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DEVELOPMENT OF IRRIGATION IN HARYANA : LIMITATIONS AND PROSPECTS – A REVIEW

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ABSTRACT : Like some other states of India, irrigation is an important aspect in Haryana's agriculture. At present all possible resources have been tapped, and a vastly improved and sophisticated irrigation has contributed significantly to the shift of state's agriculture from subsistent stage to the semi-commercial one. The need of the present day is to put in new potentials by diverting surplus water from neighbouring states and at the same time better utilization of the resources in hand.

INTRODUCTION

With about eighty per cent of the population living in villages, and about forty per cent of the national income cozing out of agriculture, it is rightly emphasized that nothing moves in India unless agriculture moves. And no input is more important than water which can move agriculture. Irrigation implies maintaining the storage of water in the soil required for plant growth at times and places of deficient water supply. Assured water supply makes possible double and multiple cropping. This is of particular importance in India where, with adverse land-man ratio, very little can be expected from extensive cultivation. Besides, irrigation helps very greatly in raising the yield of land, because this enables the application of other modern inputs like chemical fertilizers, high yielding varieties of seeds and other insecticides and pesticides, etc. This aspect has special significance for India where the present methods of production are primitive and the yields are low.

Like some other states of India, irrigation is an important aspect in Haryana's agriculture too. It is a decisive factor in agriculture of the state. As explained by King 1953, like other drylands of tropics and sub-tropics dry farming in Haryana too is possible with 50 cm. rainfall. If the rainfall decreases to less than 30 cm., agriculture becomes impossible without irrigation. Irrigational water is one of the primary foundations of farming. This water has sufficient 'Volitional command' over the location of commercial crops, improvement in agricultural production per unit area, swing in the cropping pattern and change in the mechanics of land-use in Haryana.

In the state, a vastly improved and sophisticated irrigation system has contributed significantly to the breakthrough in agriculture. Due to this large-scale expansion of irrigation, the state has shifted from subsistent agricultural stage to the semi-commercial one. In 1966–78, irrigational facilities were available in only 13.25 lakh hectares of agricultural land which rose to 22,48 lakh hectares in 1981–82. Due to that the period 1966–67 to 1981–82 saw much development of agriculture in the state. Cultivable wasteland and land-use efficiency are useful indicators of the progress. In 1966–67 cultivable waste-land was 3.22 per cent of the total area according to village-papers which moved down to 0.01 per cent in 1981–82. In 1966–67 arable land was 83.70% of the total area which moved upward to 88.90 per cent in 1981–82. Area sown more than once also increased to a significant extent. In 1966–67 area sown more than once was 34.34 per cent of the net area sown which rose to 59.18 per cent in 1981–82. The factors affiliated to this agricultural situation in the state are development of irrigation facilities together with transport development and large scale reclamation of uncultivable land. The responsiveness of the farmers most probably resulted from available scientific and technical innovations, consolidation of holdings, increasing commercialization of farm products, and allocation of liberal governmental loans.

NEED FOR IRRIGATION DEVELOPMENT IN HARYANA

Rainfall is deficient in Haryana and large areas here suffer from uncertainties of rainfall about its volume and time. Total annual rainfall varies between 18.93 cm. and 81.72 cm. along any section drawn from south-west to north-east. In spatio-temporal perspective, the variation of soil-moisture deficit is of higher magnitude. Therefore, for efficient use of existing land potentials and for increasing agricultural production, with the present rainfall regime, an acute need for irrigation has been noted. Further, the shift from 'agriculturization' to 'commercialization' of agriculture and the introduction of 'modern innovations' in place of 'traditional ones' have introduced crops like rice, cotton and sugarcane which require more water and cannot flourish without irrigation.

As evident from climatic statistics, some areas in the north-eastern parts o of the state may appear to have sufficient rainfall to raise the crops, but due to its uncertainties, irrigation becomes essential for better agricultural production. On the other hand in the western and south-western parts of Haryana due to meagre rainfall, irrigation is a must for raising crops.

POTENTIALS OF IRRIGATION IN HARYANA

The only survival for Haryana's agriculture is to adopt artificial irrigational systems. It is in the interest of the state that sizeable resources should be invested for providing irrigation to its arid regions. For irrigation, Haryana is one of the most favoured states of India. The absence of any great physiographic irregularity (except the Shivaliks in the north-east, the Aravallis in Gurgaon and scattered outcrops of hills in the districts of Mahendragarh and Bhiwani) permits the introduction of canals as the backbone of irrigational infrastructure with minimum difficulty and expense.

