in another ten years, more than four-fifth of the Indian farmers would be small farmers. The income from such small holdings was found to be very low. The cropping pattern of small farmers was overwhelmed by small food needs and the food crops occupied more than 83 per cent of the cropped area. This restricted the scope for income expansion through high valued non-food crops. Even if one assumed that farmers could cultivate the best possible crops or combination of crops in different states, the returns remained meagre. The major bottlenecks in increasing the income of small and marginal farmers were lack of credit, absence of institutions to facilitate flow of credit and poor marketing facilities for inputs. The study further indicated that the increased role of private sector in the input industries, reduction of tariff level as per the World Trade Organization (WTO) agreements, removal of quantitative restrictions, withdrawal of subsidies to power and fertilizer, privatization of commercial banks, etc. would make the survival of the small farmers extremely difficult.

Chandra (2001) in his study on crucial agriculture problems faced by small farmers observed that small farming was not viable because the net earnings of small and marginal farmers were less than minimum wages stipulated in the Minimum Wages Act, 1948. The Commission for Agricultural Costs and Prices has computed that return from a hectare of land for paddy and wheat crops in Punjab was only Rs 7300. Considering the average size of small farmers as 1.61 hectares, the total net returns were only Rs 12,000 for the two crops in a year. After ignoring the family labour wages, the total net returns were estimated to be around Rs 20,000
per annum, which was below the minimum wages prescribed for a living. The study further highlighted that the role of money lenders and other informed sources cannot be ignored without offering alternative sources. So, there was a need for evolving a link between the formal and informal agencies for providing maximum benefits to small and marginal farmers. In the light of World Trade Organization, it was observed that small farmers shall had to prepare themselves to increase productivity in order to remain in the league or look for other alternative economic activates.

Shah and Sah (2004) made an attempt to study the changes in poverty and poverty related factors in south-western part of Madhya Pradesh. The overall results brought out that there is a need for establishing basic infrastructure especially for health, education, crop productivity and market support did not develop at a sufficient rate to impact on the reduction of chronic poverty. The study revealed that parts of the rural community, particularly the landless and the small marginal farmers, remained unaffected by even a moderately faster growth rate.

Kaur and Singh (2006) made an attempt to examine the incidence of poverty and indebtedness among the small and marginal farmers in Bathinda district of Punjab state. A sample of 80 small farmers and 60 marginal farmers in eight development blocks of Bathinda district was selected. By using head-count measure, proportion of persons below the poverty line in all the small and marginal farmers taken together was 19.28 per cent. By using 50 Per cent of per capita income (PCI) of the state method, 90 per cent of the marginal farmers and 80 per cent of the small farmers live below the poverty line. By taking 40 per cent of PCI of the state method, 81.66 per cent of the marginal farmers and 67.50 per cent of the small farmers live below the poverty line. According to fourth measure of poverty, i.e., $1 per day, proportion of population living below the poverty line was 91.66 per cent and 82.50 per cent of the marginal and small farm-size categories, respectively.

Singh et al. (2009c) made an attempt to examine the factors influencing economic viability of the marginal and small farmers in Punjab state. Out of the total 240 sampled farmers, the number of viable farmers was 165 (68.75 per cent) and of non-viable farmers were 75 (31.25 per cent). In the case of marginal farmers, total fixed investment on crops and dairy, off-farm income, value of productivity of crops and net income from dairy were calculated to be significant discriminating factors,
accounting for 13.72 per cent, 39.71 per cent, 1.27 per cent and 35.52 per cent contributions respectively, towards total distance between viable and non-viable farms. However, in case of small farmers, farm-size, income and net income from dairy were the significant discriminating factors with 36.60 per cent, 27.83 per cent and 21.70 per cent contributions respectively, towards the discriminated distance between viable and non-viable small farmers in the state.

II. Socio-economic characteristics, indebtedness and suicide among marginal and small farmers

The issue of indebtedness, its magnitude/severity and causes, poverty, suicides etc. among farmers particularly the marginal and small farmers remains the important area to be investigated by research scholars. The important observations and findings of these studies are reported here.

Singh and Mehrotra (1973) studied the nature and relationship among the causative factors of credit and indebtedness among the landless labourers and various categories of farmers in Ballia district of Uttar Pradesh. The comparative analysis of credit and indebtedness signalled that the landless labourers and marginal farmers were highly indebted households. The study further disclosed that the percentage of household under debt decreased with the size of holdings while the size of debt per household increased with it. For the landless labourers, the village money-lender was the main source of finance. The marginal and small farmers obtained about 80 per cent of their total borrowing from the institutional sources like the government and the cooperatives. On the other hand, these institutional agencies accounted for about 96 per cent of the total borrowing of large farmers.

Rao (1975) conducted a study of three villages of Vishakhapatnam district of Andhra Pradesh to comparatively examine the asset structure and borrowing of the small farmers. In his analysis the author found that the small farmers were the major market for money lenders to lend their funds while the big farmers constituted a major market for cooperative and other institutional funding agencies. The study further explained that the small farmers were not in position to invest on land to produce any surplus. As a result, these farmers were handicapped in building up the asset structure.
Ghatak (1976) made an exhaustive study of factors affecting borrowing and indebtedness of Indian cultivators in the years 1951-52 and 1961-62. The author found that for the year 1951-52, the family expenditure was the most significant factor affecting outstanding loans. It alone explained 77 per cent of variations of total outstanding loans. Capital expenditure was next in the queue. In the year 1961-62, capital expenditure became the most significant factor affecting indebtedness and it alone explained 81 per cent of total variation in the total outstanding loans. Together with family expenditure, it accounted for 98 per cent for total variation in indebtedness. The author also observed that in most cases, it was capital expenditure and not family expenditure which was the most significant variable affecting demand side of the credit.

Pandey and Muralidharan (1978) examined the socio-economic factors influencing the repayment of loans in cooperative credit societies. It was found that the amount of loan and the consumption expenditure were the prominent factors determining the repayment of lent amount. The failures in repayment were also explained by the improper supervision by the cooperative officials, which eventually resulted in diversion of loan amount for consumption purposes or for items of capital investment.

