Chapter – VII

Summary, Conclusions and Policy Implications

The socio-economic structure, which prevailed prior to the British rule in the country, resulted in the organization of self-sufficient villages. It has been maintaining some kind of static equilibrium. The Indian peasant, though not properly educated, has adequate experience of farming systems and he has been dependent on it for the means of living. The Royal commission of Agriculture in India observed that both the methods of cultivation and social organization exhibit that settled order which is characteristic of all countries in which the cultivating peasant has long lived in and closely adapted himself to the conditions of a particular environment.

The Indian agrarian economy on the eve of independence was critical in situation. It could be characterized totally primitive, deteriorative and turbulent. After partition, the country is left with 82 per cent of the total population of undivided India as well as only with 69 per cent of land under rice, 65 per cent under wheat and 75 per cent under all cereals. The deficiency of food grains is quite alarming and aggravating at that time (Chahal, 1999).

In view of this, after independence tremendous efforts are made to boost the economy through agriculture as one of the tools for development. The Government of India adopted a more positive approach and hence a well defined policy of integrated production programmes with defined targets and a proper distribution programme is adopted along with other measures for the overall economic development of the country. Specific programmes like new agriculture technology are introduced to convert agriculture into a successful and prosperous business, to
bring more land under cultivation and to raise agriculture production. In India, the adoption of new agricultural technique is costly than that of traditional method of cultivation. In traditional method, inputs are least expensive, on the other hand, inputs in modern technology like high yielding varieties of seeds, fertilizers, farm mechanization and irrigation are very costly and Indian farmers being poor are not in a position to buy these expensive inputs. Then on the recommendations of food grain price committee (Jha Committee), the Government of India started the scheme of subsidies on purchase of various agriculture inputs to facilitate the farmers (Singh, 1994).

Subsidies have occupied agricultural economists for a long time because they are pervasive in agriculture, even though they are often applied in ways that benefit mostly richer farmers, cause inefficiencies, lead to a heavy fiscal burden, distort trade, and have negative environmental effects. Agricultural subsidies can play an important role in early phases of agricultural development by addressing market failures and promoting new technologies (Fan, 2008).

All of these subsidies by reducing the prices of the inputs, served in the initial stages of green revolution, as incentives to the farmers for adopting the newly introduced seed-cum-fertilizer technology. These helped in raising the agricultural output, after some time, the amount paid on these subsidies began to rise (Gulati, 2003).

In India, at present centre as well as state governments are providing subsidies on fertilizers, irrigation (canal water), electricity and other subsidies to marginal farmers and farmers’ cooperative societies in the form of seeds, development of oil seeds, pulses, cotton, rice, maize and crop insurance schemes and price support schemes etc. Out of these subsidies, the Central Government of India
provides indirect subsidies to farmers on the purchase of fertilizers from 1977, whereas state governments are providing subsidies on irrigation as well as on electricity (Government of Punjab, Agriculture Department, Chandigarh).

Subsidies are often criticized for their financial burden. Some researchers assert to the extent that these should be withdrawn in a phased manner, such a step will reduce the fiscal deficit, improve the efficiency of resources use, funds for public investment in agriculture. On the other hand, there is a fear that agriculture production and income of farmers would decline if subsidies are curtailed. These are very important issues and need serious investigation. The objectives of the present study are to study the growth and distribution of agricultural subsidies in India, to study the growth and distribution of agricultural subsidies in Punjab State, to study the impact of agricultural subsidies in Punjab, to suggest ways and means for giving agricultural subsidies to farmers of Punjab.

The present study is related to agriculture subsidies in India as well as Punjab from 1980-81 to 2008-09. In this study agriculture subsidies of fertilizers, electricity, irrigation (canal water), seeds, machinery etc. are discussed during pre-liberalisation period (during 1980-81 to 1985-86), first phase of liberalisation period (during 1990-91 to 1996-97) as well as during second phase of liberalisation period (during 2000-01 to 2008-09). For analysing the growth and distribution pattern of agriculture subsidies, five zones i.e. south zone (includes Andhra Pradesh, Karnataka, Kerala, Tamil Nadu, Pondicherry, Andaman and Nicobar Islands and Lakshadweep), west zone (includes Gujarat, Madhya Pradesh, Chhattisgarh, Maharashtra, Rajasthan, Goa, Daman and Diu and Dadra Nagar Haveli), east zone (Bihar, Jharkhand, Orissa and West Bengal), north zone (Haryana, Punjab, Uttar Pradesh, Uttaranchal, Himachal Pradesh, Jammu and Kashmir, Delhi and Chandigarh) and north-east zone (Assam,
Tripura, Manipur, Meghalaya, Nagaland, Arunachal Pradesh, Mizoram and Sikkim) as well as twenty districts of Punjab state have been taken.

This study is based on primary as well as secondary data. The districts of Punjab have been divided into three regions on the basis of levels of agricultural productivity. Average productivity is estimated by aggregation of the output of ten major crops of the state for the year 2006-07. Keeping in view the differences in agro-climate conditions and to avoid the geographical contiguity of sampled districts, it is deemed fit to select Ludhiana from high productivity zone, Bathinda from medium productivity zone and Rupnagar from low productivity zone. There are six tehsils of Ludhiana, three tehsils of Bathinda and Rupnagar each. Following random sampling, three villages from each tehsil are selected, thus thirty six villages are selected from three districts. Sampled farmers have been divided into three categories on the basis of their farm size, small size category farmers are those who own land up to five acres, medium size category farmers own land between five to ten acres and large size category farmers own land above ten acres. A detailed questionnaire is prepared for collecting information about the agriculture subsidies. Standard statistical tools like mean values, percentages have been used while carrying out tabular analysis.

The present study has been divided into seven chapters. The first chapter provides an introduction to the concept of agriculture subsidies. The second chapter is related to the different views of the analysts. The third chapter deals with the gross cropped area, fertilizers subsidies, electricity subsidy and irrigation subsidy in India. The fourth chapter shows district-wise gross cropped area, subsidies of fertilizers, electricity and subsidies provided under various schemes to the farmers in Punjab state. The fifth chapter deals the issues relating to the productivity of crops and total
subsidies in India as well as in Punjab. The sixth chapter shows the impact of agriculture subsidies in Punjab state. The last chapter presents the summary, conclusions and policy implications.

The present study is related to agriculture subsidies in India as well as Punjab from 1980-81 to 2008-09. In this study, agriculture subsidies of fertilizers, electricity, irrigation, seeds, machinery etc. and impact of agriculture subsidies are discussed during pre-liberalisation period (1980-81 to 1985-86), first phase of liberalisation period (1990-91 to 1996-97) as well as during second phase of liberalisation period (2000-01 to 2008-09). Following are the major findings of the present study:-

The gross cropped area (GCA in thousand hectares), has increased by only 1.01 times during post liberalisation period (in 2006-07) as compared to pre-liberalisation period (in 1980-81) in India, whereas declined by 1.06 times in the year 2006-07 as compared to 1990-91. In absolute terms, in north-east zone, the gross cropped area has increased throughout the study period, declined in south zone (in 2000-01) and also declined in west as well as in north zones in 2006-07. Whereas in east zone, the GCA has increased during 1980-81 to 1990-91 and declined during 1996-97 to 2006-07. The percentage-wise analysis shows that west zone has occupied first rank followed by north, south, east and east-north zones during pre as well as post liberalisation periods.

