

## **Sweet Water Ferried by Underground Pipes in Punjab**



*Under Ground Pipe Line being laid in Haryana*

### **Background and Objectives**

Rice-Wheat and Cotton-Wheat are two principal cropping sequences of Haryana covering an area of around 17 lakh ha. These crops are irrigated by canal or underground water. Mode of irrigation is still essentially flood irrigation. Flood irrigation results in loss of appreciable quantities of water by way of evaporation and seepage from irrigation channels. However, while the farmers with fields next to canals or having underground water source in their field do not care much about efficient use of water. The farmers in the tail end of irrigation command area or the farmers not having underground water resources in their fields as a consequence suffer, as irrigation water normally does not reach the fields at the tail end. Their fields remain parched. More and more farmers in the districts of Karnal, Kaithal, Kurukshetra, Panipat, Sonipat and Yamunanagar are joining the ranks of the water starved farmers as

underground water resources in the state has been consistently declining at the rate of up to 31 cm annually.

There is yet another problem in Haryana. Though 84% of cultivated area is under irrigation in the State, about 62% of area is underlain with poor quality water especially in the districts of Bhiwani, Mahendragarh, Rewari, Jhajjar, Gurgaon and Mewat. There is a serious problem of salinity and sodicity in such areas. This water cannot be used for agriculture purposes unless salinity and sodicity in the water are brought to tolerable levels by mixing it with fresh water. By laying UGPL system fresh water can be brought & collected in tanks for mixing with saline water for subsequent use for irrigation with little negative impact on productivity.

Water has to be brought from some distance to deal with the problems of farmers at the tail end, farmers without underground water sources in their fields or farmers with saline/sodic water. Traditionally, many of these farmers have tried to cope with these issues by bringing water from a distance source by digging and building open channels. However, this has had another set of problems. There is water loss in transit. Such water channels tend to get damaged very often and consequently they require constant maintenance. Such channels also consume valuable land which could be better utilised for cultivation.

Under Ground Pipe Line (UGPL) system, which uses irrigation pipes placed underground to fetch the water from the source to the field, provides the most appropriate solution to tackle the above mentioned problems. Depending on the mean sea level of the source and the fields, UGPL system can bring water by gravity or by lifting and by carrying irrigation water from a source well to the field with pressure.

The problems faced by farmers in neighbouring Bathinda District of Punjab are also very similar. Most of the area of the district is sandy and has sand dunes. Under ground water is generally brackish and of poor quality. The main source of Irrigation is canal water. In this district, the area of most of the villages falls at the tail end of canal and this water is not sufficient for irrigation. Most of the area thus

remains rain-fed. For these farmers also, the salvation lies in bringing water through underground pipelines. In Punjab, by introducing UGPL system, canal water is lifted from outlets through lift pumps and provided to the fields by laying Under Ground Pipeline System.

UGPL system minimises water losses during conveyance from water bodies to farmers' field. Further, maintenance of irrigation channels is a bigger problem particularly during paddy growing season when weed intensity is at peak. By creating underground conveyance system, thus, additional land is also effectively brought under cultivation by saving on the lands lost in making irrigation channels.

UGPLs, by bringing fresh water to the farmers' field allows conjunctive use of saline water by mixing it with fresh water for providing life saving irrigation.

### **Intervention**

Haryana initiated UGPL programme in the first year of RKVY in 2007-08 a small scale with allocation of an amount of Rs. 115 lakhs only to facilitate bringing water to an area of 2193 hectares. The programme was subsequently expanded to reach to 4457.24 lakhs in 2010-11 for bringing water to as much as 36748 hectare. In all, the Government has approved a total outlay of Rs. 8034.00 lakh in first four years with the objective of facilitating irrigation of 72560 hectares of land. An amount of Rs. 8034.24 lakh has actually been utilised on providing assistance to the 19,658 farmers covering an area of 72,560 hectares under this system up to March, 2011.

The financial assistance in Haryana for UGPL system is provided @ 50% of total cost of HDPE/PVC pipe line limited to the maximum of Rs. 60,000 per beneficiary for all categories of farmers under RKVY.



The farmers generally use HDPE/ PVC pipe for laying out UGPL system of 125/ 140/160/180 mm diameter based on the discharge of the tube-well or availability of water at the source. In order to ensure that farmers get quality material at competitive rates while at the same time have flexibility of choice of suppliers, the state Agriculture Department registers/empanels the UGPL supplying firms every year with their quoted rates but without fixing any price. The rates quoted by the empanelled firms are negotiated by the farmers when they decide to take pipes from any supplier. Adoption of this practice has provided wider and more transparent choice to the farmers for procurement of material as well as release of subsidy.

The system in Punjab is more generous considering the fact that most of the water which is used by farmers in Bathinda district is canal water which virtually comes free for farmers. Government of Punjab, therefore, provides 90% of the total cost of the project under RKVY for laying UGPL system in the state. Further, taking note of the poor economic condition of farmers in the region, the labour work is allowed to be done by the farmers themselves on community basis in lieu of their 10% share.

In Punjab, the sweet water was drawn from the Sirjeana Minor coming out of Bhakra Canal passing about 8-10 km away from the

villages. The sweet water of Bhakra has reached the fields only due to the laying of Underground Pipeline system.

Under the UGPL project of Punjab, an amount of Rs 122.43 lakhs has been provided under RKVY covering an area of 489 hectares for laying 8000 meters of pipeline for 589 beneficiaries.

## **Outcome**



The UGPL programme of Haryana is very popular with the farming community and there is huge demand for this system. Farmers are highly convinced about its benefits. Average production & productivity have increased by more than 30% in the area where such system is installed. Farmers are now taking 2-3 crops instead of only one crop earlier. In the water deficit areas & areas having unsuitable/brackish ground water, although the crop production & productivity are very low, at least one crop is now taken with life saving irrigation provided from UGPLs.

A third party evaluation conducted By NABARD revealed:

- There is significant increase in crop productivity due to use of UGPL system in the fields. The increase is 18% for paddy, 52% for wheat and 161% for Sorghum.
- There is saving of water as well. The average saving of water in irrigating one acre of paddy field is 36.1% whereas the same is 43.3% for the wheat crop.
- The UGPL system has helped in reduction of labour cost and drudgery for the farmers.
- A few other benefits reported were, land saving by about 3%, elimination of water logging near channel to the extent of 1.5%, elimination of additional wells in the area, safety in operations etc.

Punjab has also reported very encouraging results after implementation of UGPL system.

- Increase in yield: Per acre yield for Wheat has increased from 10 quintals to 20 quintals and that for Cotton from 4 quintals to 10 quintals.
- Improved Land Value: Due to assured irrigation & higher yields, the land value has increased from Rs. 60,000/- per acre to Rs. 13.00 lakhs per acre.
- Saving of cultivable land: Due to the laying of underground pipeline, the land falling under kacha channels & bunds has also come under cultivation thereby helping in higher agricultural production.
- Diversification in Crops: farmers are diversifying to other crops like Paddy, Vegetables etc. after getting assured irrigation.
- Supplementary Income from other Occupations: Assured irrigation has helped farmers in growing green fodder for cattle.