Singh et. al (1978) had studied the effect of introduction of new agricultural technology on the demand side of farm credit. The study showed that before the adoption of new agricultural technology, farmers borrowed only for crop production but after adopting the modern technology, their credit demands were backed by the capital investment purposes such as installation of tube-wells, pumping sets, purchase of tractors and power threshers, purchase of milch and draught cattle and so on. This had resulted in tremendous increase in borrowing by farmers. The authors suggested that a single credit agency was desired that can handle all the credit needs of the farmers and that it would be in a better position to coordinate advances for various purposes. This would also reduce the credit cost to the minimum and ensure better utilization of credit resources.

Singh and Sandhu (1980) estimated the extent of over dues of different categories of farmers and the causes of the over dues in Kapurthala district of Punjab. Based on a sample of 90 farmers of three size groups, the study concluded
that 66.65, 41.17 and 29.40 per cent small, medium and large farmers respectively were defaulters. The over dues amount per hectare was Rs 93, Rs 56.88 and Rs 17.27 for small, medium and large farmers respectively, indicating a negative correlation with the size of holdings. The study also concluded that the wilful defaulters were mainly large farmers because they did not repay loan in spite of their repaying capacity of Rs 7717 per defaulter as against the over-dues amount of Rs 3597 per defaulter.

Dahiya (1990) assessed the magnitude and causes of agricultural indebtedness in Sonipat district of Haryana state. In a randomly selected sample of 104 farmers from the four selected villages, the author found that most of the farmers were under debt. The level of debt per hectare was inversely related to the farm sizes. A major portion of the total debt was owned to institutional sources. The diversion of productive credit to unspecified purpose was more in the case of small farmers than medium and large farmers. Thus, total amount of borrowed funds, amount of borrowed funds diverted to unspecified purposes and consumption expenditure were mostly responsible for indebtedness of small farmers.

Pasha (1991) examined the socio-economic conditions of small and marginal farmers in a drought-prone region of Karnataka. The study revealed that these farmers were forced to exploit the available resources aggressively without caring for sustainability issue of the resources. As a result, their poverty was further aggravated. Even in a favourable condition where facilities like irrigation, HYV’s, fertilisers and bank loan for capital were available, these poor farmers were unable to overcome the ‘poverty trap’ due to social, political, technical and economic constraints. The only abundant resource available to them was their own labour, which was free to them, and they tried to use it to its maximum for their survival and thus, concentrated on animal husbandry (which was labour intensive) along with crop cultivation. The condition of subsistence economy existed due to paucity of resources. Both crop cultivation and animal husbandry of the small and marginal farmers depended on common resource, i.e., land including the forest. Equitable and fair access to common land and raising the level of productivity were found to be very much necessary for the viability and sustainability of these resource poor farmers.
Shergill (1998) in his study on small and marginal farmers’ indebtedness in Punjab found that small farms in Punjab suffered no handicap and discrimination in the rural credit markets so far as availability and cost of credit from institutional credit agencies was concerned. The small farms in Punjab were more under debts in comparison to big farms. The ratio of debt share to the operated area share was 1.8 in case of small farms compared to 0.73 for big farms. A bigger proportion of their non-productive and long-term debt encumbered them more severely with long-term repayment obligations. The proportion of farmers with a hopeless debt situation- a sort of debt trap was much higher in the case of small farms and resulted in about one-tenth of small farming families mortgaging out some of their land. He explained that the heavier indebtedness of small farms seemed to be the result of their disproportionate cash expenditure on farm operations, diversion of loans to unspecified purposes and domestic consumption. They were spending much more per acre on farm operations as compared to big farms. The disproportionately high cash expenditure on consumption and over commercialization of farm operations resulting in heavier cash expenditure on farm inputs seemed to be the root cause of huge indebtedness of small farms in Punjab.

Chowdhary et al. (2002) in an attempt to study the reasons behind the suicides revealed that the major factors leading to agricultural difficulties were, negligence of the agricultural sector by the state and central government, non-remunerative nature of farming, indebtedness of farmers, low quality seeds, overuse of fertilizers and pesticides, declining productivity, lack of efficient irrigation facilities, power supply shortage, inefficient agricultural extension services, diminishing public interest in the agricultural sector, absence of proper agricultural insurance, falling agricultural prices, problems related to tenant farming and extensive export orientation in agriculture.

Mohanty and Shroff (2004) in their study on different parts of Andhra Pradesh and Karnataka revealed the difference in prevailing agro-climatic and socio-cultural feature in comparison to Maharashtra. They also stated that Maharasthrians focused more on commercial cultivation and dominantly produced cotton. The farmers were mainly dependent upon the informal sources of credit due to the low availability of institutional facilities. The low production and sales levels were
attributed to obsolete skills, traditional knowledge base, inadequate research and ineffective method of marketing. Moreover, the dependence of agriculture on the vagaries of the monsoons and other climatic conditions has a detrimental effect on the crops. They further stated that the existing agricultural situations were not the sole reason for farmers’ suicides, but they had contributed immensely to the continued occurrence of suicides.

Raghavendra and Kunnal (2004) conducted a study to assess the economic conditions of small and marginal farmers in Bijapur district of northern dry zone of Karnataka. Primary data were used to find out the resources and liability position of small and marginal farmers. The result of the study portrayed the sad position of both the small and marginal farmers. Land formed the major asset of these farmers and they hired implement and draft power for cultivation. These farmers mainly relied upon money-lenders for their financial needs and they had huge amount of over dues with financial institutions. The owner’s equity in the investment in the case of the small and marginal farmers was only Rs 6449 and Rs 5479 respectively, whereas the total debts were Rs 26466 and Rs 14400, respectively. Debt-equity ratio (leverage ratio) was 4.10 in the case of small farmers and 2.63 for marginal farmers indicating very heartening performance of farmers. The study emphasized that custom hiring of animal power at reasonable rates should be arranged by co-operatives, non-government organizations and government agencies in dry land regions to help these farmers. Also, the formal credit institutions should take more interest in dry land farm credit, as it was the most important incentive for farmers to adopt new costlier technologies.

