CHAPTER - 1

INTRODUCTION

The agriculture sector occupies a vital position in our national economy, accounting for about 40 percent of the national income and providing livelihood to nearly three-fourth of the work force. Understandably, planning for economic development in India placed agricultural development at the centre of our development strategy. The results of such a move are self-evident - a food deficient India can now boast of 23.6 million tonnes of food stocks. As Kanugo and Sarma (1973) remarked, "Agricultural production is no longer seen as an operation limited to the farmer alone but as a function of the farmer, the Government, the financing institutions, input manufacturers and processors etc". Thus the importance of study of agricultural development and the role played by the government derives its significance from the fact that in the context of developing economies like India, government has not been, and in no longer held as, a silent spectator but an active partner in the process of economic development.

In this context Punjab's case is cited as an authentic success story by most observers the world over. The present prosperity of Punjab economy (with no mineral wealth) is largely attributed to agriculture whereon 80 percent
of its population depends. About 50.41 percent of the total state income is derived from the primary sector, followed by 17.87 percent from secondary sector and about 31.72 percent from the tertiary sector during the year 1982-83. Out of the total increase of Rs. 301 crore in state income between 1960-61 and 1970-71, 42 percent was contributed by agriculture alone and 53 percent by the primary sector. The rest was equally shared by the secondary and the tertiary sectors. The state is known for progressive and relatively prosperous nature of its agriculture. Grewal and Rangi (1983) found a five-fold increase in the index of production of cereals during the period 1960-61 to 1982-83. The authors observed that the state with less than two percent of the area in the country accounted for as much as 60 percent of the total foodgrains procured for the central pool. This well developed agricultural sector is mainly responsible for the rapid economic development in the Punjab state.

This progress, however, is not a chance outcome but the culmination of a long drawn process. In short one can say that substantial and sustained efforts of the government coupled with a remarkable change in the outlook of the progressive Punjabi farmers has brought about this great leap forward. A brief review of the history/growth performance of agriculture in the state of Panjab under British Rule and after independence is likely to help in grasping of these issues.
1.1 Agricultural Development in Panjab and the British Rule

In retrospect, we notice that the Panjab plain with its fertile soil, favourable climatic conditions, hardworking peasantry and greater potentialities for irrigation works (i.e. surface water and ground water) attracted heavy public investment in agricultural sector both, under the British Rule as well as after independence.\(^5\) With the result this state has the highly developed agricultural sector in India. In most part of the state, the land is fertile and irrigation facilities are abundant and the agriculturists in the state are hardworking and innovative in so far as the adoption of improved practices is concerned.\(^6\) Analysing the causal factors for regional growth, Rao (1984) concluded that areas with natural advantages could be developed at fast rates with a little efforts and the Panjab State was in an advantageous position with respect to both the factors i.e. human efforts and natural bounty.\(^7\)

Even under the British Rule, agricultural sector in Panjab got transformed from a static to a progressive one though improvements in this sector were made primarily to serve the Imperial economic and political interests.\(^8\) At the time of annexation of Panjab to the British territory in 1849, this province had a vast desert and waste uncultivable land. Social and economic conditions left little incentive on the part of
the cultivators to produce more. Technological changes and economic infrastructure i.e. irrigation, credit market, transport and communications were underdeveloped. State administration lacked experience, knowledge, resources for the development of this sector and above all people were less responsive to public undertaking. About one fourth of the total area was under cultivation and of this, only, one sixth to one fifth was regularly irrigated.

Soon after the annexation of Panjab, colonial power stabilised the society by restoring law and order, using military power, strong administration and construction of roads and railways. To a large extent, the great increase in population and the rise in the standard of living were due to the security by British rule and efficiency of its administration. With the introduction of various land reforms i.e. establishment of private ownership of land, detailed records of rights in land (1867), reduction in land revenue (1867), the settlement of government demand either permanently or for a long period, the land got value and could be used as a credit against debt. These land reforms provided a sense of security and incentive to the cultivators thereby, strengthening the agrarian structure of Panjab.

In the meantime economic infrastructure i.e. canal irrigation, railways, roads, market, communications and foreign trade were developed. Heavy investment was made on
canal irrigation, followed by construction of railways and roads. Existing irrigation works were improved and new irrigation facilities were created. The great irrigation scheme carried out by the British Government enterprise and British capital raised the Panjab from the poorest to the richest province.