During post-liberalisation period (in 2006-07), the GCA (in 000 hectares) in absolute terms has declined in all the states of south zone except in Karnataka and Tamil Nadu (in these states, the GCA has increased) as compared to pre-liberalisation period (in 1990-91). The percentage share has increased in all the states except in Pondicherry, Lakshadweep (percentage share remains constant) and in
Andaman and Nicobar (percentage share declined) in the year 2006-07 as compared to the year 1990-91. In all the states of west zone, a lot of variation is observed in absolute terms as well as in percentage share of GCA during the study period.

The GCA, in absolute terms, has increased in Haryana, Punjab, Uttar Pradesh and Jammu and Kashmir states of north zone during 1980-81 to 2000-01 and declined in Delhi during 1980-81 to 2006-07, whereas a lot of variation is seen in Himachal Pradesh. In Haryana, Uttar Pradesh, Jammu Kashmir and in Himachal Pradesh, it has increased by 1.08 times, 1.01 times, 1.05 times and 1.02 times respectively in 2006-07 as compared to 1990-91. During pre-liberalisation period (1990-91), Punjab has received 7.04 times more of GCA as compared to Jammu and Kashmir and Himachal Pradesh has got thirteen times more from Delhi. Whereas during post-liberalisation period (2006-07), Punjab has got near about four times from Jammu and Kashmir and Himachal Pradesh received twenty two times than that of Delhi. It is found that Uttar Pradesh has got 4.04 times and 4.3 times more of GCA as compared to Haryana during pre-liberalisation period (in 1990-91) and post liberalisation period (in 2006-07). During pre-liberalisation in Bihar state of east zone, GCA has declined in absolute terms, on the other hand, it has increased in Orissa as well as in West Bengal. In all the states of north-east zone, the GCA in absolute terms has increased only in Nagaland during pre as well as post liberalisation periods, whereas a lot of variation is seen in percentage share among all the other states.

At national level during pre as well as post liberalisation periods, the total subsidies (fertilizers, electricity and irrigation subsidies) in Rs. crores have increased at different increasing rates (as compared to other years, the rate is high during pre-liberalisation period i.e., 290.39 per cent in 1985-86 from 1980-81) and in absolute
terms. In 2008-09, the total subsidies have increased 94.38 times more than that of 1980-81, whereas fertilizers subsidies have increased by 29 times, electricity subsidy by 75.24 times and irrigation subsidy by 36.86 times in 2000-01 as compared to pre-liberalisation period (1980-81). In 2000-01, irrigation subsidies have increased by 1.07 times more, whereas electricity subsidy has increased by 1.96 times more as compared to fertilizers subsidies. All the subsidies in Rs. crores, have increased during pre and post liberalisation periods, whereas during 1980-81 to 1985-86 the percentage share of subsidies of fertilizers in total subsidies is maximum followed by irrigation and electricity. During 1996-97 to 2000-01, the percentage share of electricity in total subsidies is maximum followed by irrigation and fertilizers, whereas in 2008-09, the percentage share of fertilizers subsidies is again maximum i.e. 87.26 per cent.

The north zone has got major percentage share (36.49 per cent, 32.2 per cent in 1980-81 and 1985-86 respectively) of total subsidies at national level. Whereas during 1990-91 to 2000-01, west zone occupied topmost position and again north zone is ahead among all the other zones by getting 31.80 per cent of total subsidies at national level in 2008-09. The percentage share of east zone in total subsidies has increased during the study period except in 1990-91 and a lot of variation is seen in percentage share of north-east zone throughout the study period.

During pre as well as post liberalisation periods, the total subsidies in Rs. crores, have increased in absolute terms in all the states of south zone. In all the states of west zone, the total subsidies in Rs. crores, including fertilizers, electricity and irrigation subsidies have increased in absolute terms, whereas percentage-wise analysis shows a lot of variation during the study period. The total subsidies in Rs. crores, have increased in absolute terms in all the states of north zone except in
Jammu and Kashmir and Delhi. As compared to 2008-09 to 1990-91, it is observed that Haryana is that state, where total subsidies are increased maximum number of times i.e. 13.6, whereas only 6.5 times in Jammu and Kashmir. As compared to Haryana, Punjab has got 1.99 times more of total subsidies in 1990-91.

Total subsidies in Rs. crores, have increased in absolute terms in all the states of east zone during pre as well post liberalisation periods, whereas a lot of variation is seen in percentage share. In absolute terms, the total subsidies in Rs. crores, have increased in all the states of north-east zone except in Tripura, Manipur, Mizoram and Sikkim throughout the study period.

During pre-liberalisation period (in 1990-91), it is observed that Uttar Pradesh is leading among all the other states of India by receiving maximum percentage share of gross cropped area i.e. 13.74 followed by Madhya Pradesh (12.88 per cent), Maharashtra (11.79 per cent), Rajasthan (10.45 per cent) and Andhra Pradesh and in post-liberalisation period (in 2006-07), Rajasthan is ahead among all the other states by getting 20.67 per cent of GCA followed by Uttar Pradesh (14.69 per cent), Andhra Pradesh and Gujarat (7.29 per cent), Karnataka and Madhya Pradesh (7.08 per cent) and Tamil Nadu (4.64 per cent). In total subsidies (in Rs. crores), Uttar Pradesh has ranked first, Maharashtra, Andhra Pradesh, Gujarat, Rajasthan and Punjab ranked second, third, fourth, fifth and sixth respectively in 1990-91, whereas Uttar Pradesh leading among all the states followed by Andhra Pradesh, Maharashtra, Punjab and Karnataka in 2008-09.

At national level as well as zone level, fertilizers subsidies in Rs. crores, have increased in absolute terms and a lot of variation is seen in percentage share during pre as well as post liberalisation periods. The fertilizers subsidies have increased the maximum times i.e. more than forty five times in north-east zone. As compared to
east zone, during pre-liberalisation period (in 1990-91), the south zone has got 2.28 times more of fertilizers subsidies, whereas in 2008-09, it has received 1.81 times more. It is seen that during pre-liberalisation period, north-zone received maximum (40.47 per cent in 1980-81 and 40.76 per cent in 1985-86) amount of fertilizers subsidies followed by south, west, east and north-east zones. In 1996-97, south zone has occupied first rank by getting 33.73 per cent followed by north, west, east and north-east zones, whereas in 2005-06, North zone has got 31.79 per cent followed by west, south, east and north-east zones.

In all the states of south zone, the fertilizers subsidies in Rs. crores, have increased in absolute terms during the study period. As the year 2008-09 is compared to the year 1990-91, it is found that in Karnataka the fertilizers subsidies have increased twenty four times, in Andhra Pradesh near about twenty one times and in Kerala near about twelve times. Andhra Pradesh has got near about two times fertilizers subsidies as compared to Karnataka during pre as well as post liberalisation periods. In all the states of west zone, the fertilizers subsidies in Rs. crores, in absolute terms have increased during post liberalisation period as compared to pre-liberalisation period. Whereas a lot of variation is seen in percentage share during the study period. As the year 2008-09 is compared to the year 1990-91 of pre-liberalisation period, it is found that in Rajasthan, the fertilizers subsidies have increased 30.97 times, in Gujarat 26.55 times, in Madhya Pradesh more than nineteen times and in Maharashtra, these have risen up more than twenty one times.

