SUMMARY AND POLICY IMPLICATIONS
CHAPTER - VIII
SUMMARY AND POLICY IMPLICATIONS

The irrigation is an instrument of economic development. Therefore, irrigation affects the global economy through its impact on agriculture. It enables improvement in agricultural economy through its area, yield and income effects. Irrigation confers on the community a large number of tangible and intangible benefits. The role of irrigation becomes utmost important in a country like India, because Indian agriculture depends largely on vagaries of monsoons which are uncertain, irregular and unevenly distributed throughout the year, over an area and space. In addition, irrigation assume crucial importance in view of the country’s increasing needs of food production to the ever-increasing population. Recognizing this, massive investments, expansion and improvement of irrigation facilities occupy a central place in India’s Five-Year Plans. However, in recent years, the investment in irrigation is being questioned in view of under utilization of created potential. Many of the major and medium irrigation projects are losing their sustainability due to the longer gestation period, heavy cost escalation due to delay in construction, increasing overhead cost, inefficiency and ecological problems. However, major irrigation projects play very important role to boost the agricultural production in Indian economy. Hence, the present study was undertaken to examine the impact of Ghataprabha Left Bank Canal (GLBC) irrigation of the Ghataprabha project on cropping pattern, income and employment.

The summary and policy implications are presented in the chapter.

SUMMARY OF THE FINDINGS

The main findings of the study can be summarized as follows:

1) CROPPING PATTERN

The study indicates that there is a perceptible change in cropping pattern after the introduction of canal irrigation. This finding may not surprise anyone. Because, it is most common feature in all irrigation projects. The irrigated segment exhibited a more diversified cropping pattern as compared with
unirrigated segment. The maize, sugar cane and oil seeds dominate in irrigated cropping pattern. These major irrigated crops account for more than 71 per cent of the gross cropped area. Maize has emerged as an important kharif and rabi crop in both seasons accounting for 59.6 and 32.1 per cent of area respectively. It has occupied the first place both in macro level as well as micro level survey data of sample farmers. Sugarcane emerged as a dominant commercial crop in the study area due to the favorable agro-climatic conditions. It was grown in 23.55 per cent of the sown area. Another high value crop, cotton has not at all important crop both in aggregate and micro level. While in unirrigated segment, jowar is a dominant crop, its area being 49.4 percent. Violation of cropping pattern is a common feature in all size groups, exception being marginal farmers (I Size Group). Similarly, head and middle reach farmers are violating the cropping-pattern. Vegetables and plantain are other important commercial crops grown in the study area.

2) CROPPING INTENSITY

The index of cropping intensity was higher in irrigated segment than in unirrigated segment the figures being 181.4 per cent and 98.3 per cent respectively. Further, the cropping intensity was 226.3, 167.0, and 146.1 per cent in head, middle and tail reaches respectively. It was observed that, the intensity of cropping was highest in respect of marginal farmers and lowest in respect of large farmer in irrigated segment. On the other hand, such definite trend was not noticed in respect of unirrigated segment. The cropping intensity has significantly increased when compared with benchmark survey. It increased from 102 to 160 per cent.

3) PRODUCTIVITY

Irrigation has enabled significant increase in productivity (yield) of all-important crops. The productivity of jowar and wheat increased more than three fold, cotton has been increased 26 times, and sugar cane productivity has also increased by 1.7 times when compared with base-level data. Productivity of maize is marginally less than base level yield.
The yield of irrigated segment is better than unirrigated segment. The yield rates of four important crops in the irrigated segment are significantly higher than that of the unirrigated segment, namely maize, jowar, wheat and cotton. About two folds increase in the productivity of maize, jowar, wheat and cotton was evident. On the other hand, productivity of unirrigated crops is found to be less than irrigated segment.

Location wise productivity results revealed that the yield of maize, wheat, cotton, pulses, oil seeds, and vegetables were relatively higher in head reach than in tail-end farms. Only marginal variation in the yield of sugar cane was found across the reaches.

Food-grains and non-food grains productivity in irrigated segment were relatively two times and one and half times higher when compared to the unirrigated segment. The overall productivity in irrigated segment increased by two times.

All results indicated a positive impact of irrigation on productivity of all crops in irrigated segment.

4) COST OF CULTIVATION

Input-output analysis revealed that at the overall level the per hectare cost A and cost C is significantly higher in irrigated segment compared to those in unirrigated segment. Further, size-group wise cost A and cost C per hectare has increased as the size of the farm increases up to medium farm. And in the large farm both the costs showed declining tendency in irrigated segment.

In respect of unirrigated segment, cost A did not show any consistent trend linked with size group. On the other hand, per hectare cost C was found to decrease as the size of farm was increased. Both cost A and cost C has been relatively higher in head reach when compared to the tail end.