Institutional changes in the form of establishment of State Agricultural Department (1880), Land Alienation Act (1900), Co-operative Societies Act (1904) to save the cultivators from being exploited by money lenders, formulation of better farming societies to let their members use good seeds, chemical fertilizers and improved agricultural implements and consolidation of Land Holdings Act (1921) were introduced. By 1920, the power for allocation of receipts of revenue was handed over to the province which was earlier controlled by the Government of India.

Agricultural development based on research, experiment, education and demonstration was emphasized by Lord Curzon (1920) though effort to introduce technological changes were earlier made by the agricultural department. Strains and varieties of crops were isolated and tested for varying soil and climatic conditions, and new varieties were evolved by cross breeding of important crops like wheat, rice, cotton and sugarcane. Efforts were also made to introduce mechanical cultivation but heavy western machinery, was found ill-suited
to Panjab. Research on conservation of soil, reclamation of saline soil, green manuring, control of pests and diseases, and better utilization of ground water was encouraged. But area extension rather than intensive use of land, through the use of machines or bio-chemical technology, was the main source of increase in agricultural production during this period.  

Structural changes in the agrarian sector, development of vast irrigation projects and economic infrastructure as well as development of internal and external trade provided incentive to the farmer. The old self-sufficient type of subsistence farming of agriculture got replaced by a more commercialised agriculture as the farmers started cultivating more cash crops (cotton, sugarcane, oil-seed etc.) besides improvement in cereals. "The great expansion in the area cultivated which had been rendered possible by the construction of large canals was chiefly responsible for this development". Along with this one has to bear in mind that the Panjab peasantry itself played a vital role in transforming Punjab agriculture. Singh (1980) observed "The gross cultivated area over the total area in Punjab increased from 23 percent in 1849 to 53 percent in 1947; the irrigated area over the gross cultivated area rose from 28 percent in 1868 to 52 percent in 1940 and the yield per acre also increased by 50 percent on irrigated land. With
the result the Punjab became agriculturally the best
developed region of India as well as the far most export
province in the British empire in the twentieth century.\textsuperscript{17}

At the time of partition, the agricultural sector of
Punjab got a set back as about 70 percent of the canal
irrigated area went to West Punjab (now in Pakistan).\textsuperscript{18}
But thanks mainly to the great efforts put at the central
and state level and the good response by the hardworking
peasantry to the various opportunities created by state
policies, it again emerged as the most agriculturally
developed state of India. The strong economic infrastructural
base and various changes in agrarian structure left behind
by the British rule, helped a lot in this developmental
process.

1.2 Agricultural Development in Punjab - The Post-
Independence Period;

In independent India, the history of Punjab's
agricultural development can be distinguished into two
phases on the basis of pattern of policy adopted for the
agricultural development; the first period extends from

During the first phase of agricultural development
(i.e. 1947-60), the Government put major emphasis on policies
relating to reclamation of waste land, land reforms, develop-
ment of major and minor irrigation works and strengthening
of various institutions. Besides, these, various programmes and schemes were implemented for the adoption of technological changes in agricultural sector.

Soon after independence, central and state machinery was geared towards reclamation of waste and weed infested land. For this purpose, central tractor organisation undertook reclamation operation in Punjab in 1949; and from time to time, central government provided funds to the state government for the purchase of tractors for agricultural department. The East Punjab Tractor Cultivation Act (1949) was passed to get land cultivated by the state tractors on payment basis. Enforcement of Land Act (1951) empowered the government to take over cultivable waste land lying idle after giving notice to landlords to have it cultivated. Soil conservation schemes, though started 20 years ago, were modified (1954) and soil conservation, training and demonstration centres were opened by the Government of India (1958).

Various land reforms for the security of tenants, reduction in tenancy farming and abolition of intermediaries between the cultivators and the state were introduced. The readiness of the landlords to dispose of land, over and above the ceiling limit, and self cultivation by them led to reduction in percentage of land under tenancy.