The fertilizers subsidies in Rs. crores, have increased in absolute terms in all the states of north zone (except in Delhi) during the pre as well post liberalisation periods, whereas a lot of variation is seen in percentage-wise analysis. As 2008-09 is
compared to 1990-91, it is found that in Uttar Pradesh, these have increased near about 19.65 times more of fertilizers subsidies, Jammu and Kashmir 26.95 times, Haryana twenty four times, Himachal Pradesh eighteen times and Punjab fifteen times. In 1990-91, Punjab has got two times more of fertilizers subsidies and 1.37 times in 2008-09 than that of Haryana, whereas Uttar Pradesh has received 52.61 times more in 1990-91 and 38.37 times in 2008-09 from Jammu and Kashmir. In all the states of east zone as well as north-east zone, the fertilizers subsidies in Rs. crores, have been increased in absolute terms during the study period.

In fertilizers subsidies (in Rs. crores), Uttar Pradesh is ahead among all the by getting maximum percentage share 17.96 followed by Andhra Pradesh (12.98 per cent), Maharashtra (10.56 per cent), Punjab (9.79 per cent) and Madhya Pradesh (7.77 per cent) in 1990-91, on the other hand in 2008-09, Uttar Pradesh has got first position by receiving 16.19 per cent of fertilizers subsidies, followed by Andhra Pradesh (12.33 per cent), Maharashtra (10.30 per cent), Karnataka (7.35 per cent) and Punjab (7.10 per cent).

In India as well as in the five zones the fertilizers subsidises in Rs. per hectare, have increased in absolutes terms during pre as well as post liberalisation periods. As post liberalisation period (2006-07) is compared to pre liberalisation period (1990-91), it is observed that in south, the fertilizers subsidies have increased by fourteen times, in east ten times, west zone more than nine times, north zone more than six times and north-east zone six times. As compared to west zone, south zone has got near about two times of fertilizers subsidies in 1990-91 and more two times in 2006-07, whereas north zone has got near about three times in 1990-91 and 1.66 times in 2006-07 as compared to east zone. North zone has enjoyed major portion of fertilizers subsidies per hectare at national level during 1980-81 to 1996-97, whereas
south zone has got maximum percentage share i.e. 45.97 in 2000-01 and 43.64 in 2006-07. It is found that in all the states of south zone the fertilizers subsidies in Rs. per hectare have increased in absolutes terms during 1980-81 to 2006-07, whereas the percentage share has increased in Andhra Pradesh, Karnataka and Kerala during 1980-81 to 1990-91 and a lot of variation is observed during post liberalisation period.

The fertilizers subsidies in Rs. per hectare have been increased in the entire states (except in Goa) of the west zone as well as north zone throughout the study period, whereas percentage share analysis reveals a lot of variations. While 2006-07 is compared to 1990-91, in Maharashtra these have increased the maximum i.e. fourteen times, whereas in Goa it has increased minimum i.e. 2.11 times. In all the states of east zone, the fertilizers subsidies in Rs. per hectare have increased in absolute terms during pre as well as post liberalisation periods. The analysis of fertilizers subsidies in Rs. per hectare shows that in all the states of north-east zone these have increased except in Meghalaya, Nagaland, Mizoram and Sikkim in absolute terms during the study period. As 2006-07 is compared to 1990-91, it is observed that in Assam these have risen up by eighteen times, in Tripura more than eight times, in Manipur near about six times, in Mizoram as well as in Arunachal Pradesh near about five and Meghalaya only 1.4 times.

The electricity subsidy in Rs. crores has increased in absolute terms during the study period except in 2008-09, whereas the same pattern is found in south, west and east zones. As 2008-09 is compared to 1990-91, in north zone this subsidy has increased by 4.68 times more, in south zone more than three times, in east zone more than two times and in west zone 2.02 times. The results indicate that north zone occupied first rank by getting maximum amount of 47.34 per cent and 31.91 per cent
of electricity subsidies in Rs. crores in 1980-81 and 1985-86 respectively. West zone has got first rank after liberalisation period except in 2008-09. East and north-east zone achieved fourth and fifth rank during pre as well as post liberalisation periods.

In absolute terms, the electricity subsidy in Rs. crores, has increased in all the states of south zones during 1980-81 to 2000-01. While comparing the year 2008-09 with the year 1990-91, in Kerala this has increased more than eighty four times, in Karnataka more than four times and in Tamil Nadu only four times. As compared to Kerala, in 1990-91, Karnataka has got 37.43 times more of electricity subsidy, Tamil Nadu has got 51.32 times, on the other hand in 2008-09, in Karnataka, this has risen up by near about two times more and in Tamil Nadu more than two times. In all the states of west zone, the electricity subsidy in Rs. crores, has increased in absolute terms during pre as well as post liberalisation periods except in 2008-09. As post liberalisation period (2008-09) is compared to pre-liberalisation period (1990-91), in Rajasthan this has increased near about six times, in Madhya Pradesh more than four times and in Gujarat only two times. Gujarat has got 2.2 times more of electricity subsidy and 1.2 times in 1990-91 and 2008-09 respectively as compared to Madhya Pradesh.

In Haryana as well as in Punjab states of north zone, electricity subsidy in Rs. crores, has increased in absolute terms during pre and post liberalisation periods, whereas in Uttar Pradesh and in Jammu and Kashmir, this subsidy has declined in 2000-01. As the year 2008-09 is compared to the year 1990-91, it is found that in Haryana, power subsidy has increased by near about twelve times more, in Punjab more than five and in Uttar Pradesh more than two times. In Punjab, this has increased more than two times in 1990-91 as compared to Haryana, whereas in 2008-09, Haryana has got 1.01 times more of electricity subsidy as compared to Punjab.
In absolute terms, the electricity subsidy in Rs. crores, has increased in all the states of east zone throughout the study period. As post liberalisation period (1996-97) is compared to pre liberalisation period (1980-81), it is found that in West Bengal this has risen up by more than two hundred fourteen times, in Orissa more than fifty and in Bihar near about nineteen times. In north-east zone, the electricity subsidy in Rs. crores, has increased during pre and post liberalisation periods, whereas the increasing rate is higher in 1990-91 among all the other years of study.

In 1990-91, Uttar Pradesh has ranked first by receiving maximum electricity subsidy (in Rs. crores) i.e. 15.21 per cent followed by Maharashtra (12.79 per cent), Gujarat (11.67 per cent), Punjab (10.81 per cent) and Andhra Pradesh (10.41 per cent), whereas Haryana, which has got 17.85 per cent of electricity subsidy, is leading the other states of India like Punjab (17.61 per cent), Tamil Nadu (12.40 per cent), Uttar Pradesh (10.37 per cent) and Karnataka (10.09 per cent) during post liberalisation period (in 2008-09).

At national as well as zones level the electricity subsidy in Rs. per hectare, has increased in absolute terms during pre as well as post liberalisation periods. As the year 2000-01 is compared to the year 1990-91, it is found that in India it has increased by near about six times, in west zone nine times, south zone more than six times, in north zone near about four times, in east zone 3.4 times and north-east zone more than two times. North zone has got approximately five times more of electricity subsidy and near about seven times as compared to east in 1990-91 and 2000-01 respectively. At India level, electricity subsidies in Rs. per hectares are Rs. 343.26 per hectare, out of which north zone has got 44.39 per cent followed by south zone (34.16 per cent), west zone (15.61 per cent), east zone (5.57 per cent) and north-east zone (0.26 per cent) in 1980-81. In 1990-91, these subsidies are Rs. 4,083.80 per
hectare in India, out of which most of percentage share has gone to north zone (36.57 per cent) followed by south, west, east and north-east zones. It is observed that in absolute terms, the electricity subsidy in Rs. per hectare, has increased in all the states (except in Madhya Pradesh) of south zone as well west zone during the study period.