Singh et al. (2004a) conducted a study to analyse the socio-economic status of the small holders of Punjab. The sample size included 270 farmers (127 marginal and 143 small) from nine villages from three districts of Punjab state. The study revealed that as many as 96 per cent and 81 per cent of the marginal and small farmers respectively, had one to three family members engaged in farming and the small farmers possessed comparatively more machinery than the marginal farmers. The indebtedness of the marginal and small farmers was to the extent of Rs 9450 per acre and Rs 9600 per acre, respectively.
Singh *et al.* (2004b) examined the extent and sources of farm loans in Sangrur district of Punjab. The total sample consisted of 120 farmers in two development blocks of Sangrur district of Punjab. The study highlighted the high level of credit prevalence among the Punjab farmers. Easy availability of credit and ignorance of its long-term negative consequences among farmers were attributed to the high level of credit. The study also revealed that the average amount of outstanding loans increased with the increase in farm-size, whereas on a per acre basis there was an inverse relationship as shown by the average amount borrowed was Rs 189750, Rs 252162, Rs 317632 and Rs 396200 for the marginal, small, medium and large farmers respectively. Majority of the respondents, i.e., 42.50 per cent could not repay their loans because of the high cost of agricultural inputs along with insufficient income generation, high rate of interest, uneconomical size of land holdings, etc.

Deshpande and Nagesh (2005) highlighted that Andhra Pradesh ranked first with 82 percent farmers’ indebtedness in the state and Uttarakhand ranked the lowest with less than 10 percent farmers’ indebtedness. The study revealed that more than 50 percent of farmers availed loans for capital or to meet current expenditures for farming purposes, 58 percent of borrowing accrued to cultivation and other agricultural activities, while the remaining percentage was used to meet other consumption needs. The largest percentages of indebted farmers were in the class size of marginal and small farmers. The average amount of outstanding loan was Rs 12,585 per household.

Singh and Toor (2005) examined the agrarian crisis with special reference to indebtedness among the Punjab farmers. Respondents comprising 52 marginal, 60 small, 70 semi-medium, 48 medium and 20 large farmers were selected during 2002-03. The data pertained to the agricultural year 2002-03. The study showed that 78.40 per cent of farm households in Punjab state were under debt. The percentage of indebted households was the highest (88.57 per cent) in case of semi-medium farmers and the lowest (45.00 per cent) in large farmers. Further, these proportions were 76.92, 80.00 and 77.08 per cent in the case of marginal, small and medium farmers, respectively. The amount of debt of the sampled households was Rs 92,394 and Rs 1,17,849 for average indebted households in the state. The amount of debt of
the sampled average household was the highest (Rs1,75,206) in case of medium farmers and the lowest in case of marginal farmers (Rs23,602). The study also revealed that an average farm household in the state had Rs53,710 (58.13%) of debt from non-institutional credit agencies, while Rs 38,684 (41.87%) from institutional credit agencies. An average farm household in the state incurred a debt of Rs 37,913 (41.03 per cent) and Rs 54,481 (58.97 per cent) for productive and non-productive purposes, respectively.

Gill and Singh (2006) in their study revealed that the Punjab economy is undergoing a transformation leading to a grave crisis, instead of becoming a healthy sign of capitalist economic development. The study highlighted that the surpluses were being rapidly extracted and the dependence of the workforce on agriculture was still very heavy. This manifestation of the agrarian crisis in the form of suicides had reached a dangerous level in Punjab. Intensive field surveys were carried out to gauge the gravity of the problem as well as its causes. The study pointed out that most of the suicide victims were cultivators and belongs to the category of small and marginal farmers. Suicides were attributed to a number of reasons, ranging from poverty to crop failure, indebtedness, marital discord and alcoholism, but in author’s view it was mainly due to the economic crisis faced by the peasantry, which had led them to borrow heavily. Small and marginal farmers suffered more, since they are at a disadvantageous position so far as borrowing from institutional sources is concerned as land ownership is a criteria for borrowing. Remedies thus have to be found not only in terms of short term or immediate solutions to suicides, but also long-term solutions to end the agrarian crisis itself. While immediate measures could include relief, mainly financial, to the families of suicide victims, and attempts at their rehabilitation, the long-term measures were required to “nip the evil in the bud” and to promote rural industrialization.

Jayachandra and Naidu (2006) conducted a study to examine the impact of dairy co-operatives on income employment and creation of assets of the marginal and small farmers. The study covered 60 families (small and marginal farmers) in Rangampet village of Chandragiri Mandalam in Chittoor District of Andhra Pradesh. They fund that dairying offered a vast scope for increasing the income, employment opportunities and assets value of the marginal and small farmers, whose marginal
and average productivity was low. The study revealed that the two categories of farmers had registered an increase in their net income through dairying, but the increase was higher in case of marginal farmers (25.50 per cent) as compared to the small farmers (22.98 per cent). The value of assets has also increased with the help of dairying in both the categories, but the increase was higher in the case of marginal farmers (15.00 per cent) as compared to that of the small farmers (12.50 per cent).

Kaur and Singh (2006) examined the extent and nature of indebtedness among the small and marginal farmers in Bathinda district of Punjab state. The total sample consisted of 140 farmers (80 small and 60 marginal) were selected for the study. The study concluded that 95 per cent of the small and marginal farming households were under debt. The study revealed that 44.74 per cent of the total debt was spent on agriculture and purchase of machinery by average small and marginal farming households, following the purchase of animals (22.57 per cent). In the case of source of credit, institutional agencies were providing 60.98 per cent of the total debt and 62.32 per cent and 58.24 per cent for the small and marginal farmers, respectively. The institutional agencies were having upper hand in proving loans to the small and marginal farming households.

Jeromi (2007) examined the extent of the farm crisis, the rise of indebtedness and various dimensions of suicides of farms in Kerala. The study revealed that the incidence of indebtedness in the rural areas of Kerala state was higher than the national average. The study also revealed that when the landholding size was less than one acre, the cultivation was marginally profitable. The loss in the case of land holding above one acre arose due to hiring of labor. A majority of farmers, nearly 60 per cent of that who committed suicide, owned less than one acre of land. Agricultural crisis was the main determinant for suicide of 38.90 per cent of farmers of the state.