Since the major portion of the irrigated land was left in the West Punjab, power and irrigation was given the
highest priority under Five Year Plans. In the First, Second and Third Five Year Plans of Punjab, the expenditure under irrigation and power sector was respectively 58.6 percent, 51.7 percent and 52.8 percent of the total plan outlays. The state government made all out efforts to bring as much area as possible under canal irrigation. For this purpose, gigantic multipurpose river projects like Bhakra Nangal Project, the Harike barrage, the Madhopur-Beas Link, the Sirhind feeder extension of non-perennial irrigation to areas in Upper Bari Doab Canal, the Sutlej Beas Link Unit No. 1 and Pong Dam Unit No. II, both part of the Beas Project were undertaken with the help of central government. To encourage tubewell irrigation, government provided incentives in the form of subsidy (in PEPSU 50 percent of the total cost was given as subsidy and Punjab sanctioned a scheme on no profit no loss basis). The Punjab Government also entered into contract with the Associated Tubewell Firm for the installation of tubewells in Punjab, and the central government collaborated with M/S Associate Tubewell Limited; Indo-American Technical Association Programme (1952) Indo-U.S. Technical Programme (1953), for the construction of tubewells in Punjab, Bihar, U.P. and PEPSU. Large scale tubewell construction schemes for irrigation purposes in India were hitherto confined to alluvial soil and Indo-gangetic plain in Punjab and PEPSU where sub-soil water suitable for irrigation was known to exist in adequate quantities.
For popularising the technological changes, 'Grow More Food' Campaign, earlier started under the British Rule in 1942, was resumed. Central Government provided fertilizer free of cost to East Punjab (1949) for experimental purposes, sanctioned grants for various intensive cultivation schemes, and provided coal, iron and other machinery for agricultural development to the Punjab state.

For strengthening the institutional base, the Panjab Panchayats Act (1952), the Punjab State Co-operative Bill (1954), Community and National Extension Service (1954) were introduced. The Co-operative societies educated their members on improved agricultural practices and use of new agricultural implements and also provided them long term as well as short term loans both in cash and kind. Community Development and National Extension Services made remarkable progress by digging compost pits, distributing better seeds, giving agricultural demonstration in fruits and vegetables cultivation, animal husbandry, and also reclamation of new lands and minor irrigation etc. During 1959, Rabi Campaign was launched in Punjab and concerted efforts were made for the timely supply of improved seeds, agricultural implements, insecticides and agricultural credit for raising the production of four crops viz. wheat, gram, barley and jowar. Later, this scheme was extended to kharif crops also.
During 1960, the Uppal Committee surveyed waste lands in Panjab. It located jungles and bushes in fertile and irrigated areas; some waste land lying along the river and some saline alkaline soil, and made various recommendations to bring such land under cultivation.

All these efforts culminated in ushering a new era of agricultural growth in Punjab. Of this growth, the growth in area was major component in the initial years of planning.\(^{22}\) Minhas and Vaidyanathan (1965) estimated that during the period 1951-54 to 1958-61, 3.59 percent points, out of a total growth rate of 5.14 percent could be attributed to growth of gross crop area sown.\(^{23}\) Though extension in area was the major component of agricultural growth but institutional changes, creation of a well developed structure of agricultural credit and irrigation works during the first phase (1947-60) made possible the diffusion of technological changes at a comparatively higher rate in Panjab and laid a foundation for Green Revolution.\(^{24}\)

During the initial years of the second phase of agricultural development (i.e. 1960-83) the major policy emphasis was on increasing agricultural production through concentration of financial resources, technical know-how and agricultural inputs in potential areas with maximum irrigation facilities and minimum natural hazards. "With the limited resources that we had, the policy of uniform
spreading of the resources would not have produced the results as we see today.\textsuperscript{25} Thus, the Programme Evaluation organisation of the Planning Commission (1969) observed that the approach in the sphere of agricultural development had been to pay attention to those projects which were less expensive and more amenable to development. It further stated that in the selection of area also, this approach tended to get the preference.\textsuperscript{26} After achieving self-sufficiency in foodgrains (during Fifth Five Year Plan) emphasis was shifted to the development of backward areas of the state i.e. sub-montane areas, bet areas, border areas and other backward areas of the Punjab. We find that during the second phase of agricultural development in Panjab the process of agricultural development was carried out on the basis of two broad categories of policies: i) with limited available resources, priority being given to programmes in potential areas and crops which could yield an early increase in production, and (ii) adequate measure for the development of backward areas, draught prone areas and other disadvantaged areas by offering necessary facilities.