State of Haryana does not have any perennial river flowing through its territory. For that reason, its canals are fed mainly from Sutlez which passes through the adjacent state of Punjab. The other main river supplying water to Haryana's canals is Yamuna (Figure 1). Both of these rivers have good water regimes. These rivers get water from the melting snow and heavy rains in the Himalayas.

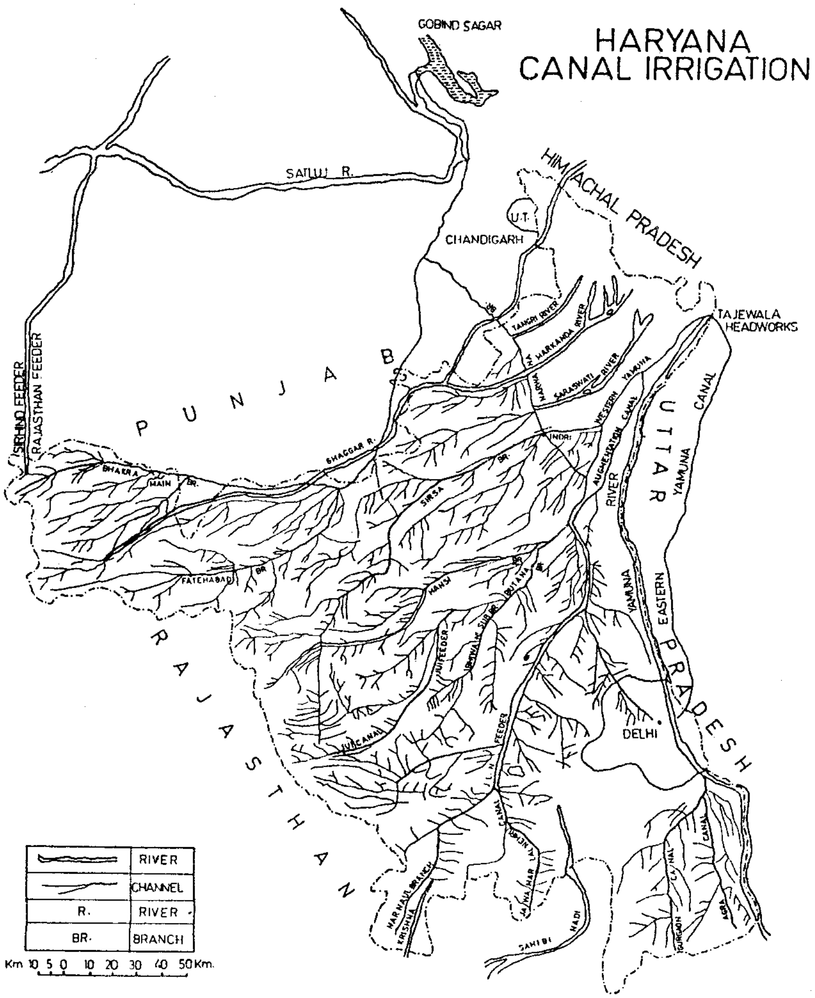

Fig. 1

For future irrigational development Haryana's best hope lies in the Ravi-Beas waters. Under the tripartite SYL (Sutlex-Yamuna Link) agreement, 3.5 M. A. F. (Million Acre feet) water would be made available to Haryana raising its irrigation potential to cover additional 5.67 lakh hectares of land. Haryana has already constructed 91.15 km. length of SYL canal falling in its territory. Rupees 20.5 crores has already been paid to the Governm-ent of Punjab for the execution of the SYL project in its area. This link is of vital importance to the state's economy. Due to certain political problems the work in Punjab's territory could not be completed. Although the water-table is very high in almost every part of Punjab, yet the Punjab Government does not agree to part with the surplus-water. For the alround agricul-tural development of both the states, the surplus water from Punjab should be diver-ted to Haryana.

Because of unfavourable rainfall and ground-water conditions the flow of irrigational water has got a particular signi-ficance in the state. But a large amount of water percolates from the unlined canals, raising the water-table in adjoining areas. This problem can be solved by a judicious use of this water, i.e. by putting the excessive water in augmentation canals (as one near Karnal) through tube-wells. Till 1981-82 under MITC (Minor Irrigation Tubewell Corporation) Schemes, 1681 augmentation tubewells had been drilled to increase water supply in canals. On a permanent basis the problem of water percolation can be solved by proper linning of the canals. Till now 295 million sq. feet of cansls and distributaries and 37 million running feet of water courses have been lined, resulting in a saving of good amount of canal water annually.