Nagraj (2008) studied trends in suicide in India. He concluded that the intensity of farm suicides had shown no real decline, nor did the number show a major fall. The suicides were concentrated in the farming heartlands of five key states and have aggravated ever since as the adjusted farmers’ suicide rate for 2011 was in fact slightly higher than it was in 2001. According to National Crime Records
Bureau, five states, namely Maharashtra, Andhra Pradesh, Karnataka, Madhya Pradesh and Chhattisgarh account for two thirds of all form suicides in the country. The share of these 'Big 5' in total farm suicides was higher in 2011 than it was in 2001. At the same time, the new census data showed that four of those states had far fewer farmers than they had a decade ago. Only Maharashtra reported an increase in the number of farmers. In 1995, the 'Big 5' accounted for over half of all farm suicides in India. Given this concentration, even the dismal all-India figures tended to make things seem less terrible than they were. Ten states show a higher farm suicides rate in 2011 than in 2001, these included the major farming zones of Punjab and Haryana. The average farm suicide rate in the 'Big 5' was slightly up, despite a decline in Karnataka and in Maharashtra. The latter had the worst record of any state since there were at least 53,818 farmers suicides recorded since 1995.

Shergill (2008) critically analysed the issues of indebtedness and suicide among Punjab farmers. He estimated that the peasants of Punjab had debts of Rs 5701 Crores during the year 1998-99; and in 2008, it touched the figure of around Rs 30,394 crores which has been the prime reason for farmer’s suicides in Punjab. The study highlighted that more than 80 per cent peasant suicide victims were small and marginal farmers. Declining income, stagnating yield, repeated crop failures and swelling debt proved to be the major causes of non-repayment of the loans. Majority of suicide victims borrowed from non-institutional credit agencies and spent these small borrowings for the non-productive purposes. Psychological pressure caused by increasing debt burden and a constant feeling of social stigma compelled them to commit suicide. On economic front, the indebtedness was creating havoc for small and marginal farmers. Even on the social front was not immune from its evils. The study focused on formulation of new policies to prevent farmers’ suicides. The set of corrective measures suggested in the study were that the agriculture sector must be made more remunerative and employment generating; seeds, fertilizers and pesticides should be provided on subsidized rates to small and marginal farmers; and that there should be a special compensation in case of crop-failure or crop damage. The study further suggested that education in the rural areas needs to be reformed, more and more peasants must be educated, academically and vocationally; families of the suicide victims must be rehabilitated and free education must be provided to
their children. The state must devise institutions and norms which may assure the real economic and social development of the agriculturists.

Singh et al. (2008) studied indebtedness among farmers in the Punjab state. They estimated that the average gross income was Rs 2, 80,694 per sampled farm household on overall basis. The relative share of livestock to gross family income was 20.60 per cent. The marginal holding constituted 40.80 per cent of the total land holdings and the percentage of large holdings to total land holdings declined consistently and was 16.40 per cent. Non-farm income was an important source of relative income for the marginal and small holding, where it had a contribution of 28.50 per cent and 22.00 per cent respectively to the total family income. The study also revealed that the proportion of indebted farm households was found to be 88.83 per cent in Punjab. The percentage of indebted households was the highest (93.23 per cent) in case of large farmers and that percentage was the lowest (80.37 per cent) as far as marginal farmers were concerned. Further, those proportions were 88.67, 90.85 and 91.95 per cent in the case of the small, semi-medium and medium farmers respectively, which shows that there was a direct relationship between the percentage of indebted farmers and farm size category. An average farm household in the state incurred Rs 1,33,858 (74.80 per cent) and Rs 45,076 (25.20 per cent) on productive and non-productive purposes, respectively.

Singh et al. (2009a) examined the inadequacies of institutional agricultural credit system in Punjab. The study was based on a random sample of 600 farm households covering 11 districts of Punjab state, comprising of 107 marginal, 150 small, 153 semi-medium, 87 medium and 103 large farmers during the year 2005-06. The study revealed that the total loan per farmer household in the state was Rs 178934, which comprised of Rs 110828 (61.90 per cent) from institutional sources and Rs 68106 (38.10 per cent) from non-institutional sources. The small and large farmers got 65 per cent of their loans from institutional sources and the semi-medium and medium farmers got less than 60 per cent of these loans from institutional sources. The study also revealed that an average farm household in the state incurred Rs 1,33,858 (74.80 per cent) on productive and Rs 45,076 (25.20 per cent) on non-productive purposes.
Singh *et al.* (2009b) conducted a study to examine the magnitude of the shift from farming to non-farming activity in Punjab. Out of 920 farmers who had left farming, only 589 remained in the villages and they comprised the sample of the study. Low income from farming due to low productivity and high input costs were the main reasons for abandoning farming. The study father revealed among the farmers that were earlier operating up to 4 ha of land, earlier 22 per cent joined the labor market, 23 per cent joined low-paid private/government jobs, 27 per cent started some low-skill self-employed venture. As many as 23 per cent of these farmers were not satisfied with their new occupation. Small and marginal farmers had left farming in distress and further they faced a decline in income and thus again entrapped in distress.

Singh (2010) estimated the levels of credit taken for different purposes by the marginal and small farmers in selected villages of Amritsar and Gurdaspur districts of Punjab in 2008-09. The study revealed that the total annual incomes were estimated to be Rs 56,428 and Rs 1,05,680 for the marginal and small farmers, respectively. The average annual expenditure was estimated to be Rs 79,769 and Rs 1,46,378 for the marginal and small farmers, respectively. The annual income fell short of the annual total expenditure by 41.40 per cent and 38.50 per cent in the case of marginal and small farmers, respectively. The study also revealed that the amount of debt per household was found to be more in case of small farm-size category standing at Rs 70,502 as against the amount of Rs 44,635 for the marginal farm-size category. The study also highlighted that as much as 46.40 per cent and 40.90 per cent of the total credit for the marginal and small farmers was acquired for the purchase of agricultural inputs followed by healthcare purposes which comprised of 20.00 per cent and 23.20 per cent of the marginal and small farmers respectively, of the total credit.