Under the first category, i.e. following the principal of rapid increase in agricultural production through concentration of financial and technological resources in potential areas, intensive Agricultural District Programme was introduced in Ludhiana district in the year 1960, which was extended to Ferozepur and Sangrur Districts in 1971-72,
Faridkot and Gurdaspur districts in 1973-74 and in Amritsar district in 1975-76. Various programmes and projects for the increase in production of selected crops in their respective potential areas were also started. For instance, Intensive Cotton Development Programme was launched in Ferozepur, Faridkot and Bathinda in 1971-72 where 80 percent of area was under the cultivation of this crop. Similarly cotton projects in Faridkot and Ferozepur, Rice Projects in Sangrur and Gurdaspur, Rape Seed and Mustard Projects in Ferozepur, Faridkot and Sangrur in 1973-74 have been undertaken. Besides these, the adoption of high yielding varieties, in areas with irrigation facilities, further accelerated the process of agricultural development in Punjab.

Coming to the second category, though the objective of speedy development of backward areas, i.e., hilly areas, border areas, bet areas and other backward areas was introduced in the Fifth Five Year Plan of Punjab, but efforts had already been made earlier to develop the backward sub-montane and ravine tract through various soil conservation and certain management schemes during the Third Five Year Plan. For the development of 'Kandi Area,' Pilot Project Scheme was introduced in 1973-74; Agricultural Department sanctioned a scheme for the sinking of tubewells on trial basis to find out the availability and suitability of ground water, and Punjab State Tubewells Corporation provided 50 percent subsidy for the sinking of deep tubewell during the
Fourth Five Year Plan. The state government also gave high priority to the extension of irrigation facilities to the remaining 30 percent of area (irrigated) in the state. For the development of border areas, backward areas and other areas aid other backward areas, various developmental schemes to improve agricultural structure, agricultural production, electrification and soil conservation, irrigation and infrastructural facilities, were launched.

During this phase of agricultural development, agricultural production showed remarkably higher rate of growth, and yield per acre happened to be the major component of agricultural growth.28

1.3 Regional Imbalances in Panjab Agriculture – Genesis and Consequences

While, it is an accepted fact that agricultural modernization in Punjab stretches over relatively long period, consequently Panjab has emerged to be the most progressive state; it sounds unconvincing, nay paradoxical, to talk about agricultural backwardness in Punjab. Yet it is a fact that all areas in the state have not witnessed a uniform growth and some sort of geographical pluralism has taken roots.29

As mentioned earlier, before independence, the British Government made heavy investment in agricultural sector in the state due to its rich land and water resources and higher
potentialities for agricultural development. As a result, agricultural sector made a remarkable progress but geographic disparities also emerged, during that very period in the process of development. Canal colonies were most developed and then came the central plain district; with well developed canal irrigation, railways, roads and other infrastructural facilities in both these regions. On the other hand sub-montane region, south and northern region of Panjab were underdeveloped in terms of economic infrastructure as well as canal irrigation and these areas had to depend on rainfall.

During the first four decades of the period (1849-1947) canal irrigation, railways and roads were concentrated in eastern Punjab plain but in the last six decades, the developmental efforts were shifted from the eastern to the western Punjab, and the western plain (canal colonies) became the best cultivated tract of India. Thus canal irrigation was the major cause for non-uniform development of agricultural sector on Punjab. It is widely held view that, on the average, West Panjab experienced a significantly higher growth rate in agriculture than that of East Panjab (excluding PEPSU districts and over a fairly long stretch before partition) consistent with the pattern of large scale public investment in irrigation and colonisation in West Panjab over roughly the same period.
After independence, during the first phase of agricultural development (1947-60), implementation of various policies and programmes for the development of agricultural sector (viz. massive public investment on creation of institutional and economic infrastructure such as major and medium irrigation works, power, land reforms, consolidation of land holding and strengthening of credit structure) were of such a type that their benefits were, more or less, equally shared by all the areas of the state.