5) GROSS VALUE OF AGRICULTURAL OUTPUT (GVAO)

The overall level gross returns or gross value of agricultural output (GVAO), per/ha for the crop enterprise of all crops per annum was
Rs.46,477.18 and Rs.12,529.11 in irrigated and unirrigated segments respectively. It indicates that GVAO of irrigated farm was higher than unirrigated segment. In irrigated and unirrigated segments there was no particular trend between farm-size and the GVAO per hectare. In respect of the irrigated segment, the large farmers have been spent less amount per hectare which was resulted in relatively low, per hectare gross value of agricultural output as compared to that of medium farmers. Therefore, higher returns were associated with higher costs. It is essentially because of more area under sugarcane and cotton in medium size-group farmers of irrigated segment.

The head reach farmers, derived Rs.76,291.16 per hectare, middle and tail reach farmers derived Rs.38,389.28 and Rs.29,751.10 per hectare respectively. It implies that farmers in head reach reap more GVAO per hectare as compared to middle and tail reach farmers.

6) FARM BUSINESS INCOME (FBI) and NET INCOME (NI)

The two measures of farm profit, such as farm business income or profit with cost A and net income or profit with total cost C for all size groups in irrigated segment were higher than that of unirrigated segment. At the overall level FBI was Rs.30,527.57 and Rs.27,475.75 in irrigated and unirrigated segment respectively.

There was large variation in the FBI from both irrigated and unirrigated segments in the different size groups. In irrigated segment, semi-medium farmers derived the maximum income of Rs.29,002.12 per hectare while large farmers derived minimum income of Rs.22,823.19. The marginal, small and medium farmers derived a Farm Business Income (FBI) of Rs.27,596.79, Rs.27,590.20 and Rs.26,787.10 per hectare respectively.

The net income or profit at cost C at overall level was Rs.27,475.75. The semi-medium farmers derived maximum net income of Rs.26,742.57, while large farmers earned lowest net income of Rs.22,655.39 per hectare. However, the marginal, small and medium farmers derived net income of Rs.22,941.60, Rs.24,032.55, and Rs.26,247.49 respectively.
Similarly, in respect of unirrigated segment, farm business income was positive in all size groups and progressively declined with increase in farm size. The semi-medium farmers earned maximum farm business income of Rs.9,216.80 per hectare, while marginal farmers derived lowest farm business income of Rs.5,731.28 per hectare. The small, medium and large farmers derived of farm business income of Rs.8,067.56, Rs.6,517.94 and Rs.5,853.28 per hectare respectively.

The net income increased as the farm size increased, exception being large farmers. The marginal farmers earned the lowest net income of Rs.3,639.76 per hectare. While small, medium, and large farmers reaped net income of Rs.6713.13, Rs.6,378.42, and Rs.5,740.37 per hectare respectively. However, semi-medium farmers gained maximum net income of Rs.8,748.38 per hectare.

The farm business income per hectare in head and middle reaches was Rs.51,991.66 and Rs.25,806.65 respectively. Contrary, in tail end the farm business income was Rs.18,784.40. The net income per hectare was Rs.47,370.27, Rs.23,577.57, and Rs.16,479.43 in head, middle, and tail reaches respectively.

7) INPUT-OUTPUT RATIOS

The overall average input–output ratio in the irrigated and unirrigated segment were 2.45 and 2.00 respectively. It indicated that input – output ratio was higher in the irrigated segment than in unirrigated segment. In irrigated segment the ratio was maximum 2.61 in respect of the medium farmers, followed by large, semi-medium, marginal, and small farmers where the ratio was 2.46, 2.41, 2.32 and 2.25 respectively.

The input-output ratio of gross returns to cost C was 2.24 in tail-end as against 2.64 and 2.59 in middle and head reaches respectively. It revealed that input-out put ratio in head reach was 1.17 times higher than in tail end.

In unirrigated segment as farm size increased input – output ratio was found to increase, while it was progressively declined after medium size group farmers. It was 2.40 highest in respect of semi-medium farmers and lowest
in respect of large farmers. Further, higher input-output ratio was noticed each size group of farm in irrigated segment than the corresponding size group of farm in the unirrigated segment.

8) INCREMENTAL INCOME

The incremental income in terms of GVAO, FBI and NI were higher in irrigated segment by Rs. 33, 948 (247%), Rs. 20, 283 (275%), and Rs. 18, 280 (196%) over those of unirrigated segment respectively.

The foregoing discussions have revealed that cost of cultivation and income (return) per hectare were relatively higher for irrigated farms than those of unirrigated farms.

9) INCOME INEQUALITY

The extent of inequalities in income distribution between reaches and over all irrigated and unirrigated segments was measured by Gini concentration ratios and coefficient of variation. The Gini concentration ratios were 0.3599 in tail end, followed by 0.3242 and 0.2815 in middle and head reaches respectively. These figures indicate that maximum variation in the income distribution among tail-end farmers than those in head and middle reach farmers. This was also again supported by the results of coefficient of variation (CV) of gross income (GVAO). Since the value of CV (72.60%) was relatively higher in case of tail end farmers compared with head and middle reach farmers.