No doubt, the state has placed the highest stress on modernising its irrigation system by improving the regulation efficiency of water, but the current linning methods do not provide a satisfactory protection to control water seepage. For linning canals – clay, cement and tiles are used in Haryana. Clay offers only a limited protection to save the water from its seepage. Tiles and cement do develop cracks with the passage of time.

In developed countries plastics are being used for lining purposes with much better results. While taking the water from main canals to the fields, PVC pipes have been found much lighter, more durable and flexible than galvanised conduits and cement pipes used in India. Low density polye thylene films should be used for linning in Haryana as some canal authorities applied them with success in other parts of the country. It is true that this method of linning the canals is much costly, but it saves a lot of water which can be used for increasing agricultural production. The beginning of this programme in the state should begin with areas having maximum seepage. In Haryana, it would be a good policy to line all the canals with plastics on the same lines as in the developed countries of the world.

Apart from canal irrigation, wells and tubewells too play a significant part in the enhancement of irrigational facilities of the state. Previously, only the northern and eastern portions were considered to be suitable for "Chahi" irrigation, but at present even the areas with deep fresh-water table have well and tubewell irrigation. With the help of powerful electric pumping sets 1714 deep tubewells have been installed to facilitate direct irrigation.

Flood waters can also be harnessed to serve the irrigational needs through comprehensive control and drainage programmes. Ottu reservoir (near Sirsa) and Bibipur Lake (near Kurukshetra) have served the purpose to some extent by storing the flood-waters of Ghaggar and Markanda rivers respectively. In future even the waters of Tangri river near Ambala can be tapped. By doing this agricultural land can be saved from flash-floods as well as its water can be used for irrigational purposes.

REGIONAL IMBALANCES IN IRRIGATIONAL FACILITIES IN HARYANA

As already discussed in Haryana irrigation is a basic requirement for agriculture and is mainly obtained from canals, wells and tubewells. The sources of irrigation here are adjusted to topography, water-table and quality of ground-water. Due to variations in these factors there are marked regional imbalances in irrigational facilities of the state. Before the introduction of canal water the sub-alluvial ridge lying in the centre of Haryana played a significant role. The areas lying in the north-east of the ridge, i.e. Ambala, Kurukshetra, Karnal and Sonepat districts had high ground water while the areas on the south-western side were having very low water-table which was mostly beyond 20 mts. in 1967 (June) (Figure 2). Further it was brackish because of limited underground replenishment and the process of salinization.