In all the states of north zone except in Jammu and Kashmir and Himachal Pradesh, the electricity subsidy in Rs. per hectare, has increased in absolute terms, whereas in case of percentage share a lot of variation is seen during pre as well as post liberalisation periods. As the year 2000-01 is compared to the year 1990-91, in Haryana, this has increased by more than eight times, in Punjab 4.26 times. In all the states of east zone in absolute terms, electricity subsidy in Rs. per hectare has increased during the study period.

At national level as well as zone level the irrigation subsidy in Rs. crores, has increased in absolute terms during pre as well post liberalisation periods. As post-liberalisation period (2006-07) is compared with post-liberalisation (1990-91), it is found at national level this has increased near about nine times, whereas in south zone this has increased near about nineteen times, in west zone has got more than seven times, in east as well as in north-east zones near about five and in north zone more than four times of irrigation subsidy. In 1990-91, west zone has got subsidy more than two times and north zone near about three times more of irrigation subsidy as compared to south and east respectively, whereas in post liberalisation period (in 2006-07), south zone has received 1.23 times and north zone near about three times more of irrigation subsidy as compared to west zone and east zone respectively. Out of five zones of India, west zone is ahead among all the other states during pre as
well as post liberalisation periods except in 1980-81 and in 2006-07 (in these two years south zone has got first rank).

In absolute terms, the irrigation subsidy in Rs. crores has increased in all the states of south zone during the study period. In all the states of west zone except in Madhya Pradesh, the irrigation subsidy in Rs. crores has risen up in absolute terms during pre as well as post liberalisation periods. As post liberalisation period (in 2006-07) is compared to pre-liberalisation period (in 1990-91), in Gujarat this has increased approximately nine times and in Maharashtra, Rajasthan and Madhya Pradesh received near about seven times. In 1990-91, Gujarat has got approximately 1.95 times more of irrigation subsidy as compared to Madhya Pradesh and Maharashtra received more than four times as compared to Rajasthan.

In all the states of north zone irrigation subsidy in Rs. crores, has increased except in Punjab, Jammu and Kashmir and Himachal Pradesh during pre as well as post liberalisation periods. As the year 2006-07 is compared to the year 1990-91, it is observed that in Haryana, this has increased near about seven times more of irrigation subsidy, in Uttar Pradesh as well as in Himachal Pradesh more than four times, in Jammu Kashmir 2.12 two times and in Punjab 3.48 times. In all the states (except in West Bengal) of east zone the irrigation subsidy in Rs. crores, has increased in absolute terms throughout the study period, whereas a lot of variation is seen in all the states of north-east zone during the study period.

Maharashtra has got topmost position by getting 21.44 per cent of irrigation subsidy (in Rs. crores), Uttar Pradesh (16.27 per cent), Gujarat (10.18 per cent), Andhra Pradesh (9.46 per cent) and Karnataka (5.53 per cent) has got second, third, fourth and fifth position in pre-liberalisation period (in 1990-91). Whereas in post liberalisation period (in 2006-07), it is observed that Andhra Pradesh (30.62 per
cent), followed by Maharashtra (16.37 per cent), Karnataka (11.00 per cent), Gujarat (10.30 per cent) and Uttar Pradesh (8.20 per cent).

Irrigation subsidy in Rs. per hectare shows that at India level as well as zone level this subsidy has risen up during pre as well as post liberalisation periods. South zone is ahead by getting maximum percentage share 36.24 in 1980-81, north zone is ahead among all the other zones by getting 27.20 per cent in 1985-86, whereas north-east zone is leading the other zones by obtaining 35.01 per cent in 1990-91 and again west zone has occupied topmost position by receiving 28.79 per cent in 1996-97 and 35.55 per cent in 2000-01. Irrigation subsidy in Rs. per hectare in all the states except in Tamil Nadu of south zone has increased in absolute terms throughout the study period. In absolute terms, the irrigation subsidy in Rs. per hectare has increased in all states of west zone during pre as well as post liberalisation periods. As the year 2006-07 is compared to the year 1990-91, it is observed that in Madhya Pradesh, this has increased more than twelve times and in Gujarat 7.2 times. It is found that in 1990-91, Gujarat has got more than four times, whereas in 2006-07, 2.63 times as compared to Madhya Pradesh. In 1996-97, Goa has received 4.09 times and in 2006-07 near about twenty times than that of Rajasthan.

As post liberalisation period (2006-07) is compared to pre-liberalisation period (1990-91), it is observed that in Punjab, this has increased the maximum i.e. more than sixty five times, in Haryana more than six times and in Himachal Pradesh more than four times. In 1990-91, Uttar Pradesh has got 1.1 times more of irrigation subsidy than that of Haryana, whereas in 2006-07, this has increased by approximately thirteen times as compared to Uttar Pradesh. On the other hand, Jammu and Kashmir has got three times and 1.36 times in 1990-91 and 2006-07 as compared to Himachal Pradesh. During pre as well as post liberalisation periods,
irrigation subsidy in Rs. per hectare has been increased in all the states of east zone in absolute terms, whereas a lot of variation is seen in percentage-wise analysis.

A lot of variation is observed in absolute terms as well as in percentage-wise analysis of irrigation subsidy in Rs. per hectare in all the states of north-east zone during the study period. As post-liberalisation period (2006-07) is compared to pre-liberalisation period (1990-91), in Manipur this has risen up in the maximum ten times, in Assam as well as in Tripura 1.44 only. Manipur has got approximately eight times more, whereas 60.22 times in 1990-91 and 2006-07 respectively as compared to Assam.

As GCA is compared to total subsidies, it is observed that at national level, the increasing rate of total subsidies (fertilizers, electricity and irrigation) is higher than gross cropped area (GCA) during pre, first as well as second phase of liberalization periods. In 1985-86, the total subsidies increased by 290.39 per cent and GCA 2.4 as compared from 1980-81, in 1996-97 total subsidies increased by 174.78 per cent and GCA 1.73 as from 1990-91, whereas total subsidies increased by 109.53 per cent in 2008-09 and GCA declined by 5.84 per cent in 2006-07 as compared to 2000-01 at the national level.

There is a lot of variation to find out the relationship between gross cropped area (GCA) and in total subsidies in zones as well as in states throughout the study period. As zone level, it is observed that there is a negative relationship between GCA and total subsidies, in west zone and in north zone (in 2006-07) and in east zone (in 1996-97 and in 2006-07) and at state level in Andhra Pradesh (in 1985-86 and 2006-07), Karnataka (in 2000-01), Kerala, Punjab, West Bengal and Assam (in 2006-07), Tamil Nadu (during 1990-91 to 2000-01), Gujarat and Mizoram (in 1985-86), Madhya Pradesh (in 2006-07), Maharashtra (in 1996-97), Rajasthan and Tripura.
(in 2000-01), Bihar (during 1985-86 to 2006-07), Orissa (during 1996-97 to 2006-07), Manipur (during 1985-86 to 1990-91), the GCA has declined, whereas total subsidies have increased.

It is seen that there is a direct relationship in GCA and total subsidies i.e. GCA as well as total subsidies have increased at zone level in west and in north (during 1980-81 to 2000-01), in south zone during 1980-81 to 1996-97 and in north-east zone (during 1980-81 to 2006-07) and at state level, in Andhra Pradesh, Gujarat and West Bengal (in 1990-91), Tamil Nadu (in 1985-86), Karnataka, Haryana (1985-86 and 2006-07), Madhya Pradesh, Rajasthan (in 1996-97), Maharashtra (in 2000-01), Uttar Pradesh, Jammu and Kashmir and in Orissa (in 1985-86).