Various studies pertaining to differential behaviour of agricultural development among the districts of the Panjab, over that period, conclude that uneven distribution of irrigational facilities uneven level of development obtained in the earlier period and some other growth inhibiting factors were responsible for such disparities in agricultural development. Kaul and Johl (1967) feel that developmental efforts were equitably distributed but differential irrigational facilities were the most important factor contributing towards the differential growth in Panjab.

Mid-sixties can be taken as a watershed in the history of agricultural development in India, in general, and Punjab in particular. The period saw us entering a phase of rapid transformation of agriculture popularly known as the green revolution. The unpredicted growth of agricultural output, area and productivity entailed mechanization and
modernization of agriculture. In spite of the so called 'neutrality' of modern technology, none expected it to be resource neutral (Rao, 1980). Intra-regional and inter-region balances did get shaken. Besides answering the questions like 'who has gained?' the researchers were keen at decoding the dynamics of this development.

The works of Bal (1980), Johar and Raikhy (1980), Bawa and Singh (1980), Grewal and Rangi (1980) bring out the role of assured irrigation and technological factors in the development process. However, the precise role of public investment and its contribution in quantitative terms needs further probe. That is where the focus of the present study lies.

1.4 Orientation of the Present Study:

Our discussion in the preceding pages has shown that public investment is an important determinant of agricultural development. As the unequal distribution of public investment is likely to cause disparities in agricultural development, the main concern of the present study is, to examine, as to what extent public investment is responsible for accentuating or narrowing down of these disparities.

A close examination of these issues is all the more relevant and compulsive since regional balanced development has been one of the long term objective of the Panjab Planning. Since 1956, the Panjab government from time to
time has identified areas which were lagging behind in the matter of development, for one reason or the other, and declared them as backward. It was felt in 1963 that the benefits under various development plan schemes did not percolate equitably to various regions. In order to ensure the balanced development of all the regions in the state, the first step in this direction of area planning was taken in September, 1963, when districtwise break-up and divisible plan scheme was circulated among all the districts. The main objective was that relatively backward areas should receive proportionately higher allocation of funds so that growing gap between the development levels of these areas and the rest could be reduced. In the past, efforts to accelerate the pace of development in the backward regions of the state, through plan activity, had mostly remained confined to hilly areas which were comparatively more backward, and it was only after reorganisation of the state, in 1966, that attempts were made to nurse other backward areas of the state. While drawing up Districtwise Distribution of Divisible Plan Schemes, the present stage of socio-economic development of the area was kept in view, and it was ensured that benefits of these schemes reached the underdeveloped areas requiring special attention so that the disparities between the level of development could be progressively reduced. The development efforts of the state government were dispersed over different areas in such a
manner that the benefits of development and growth percolated in all parts of the state in suitable manner. The state's fifth Five Year Plan recognised the problem as one which requires specific measures and multi-level co-ordinated efforts at the state and regional levels. During 1981-82, Government decided to earmark 9 percent, 15 percent, 4 percent and 12 percent funds of the total divisible plan scheme for the development of sub-montane areas, border areas, bet areas and other backward areas respectively.

1.5 Focus of the Present Study:

Realising the need for balanced development of all the regions, as stated above, though efforts have been made since the beginning of the Second Five Year Plan, in one way of the other, but in the face of 'food crises' in the country, at the end of the Second Five Year Plan, a decision was made for concentrating financial resources in potential and irrigated areas to get quick results and achieve self-sufficiency in foodgrains production.

Consequently, the focus of the present study is to examine the impact of these two conflicting objectives - 'balanced regional development' and 'growth through concentration' of financial resources in the potential areas on the pattern of agricultural development and resulting disparities.
For this purpose, an attempt would be made to:

1) determine the extent of inter-district variation in agricultural development;

ii) identify the factors responsible for these disparities;

iii) quantify and analyse the role of public investment/policy in the dispersal of these inter-district disparities, and

iv) suggest ways and means of attaining the desired objective of balanced regional development.

In short, the study would look into the causes of variation in agricultural development of Panjab during the development process and the role of the government in accentuating or narrowing down these disparities in agricultural sector. We expect that the findings would prove useful for other states which are still at relatively early stages of agricultural development.

1.6 The Study Area:

The objectives of the present study have already been stated in the preceding section. A brief description of the study area with respect to its physical features, population, climate and the main characteristics of the agricultural economy would be quite in order.

