SUMMARY

6.1 INTRODUCTION

Development of rural areas has remained a core theme of government policies in India since its Independence. Most of the India’s poor live in rural areas and are engaged in farming. Agriculture is an integral part of general development system. It is serving the system as a whole and is being served by it. Agriculture has the proven capacity and potential to support the vitality of rural communities through maintaining family farming, rural employment, quality of life and cultural diversity. Agricultural growth acquires an additional importance in alleviating poverty in relatively poor economies like India with population concentration in rural areas. This fact led to conclude that agricultural development is essential in helping the poor not only by directly increasing their income but, also by releasing labour and capital that can be used in non-agricultural enterprises and by stimulating the demand for non-agricultural goods. Agricultural and allied activities constituted the single largest contributor to the gross domestic product in India. Agriculture is accounting for around 60 per cent of aggregate employment and its growth performance has important implications for overall economic growth.

Substantial progress has been made in increasing production and productivity of major crops during the last 50 years. Following the onset of Green Revolution, increase in public investment in agriculture in the 1970’s coupled with technical progress, provided further impetus to the production process. Agricultural growth accelerated significantly during 1980’s with a spread in growth across different
regions of the country. But, since 1980’s all items of public investment in agriculture has experienced a decline. With shrinking public investment, the growth impetus for agriculture has been declining. Private investment in agriculture has been rising, yet it has not fully compensated for the loss from falling public investment.

A comparison of the growth performance of agriculture at state level revealed that some states/regions have performed better than other states/regions in different time periods. The regional differences in agricultural development arises out of varied agro-climatic conditions, resource endowment, etc., tended to get further accentuated because of varying levels of investment in agriculture and rural infrastructure. Since, agriculture in mountains is different than that in plains because of various mountain specificities, therefore, an attempt has been made in this study to investigate the behaviour of investment and its impact on agricultural growth and rural development in Himachal Pradesh.

6.2 OBJECTIVES

Specifically, the main objectives of the present study are:

iv. To analyze the trends and composition of investment in agriculture and study its determinants.

v. To examine the impact of investment on agricultural growth and rural development.

vi. To study the problems and constraints thwarting investment in agriculture and rural development and suggest policy options.

6.3 METHODOLOGY

The present study was conducted in Himachal Pradesh. Based upon the agro-climatic diversity state’s agriculture was divided into three farming systems viz food-grain based farming system, vegetable based farming system and fruit based
farming system. Each farming system was then divided into two sub-farming systems. Food-grain based farming system was divided into maize based and rice based sub-farming systems, vegetable based farming system was divided into off-season and main-season vegetable based sub-farming systems and in like manner fruit based farming system was divided into temperate fruit based and sub-tropical fruit based sub-farming systems.

Three stage stratified random sampling method was employed for the selection of blocks, villages and cultivators. In the first stage of sampling, two blocks representing each sub-farming system were randomly selected on the basis of dominant cropping pattern thus, making a total of 12 blocks. In second stage of sampling, one village from each selected block was randomly selected, thus making a sample of 12 villages. In the third stage of sampling, a complete list of all the cultivators was prepared in consultation with the revenue officials. Keeping the time and financial constraints at the disposal of the researcher in view, a manageable sample of sixty farmers from selected villages of each farming system representing small (≤2 ha) and large (>2 ha) farmers were chosen randomly through proportion allocation method thus, making a total sample size of 180 farmers. However, the information obtained from two farm categories were ultimately pooled for comparative study of different farming systems.

Both primary and secondary data were collected and used for economic analysis. The primary data on various aspects of farming and investment pattern were collected from the sample households on well designed and pre-tested household schedule through personal contact method for an agricultural year (2004-05). The secondary information related to agricultural investment (public and private) and other rural development indicators were collected from various published
(NSSO-RBI Survey Reports, Annual Plan Drafts of Himachal Pradesh, Statistical Outline of Himachal Pradesh, State Statistical Abstract of Himachal Pradesh, Economic Review of Himachal Pradesh, UCO Bank Agenda Papers, etc.) and unpublished sources of state government (Directorate of Planning Commission, Department of Economics and Statistics, Directorate of Land Records, etc.). Besides, the secondary data pertaining to sampled villages and village level public agricultural investment were collected on well designed and pre-tested village schedule from village level officials, ADO circles, Patwar circles and various offices at Tehsil and Block level.