Therefore, the intruded ridge of impervious material, which is lying conceal-

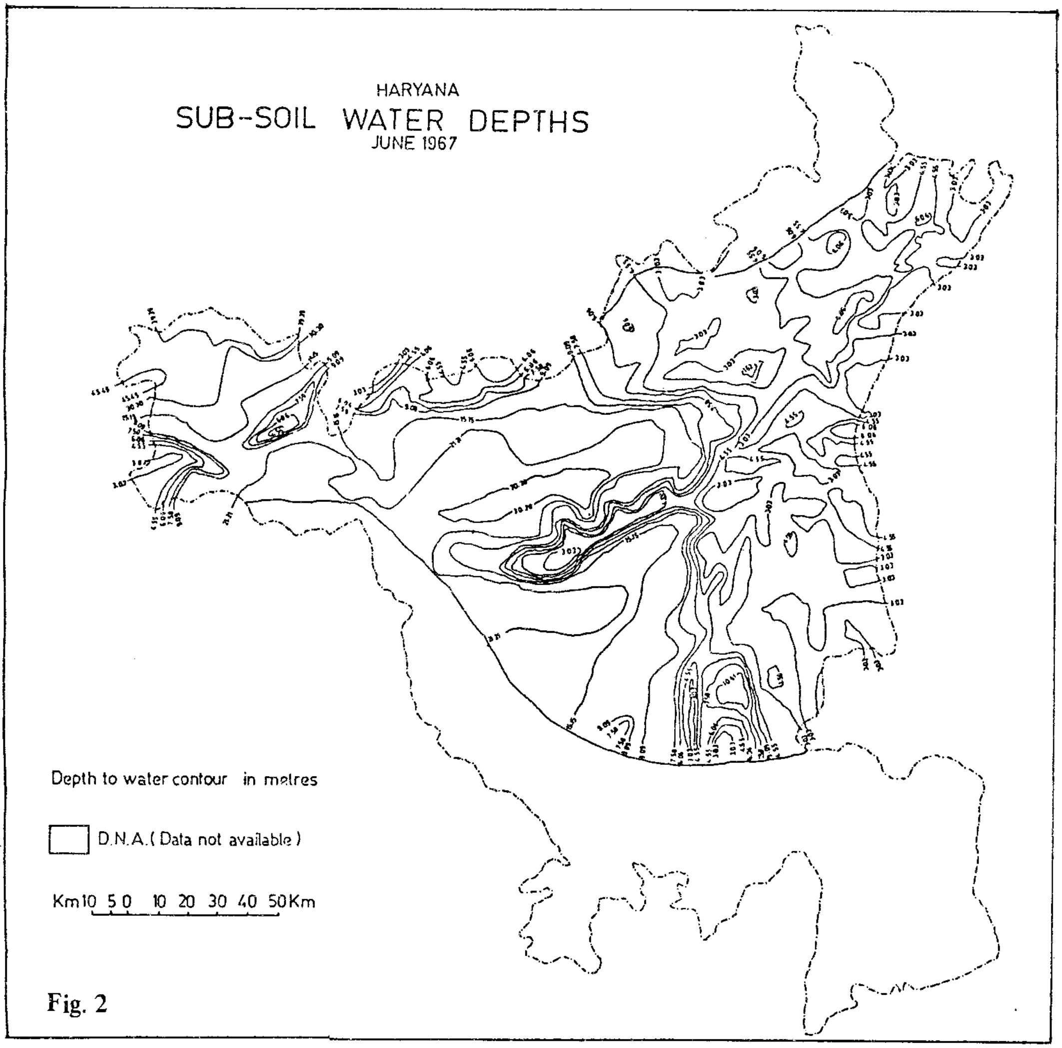

Fig. 2

ed under the Yamuna-Ghaggar alluvials acted as an obstacle to the free flow of sub-terranian water from the Siwalik area towards the south-western dry region of Haryana. For that reason there was a scarcity of fresh-water for drinking and irrigational purposes.

To remove this anomoly canal irrigation was introduced and in the areas where canal water could not reach, the water was lifted mechanically. The Jui, Loharu, Sewani and Jawahar Lal Nehru Lift Irrigation Schemes have been designed to stabilize the agricultural economy in the south-western arid zone. With these schemes an additional area of nearly 2,85,000 hectares has been provided with irrigational water. The frequent water supply in south-western and western parts have risen the water-table of these areas considerably (Figure 3).

Total irrigated area is shared by the three sources of irrigation as under:

In 1966–67 government canals accounted for 74.69 per cent of net area irrigated, wells and tubewells 20.22 per cent and the remainder 5.09 per cent by other sources. While in 1981–82 canals,