Punjab had to bear the main brunt of India's partition in 1947. The pre-1947 province of Punjab was partitioned into
two segments - the western and the northern segment. The eastern segment of the Punjab, which came to India's share, had 13 districts and eight princely states. This accounted for 45 percent of the population, and 38 percent of the total area with only 30.1 percent income of the pre-partition Punjab. In 1948, all the eight princely states of the East Punjab were grouped together to form one single state known as the PEPSU - the Patiala and East Punjab States Union - with Patiala as its capital. The PEPSU state was merged into the Punjab in 1956.

On November 1, 1966, the erstwhile Punjab was reorganised and new states of Punjab and Haryana came into being; while the hilly areas of the erstwhile Punjab state were integrated with Himachal Pradesh.

**Physical features, population and climate:**

The present state of Punjab covers 50,362 sq. kms. area and has a population of 167.89 lakh (as per census of 1981). The information of important aspects of population is summarized in Appendix 1.1. The state is situated in the north-western corner of the Indian Union, between 29° and 32° North latitude and 73° and 77° East longitude. It is surrounded by the states of Jammu & Kashmir and Himachal Pradesh in the North, Himachal Pradesh in the East, Haryana and Rajasthan in the South and Pakistan in the West. The
climate of the state, over the greater part, is of the continental character i.e. extreme summer heat alternating with severe winter cold.

Punjab has three physical regions namely, the sub-montane strip, the alluvial plain and the southwestern arid region. The sub-montane tract is a narrow strip of territory lying between the Himalayas and the plains comprising of districts, Gurdaspur, Hoshiarpur and Ropar. The central plains and the south arid region comprise the remaining nine districts of the state. There are three snowfed rivers; viz. the Sutlej, the Beas and the Havi, which are important natural sources of irrigation. The annual rainfall in the state varies from 37 centimeters in the southern plains to about 83.66 centimeters in the sub-montane region (as per 1962 records).

**State Income:** The state economy has been making a steady progress. The state income measured in constant prices (1960-61) reveals an annual compound growth rate of 5.5 percent during 1960-61 to 1970-71, whereas the country's economy registered a growth rate of 3.3 percent in the same period. The state income at 1970-71 prices, registered an average annual growth rate of 5.1 percent as against 3.3 for the overall national income. The state economy continued its growth spree in the seventies with the state income increasing at almost double the rate of growth for the national economy, the agricultural development obviously provided the main impetus in this case.
Punjab ranked first among the states in terms of per capita income also (₹ 1515 at constant prices, base 1970-71) during 1962-83. The primary sector shares relatively higher percentage to the state income. For example, during 1982-83, the percentage share of primary sector was 50.41; of secondary sector 17.87 and that of territory sector was 31.72 (at constant 1970-71 prices). But over time, the share of primary sector in the state income has declined (see Appendix 1.1).

Main characteristics of the agricultural economy:

Crop production, followed by livestock, has been the major source of income in agricultural sector. Crop production and livestock shared 70.17 percent and 29.13 percent respectively, of the total produce of the primary sector during the year 1982-83. Data, covering the different aspects of agricultural economy are listed in Appendix 1.2.

a) Land Use: Of the total reporting area, 84 percent is under cultivation. There is only negligible area available under 'current fallow' and other 'uncultivated land'. The area under forest is also very small. Consequently, cropping intensity show a fairly increasing trend over time.

b) Cropping Pattern: As far as cropping pattern is concerned, cereals have come to dominate the cropping pattern in the state. For example, during 1982-83, 69.1 percent of
the area was under cereals, 3 percent under pulses, 15 percent under cash crops i.e. cotton, sugarcane, oilseeds and potatoes and just 0.8 percent under fruits and vegetables.

c) Growth of crop output - salient features:

Compound growth rates in respect of area, yield and production for important crops of the state through 1966-67 to 1981-82 are shown in Appendix 1.4. Rice, potato, cotton (American) and wheat production have recorded significant growth rates per annum. The share of area in comparison to yield is relatively more significant in the production of each of the above given crops. In the case of cotton (American), the yield has rather declined significantly. Sugarcane witnessed a zero growth rate in the production on account of decline in acreage, although productivity growth rate in this crop was quite high. Other crops, namely, maize, barley, bajra, pulses, oilseeds and cotton (desi) have shown negative growth rates of production. This fall is mainly due to decline in acreage.