Centre for Human Rights and Global Justice (2011) estimated that more than a quarter million farmers had committed suicide in the last 16 years and was the largest wave of recorded suicides in human history. A great number of those affected were cash crop farmers and cotton farmers in particular. In 2009 alone, 17,638 farmers committed suicide which amounted to one farmer every 30 minutes. These farmers & their families were among the victims of India’s longstanding agrarian
crisis. Economic reforms and the opening of Indian agriculture to the global market over the past two decades had increased costs, while reducing yields and profit for many farmers to the point of great financial and emotional distress.

Satapthy and Mishra (2012) conducted a study in Odisha with a sample of 50 respondents consisting of agricultural scientists and farmers with equal proportion. They concluded that the farmers committed suicide because of multiple factors; these were crop failure, poor economic condition, social situation, poor market, non-remunerative technology, pressure of repayment by credit agencies, and weak psychology. They revealed that suicide has spread like an epidemic among the distress farmers; many farmers committed suicide by consuming the very pesticides that no longer worked on their crops. The number of farmers committing suicide staged, more than 100,000 farmers have taken their lives since 1997. The Study strongly called for the crucial intervention of governments and NGOs to work together, on a local, national and global level, to address and solve this critical issue.

Sajjad and Chauhan (2012) conducted a study on agrarian distress and indebtedness in rural India based on the state level data. NSSO data related to the agricultural year 2002-03. The study revealed that the major factors that led to indebtedness were the instability of food grain productivity, production, net returns and the cost of cultivation. The states having high level of agricultural development were characterized by high incidence of indebtedness. Most of the indebted farmers belong to the small and marginal categories, but the states where the degree of commercialization was high, the incidence of indebtedness was found to be high among the semi-medium and medium farmers. The agricultural credit system was abysmal and the farmers were not getting appropriate price for their crops. The authors emphasized that the situation demands urgent attention of the government, policy makers and planners to save the farmers from committing suicide and to re-boost the agricultural economy of the country.

Dongre and Deshmukh (2012) conducted a regional survey on farmers’ suicide in rural Vidarbha regions of Maharashtra and applied Smith's Saliency method to qualitatively rank the expressed causes among farming families of suicide victims. The study confided the reasons in order of importance behind farmer
suicides as – debt, alcohol addiction, environment, low produce prices, stress and family responsibilities, apathy, poor irrigation, increased cost of cultivation, exploitation by private money lenders, use of chemical fertilizers and crop failure. In other words, debt to stress and family responsibilities were rated significantly higher than use of chemical fertilizers and crop failure.

Kennedy and King (2014) conducted a study on farmers’ suicides and found that there were three specific characteristics associated with high risk farmers: "those that grow cash crops such as coffee and cotton; those with ‘marginal’ farms of less than one hectare; and those with debts of 300 Rupees or more." The study also found that the Indian states in which these three characteristics are most common had the highest suicide rates and also accounted for 75 per cent of the variability in state-level suicides. The findings of the study have clear policy implications. The authors suggested that if the state were able to reduce the proportion of marginal farmers, cash crops or indebted farmers by one per cent, the suicide rates per 100,000 per year–would be reduced by 0.437, 0.518 and 0.549 respectively, when all other variables were held constant. The study also highlighted the fact that the majority of Indian states have been unable to enact meaningful land reforms even after trying for six decades, largely because of the strength of the rural elite at the local level. The authors strongly advocated the need of state interventions to stabilize the price of cash crops and relieve indebted farmers which can effectively reduce suicide rates in India.

Gaur (2014) examined the development story of the state and revealed that the rural economy of Punjab was based on agrarian and allied activities, mainly livestock. The swelling cost of production and commercialization had escalated the costs and risks prone to crop failure have landed small and marginal farmers in the state of distress. The falling income and unproductive expenditure on religious as well as social ceremonies has made the peasants debt-ridden. In 1997, the approximate indebtedness of Punjabi peasants mounted to 5700 crores. Hence, the number of farmer suicides escalated in the state. According to a pilot survey conducted by Punjab Agriculture University, Ludhiana (2008), 2890 farmers committed suicide in Bathinda and Sangrur districts only during 2000-2008. Indebtedness was the major reason behind this phenomenon. The burden of debt and
constant pressure of social-stigma compelled these farmers to take this drastic step. Consequences of rural indebtedness were disastrous. Economically, rural indebtedness had resulted in the extreme poverty of the farmers, especially marginal and small farmers. Land was passing into the hands of non-agriculturists and the farmers were becoming landless. Socially speaking, rural indebtedness had created a class of landless labourers and tenants; it had also resulted in bonded labour and many other evils. Thus, the study was conclusive of the evidence that ‘development’ is a cumulative force and should influence social as well as economic growth. The disequilibrium in agrarian society had lead to wrong tendencies like drug abuse and suicides. For preserving its ‘bread basket’ crown, Punjab should try to improve the lot of the agrarian community, particularly of the marginal and small farmers.

III. Sustainability prospective of marginal and small farmers

Studies that dealt with viability and sustainability aspects of marginal and small farmers are reviewed and major finding are reported here.

Srivastava (1984) examined the potentiality of vegetable farming on small farms in Bihar. The study discovered that vegetable farming was the best option to make marginal operational holdings viable. It was observed that the area under vegetables, the proportion of irrigation area to net cultivated area and the intensity of cropping was fairly high. The per acre net income received from vegetables was almost four times higher than the food crops. The marginal value of productivity indicated that the investment on manure and fertilizers provided the highest return per rupees of investment. Also, the marginal value of productivity, for human labour suggested more investment on this input, thereby creating additional jobs for the rural people on vegetable farms. Irrigation processes demanded the replacement of irrational use of bullock labour in vegetable farming with trained water management technology. Moreover, the development agencies should encourage the marginal and small farmers to concentrate more on vegetable farming.

