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**LINING OF COMMON WATER COURSES
(AN EVALUATION)**



**ECONOMIC ADVISER TO GOVERNMENT, PUNJAB
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PREFACE

The Punjab State Tubewell Corporation (PSTC) was incorporated during 1975 under the Companies Act with the object of exploiting under ground water resources for irrigation purposes and allied works by availing financial assistance from the financial institutions. Lining of vast net work of water courses in Punjab was taken up by the PSTC during 1975-76 and upto March, 1978, it had lined 3134 kms. of water courses. This work gained momentum when the World Bank Assistance was extended to this programme in April, 1979. About 13500 water courses in the State were planned to be lined by the PSTC.

2. It was envisaged to line water courses to the tune of 15200 Kms. in the districts of Sangrur, Faridkot, Bathinda, Firozpur and parts of Amritsar district with an out-lay of Rs. 117.95 crores (revised to Rs. 162.90 crores) in a period of five years beginning from the year 1979-80, but upto March, 1984, the PSTC could line 11810 kms. of length, leaving a shortfall of 3390 kms. due to financial constraints and inadequate supply of cement. With the completion of lining process of water courses measuring 15,200 kms in length, it was anticipated that additional irrigation potential to the tune of 1,21,600 hectares would be created resulting in an increase of 520.00 thousand tonnes in farm output.

3. The present survey was conducted to study the impact of lining of common water courses with special reference to irrigation intensity, change in cropping pattern and generation of additional irrigation potential and implementation of the scheme including financing, recovery and maintenance aspects. In all 144 beneficiaries (shareholders) were selected whose lands were falling in the Culturable Command Areas (CCAs) of 24 selected water courses of 8 selected distributories. Of the 144 selected beneficiaries, 45.14 per cent reported 'increase' in the supply of water after lining, while 29.17 per cent and 25.69 reported 'decrease' and no change, respectively. Increase in the irrigated area of 144 selected beneficiaries after lining was 7.85 per cent over the pre-lining period while it was 7.88 per cent as per records of the PSTC pertaining to 24 selected water courses. During the course of field study, the evaluation team noted with concern that the lined water courses were not functioning efficiently due to frequent breaches caused by Sub-Standard material used in their construction. The PSTC was under obligation to under take repairs and upkeep the lined water courses during the course of loan recovery period, but it failed to comply with the obligation. Recovery of cost of lining prior to 1979-80 was 33.69 per cent. It declined sharply to 11.87 per cent during 1979-80 and 0.05 per cent during 1983-84. The recovery during 1984-85 and 1985-86 was absolutely nil. The State Govt. being guarantor for the repayment of principal and interest, had to pay back the entire loan amount including interest to NABARD. In this way the PSTC goes on raising institutional finance for the guarantor Govt. since 1984-85.

4. The scheme of 'Lining of Common Water Courses' can yield the anticipated results if prescribed proportions of sand and cement

are used at the construction stage and due curing is done. The institutional responsibility for the maintenance and repair of lined water courses must be identified immediately otherwise assets created worth crores of rupees will vanish in much shorter time than the estimated life. The lining divisions should be closed and the remaining work may be entrusted to the Irrigation Department to lessen financial burden on Govt. exchequer due to non-recovery of cost of lining from the beneficiaries since 1984-85.

5. This evaluation report has been prepared by the Evaluation Unit of the Economic and Statistical Organisation, Punjab. Acknowledgement is made of the useful work done in the preparation of this report by Sarvshri Amolak Singh, Deputy Economic and Statistical Adviser (since Retired) Ajit Singh Sandhu, Research Officer (Now Deputy Economic and Statistical Adviser), Bagicha Singh, Sher Singh and Bhupinder Singh Technical Assistants under the guidance of Sh. K. S. Aulakh, Joint Director (Now Director Capital Formation).

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SUMMARY OF FINDINGS AND RECOMMENDATIONS

(A) Summary of Findings

On the suggestion of the State Evaluation Committee, survey on "Lining of Common Water Courses" was undertaken to study the impact of lining on irrigation intensity, change in cropping pattern including financing, recovery and maintenance of these water courses. Of the selected 8 distributories, 24 water courses, serving the selected 144 beneficiaries were taken for sample study.

1. Targets and Achievements

It was envisaged to construct a total length of 15,200 kms. in the districts of Sangrur, Faridkot, Bathinda, Firozpur and parts of Amritsar, under Phase-I of Punjab Composite Irrigation Project (PCIP), while achievement to this effect was 15,192 Kms., with an outlay of Rs. 117.95 crores revised to Rs. 162.90 crores.

2. Financing

It was laid down in the scheme that 20 percent of the total cost of the project would be provided by the State Government and the remaining 80 per cent would be financed by the participating commercial banks. By the end of March, 1986, about 24 per cent of the total funds raised for lining the water courses, was provided by the State Govt. and the remaining 76 per cent by the banks. Proportionate contribution by the State Govt. was more in the beginning (1979-80) and went downwards thereafter.