The Gini concentration ratio at overall level for irrigated segment was 0.3882. It was relatively higher when compared with the Gini concentration ratio of 0.3305 of unirrigated segment. It indicates that the extent of income disparity was more in irrigated farmers than in the farmers of unirrigated segment. It was also supported by the result of 81.03 per cent coefficient of variation of GVAO. It was relatively higher in case of irrigated segment as compared to unirrigated segment 60.17 per cent of GVAO.
10) FUNCTIONAL ANALYSIS

The production function approach was adopted to examine input-output relationship. The elasticity of production for bullock labour, seeds, fertilizers, irrigation, and other paid out costs were positive and significant. It revealed that the significant impact of irrigation on the per gross value agricultural output (GVAO). Further, the estimation of marginal value product of inputs indicated that the per hectare GVAO could increased by increasing the level of irrigation.

The overall significance of the fitted production function was tested by F values. The F values were significant for both the segments at one per cent level.

11) INPUT USES

In the study, results of the field data revealed that assured irrigation has led to enhance the input utilization. In irrigated segment, 371.4kgs. of chemical fertilizers (NPK) were used by farmers, as against 91.2 kgs. in unirrigated segment. The increase was by 308 per cent over unirrigated segment. In head reach, the application of chemical fertilizers (NPK) was 569.9kgs per hectare as against 301.71 and 243.61kgs per hectare in middle reach and tail end farmers respectively. The use of farm yard manure (FYM), bullock labor, modern implements, and plant protection chemicals (pesticides/ insecticides) by irrigated farmers was 12.86 bullock carts, 17.33 days, 7.5 hours, and 1.22 liters per hectare as against 3.25, 9.12, 1.11 and 0.24 in unirrigated segment.

12) GENERATION OF EMPLOYMENT

Augmentation of irrigation facilities has generated the labour employment in the study area. At overall, a hectare of irrigated farm had increased the use of labour by 165.36 man-days per year. It revealed that incremental employment generation as result of irrigation by 157 per cent in irrigated segment as compared to the unirrigated segment. Assured and timely supply of water by supporting labor intensive and long duration perennial crops, has been resulted in increased uses of higher quantity of per hectare human labour in head reach. It was 211.58, 137.55 and 146.94 man-days per hectare in head, middle and tail
reaches respectively. Between reaches, 44 per cent more employment was generated in head reach than in tail end. The variation in employment generation in tail end was lower than in head and middle reaches.

THE POLICY IMPLICATIONS

Some policy implications emerged from the present study for the use of policy makers may be summarized as follows:

(1) It is noted in Chapter IV that irrigation potential created under the Ghataprabha command area of the GLBC, of Ghataprabha project, is not 100 per cent utilized. This is due to lack of development of infrastructure like, field channels, on-farm development, non-functioning of water user societies, etc. under the GLBC command area. Thus, to make possible 100 per cent utilization of scarce irrigation potential already created by mass investment of State, it is better to develop the field channels in the whole command area.

(2) As the productivity of water is higher than cost of its harvesting and water distribution system, the higher investment on irrigation projects is justified. However, the present water rate varies between minimum of Rs. 15/- to Maximum of Rs. 400/- per hectare. It is far lower than what it should be in view of the productivity of water. Therefore, there is need for rationalization of water rate structure and ensuring efficiency in its collection.

(3) Violation of envisaged cropping pattern is quite common in the study area. Thus, irrigation officials and CADA people is to make an effort to implement designed cropping pattern.

(4) For efficient and effective harnessing the scarce water resources, the State need to create a congenial environment for developing farmer’s water users societies to participate in canal irrigation management from bottom level to top. It is need of the hour. For this a strong political will and dedicated administrative machinery certainly develop good water user societies.
(5) Commercial crops like sugarcane, turmeric, plantain and others horticultural crops are coming up on large scale through corporate farming with help of liberal high-tech financing from co-operative agencies and commercial banks. This would create problems of produce management and marketing. Thus, essential steps are needed to be taken by the both State and Union government.

(6) There is a mushrooming growth in the number of sugar factories in the command area. The chances to reduce sugarcane area or strictly implementation of envisaged cropping pattern is not possible. Therefore, project personnel and CADA officials have only option to regularise sugarcane cultivation in the command area. Another alternative option is to encourage to conjunctive use of ground and canal water on a large scale in a scientific method.

(7) The area under alkaline, saline and water logged soils was found to have increased many times between 1986 and 1999. This showed the negative impact of canal irrigation. The increasing soil alkalinity, soil salinity and water logging would damage the valuable fertile land resources irretrievably. The farmers in the Ghataprabha command area could attribute the increase in the area under these problematic soils due to mismanagement of canal irrigation. Therefore, there is an urgent need to control this tendency and to have a comprehensive drainage scheme to avoid adverse effects of alkalinity, salinity and waterlogging. Further, there is a need to impart modern and sustainable soil and water management practice trainings to the farmers.

(8) Lastly, an integrated water management approach is urgent need to integrate and implement the programmes of Command Area Development Authorities for better utilisation of scarce water resource.