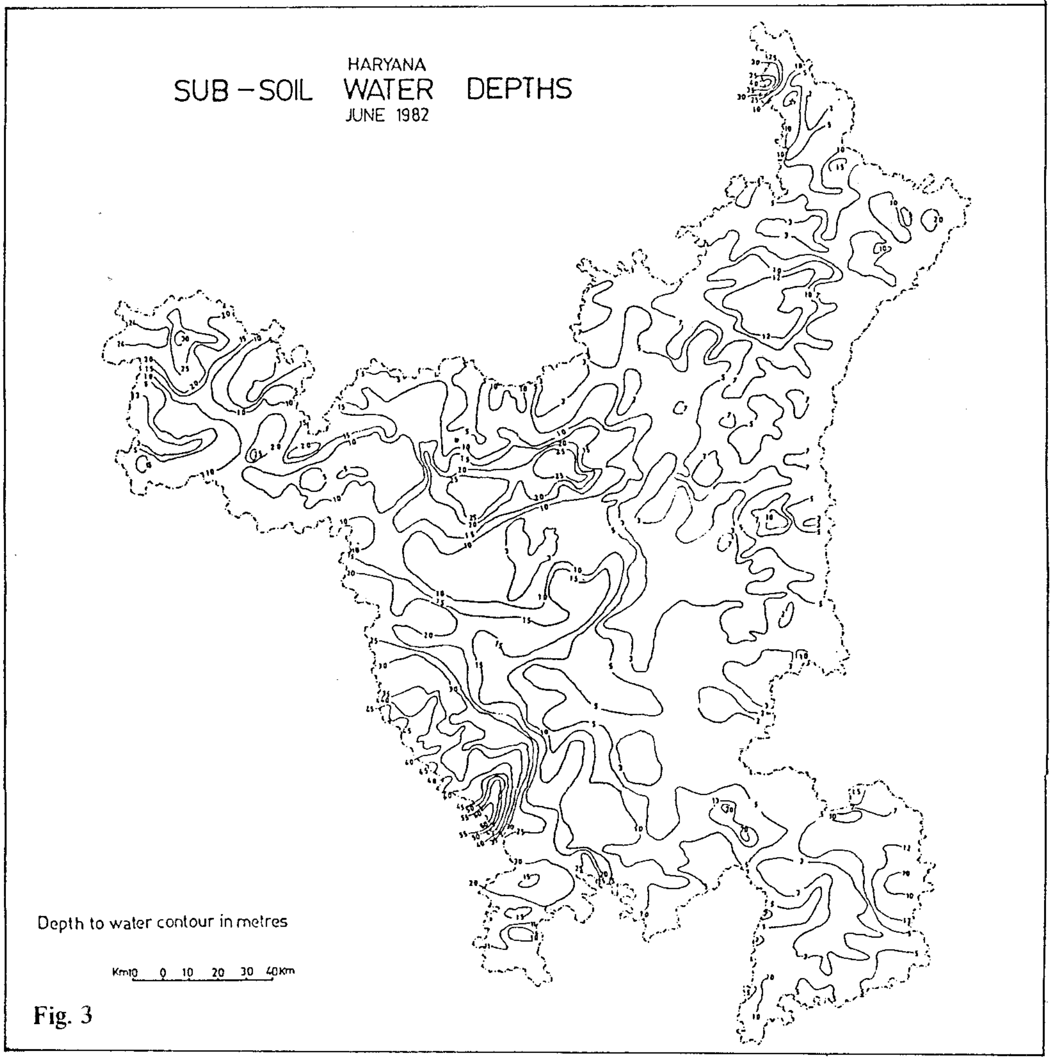

Fig. 3

wells and tubewells and other sources shared 52.62, 46.93 and 0.45 per cent respectively. Although, net area irrigated by canals decreased, then too the expansion of canal irrigation in the state is a remarkable achievement in the irrigated agriculture of the state.

Like other aspects regional variations are also visible in the intensity of irrigation (net area irrigated as a percentage of net area sown).

In 1966–67 the intensity of irrigation varies from 5.49 per cent in Bhiwani to 50.95 per cent in Sirsa which shows a marked regional disparity (Figure 4). The overall figures show that in fact intensity is low everywhere, as the highest percentage is just only 50.95. It can be said that at that time irrigation potentials in Haryana were under-developed.

Region-wise, in 1966–67 the maximum intensity of irrigation was visible in Bhakra Canal irrigated area which ranges from 48 per cent in Kurukshetra to 50.95 per cent in Sirsa districts. Other canal irrigated areas in Haryana too enjoy higher percentages. Apart from canal irrigated