3. Cost of Lining

Average cost of lining per Kms. in respect of all the water courses lined by the PSTC up to March 1986, was Rs. 89 thousand (Rs. 27.21 per feet) while cost per feet in respect of 24 selected water courses worked out to Rs. 28.88. Cost per feet varied from Rs. 7.64 to Rs. 48.30. The difference in cost has been attributed mainly to the time gap.

4. Recovery of Cost of Lining

The PSTC borrows funds from the financial institutions on behalf of the farmers. The Revenue Department did not pursue the process of recovery vigorously, resulting into steep fall in the process of recovery. The recovery which was 33.69 Per cent before 1979-80 steeply came down to 0.05 percent during 1983-84. The recovery during 1984-85 and 1985-86 was absolutely nil. It seems that sincere efforts were not made either by the PSTC or by the Revenue Department to pursue the process of recovery.

5. Repairs and Maintenance of Lined Water Courses

Before lining, the 'Katcha' water courses were repaired and

maintained by respective shareholders collectively. After lining, the water courses were not being repaired and maintained either by the shareholders or by the PSTC, though, it was laid down that the PSTC would repair and maintain the said courses during the currency of loan period i.e. seven years. Assets worth crores of rupees were created/constructed by the PSTC without caring for their repairs and maintenance. Shareholders were found unable to repair the lined water courses on the plea that the same was a costly affair, which involved skilled labour etc. The PSTC pleaded for not taking into hand the repairs and maintenance of lined water courses because there were no funds for this purpose.

6. Extent of Lining

It was laid down that the PSTC would line about 70 per cent of the original length of each water course and leave about 1000 feet unlined at the tail-end. Taking into account the length lined of all the 24 selected water courses, overall average lined length of the original length of the water courses was 82.23 per cent. It was as low as 48.80 per cent in case of a water course in Arakwas distributory, while cent-per-cent in case of one water course in Kotkapura, and two water courses each in case of Muktsar-Rupana and Rupana (U) distributories.

7. Area Irrigated Before and After Lining

(i) It was envisaged that lining would generate additional irrigation potential to the tune of 25 to 30 per cent. Taking into account the area irrigated by 24 selected water courses, the overall increase in the irrigated area was about 8 per cent. In some selected water courses of Bhawanigarh, Kotkapura and Muktsar-Rupana distributories, the irrigated area was reduced to the extent of 80.74 per cent, 41.83 per cent and 32.89 per cent respectively, while potential in case of a water course of Arkwas, Ghuman, Muktsar-Rupana and Sangrur distributories, increased by 56.71 per cent, 52.23 per cent, 74.44 per cent and 37.86 per cent respectively.

(ii) It was reported that after lining, the discharge of some of the water courses, has reduced, as a result of which the shareholders were compelled to instal tubewells in areas where the underground water was suitable for irrigation purposes, to supplement canal irrigation.

8. Intensity of Irrigation of Selected Beneficiaries by Location of Their Land in CCA.

Tail-end beneficiaries were benefited to the tune of 15.78 per cent after lining, over the pre-lining period while middle portion beneficiaries were benefited to the extent of 10.61 per cent and that of head portion to 2.99 per cent. Over all increase in irrigated area of all the selected beneficiaries worked out to 7.85 per cent.

9. Change in Cropping Pattern

Increase in area under Paddy crop in Kharif season was 126.57 per cent after lining and increase in area under Wheat crop in Rabi season was 15.50 per cent. Area under Maize, Sugarcane, Cotton and other kharif crops in kharif season decreased and area under Gram and Oilseeds etc, also decreased in Rabi season. Area under current fallows in kharif season decreased to the tune of 50.42 per cent and in Rabi season to the extent of 44.47 percent. Area under watery crops like paddy was on the increase, not due to lining alone but there was a trend towards sowing high yielding and cash crops and ensured irrigation was an important factor for this.

10. Participation of Cultivators

In accordance with the procedure, the shareholders were served notices by the PSTC. Out of 144 beneficiaries, 82 per cent were taken into confidence before the lining of common water courses was started and out of them, about one half had signed the requisite agreement with the PSTC.

11. Quality of Construction Work

It was found that though a Committee of shareholders was formed to supervise the construction work, but proper quality material and its proper proportions were not strictly adhered to, resulting into frequent breaches in the water courses. The percentage of beneficiaries who were satisfied with the masonry work and quality of material used for lining was sixty. The remaining 40 per cent were not satisfied.

12. Some Draw-backs in Lining

The shareholders who happened to possess land on both sides of the water courses, faced difficulties in crossing over to the other side after lining for want of permanent crossings over the lined water courses. In the absence of such crossings, the water courses often breached. It was also found that some water courses were over flowing due to defective or faulty levelling. In some cases brick-lining of water courses was resorted to without caring about the water table of the area, condition of the soil, effect of 'seim' etc. The nitrates and other soil salts affect the life of bricks considerably.