d) Infrastructure and technological changes in agricultural sector:

The present prosperity of state agriculture owes much to the development of infrastructure and adoption of new technology in this sector. Fairly high percentage of
net area sown has been brought under irrigation and
tubewell irrigation now contributes comparatively higher
percentage to total irrigated area. Variables representing
power consumption in agricultural sector and co-operatives
sector also depict noticeable changes over time. Number
of tractors, pumping sets (oil engines + electric pumps),
use of chemical fertilizers and area under H.Y.V. of seeds
show an increasing trend over time. Reduction in average
size of the holdings, as well as the cultivable area per
cultivator, overtime, in the state indicates growing pressure
of human population on land.

Above all, the 'human factor' in the state is known
for its enterprising, courageous and tenacious nature.
The Punjabis have always been receptive to new ideas and
opportunities. The farmers of this state are considered
to be the best farmers of India. 38

1.7 Plan of the Study

The study is divided in seven chapters.

1. The first chapter analyses the Government policies/
programmes for the development of agricultural sector
in Punjab overtime and development of disparities
during this process. It also presents the theme,
objectives and need for the study.

2. In the second chapter, a brief review is made of the
related studies and highlights the need for an another
study.
3. The third chapter deals with the selection of variables, sources of data and the methodology used.

4. The fourth chapter examines the inter-district disparities in the level of agricultural development.

5. The fifth chapter explains the differences in agricultural development as related to the public investment/policy.

6. The sixth chapter analyses the relationship between the adoption level of technology and divisible plan outlay in agricultural sector.

7. The last chapter summarizes the main findings and indicates their implication for policy.
NOTES AND REFERENCES

(Ch. 1)


3. Approach to the Fifth Five Year Plan, Planning Department, Punjab, Chandigarh, p. 1.


5. Of the gross public investment of Rs. 1120 crores on Overheads during British India as a whole, Rs. 212 crores i.e. about 18.5 per cent was invested in Punjab which had only 8.9 per cent of the total population of British India during this period, observes Chander Prabha in District-wise Rate of Growth of Agricultural Output in East and West Punjab during the Pre-partition and Post-partition Periods, IESHR, Dec. 1969. Also see Thavaraj, M.J.K., Investment in India 1898-1938', Ph.D. Thesis, Delhi University, N. Delhi, 1957; and Pattern of Public Investment in India, 1900-1939, IESHR, Sept. 1963 (by the same author).


9. Lack of thrift due to fear of foreign invaders, heavy expenditure on litigation, more investment on purchase of land instead of improvement of agriculture, diet, religion, heavy land revenue, exploitation by non-agriculturists class and agrarian structure left little incentives on the part of cultivators to produce more. Calvert, H., in The Wealth and Welfare of the Punjab, The Civil and Military Gazette, Limited, (2nd ed.) 1936, observes that 'Tenants at will were 40 per cent in 1892-93, 3.7 per cent of the owner own more than fifty acre land, which was about 25.7 per cent of the whole land'. (pp. 169-2110.)
10. Cultivation was confined to the sub-montane areas and the adjoining doabs, north eastern plains and the river valley in southwest with water near the surface and a large number of wells and canals at work, and the remaining areas of Punjab have vast stretches of arid land, see Report on the Administration of the Punjab for the year 1849-50 and 1850-51, paras 5-7.

11. In 1887, the Punjab Land Revenue Act was passed and the rate was finalised at one half of the net produce as in Madras in 1864. The Punjab Tenancy Act, passed in 1887, aimed at defining the status and rights of occupancy tenants, regulating the relations between land-owners and tenants, providing for a summary procedure for the realisation of rents in cash or kind and laying down the jurisdiction and procedure of revenue officers and courts in matters involving the rights of land owners and tenants and land tenure. For details see, Darling, Malcolm, The Punjab Peasant in Prosperity and Debt, Oxford University Press, London (4th ed.) 1947, and Shigemochi, Hiroshima (1978) op. cit., pp. 11-21.