In Gurdaspur, the gross cropped area (GCA) has increased during the study period, in Muktsar as well as in S.B.S. Nagar, the GCA has increased during 1996-97 to 2008-09, whereas a lot of variation is seen in Kapurthala, Jalandhar, Hoshiarpur, Rupnagar, S.A.S. Nagar, Ludhiana, Ferozepur, Faridkot, Moga, Bathinda, Mansa and Patiala in absolute terms. As compared to post liberalisation period (2008-09) is compared to pre-liberalisation period (1990-91), it is observed that in Gurdaspur as well as in Kapurthala, the GCA has increased by 1.08 times and 1.1 times respectively, whereas declined in Amritsar (1.84 times), Jalandhar (1.2 times), Hoshiarpur (1.08 times), Rupnagar (1.39 times), Ludhiana (1.01 times), Ferozepur (1.05 times), Bathinda (1.5 times), Sangrur (1.43 times) and Patiala (1.35 times). In 1990-91, Gurdaspur has got 2.34 times of GCA and Ludhiana 2.2 times, whereas in 2008-09, Gurdaspur has got 3.5 times and 2.2 times as compared to Rupnagar and Kapurthala respectively. During pre-liberalisation period (1990-91), Faridkot has got 2.3 times than that of Hoshiarpur, on the other hand, during post-liberalisation period (2008-09), Hoshiarpur has got 1.4 times more of GCA as compared to Faridkot.
In pre-liberalisation period (in 1990-91), it is observed that Ferozepur has occupied first position by getting 12.33 per cent of GCA (in 000 hectares), followed by Faridkot (12.13 per cent), Sangrur (11.84 per cent), Bathinda (11.17 per cent) and Amritsar (10.37 per cent), whereas in post-liberalisation period (in 2008-09), Ferozepur (11.07 per cent) has followed by Sangrur (7.84 per cent), Ludhiana (7.52 per cent), Bathinda (7.03 per cent) and Patiala (6.77 per cent).

In absolute terms, the total subsidies (including electricity and fertilizers subsidies) in Rs. crores have increased in all the districts of Punjab state except in Faridkot and Bathinda (in this district these have declined in 1996-97) and S.B.S. Nagar (in this district, total subsidies remain constant i.e. Rs. 23.05 crores) during pre as well as post liberalisation periods. As the year 2009-10 is compared to year 1990-91, it is found that in Hoshiarpur, the total subsidies have increased the maximum number of times i.e. 5.77 times and minimum i.e. 2.4 times in Faridkot, whereas in Gurdaspur as well as Ludhiana, the total subsidies have increased by 4.8 times. District Amritsar has got five times and near about four times of total subsidies as compared to Rupnagar in 1990-91 and 2009-10 respectively. District Kapurthala has got two times more of total subsidies and Ferozepur has got 1.03 times as compared to districts Jalandhar and Ludhiana respectively in 1990-91, whereas in 2009-10, Jalandhar has received 1.79 times more as compared to Kapurthala and Ferozepur has got 1.17 times than that of Ludhiana.

In total subsidies, including fertilizers, electricity and irrigation subsidies (in Rs. crores), it has found that Amritsar (13.57 per cent) is leading among all the other districts followed by Ferozepur (12.03 per cent), Ludhiana (11.64 per cent), Sangrur (11.55 per cent) and Jalandhar (9.59 per cent) in 1990-91, on the other hand, in 2009-10, Sangrur is leading the other districts of Punjab by getting 10.14 per cent of total
subsidies, followed by Ferozepur (9.70 per cent), Ludhiana (8.29 per cent), Patiala (8.25 per cent) and Jalandhar (6.56 per cent).

It is found that in absolute terms, the fertilizers subsidies (in Rs. crores) have increased in all the districts of Punjab except in Districts Faridkot and Bathinda (in these both districts, fertilizers subsidies have declined in 1996-97) during pre as well as post liberalisation periods. During pre-liberalisation period (in 1990-91), it is observed that Ludhiana has got maximum percentage share of fertilizers subsidies (in Rs. crores) i.e. 11.79, followed by Faridkot (11.71 per cent), Ferozepur (11.38 per cent), Patiala (10.73 per cent) and Amritsar (10.65 per cent), whereas during post-liberalisation period (in 2009-10), Ferozepur (10.45 per cent) has ranked first followed by Sangrur (8.57 per cent), Ludhiana (8.31 per cent), Patiala (7.40 per cent) and Bathinda (6.54 per cent).

During pre-liberalisation period (during 1980-81 to 1990-91), the electricity subsidy in Rs. crores has increased in absolute terms, whereas a lot of variation is seen among all the districts of Punjab state during the post liberalisation period. As the year 2009-10 is compared to the year 1990-91, in Patiala, this subsidy has increased by 10.8 times (maximum times among all the other districts), in Faridkot, this has increased only 1.2 times. In electricity subsidy (in Rs. crores), Amritsar (15.19 per cent) is followed by Ferozepur (11.71 per cent), Sangrur (11.64 per cent), Patiala (11.18 per cent) and Jalandhar (11.03 per cent) in 1990-91, whereas Sangrur has got first position by receiving 13.95 per cent of electricity subsidy, Patiala (10.88 per cent), Ludhiana (7.62 per cent), Tarn Taran (7.51 per cent) and Moga (6.84 per cent) ranked second, third, fourth and fifth respectively in 2009-10.

Variations are found in absolute terms as well as in percentage share of power subsidy in Rs. per hectare among all the districts of Punjab during the study
period. It is observed that in 2009-10, the power subsidy has declined in all the districts of Punjab state as compared to 1990-91. In Bathinda, it has declined the maximum number of times i.e. 8.5 times, whereas minimum times i.e. 1.9 times in Gurdaspur as well as in Kapurthala in 2009-10 (as compared to 1990-91). In 1990-91, Amritsar has got 1.05 times as compared to Kapurthala, whereas Kapurthala has got 1.3 times than that of Amritsar. Faridkot has received 2.6 times and 1.4 times as compared to Ludhiana in 1990-91 and 2009-10 respectively. Bathinda has got topmost position in case of electricity subsidies in Rs. per hectare during 1980-81 to 1990-91, whereas it has lost its first position during 1996-97 to 2009-10.

As total subsidies have increased during pre-liberalisation period in all the districts, whereas during post-liberalisation period, these have increased in all the districts except in Faridkot and Bathinda. The same pattern is found in case of fertilizers subsidies during the study period, whereas electricity subsidy increased in all the districts in pre-liberalisation period and declined in 2009-10 in Gurdaspur, Amritsar, Kapurthala, Jalandhar, Rupnagar, Ludhiana and Ferozepur districts.

A lot of variation is seen in relationship of GCA and total subsidies at district level throughout the study period. The direct relationship is found in Gurdaspur throughout the study period and same pattern is observed in Amritsar, S.A.S. Nagar, S.B.S. Nagar, Kapurthala, Jalandhar, Hoshiarpur, Rupnagar, Ferozepur, Faridkot, Bathinda, Sangrur and Patiala during pre-liberalisation. In post liberalisation period (2008-09), it has also found that there is direct relationship between total subsidies and gross cropped area in Kapurthala, Hoshiarpur, Rupnagar, Ferozepur and Sangrur. The GCA declined and total subsidies increased in Rupnagar (in 1985-86) and in Jalandhar (in 1996-97), whereas the same pattern is observed in Amritsar, Jalandhar,
Ludhiana, Sangrur, Patiala (in 2009-10) and Ferozepur (in 2005-06) during post-liberalisation period.