13. Space Provided for Water Course

At the time of survey, it was observed that about four feet space was available where the water courses were lined, though at the time of consolidation of holdings, 11 feet space was provided for the purpose. With the lesser space available for the water course, frequent breaches occurred due to less earthen support to its walls. Some shareholders were found to have planted trees along the water courses which had made encroachments into the walls and bases of water courses which in turn resulted into frequent breaches and also shortened the life of the water courses.

14. Relationship of Investment in Lining with the increase in Production

The PSTC did not try to relate the investment in lining with the increase in production. It went on making investment in lining without caring for the laid norms i. e. to establish relationship of lining with the increase in production, hence, it was found difficult at the time of survey to relate investment figures supplied by the PSTC for lining on each water course with the increase in production in any of the water courses.

15. Water Logging Vis-a-vis Lining of Water Courses

The PSTC did not undertake any survey before taking the lining work in hand. Although, the CCA of certain water courses were water logged, still the PSTC continued the brick lining, as a result of which 'sem' damaged the walls and beds of the lined water courses in a big way.

(B) Summary of Recommendations

1. Access to Each Holding

Permanent crossings were required to be constructed over each and every water course to permit access of bullock-carts and tractor-trolleys to each holding. The PSTC did not observe this norm especially in those cases where the holdings of the cultivators were situated on both sides of the lined water courses. The PSTC should provide permanent crossings to individual holdings, if the land owners agree to bear the cost of pipes which is approximately Rs. 300/- against the total cost of Rs. 2,000/- for the construction of such passage.

2. Space for Water Course

At the time of consolidation of holdings, 11 feet space was provided for each water course, but it was observed that share-holders made encroachments on the land provided for the water course. Hardly 4 feet space was left for the water course. It is suggested that encroachments made on this land on either side of the water course by the shareholders should be got vacated. It is further suggested that growing of plants and trees along the lined water courses should be banned to avoid encroachments in the walls and bases of the water courses by the roots of trees and plants. However, some shrubs can be planted on the embankments of water courses to discourage encroachments.

3. Use of Proper Material

The PSTC official visit the site at the time of construction and certify the quality of material used and ensure the maintenance of requisite proportions of material used for different processes of construction and would do prescribed curing. In actual practice the PSTC officials did not observe the said norm which inturn resulted in frequent breaches in the water courses. It is suggested that testing of material to be used to construct the water course be entrusted to some independent agency and the PSTC should ensure about the proper proportion of material being used and due curing being done.

4. Criteria of Investment in Lining

It was laid down that the PSTC would relate investment in lining to increase in production, but the said norm was not adhered to at any stage. It is suggested that the PSTC should conduct studies after two years of its lining, in order to see the increase in production with the investment in lining.

5. Recovery of Cost of Lining

The recovery of cost of lining was far from satisfactory. The Revenue Department was under obligation to make recoveries from the respective shareholders on the basis of demand lists supplied by the PSTC. The Revenue authorities were expected to recover the cost of lining and the recovered amount was to be passed on to the PSTC for repayment of loan by the later to the banks. There has been no recovery from 1984-85 onward. It is suggested that the aspect of remission of recovery of cost of lining may be examined at the level of Secretary, Irrigation and Power to sort out the repercussions of recovery not being affected and future policy in this regard should also be laid down accordingly.

6. Lining of Water Courses by the PSTC Vis-a-vis Institutional Finance

The PSTC was involved in the water-course lining programme with the main objective to get finance from the institutional agencies on behalf of the farmers. Since this system of financing has got a set-back due to non-recovery of the cost of lining from the cultivators and the entire cost of lining is to be borne by the Govt., it is, therefore, suggested that all the Lining Divisions of the PSTC should be closed forth-with and lining of the remaining water courses should be entrusted to the Irrigation Department. It has already been doing lining job in respect of the distributories and the Irrigation Department has the requisite expertise and experience in the line.

7. Repairs and Maintenance

The water courses lined by the PSTC were not repaired and maintained by any agency, hence the condition of these water courses was pitiable. Once a breach occurred in a water course, none tried to repair the same. With this situation, the lined water courses were worse than the 'Katcha' water courses. Though the PSTC was under obligation to undertake repairs and upkeep the lined water courses during the currency of loan recovery period, but it failed to comply with the laid norms in this regard. It is suggested that no new work pertaining to fresh lining should be undertaken until all the lined water courses are properly repaired and put in working order. This work should be entrusted to the Irrigation Department by making special provisions for the purpose.

8. Water logging Vis-a-vis Lining of Water Courses

For the development of water logged areas and to lower the water table, where lining has been done, it is suggested that the area regarding construction of new flood protection embankments and improvement of drainage system should be taken on priority basis so that damage to crops may be prevented in the future.