12. During the period (1872-73 to 1932-33), per cent increase in canal irrigation was 614.3 per cent, in railways 1241.46 per cent, in roadways 276.83 and for cultivated area 61.32 per cent, observes Calvert, H. (1936), op. cit., p. 107.

13. The Canal Irrigation works under British Rule can be classified into three categories:

(a) Improvement of the existing irrigation works, i.e. remodelling Jamuna Canal (1873), The Upper Bari Doab Canal (1851);

(b) As before the British period most of the canals were of non-perennial type, efforts were made to restore them, old channels were cleared, remodelled and extended, new channels were constructed (Sidhwan Canal in 1886);

(c) Creation of new irrigation facilities;

(i) Sirhind Canal was finally approved in 1879;

(ii) The Lower Chenab Canal was proposed in 1875 but its three projects were finally sanctioned in 1887, 1889, and 1891 respectively;

(iii) The Lower Chenab Canal colony began in 1892 in waste land;

(iv) The Lower Jhelum canal was opened in 1901; and

(v) The Lower Jhelum canal colony - Colonisation began in 1902 and by 1919-20, 819000 acres were irrigated.
Besides it, the triple canal project was opened with its three sections:

(i) The Upper Chenab Canal (1912)
(ii) The Lower Bari Doab (1913),
(iii) The Upper Jhelum Canal (1915)

For details, see Trevaskis, H.K., The Punjab of Today - An Economic Survey of the Punjab in Recent Years (1899-1925), The Civil and Military Gazette Press, Lahore, 1931; and Trevaskis (1931) op. cit., pp. 242-283.


15. 'It turns out that growth of output in Punjab was 1.1 p.a. during 1913-1946, was mainly a function of irrigated acreage which accounted for 93 per cent of the actual growth rate while unirrigated acreage contributed only a minor proportion of the total growth in output. Productivity per acre did not grow during this period and growth was largely explained by area extension, says Raj Krishna, Quoted in Chander Prabha op. cit.


18. West Pakistan was given 62 per cent of the richer irrigated area against 55 per cent of the population. About 70 per cent of the canal irrigated area including some of the best canal systems of Lyallpur, Montgomery, Sargodha went to West Pakistan, writes Chadha, G.K., Dynamics of Rural Transformation: A Study of Punjab 1950-80. C.R.D., JNU, New Delhi, 1983 (p. 7); Gosal, G.S. and Gopal Krishna, Regional Disparities in Levels of Socio-Economic Development in Punjab, Vishal Publications, Kurukshetra, 1984, remark that in 1947, more prosperous and developed sectors went to Pakistan and the relatively backward eastern part came as a constituent of India.

19. Land tenancy, which was 48.6 per cent in 1947, was reduced to 19.3 per cent in 1957 and 80.7 per cent of land came under self cultivation, states Talib, B.D. in 'Agrarian Tensions and Peasant Movement in Punjab', Mimeographed, J.N.U. 1979. Also see, Gill, Sucha Singh, 'Capitalism in Punjab Agriculture' PSE Economic Analyst, Vol. II, Dec. 1980,


24. Gill, K.S. in 'Agricultural Development in Punjab', PSR Economic Analyst (1980), observes that ground for green revolution had already been prepared by the institutional changes in the form of consolidation of land holdings, elimination of intermediaries, creation of well developed structure of agricultural credit and extension services and technological change (spread of irrigation), p. I. Also see Chadha, G.K. (1983) op. cit.; Gosal, G.S. and Gopal Krishan (1984), op. cit.

25. Fifth Five Year Plan (1974-79) Draft Outline Punjab, Planning Department, Punjab, Chandigarh, p. 34.


27. Area situated in the uphill side of the road from Chandigarh through Kharar, Bopar, Balsahur, Garhshankar, Dasuya, Mukerian, Pathankot, Sujampur and Madhopur is known as the Kandi area.

28. 'The most important factor of agricultural growth has been the improvement in yield per acre i.e. 93 per cent; the net area increased by 17 per cent, improvement in cropping intensity was 23 per cent and in cropping pattern 5 per cent', observes Gill, K.S. (1980), op. cit., p. III.


33. For details see, 'Imbalance in Development: Backward Areas as identified by the State Government', in *Fifth Five Year Plan (1974-79), Draft Outline*. Planning Department, Punjab, Chandigarh.