Azad et al. (1985) in their study revealed that the crop enterprises hardly met the basic requirements of the marginal and small farmers and hence they were compelled to go in for livestock enterprise and work for wages in order to cope with their cash needs. The utilization of family labour of marginal farmers for crop
production and raising of milch cattle for other purposes accounted for only 40 per cent of the total availability of family labour during the year. They remained idle or bound to go baigar (self labour) to the big farmers during the unemployment period. The result of cost-benefit analysis showed that the diversification of marginal farmers from crop production to livestock enterprises helped to reduce the pressure on land by opening up new avenues of labour employment. Moreover, this would increase the entrepreneurial skill of marginal farmers, which would eventually increase the marginal productivity of labour. The cost-benefit ratio accruing from milk production of marginal farmers was just equal to the cost-benefit ratio of crop production. The small farmers might take to either of the two enterprises as the cost-benefit ratio from livestock and crop production was observed to be equal. Keeping in view the limited cultivated area with them, the marginal and small farmers should be encouraged to adopt multiple farm enterprises by providing them loans and subsidies.

Satheesh et al. (1985) in their study on non-viable farmers in Andhra Pradesh pointed out that the adoption of recommended technology coupled with adequate credit facility under crop-dairy-sericulture farming system incremented the entire gamut of income potential and offered an economically viable and practically feasible solution to low income problem of the non-viable farms. The study also highlighted that when capital was limited, the crop-sericulture farming system has maximum potential of augmenting income and employment. For the small farmers, who basically relied upon labour intensive techniques, a liberal dose of credit was thus found to be essential to push them into higher levels of production and consequently income, as they did not have sufficient saving and liquidity in hand to invest in the farm sector.

Singh and Sharma (1988) examined the potential of increasing income and employment on small farmers under different farming systems and indicated the maximum potentialities in increasing the level of income under different combinations over the existing one in the crop and goat farming followed by combination of crop and dairy farming, crop-cum-dairy-cum-goat farming, crop farming along crop-cum-dairy-cum-poultry farming system. Another combination suggested that the maximum potentialities of increasing income over the existing
levels existed in crop, dairy and goat farming system followed by crop and goat farming and thirdly crop-cum-dairy-cum-poultry farming system in an order. It was found that wherever dairy constituted a component of farming systems, even in the optimized farming situation, it appeared as the major source of income.

Barbier and Conway (1989) found that animal husbandry played a very important role in the economy of small and marginal farmers. Within the animal husbandry, the role of cattle, particularly of sheep and goats was very important. Further, wherever irrigation facilities were poor, one could generally find large area of waste and other common property land, which was the only resource for the poor households to make both ends meet. A major part of their fodder requirements was met through such waste and common property land. These rural households had often capitalised upon their available meagre resources to develop their agriculture and livelihood systems. Thus, they could sustain agriculture on marginal land.

Dantwala (1991) in his study firmly argued the need for efficient policies and operational system to generate income, sustain livelihood and simultaneously meet the national requirement of food and raw material. The author revealed that in the long run, a substantial proportion of agricultural population might have to abandon agriculture and go for non-agricultural occupations. The study highlighted the need to focus on the issue of non-viability of farming, especially for marginal and small farmers in the short run on a priority basis. Therefore, the author felt a need to frame suitable strategies and policy options for making small farmers viable and sustainable.

Radha et al. (1995) made an attempt to analyze the potentials of dairy farming as an additional avenue for income generation in Karimnagar district of Andhra Pradesh. The results indicated that the farms in the study area obtained a net return of Rs. 10549 from agriculture. The analysis also revealed that by maintaining one milch animal in addition to crop husbandry and incurring an additional expenditure of Rs 4485 for cultivating one hectare of land, the farms would drive additional net returns of Rs 2194 besides generating additional employment of 76 days or by 24 per cent of the total employment per year. Thus, dairying played a major role in augmenting the income as well as creating employment among the
farming community. Further the study brought out some constraints in dairy farming like transport, processing and storage of milk and low productivity of milk animals is being faced by sampled farmers.

Singh et al. (1995) conducted a study in Gwalior district of Madhya Pradesh, to examine the role of dairying in the farm economy of marginal and small farmers. A sample of 50 irrigated farms each from small and marginal size-groups and an equal number of un-irrigated farms each from the corresponding size-groups were randomly selected representing different farming situations in the study area. It was found that the contribution by dairying was higher on the irrigated farms, but in relative terms, un-irrigated farms were better in both the size categories. Within the dairying enterprise, buffaloes contributed more than 73 per cent and 76 per cent of total per farm income of marginal and small farms, respectively. A similar trend was visible under un-irrigated situation, though the contribution was slightly less than that of irrigated counterparts. The study brought some important factors responsible for low productivity of milk animals such as poor feeding, high death rate and scarcity of funds, besides lack of veterinary facilities in the study area. It was concluded that dairying, as a non-land augmenting enterprise and as an adjunct to crop production, played an important role in improving and propelling the farm economy of the marginal and small farmers irrespective of their farm situations either irrigated or un-irrigated.

Singh (1995) examined the potential options for betterment of peasants in the view of new economic environment in Himachal Pradesh. The study revealed that the potential option for upliftment of marginal and small farmers of the state lies in the adoption of vegetable farming. It was supposed to be the best option for small farmers as it would utilise the limited land endowments for high pay-off crops like fruits and vegetables. Vegetables cultivation was one such vocation that suited most to hilly terrain and moderate climate, which in general yielded much higher returns per unit of land than other crops. The production of fruit crops by small farmers was ruled out because these need high amount of capital and a long gestation period. Though the total profit were not as expected due to low volume of production and high cost of marketing, yet vegetable farming along with livestock rearing was found to be more profitable on marginal and small farms than on large farms. It was
suggested that in areas suited for off-season vegetables, the farmers should be given incentives in terms of cheap credit, quick and cheap transportation, irrigation facilities, and quality seeds, marketing assistance and assured floor prices.

Saini et al. (1996a) studied on the impact of diversification on the small farm’s economy in Kangra district of Himachal Pradesh. They found that income of the small farmers could be raised and credit needs of the small farmers could be easily met through the execution of diversification plans suggested in the study. The diversification plans were suggested only after closely examining their impact on income, employment and credit needs of the small farmers. A broad investigation was conducted in the study area by the Himachal Pradesh Krishi-Vishwavidyalaya on economics of farming system. Mixed integer programming techniques were used to generate these diversified farming plans by making provision for the introduction of commercial enterprises like dairying, poultry, beekeeping, floriculture etc. in the existing farming system.