It is observed that total subsidies are unequally distributed among all the districts of Punjab state during pre as well as post liberalisation periods. During pre-liberalisation period, Faridkot is ahead among all the other districts in the GCA, on the other hand same position is not achieved by the same district in total subsidies. During post liberalisation period (in 1996-97 and in 2000-01), Amritsar got topmost position in total subsidies, whereas GCA is not increased in the same manner.

During pre as well as post liberalisation periods, at country level as well as zone level, the total subsidies (in Rs. per hectare) have increased in absolute terms, whereas at India level as well as in south, west, north, north-east zones, productivity (in kgs per hectare) has also increased except in 1996-97 and in east zone productivity has declined during 1996-97 to 2000-01. As compared to post-liberalisation period (in 2006-07) with pre-liberalisation period (in 1990-91), it is observed that in India, subsidies have increased 8.32 times, whereas productivity increased by only 1.1 times. While comparing the same time period, as zone level analysis shows that in west zone, subsidies have increased the maximum number of times i.e. 11.95 times, followed by south zone (8.93 times), east zone (7.67 times), north zone (7.49 times) and north-east zone (6.28 times), On the other hand productivity has increased maximum i.e. 1.90 times in south zone, followed by west zone (1.12 times), north zone (1.11 times), east zone (1.1 times) and north-east zone (1.05 times). In 1990-91, south zone has got near about three times of total subsidies and has near about two times of productivity, whereas in 2006-07, it has received 3.37 times of subsidies and has near about two times of productivity as compared to east zone.
Total subsidies in Rs. per hectare have increased in absolute terms in all the states of south zone during pre as well post liberalisation periods, on the other hand, variations are seen in productivity in kgs per hectare. As compared to the year 2006-07 with the year 1990-91, subsidies have increased by 9.55 times in Andhra Pradesh, more than six times in Karnataka, 2.66 times in Kerala and 1.8 times in Tamil Nadu, whereas productivity increased maximum 1.33 times in Kerala, 1.29 times in Andhra Pradesh, 1.12 times in Karnataka and 1.03 times in Tamil Nadu. In 1990-91, Andhra Pradesh has increased near about two times of subsidies and 1.22 times of productivity, whereas in 2006-07, Andhra Pradesh has received 6.5 times of subsidies and 1.19 times of productivity as compared to Kerala. During pre-liberalisation period (in 1990-91), Tamil Nadu has got near about two times of subsidies and 1.36 times of productivity than that of Karnataka, on the other hand, during post-liberalisation period (in 2006-07), Karnataka has got 1.77 times of subsidies as compared to Tamil Nadu, whereas Tamil Nadu has got 0.79 times of productivity than that of Karnataka. Subsidies in Rs. per hectare have increased in absolute terms in all the states of west zone except in Gujarat and Rajasthan (in these states total subsidies have declined in 2006-07) and variations are observed in case of productivity (in kgs per hectare) in all the states throughout the study period.

It is found that the total subsidies have in Rs. per hectare increased in absolute terms and variations are seen in case of productivity (in kgs per hectare) in all the states of north zone during pre as well as post liberalisation periods. As post-liberalisation period (2006-07) is compared to pre-liberalisation period (1990-91), the subsidies have increased in all the states, whereas productivity has also increased in all the states except in Uttar Pradesh and Jammu and Kashmir. In Punjab, subsidies have increased maximum times i.e. 14.11, whereas productivity has
increased by 1.06 times and Haryana has got 3.58 times more and 1.04 times of subsidies and productivity respectively. In 2006-07, Himachal Pradesh has received 19.94 times more of total subsidies and 2.58 times of productivity than that of Himachal Pradesh.

In east zone, it is observed that in all the states total subsidies in Rs. per hectare have increased and variations are found in productivity (in kgs per hectare) in absolute terms during 1980-81 to 2006-07. On the other hand, variations are found in the total subsidies in Rs. per hectare as well productivity (in kgs per hectare) in all the states of north-east zone during the study period.

It is observed that in absolute terms, total subsidies in Rs. per hectare have increased during the study period in all the districts of Punjab state, whereas productivity (in kgs per hectare) has declined in 1985-86 in all the districts. As post-liberalisation period (in 2009-10) is compared to pre-liberalisation period (in 1990-91), it is found that total subsidies have increased in all the districts except in Faridkot and in Bathinda, whereas productivity also increased in all the districts except in Faridkot. The interesting fact is found that in all the districts except Faridkot that the productivity has increased less than two times i.e. in Kapurthala 1.63 times followed by Hoshiarpur 1.55, Jalandhar 1.33, Ludhiana 1.3, Amritsar 1.29, Gurdaspur 1.25, Ferozepur 1.13, Sangrur 1.07, Bathinda 1.03 and Patiala 1.02. In Sangrur, total subsidies have increased the maximum i.e. 11.88 times followed by Hoshiarpur 11.33 times, Jalandhar 11.23 times, Ferozepur 9.8 times, Patiala 9.54 times, Amritsar 9.24 times, Kapurthala 8.86 times, Gurdaspur 7.76 times, Rupnagar 7.39 times and 7.33 times in Ludhiana. In 1990-91, Gurdaspur has got 1.00 times of total subsidies and 1.13 times of productivity as compared to Kapurthala, whereas in 2009-10, Kapurthala has got 1.14 times of subsidies and 1.17 times of productivity
than that of Gurdaspur. In 2009-10, Sangrur has got 1.1 times of subsidies as well as productivity more than that of Bathinda.

State-wise analysis shows that states like Tamil Nadu (in 1980-81), Pondicherry (during 1996-97 to 2006-07), Gujarat (in 2000-01), Maharashtra (in 2006-07) and Mizoram (during 1985-86 to 1990-91) have received more amounts of total subsidies at national level, these have got less percentage share of productivity, while some states like Kerala (during 1996-97 to 2006-07), Rajasthan Karnataka, Tamil Nadu (in 2006-07), Madhya Pradesh (during 1980-81 to 1996-97), Orissa (during 1980-81 to 2006-07) and Gujarat (in 1980-81) have showed better performance in case of productivity by consuming a little amount of subsidies.

District-wise analysis reveals that in the districts, the increasing rate of total subsidies (in Rs. per hectare) is higher in 2009-10 (as compared to 2000-01) among all the other years of study. It is also observed that during pre-liberalisation period, districts like Gurdaspur, Kapurthala, Rupnagar (in 1990-91), Ludhiana (in 1985-86), Bathinda and Faridkot (in 1980-81), whereas during post-liberalisation period, districts i.e. Jalandhar (in 1996-97) and Moga (in 2009-10), has got more percentage share in total subsidies than that of productivity (in Kgs per hectare). On the other hand, districts like Kapurthala, Jalandhar, Amritsar and Ludhiana (in 1980-81), Faridkot (in 1990-91 and in 2009-10) and Sangrur (in 1985-86), Rupnagar and Hoshiarpur (in 2009-10) have got more percentage share in productivity as compared to total subsidies.

As state-wise analysis shows that during pre-liberalisation period (in 1990-91), Tamil Nadu has ranked first by getting maximum percentage share of productivity (in Kgs. per hectare) i.e. 7.21, followed by West Bengal (5.72 per cent), Gujarat (5.59 per cent), Maharashtra (5.58 per cent) and Haryana (5.44 per cent),
whereas during post-liberalisation (2006-07), Tamil Nadu (6.73 per cent) has got first position followed by Gujarat (5.58 per cent), Andhra Pradesh (5.51 per cent), Haryana (5.14 per cent) and West Bengal (5.07 per cent).