Tabular analysis was attempted to examine the existing resource structure, investment pattern and problems/constraints thwarting investment in agriculture in different farming systems. Exponential function, incremental capital-output ratio and marginal efficiency of capital were employed to meet out the first objective. To meet out the second objective Hausman’s specification test and Two Stage Least Square (2SLS) simultaneous equation models were used. The problems/constraints faced by the farmers that thwart investment in agriculture were analyzed by computing average cumulative response. Chi-square test was used to test the association between different problems/constraints faced by the farmers and different farming systems while, the degree of association was estimated by using coefficient of mean square contingency.

6.4 MAIN FINDINGS

The main findings emerged out of present investigation are summarized as:

- It was observed that sample villages under FTFS have comparatively higher geographical area and consequently less population density. However, the proportion of area available for cultivation was found higher under FFS in
comparison to VFS and FTFS. The lower proportion of cultivated area under FTFS in comparison to other farming system was due to hilly terrains and more undulating topography.

- It was observed that under all the farming systems small farmers were dominating the large farmers though the proportion of large farmers was comparatively higher under FTFS. This clearly indicates that holdings are becoming smaller in mountains due to regressive fragmentation of holdings. It calls for the reform measures that promote consolidation of holdings and discourage further fragmentation. So far as the pattern of working population is concerned, around 50 per cent of working population was engaged in agriculture or allied activities under different farming systems. It implies that agricultural sector is providing livelihood and employment opportunities to bulk of labour force.

- The proportion of capital formation in the form of transport equipments was relatively higher under all the farming systems though, only few farmers in the study area were found to keep tractor and other power driven equipments. The pattern of per farm capital formation in terms of implements and machinery indicated higher investment under VFS in comparison to other farming systems which confirmed the relation between irrigation and mechanization of agriculture.

- The higher proportion of capital formation in the form of cross-bred cows and buffaloes indicated the dominance of improved milch animals under all the farming systems. Per farm capital formation in the form of livestock was higher in case of FTFS farms, which was in consonance with higher number of animals under this farming system.

- Under FFS, about 78 per cent of the total cropped area was under cereal crops. Among cereal crops, maize in kharif and wheat in rabi season were the
predominant crops of the study area. The vegetable crops were preferably grown under irrigated conditions under this farming system. Under VFS, obviously vegetables were dominating the cropping pattern (about 65% of cropped area) due to the assured irrigation facilities. Only around 26 per cent of cropped area was allocated to cereals. The cropping intensity (228%) on VFS farms was higher in comparison to other farming systems due to multiple cropping of vegetables under irrigated conditions. Under FTFS farms, higher proportion of cropped area was under orchards (59.87%), followed by cereals (25%) and vegetables (8.55%). Among fruits, the average yield of mango was higher than other fruits followed by orange. The average yield of major crops was relatively higher on VFS farms due to higher irrigated area (92%), better use of inputs and technology and favourable agro-climatic conditions.

- It was found that under FFS farms, ginger recorded higher gross as well as net returns followed by garlic. In general, the vegetable crops grown under FFS were more profitable than cereals, which clearly show the possibilities for enhancing farm income under FFS by increasing more area under vegetable crops. Under VFS, garlic was found quite profitable in comparison to vegetable crops. This crop can be taken up on commercial lines if its increasing production is accompanied with market development. Needless to mention, the off-season nature of vegetable crops ensures lucrative prices and higher returns per se. Under FTFS, dry fruits recorded higher returns followed by mango and orange. It was due to remunerative prices of dry fruits within and outside the state. Paddy recorded higher returns among cereals under all the farming systems.

- The study revealed that under all the farming systems, the gross and net returns were more in case of cross-bred cows and buffaloes due to higher yield in all the
farming systems. The yield per milch animal also supported that the performance of cross-bred cattle and buffaloes was markedly higher under all the farming systems. This was the major reason behind more popularity of cross-bred cows in the state.

- The pattern of village level public agricultural investment revealed that investment on irrigation structures was relatively higher under VFS situation. The proportion of public investment on rural infrastructure and rural development was relatively higher under FTFS and lower in case of VFS. The total as well as per hectare village level public investment was found to be higher under VFS followed by FTFS and FFS.