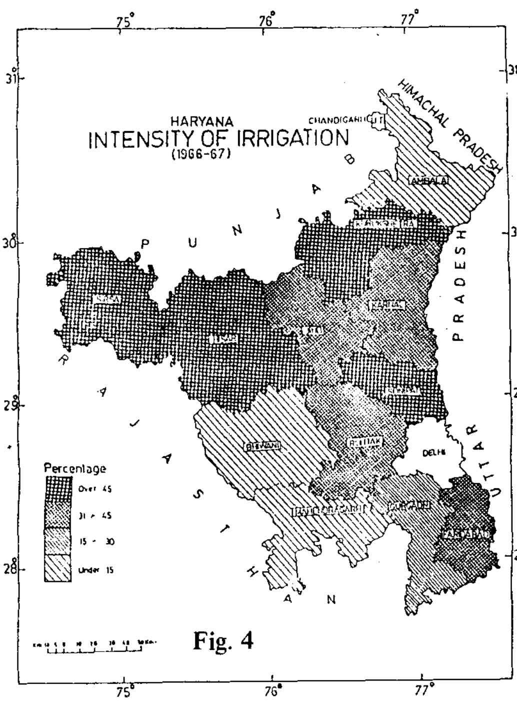

Fig. 4

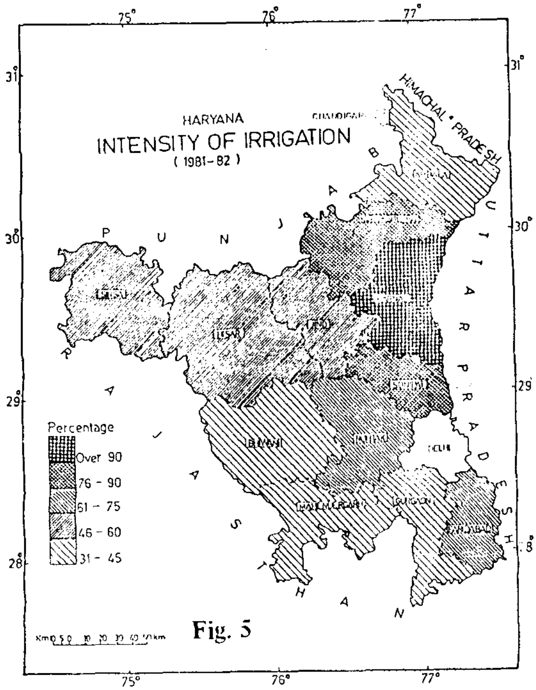

Fig. 5

areas, the regions having higher and fresh water-table too have higher percentages. Bhiwani, Gurgaon and Mahendragarh were the only districts having low percentages.

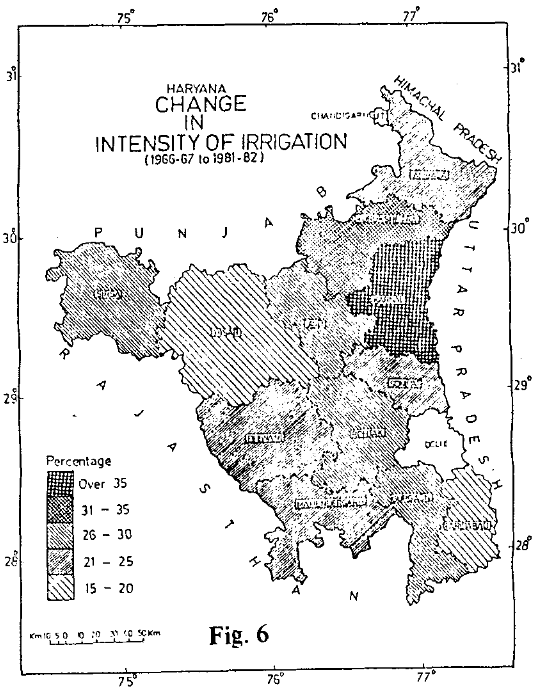

Fig. 6

These were devoid of canal irrigation facilities and at the same time were having deep water-table with brackish quality. Another district, i.e. Ambala was also having lower intensity of irrigation due to its topography.

By 1981–82 there was a marked change in the intensity of irrigation in whole of the state as compared to 1966–67 figures. In 1981–82 intensity of irrigation ranges between 34.20 per cent of Bhiwani to 96.90 per cent in Karnal districts (Figure 5). It clearly shows a positive trend in the irrigational facilities all over Haryana. As shown in the figure No. 6 there is a positive gain of irrigational intensity in all the districts of Haryana. The districts of Karnal and Kurukshetra have the maximum change due to a very high water table which facilitated easy and cheep digging of wells and tubewells. The districts of Bhiwani and Mahendergarh have a higher positive change due to new dimensions of lift irrigation in the areas. In some parts intensity of irrigation was increased due to deep digging to acquire water from fresh aquafier.

CONCLUSION

It can easily be concluded that without artificial irrigation, agriculture in Haryana is a gamble. It is an important constituent of the current strategy for raising agricultural production. It has become a must in the light of pressure of population, unfavourable climatic conditions, and topography etc. As the scope for extending the cropped area is limited, greater reliance has to be placed on irrigation so as to have double or multiple cropping.

The importance of irrigation is further enlightened by the introduction of Intensive Agricultural District Programme and the high yielding varieties programme only in those areas which have assured rainfall or sufficient irrigational facilities.

As is clear from the statistics already taken into account a major part of agricultural land still awaits irrigational water. It is possible only if new potentials are created and surplus water from Himalayas and adjoining states are diverted towards the state.

Equally important is the better utilization of the irrigation facilities already developed. So far we have failed in getting the maximum benefits out of our investment in irrigation in the sense that irrigated land has not contributed its maximum to agricultural output.

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