Saini et al. (1996b) made an attempt to analyse the income and employment potential of dairying in Punjab. The study revealed that the share of dairying in supplementing farm income had increased from 14 per cent during 1975-76 to 18 per cent over 1991-92. Though the increase at state level did not seem to be much impressive, yet its impact on the smaller holdings was very much significant as it served as an addition to crop husbandry in the farm economy of small and marginal farmers. The dairy enterprise supplemented almost one-third of the total family income of smaller farmers in the state. It was found that dairying enterprise along with crop farming had a greater impact on the improvement of distribution of family income, especially smaller farms, with a greater share in comparison with the situation when crop farming alone was followed.

The study emphasized that dairy farming needed to be encouraged in the rural area of the state to improve the economic lot of the smaller peasantry. The government can further aid in uplifting the plight of small and marginal farmers by providing cheaper finance on one hand and better quality of milch animals on the other so that the farming community would be able to adopt this enterprise along with crop farming.
Singh et al. (1997a) in a study on marginal farmers highlighted that the potential for supplementing the farm incomes probably lies in diversification of crop farming with high yield milch animals because the crop cultivation alone in India was subjected to a high degree of risk and uncertainly and had provided only seasonal, irregular and uncertain income to the farmers. Dairying, being a self generating income enterprise had reduced the short-term credit requirements by supplying regular income to the farmers. However, the available medium term credit to the farmers being meagre, a substantial amount of its requirement for medium-terms loans had increased manifold with the introduction of high yielding milch animals of improved breeds. Thus, the author emphasized on providing conducive terms of medium-term credit to support the marginal farmers which would enable them to diversify their farming with dairy enterprise, which seemed to be the single best measure to solve the chronic problem of unemployment/disguised employment of family labour on these farms.

Padmanabhan (1999) made an attempt to analyze the problems of small and marginal farmers in Tamil Nadu. The study envisaged that the land that they own could not be engaged fully to provide them the necessary income. The position was deplorable in the rain fed areas, where they could raise only one crop. The men and women of the small and marginal farms undertook wage employment. But, demand supply imbalances pushed the wage rate down. Further, mechanization of farming activities had reduced the scope for employment in agriculture. Indebtedness, starvation deaths, continuous drought, migration to towns and cities were the common problems encountered by this group of farmers. To mitigate the sufferings of these unfortunate victims, the farmers’ self-help clusters were formed to help the small and marginal farmers. The groups aimed at mitigating the sufferings of these unfortunate by creating awareness about production and marketing activities, exploitation by the money-lenders, supply of inputs at reasonable prices, promoted savings among members and to take appropriate measures to improve their living conditions. The Farmers’ Self Help Clusters (FSHCs) organized various activities like education watch forum to monitor the functioning of government schools, spread literacy among women and drop-out children and to undertake the training programs for small and marginal farmers. The groups succeeded in their efforts and
the members started earning income, which induced them to save, and reduced their dependence on money-lenders, traders and landlords.

Senthil et al. (1999) conducted a study on marketed surplus, farm investment and economic viability of small farms in Tamil Nadu. They found that marketed surplus was high in the garden lands and the only source of capital investment was own saving of the farmers. Role of commercial banks was considerable in wetlands, whereas cooperative societies had some share in partly irrigated lands. Investment pattern showed that in all the situations, farmers’ major investment was on farm development activities like digging or deepening the well, fencing, soil conditioning etc. Viability per cent was found to be high in garden lands followed by partly irrigated lands and wetlands. The policies like developing a credit package that would link creation of farm processing of infrastructure to the quantum of products marketed, for garden lands advancing self-liquidating terms loans for purchase of livestock and machinery to supplement the farm income in partly irrigated situation and offering a credit package that would link the amount sanctioned with extent of diversification of farm activities particularly on post-harvest processing through mechanization in wet lands were suggested.

Rangi and Sidhu (2000) studied the problems of small and marginal farmers in marketing of fruits and vegetables in Punjab. The covetous findings of the study revealed that cultivation of horticultural crops could play an important role in increasing the income of the small and marginal farmers, but the farmers preferred rice-wheat rotation of crops mainly on account of assured price policy, easy market clearance, stable yield, short duration of the crops, etc. On the other hand, these attractive factors were lacking for horticultural crops. It was recommended that a subsidy at the rate of Rs 50 per quintal might be given to the small and marginal farmers for the potato seed purchased from the public seed agencies/department of horticulture. Similarly, arrangements should be made for supplying quality seeds/plants of other fruits and vegetables grown in the state especially for small farmers. The study also recommended that suitable changes should be made in the rules and regulations of the cold stores to reserve 10-15 per cent of their capacity exclusively for the small and marginal farmers. Also, cooperative cold stores may also be built up exclusively for this class of producers. To enhance the producers'
share in the customers' rupees, it was suggested that small and marginal farmers should form marketing cooperative or may adopt group marketing. These measures could almost double their share.

Ghuman (2001) conducted a study on commercial bank loans to agricultural sector with special reference to small and marginal farmers. The study was based on data relating to seven northern states. The major findings of the study indicated that both short-term and long-term bank loans to agricultural sector had witnessed phenomenal growth overtime in the northern states of India. However, the benefits of bank loans were unevenly distributed across various stratas of farmers with a large bend towards medium and large farmers. The small and marginal farmers received relatively less bank loans as compared to their total land holdings. In contrast, medium and large farmers emerged as the principal beneficiaries of bank loans. Thus, small and marginal farmers had to depend upon informal sector services to fulfill their credit needs. The study recommended that commercial banks should extend liberal finance to small and marginal farmers with a view to liberate them from the clutches of informal financial institutions. As a policy matter, the banks should strike a balance between distribution of loans and size holdings.