- Pattern of village level private investment in agriculture revealed that livestock and farm buildings constituted for higher proportion of investment under all the farming systems. The investment on irrigation was higher under VFS in comparison to other farming systems, thereby, showing direct relationship between availability of irrigation water and investment on irrigation. Per farm investment was comparatively higher under FTFS. However, per hectare private investment revealed higher investment on VFS farms. Moreover, the net investment made during 2004-05 as per cent of total capital stock revealed that the capital was accumulated at the rate of around 12 per cent per year in case of FTFS, which was higher in comparison to FFS (11.02%) and VFS (11.90%).

- The real public investment in state agriculture steadily grew up to early 1980’s. After this, it suffered a minor set back during 1985-86, which might be due to the shift of emphasis to other economic sectors. Later it increased continuously up to 1995-96. The public investment again showed decline during 2001-02. On the other hand, the private investment in state agriculture after fluctuating during
1970’s showed constant and appreciable increase over the years. The government incentives might have became favourable for private investment in the state.

- Per hectare public investment increased almost three times from period-I (Rs 126.93/ha) to period-III (Rs.315.13/ha). The intensity of the public investment (investment as per cent of AGDP) increased from 12 per cent of AGDP during period-I to about 18 per cent of AGDP during period-II. But, its intensity remained almost stagnant at around 18 per cent during period-III. The compound growth rates revealed that there has been a decline in the growth rate of public investment from about 7 per cent during period-I to about 2 per cent during period-III. The irrigation investment also showed declining trend over the years. This declining trend needs to be corrected to achieve desired growth in output.

- The state level private investment in agriculture as per hectare of net sown area increased more than two times from first period (Rs 97.09/ha) to third period (Rs 215.74/ha). The intensity of private investment increased significantly over the years from about 4 per cent in first period to 6 per cent of AGDP during third period. Private investment showed declining trend during period-I but, later showed an increasing trend and grew at an annual growth rate of about 9 per cent during second period. In period-III, its growth rate slightly declined to about 8 per cent per annum, which might be attributed to declining trend of public investment in view of their complementary relationship.

- It was observed that public investment has remained the major constituent of total investment in agriculture. It constituted major proportion of total agricultural investment. The composition of public investment showed some fundamental changes based on new priorities in different plan periods. The relative contribution
of different items in public investment revealed that during period-I, agricultural crop husbandry and irrigation constituted for about 32 and 20 per cent of total investment while, rural infrastructure contributed about 13 per cent to the total public investment. Although, the per cent share of these items decreased during second period (1980-90) but, still they constituted higher proportion of total public investment. The per cent share of rural development and agricultural research and education showed a constant increase over the years.

- However, the composition of private investment did not show any appreciable change. Although, the proportion of investment on transport equipments and farm houses declined from 1991-92 to 2001-02 but, these items still contributed higher proportion towards total private investment indicated that farmers have purchased tractors and power driven equipments to supplement their income and to replace bullock labour. The increase in the share of investment on irrigation indicated that farmers were realizing the role of irrigation in improving agricultural productivity.

- The results of correlation coefficient revealed that there exists a long term complementarity between public and private investment. This might be due to inducement effect of public investment on private investment. Therefore, in view of the positive association between private and public investment, the public investment in agriculture should be increased to boost private sector investment in agriculture. The positive association of investment with AGDP, institutional credit to agriculture and terms of trade was also confirmed in the study.

- Results of the incremental capital-output ratio (ICOR) and marginal efficiency of capital (MEC) revealed that the efficiency of capital used in agriculture improved during period-II but, later during third period there was less efficient utilization of capital in this sector. The increasing use of production technologies like HYVs,
chemicals, etc. was not accompanied with increase in irrigation facilities. Moreover, the harsh climatic conditions also led to less efficient utilization of capital in agriculture during period-III.

- It was found that although the agricultural gross domestic product (AGDP) was increasing in absolute terms but, its percentage share in state accounts decreased from about 47 in first period to just 24 per cent during third period. The growth performance of agricultural sector showed that its growth rate increased from 1.23 per cent (1969-79) to 3.33 per cent (1980-90). However, its growth rate slowed down towards third period, which is in consonance with decline in the production of major crops in the state. Moreover, the shrinking net sown area in the state also resulted in declining growth of agricultural sector.

- There is no denying the fact that considerable improvement in the agricultural productivity and the increase in per capita income helped the state in alleviating the poverty to a great extent. Despite the remarkable increase in per capita income, poverty is still existent in some pockets of the state particularly in rural areas. This might be due to inequality in distribution of productive asset and wealth. Complete eradication of poverty requires emphasis on development of agricultural sector along with the growth of non-farm sector.