The district-wise analysis shows that Faridkot is leading all the other districts of Punjab by receiving 20.63 per cent of productivity (in Kgs. per hectare) followed by Patiala (9.29 per cent), Sangrur (8.60 per cent), Rupnagar (8.02 per cent) and Ludhiana (7.83 per cent) in 1990-91, whereas Ludhiana (6.23 per cent) has ranked first followed by Patiala (5.82 per cent), Fatehgarh Sahib (5.72 per cent), Barnala (5.70 per cent) and Sangrur (5.65 per cent) in 2009-10.

Punjab farmers have got subsidies under schemes of macro management, technology mission and push in agriculture. In 2006-07, Rs.261.33 lakhs are distributed as subsidies, out of which Rs. 20 lakhs are distributed on improvement of soil health and Rs. 42 lakhs, Rs.100 lakhs, Rs. 18 lakhs and Rs. 81.33 lakhs are distributed for promotion of agriculture mechanisation, reclamation of alkali soils, development of bee-keeping for improving crop productivity and pest and weed management respectively. Rs. 814 lakhs and Rs. 240 lakhs are distributed under technology mission scheme and push in agriculture scheme respectively. Under national food security mission-wheat, total subsidies of Rs. 1,758.44 lakhs, Rs. 3,449.85 lakh, Rs. 6,744.27 lakhs and Rs.3,792.75 lakhs are given to Punjab farmers in 2007-08, 2008-09, 2009-10 and 2010-11 respectively. Whereas under national food security mission-pluses, Rs. 739.4 lakhs and Rs.569.31 lakhs are given to Punjab farmers as subsidies on various items like pest, zero till seeds drill, rotavetors etc. in 2009-10 and 2010-11 respectively.

Income from agriculture depends upon the size of land. It is observed that the most of small size category farmers (51.79 per cent) are earning less than Rs.2 lakhs
per annum from agriculture sector followed by 46.43 per cent between Rs. 2 to 3 lakhs, whereas only 1.79 per cent is earning between Rs. 3 to 4 lakhs per year from agriculture. Majority (48.48 per cent) of medium size category farmers are getting income between Rs. 3 to 4 lakhs per annum, on the other hand, 28.79 per cent and 22.73 per cent are earning above Rs. 4 lakhs and between Rs. 2 to 3 lakhs per year respectively. Out of large size category farmers 97.14 per cent are earning above Rs. 4 lakhs whereas only few (2.86 per cent) are getting between Rs. 3 to 4 lakhs from agriculture sector only. Regarding the education level, the majority (40.13 per cent) of the total farmers are educated up to matriculate level, out of which most of farmers are belonged to small-size category of farmers. It is observed that 33.76 per cent of total farmers are illiterate, out of which mostly farmers are related to large size category farmers. A few (0.64 per cent) farmers possessed above post graduate level of education those are belonged to large-size category farmers only.

Type of house is the indicator of standard of living of farmers. Among all the farmers have their own house. Majority (54.14 per cent) of total farmers having Pucca house followed by 42.04 having semi-Pucca, 3.82 per cent Katcha. Most (69.64 per cent) of farmers out of small size category having semi-Pucca, 60.61 per cent of medium size category as well as 97.14 per cent of large size category farmers having Pucca house. At present, farmers are using different types of fertilizers in Punjab state. Field survey related to use of fertilizers shows that all the farmers including small, medium as well as large are using urea as well as DAP fertilizers for their crops. They all are also using pesticides, insecticides for protecting their crops from pests etc. It is also observed that they all are using maximum amount of urea as compared to DAP. Majority (58.6 per cent) of total farmers are using submersible as well as diesel pump sets, 28.03 per cent are using
submersible, diesel pump sets and water canal, 7.64 per cent used submersible and canal water, 3.82 per cent has only submersible pump sets and only 1.91 per cent are using mono-block pump sets. Data reveal that the maximum number (57.14 per cent) of small size category farmers, 57.58 per cent of medium and 62.86 per cent of large size category farmers are using submersible as well as diesel pump sets. According to maximum number of farmers submersible pump sets are very useful for irrigation purpose, the reason is that it produces more water than other pump set. It is observed that few farmers (5.36 per cent) having less than 2 acres of land are using mono-block pump sets as they are unable to afford the expenditure of submersible as well as diesel pump sets due to the low income level.

All the farmers are in favour of agriculture subsidies, the most (72.61 per cent) of total farmers are in favour of fertilizers, electricity as well as irrigation (canal water) subsidies, on the other hand, 27.39 per cent of total farmers are in favour of fertilizers and electricity. Out of total large size category farmers, 80 per cent are in favour of fertilizers, electricity and canal water subsidies followed by small (71.42 per cent) and medium (69.7 per cent) size category farmers. Majority (30.3 per cent) of medium size category farmers are in favour of fertilizers and electricity subsidies followed by small (28.57 per cent) and large (20 per cent) size category farmers.

Sometimes when farmers are unable to meet their productive requirements, they have to take loan. It is observed that 71.97 per cent of total farmers are in debt. Among all the categories of farmers, 82.14 per cent of small size category farmers, 71.43 per cent of large size category farmers and 63.64 per cent of medium size category farmers took loan for meeting their requirements. Money is required for the productive as well as unproductive purposes. Out of total farmers, it is observed that
69.91 per cent of total farmers have got loan for productive purposes, 18.58 per cent for unproductive purposes, whereas only 11.5 per cent have taken loan for the both purposes i.e. productive as well as unproductive purpose. Out of total small size category farmers, 73.91 per cent have taken loan for productive purpose followed by 21.74 per cent and only 4.35 per cent for unproductive and both purposes respectively. Majority (59.52 per cent) of medium size category farmers has taken loan for productive, 21.43 per cent for unproductive and 19.05 per cent for both purposes. Mostly (80 per cent) of large size category farmers has got credit for productive followed by 12 per cent and 8 per cent for unproductive and both purposes.

The farmers have taken loans from institutional and non-institutional sources. It is found that most (59.59 per cent) of total farmers have taken loan from non-institutional sources, whereas 40.14 per cent from institutional sources. Data reveal that 48.18 per cent of total farmers have availed the credit from cooperation societies followed by 27.74 per cent farmers, who have availed the credit from commercial bank, 19.71 per cent and 4.38 per cent of farmers have acquired credit from regional rural banks and land development banks respectively. In case of non-institutional sources, majority (63.86 per cent) of total farmers has taken loan from commission agents/money lenders followed by 13.86 per cent of the total farmers availed the credit from relatives and friends. Whereas 13.37 per cent of total farmers borrowed from landlords and 8.91 per cent from cloth merchants/grocers etc. Although the rates of interest charges by institutional sources is very less yet the farmers prefer taking loans from non-institutional sources. Amongst the institutional sources the major source of loan is from co-operative societies whereas in non-institutional sources major source is commission agents/money lenders.
There is a positive impact of agriculture subsidies on the income of farmers. It is observed that the cost of production is declined as they have to pay less amount on purchase of fertilizers where as they are getting electricity and canal water free of cost. During survey it is found that maximum number of farmers is using diesel pump sets for irrigating the crops. Large size category farmers are spending on diesel pump sets as compared to small and medium size category farmers. The main reason behind it is poor supply of electricity. Comparing the diesel cost with the electricity charges even if the subsidy is withdrawn by Punjab Government, it is found that the diesel cost is higher than electricity charges (flat rate). The farmers are ready to pay the bills for electricity at the condition, supply of electricity should regular.