Kapur (2001) studied the prospects of agro/farm-forestry to solve the problems of small farmers in Haryana. It was observed that small farmers could boost their income from limited holdings and at the same time maintains the soil health by adopting agro-forestry. Poplar and Eucalyptus were found to be the most suitable for this purpose. The small farmers could adopt periphery plantations in N-S direction as it causes negligible reduction in yield of agricultural crops. The average net profit per acre per year from agriculture plus poplar was estimated to be Rs 28,361 whereas from agriculture alone the net profit per acre per annum was estimated at Rs 15,333. Thus, net profit under agro forestry was almost double of the income from agriculture alone. The study further suggested that farmers should make efforts to improve the survival rate of plants and shorten the harvesting age through intensive management practices.

Kaur et al. (2001) made an attempt to examine the problems of small farmers and possibilities of indebtedness in the state of Punjab. The study revealed that there
was a decline in marginal holdings during the nineties due to marginal owner leasing out their land to other farm groups, owing to the limited potential and meagre income from the holdings. Majority of the small and marginal farmers followed wheat, paddy and vegetables cropping pattern and obtained yield level at par with large farmers. The major discouraging factor for small farmers was higher cost of cultivation as compared to large farms because of hired machinery and high transportation costs. Even marketing of their produce was also a herculean task because they had no clarity about the marketing charges to be charged by marketing agencies. They were cheated by arhtiyas and high deductions from their payments were made at the mandis. The study also revealed that the farming families who adopted subsidiary occupations like service, shops etc. were better off than their counterparts who did not adopt these. The author laid stress on cooperative farming and cooperative marketing as remedial measures to solve problems of this most vulnerable section of the farming community.

Vashist and Pathania (2001) formulated a comprehensive strategy for sustainable development of small and marginal farmers in Himachal Pradesh. The elements of strategy were: (1) consolidation of holdings for making economically viable size on small and marginal farms, (2) re-organization of cropping pattern to change the economy of small and marginal farmers, (3) supply of agricultural inputs in adequate quantity, timely delivery at reasonable rates, (4) thrust on diversification of agriculture, enhancement of productivity and environmental safety, (5) improving irrigation through harvesting of excessive rain water during rainy season and using it during scarcity periods, (6) Balanced use of fertilizers including us of bio-fertilizers, (7) growing off-screen vegetable crops and linking production with marketing in different areas of the state, (8) establishment of agro-industries for enhancing income and employment, (9) training of women farmers, (10) use of bio-technology and bio-processing to enhance the efficiency and economics of small holders.

Kumar and Kumar (2003) made an attempt to study the sustainability perspective of small and medium farmers in Visakhapatnam district of high altitude and tribal area zone of Andhra Pradesh. The study concluded that the income and employment of small and medium farmers from their sub-divided and fragmented land holdings can be increased and sustained by practicing farming system
approach. The three predominant farming systems studied were: (1) Agriculture with apiculture (2) Agriculture with sheep rearing and (3) Agriculture with sericulture. The estimates of costs and returns of the selected farming systems revealed that agriculture with apiculture was the most profitable farming system followed by agriculture with sheep rearing and agriculture with sericulture. In terms of number of man days generated, the highest percentage of man days were generated by the sheep enterprise in the sheep rearing farming systems to an extent of nearly 250 per cent over the crop enterprise. This was followed by sericulture and apiculture enterprises with 38 and 16 per cent respectively, higher man-days over their respective cropping systems.

Sidhu and Bhullar (2004) studied the impact of livestock especially dairy on income and employment in the farming sector of Punjab. The study witnessed the importance of dairy especially in augmenting the business income over the years. In fact, the economic surplus of small and marginal farmers largely depended upon the incomes from the dairy. It was observed that dairy contributed by 75 per cent to gross farm business income whereas crop sector contributed about 25 per cent of farm business income of marginal farms during the period 1987-90 to 2000-03. The respective contribution of dairy and crop income was 54 per cent and 46 per cent of small farms during the same period. The labour absorption was higher by 23 man-days on marginal farms and 4 man-days per annum on small farms. It showed that it was only to the dairy sector that the marginal and small farmers were sustaining. Also, their future economic growth was largely dependent on the growth of livestock economy in the state.

Jayachandra and Naidu (2006) conducted a study to examine the impact of dairy co-operatives on income employment and creation of assets of the marginal and small farmers. The study covered 60 families (small and marginal farmers) in Rangampet village of Chandragiri Mandalam in Chittoor District of Andhra Pradesh. They fund that dairying offered a vast scope for increasing the income, employment opportunities and assets value of the marginal and small farmers, whose marginal and average productivity was low. The study revealed that the two categories of farmers had registered an increase in their net income through dairying, but the increase was higher in case of marginal farmers (25.50 per cent) as compared to the
small farmers (22.98 per cent). The value of assets has also increased with the help of dairying in both the categories, but the increase was higher in the case of marginal farmers (15.00 per cent) as compared to that of the small farmers (12.50 per cent).

Singla and Sidhu (2010) examined the viability of small and marginal farmers in Ludhiana district of Punjab. They reported that it was a matter of organizing their resources efficiently through optimum combination of supplementary/complementary enterprises while using efficient technology backed by effective intervention of the developmental agencies in terms of training, credit and remunerative markets. It was further pointed out that even in the Manchester of India, small and marginal farmers were not commercially viable; rather they were subsistent at margins. They were thriving the crisis due to acquisition of hereditary lands and supplementing their possible minimum standard of living by selling the residual marketed surplus. They remained vulnerable facing social and health uncertainties and this needed special care to make them viable. The study further highlighted the potential to increase their income by simply recognizing the limited land and surplus family labour, achieving the maximum efficiency by using high yielding labour-intensive technologies.

The above studies proclaim that the new agricultural technology has widened the gap between the different sections of farming population. The farming practices have been largely biased in favour of the big farmers as compared to the small farmers, as the latter were not capable enough to accept the new technology due to financial constraints. Some of the studies revealed that the marginal and the small farmers were unable to obtain a higher output per acre than the big farmers, as those did in the pre-green revolution period.

Various studies conducted in different agro-climatic zones and varied socio-economic conditions throw light on the status and various constraints of the rural households, especially marginal and small farmers. Many suggestions have also been put forward to raise their income and employment levels in order to make them viable and sustainable. The valuable information collected from various empirical studies provided great help for the current study in identifying the factors affecting the viability of marginal and small farmers and also to develop viable and sustainable farming systems.