- The estimates of micro-models revealed that in all the farming systems, gross farm returns, average size of operational holding and dummy variable for off-farm income were the positive and significant determinants of total capital stock on farm. However, more expenditure on variable inputs certainly reduced the surpluses with the farmer and thus, affects the farm investment negatively. Although, the coefficient of expenditure on variable inputs was not statistically
significant under VFS. The significant coefficient of average size of family in case of FTFS indicated that this variable have negative effect on capital formation in agriculture.

Per hectare total capital stock on farms, per cent area irrigated and cropping intensity showed positive relation with gross farm returns. The expenditure on variable inputs on FTFS farms has negative effect on gross farm returns a indicated by its regression coefficient. It suggested the use of quality inputs as per scientific recommendations to improve returns and in turn attract more investment. The coefficients of literacy in both the equation indicated that the education level not only improved gross returns directly by scientific management of farm business, but, also indirectly by higher capital accumulation on farm.

- The Two Stage Least Square (2SLS) estimates for macro-model revealed that agricultural productivity, SGDP, literacy level and grants from central government were positive and strong determinants of public investment where as, depletion of public resources in the form of subsidies was found to have negative effect on public investment. The positive and significant coefficients of population growth, per hectare public investment, agricultural productivity, terms of trade and literacy revealed their positive influence on private investment. Marginalization of holdings and incidence of poverty were found to reduce private investment in agriculture. Per hectare investment, literacy level, cropping intensity and area under HYVs have contributed significantly in improving agricultural productivity. Whereas, fluctuations in the weather have negative effect over it. Except for terms of trade and population growth rate, all the other variable specified in the poverty equation like agricultural productivity, per hectare investment, agricultural labour wages, literacy level, non-farm employment, institutional credit and expenditure on rural
development have helped in reducing poverty in the state. The investment on soil and water conservation, rural development and irrigation were found to be the strong determinants of off-farm employment. Literacy level and road density were other determinants of non-farm employment. Agricultural investment is instrumental in development of rural areas by improving agricultural productivity, increasing non-farm employment and consequently alleviating poverty from rural sectors.

- It was found that there were number of problems/constraints that thwart investment in agriculture. The extent of resource based, socio-economic and political/institutional problems were found to be higher under FFS as revealed by average cumulative response of respondents. The intensity of personal/educational problems was found higher under VFS while, the intensity of miscellaneous problems/constraints was relatively higher under FTFS. The estimates of the chi-square test indicated that except personal/educational and miscellaneous problems/constraints, there was significant association between different problems/constraints and different farming systems and the effect of different problems differ significantly under different farming systems.

6.5 POLICY OPTIONS

Based upon the findings of the present study, the following policy options have emerged out:

1. Considering the direct impact of investment on agricultural growth and development, the declining trend in the public investment need to be reversed. There is a need to develop a consensus on investment themes and priorities. The investment in agriculture needs to be supported through appropriate policies that should not discriminate rural poor. The policies should confirm the greater
investment opportunities in underdeveloped regions of the state to remove inequality.

II. The investment on agriculture technology development and its dissemination, rural infrastructure (road, electricity), irrigation, rural development and soil and water conservation amounts to a “win-win” strategy for reducing rural poverty. There is simultaneous increase in non-farm avenues of employment, higher rural wages and reduction of poverty. Hence, investment on such components needs to be improved.

III. The private investment has been the principal source of agricultural growth. Private investment in agriculture must be encouraged by providing the necessary support like credit, cheap power, tube-well subsidy, etc. Resource poor farmers in hills can not invest on costly technology. In that case group investment should be encouraged.

IV. Since, input subsidies have negative effect on public agricultural investment, the state government should restrain from diverting further resources to subsidize agriculture at the cost of more productive investment. At the same time, whatever subsidies to be provided should be targeted to the poor and to backward regions, where productivity is less and farmers are unable to invest more in agriculture.

V. Recognizing that in the liberalized economic environment, efficiency and growth orientation will attract maximum attention. Also future agriculture will increasingly be science and market led avocation. Therefore, it would require modern economic management and the return to investment on education and research will be high. For this, public investment in agricultural research, education and extension should be increased as these are dominant sources of agricultural productivity.
VI. Capital use efficiency in the state agriculture should be improved, by
developing hill specific tools and implements and by dissemination of package of
appropriate technology. Further fragmentation of holdings should be discouraged
and the consolidation of holdings should be promoted, by enforcing effective land
reform measures in the state.