The foregoing discussions about the impact of agriculture subsidies on the different aspects of Punjab economy reveals that agriculture subsidies have positive impact on the income of small, medium as well as large size category farmers, whereas subsidies are regressive, as large size category farmers have more land, pump sets, electricity load etc. and they use more quantity of fertilizers, electricity as well as canal water as compared to small and medium size farmers.

The balance sheet of the Punjab State Electricity Board (PSEB, now is bundled into Punjab State Power Cooperation Limited and Punjab State Transmission Cooperation Limited) for the years consistently shows a rising mismatch between the assets and liabilities, resulting from mounting accumulated losses. The main reason is due to free electricity to farmers, SC (Schedule Caste) and BPL (Below Poverty Line) consumers. Data related to financial position of PSEB shows that its loss has increased from Rs. 266.63 crores in 1991-92 to Rs.555.27 crores in 1997-98 and further increased to Rs. 4,767.8 crores in 2009-10.
Secondary data show that centre as well as state government’s fiscal deficit has increased during pre as well as post liberalisation periods. The combined deficit of all the governments of India has increased from Rs.12,012 crores in 1980-81 to Rs.1,03,294 crores in 1996-97 and again rise up to Rs.4,83,341 crores in 2008-09. It is found that the percentage share of electricity as well as irrigation subsidy in state government’s fiscal deficit is high as compared to fertilizers subsidies in centre government’s fiscal deficit during pre as well as post liberalisation periods except in 2008-09. The percentage share of fertilizers subsidies in centre government has increased from 5.69 per cent in 1980-81 to 39.86 per cent in 2008-09. Secondary data indicate that the fiscal deficit of Punjab state government has increased during pre as well as post liberalisation periods except in 1995-96 and during 2004-05 to 2005-06. It is observed that the percentage share of electricity subsidy in state’s fiscal deficit is high as compared to canal subsidy during pre as well as post liberalisation periods. In 1992-93, the percentage share of electricity subsidy in fiscal deficit is 54.88, whereas irrigation (canal water) subsidy is 22.23 per cent. In 2003-04, the percentage share of electricity subsidy is 16.15 per cent in fiscal deficit, on the other hand, percentage share of irrigation (canal water) is 8.89, which is approximately twice.

The consumption of Nitrogenous (N) is the maximum followed by Phosphatic (P₂O₅) and Potassic (K₂O) during 1980-81 to 2006-07 in Punjab. In 1980-81, the total consumption of NPK is 762,000 nutrients tonnes, out of which 69.03 per cent is of N followed by 27.17 per cent of P₂O₅ and 3.81 per cent of K₂O. The percentage share of N is constant in 2000-01 and in 2006-07, whereas the percentage share of P₂O₅ declined from 21.48 in 2000-01 to 20.92 in 2006-07.
The provision of subsidy on electricity has a negative impact on the sustainability of agriculture as it has implications for depletion of underground water. The cheap availability of electricity has increased steeply the use of tube wells for irrigation purpose in Punjab. The number of electrically operated tube wells have increased from 6 lakhs in 1990-91 to 9.71 Lakhs in 2007-08 and further increased to 10.65 lakhs in 2009-10 (Government of Punjab, Economic survey, various years). The subsidized electricity sale has reduced the marginal cost of irrigation to almost zero. It persuaded farmers to over-irrigate their lands. This reveals the non-optimal use of electricity and of the scarce underground water resources by the farmers. The reckless use of water through tube wells has caused the problems of underground water depletion in some areas. This rapid pace of underground water depletion may trouble sustainability of Punjab’s agriculture.

Agriculture in Punjab has a heavy requirement of water for irrigation purposes. The dominance of rice and wheat monoculture cropping pattern over the years has led to overexploitation of ground water resulting in rapid decline of water table in the entire state (except south western part), as ground water is generally sweet and fit for irrigation. Out 4 blocks are semi critical and only 25 blocks are in safe category (State of Environment Punjab -2007).

**Policy Implications and Suggestions:**

Most of the studies either supported distributing subsidies or withdrawal of subsidies. However, the present study reveals that some subsidies should be given and some others can be withdrawn without harming the farmers. Withdrawal of subsidies should be carried out in phased manner. Following are the some suggestions emerging out of the present study:
The centre government should adopt some criteria to give away subsidies to states either on the basis of gross cropped area or productivity.

From the study it has been noted that subsidies which have direct relationship on productivity and income like seeds, fertilizers should be given to farmers, on the other hand, subsidies on electricity can be withdrawn as supply of electricity in Punjab is irregular moreover farmers prefer regular supply of power even if they have to pay for it. If implemented, it will reduce state electricity board’s burden and this amount can be used for production of more electricity, reducing the need of purchasing electricity at very high prices, which adds to the deficit of state finance.

Due to irregular supply of electricity and canal water, farmers have to use diesel pump sets to irrigate the crops. The expenditure of diesel pump sets is very high as compared to flat rates of electricity and nominal charges of canal water. From farmers point of view they are ready to pay bills for irrigation as uninterrupted supply of canal water and electricity is given to agriculture sector. As a result government should impose flat rates on electricity supply given to agriculture sector.

Subsidy should be given to those areas where, it is actually required like if water table depletion is to be checked then farmer should be motivated to grow crops like potatoes, oilseeds and sunflowers etc., subsidies should be given to promote these practices, it will reduce quantity of fertilizers and water usage for cultivation. Checking of water table depletion will reduce expenditure on higher horse power motors viz-a-viz subsidy on electricity. Provision of market facilities will also be helpful in motivating farmers to grow these crops.

Unbalanced fertilizer use does not lead to immediately visible harmful effects whereas it adversely affects soil quality over time. Excessive use of insecticides also affects the human health. Farmers should be educated about the effects of unbalance
use of fertilizers and they should be encouraged to use these in proper ratio. Government should provide training to the farmers for increasing the productivity of crops. Different types of campaigns should be organised at village level to encourage them to use environment-friendly practices and balanced use of chemicals, fertilizers, increasing area under high yielding varieties of seeds etc.

Government should formulate farmer friendly agriculture price policy, under which the price of farm produce should be fixed keeping in view the rising costs of farm inputs; this will help in making the farmers financially independent.

In view of drought/deficit rainfall in certain regions (Bihar, Jharkhand, Orissa and West Bengal), it was decided by centre government to implement a diesel subsidy during kharif (in 2010) to save standing crops in the field, same pattern should be followed in states where this problem occurs.

Government should keep aside its motive to please voters or strengthen the vote bank, it should frame rational policy in which small size category farmers, who are not actual beneficiaries of subsidies, could get more and subsides, which they do not want should be withdrawn.

The cooperative sector should be developed/strengthened in the state. The sale of fertilizers, high yielding varieties of seeds should be promoted through village level primary agriculture co-operative societies. It will help in checking diversion of loans as well as use of spurious chemicals purchased from commission agents.

Government should provide the funds timely to Punjab State Electricity Board to (Now it is unbundled into Punjab State Power Cooperation Ltd. and Punjab State Transmission Cooperation Ltd.) improve the conditions of the Power Plants and to recruit new man-power in order to improve performance of the electricity department.
Subsidies should be given to those who actually need, like small and medium size category farmers. Subsidies, which they do not need should be withdrawn but in a phased manner. On the other hand, instead of subsidies, the government should focus on just three things - electricity generation, infrastructural development and water supply. The accompanying development will take care of the rest. The subsidies should be replaced with constructive schemes that empower people and give them that one push they need to get out of poverty.