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Diagnostic Analysis of Wan River Project

M. U. Kale
Assistant Professor
Dept. Irrigation and Drainage Engineering
Dr. PDKV,
Akola

S. B. Wadatkar
H.O.D
Dept. Irrigation and Drainage Engineering
Dr. PDKV,
Akola

M. S. Supe
JRA
Dept. of Agril. Engg.,
Dr. PDKV,
Akola

Abstract

The study was undertaken to explore the causes of inefficient performance of Wan River Project. The data like problems faced by beneficiaries, conditions of canal structures, canal bed etc had been collected. Data regarding the performance of canal was collected through personnel interviews through questionnaires. On the basis of this data, a problem tree and subsequently a solution tree were developed. The study emphasized on reinforcement of user organizations to guarantee an efficient maintenance program on irrigation infrastructure.

Keywords: WRP, Problem tree, Solution tree, WUA

Introduction

The development of irrigation facilities has dominated agricultural and rural investment strategies in India for last few decades. After independence, irrigation was given a prominent position among the national development plans. After independence, India is continuing to invest substantial amount of money for the extension and improvement of irrigation facilities. High priority has been given to irrigation by the Government of India with nearly 10 per cent of all planned outlays since 1950 being invested in irrigated agriculture. About Rs7500 crores are invested every year in irrigation programmes in India. This has resulted in about 0.6 million ha of new irrigated schemes being developed every year. As a result of continuous investment in irrigation sector by Indian Government, irrigation potential has now reached about 100 Mha. The Central Water Commission (CWC) estimates the ultimate irrigation potential from surface and ground water sources would be about 139.9 Mha (Swaminathan, 2006).

Despite these massive investments and the high priority given to irrigation, the general consensus is that in terms of performance the large scale public irrigation systems does not met the expected standards. Returns on irrigation investments in terms of crop yields, farm incomes and cost recovery are disappointing. Gaps are wide between the potential created and the potential realized.

In many systems, the distribution of water is often inequitable, unreliable and inadequate. Ironically, deprivation in the tail reaches and water logging in the head reaches coexist in many systems. Approximately three million ha of irrigated land are estimated to be subject to waterlogging and /or salinization, though these conditions are not necessarily induced by irrigation. Despite this, there is scope for significant improvement. Diagnostic analysis of canal irrigation system is an approach for development whereby the analysis of existing (identified) problems leads to the identification of the underlying causes or constraints. Diagnostic analysis forms the basis for search for solutions to decrease or eliminate the problems by taking away or solving the causes. Diagnostic analysis focuses on the problems of critical performance, pin-pointing suitable reforms for improving the management and hence the performance of the irrigation system (Chambers, 1988; Dorian *et al.*, 1999; Podmore *et al.* 1983; Tyagi, 1990).

Wan river project (WRP) is multipurpose major project constructed on river wan, a tributary of Purna river near village Wari Bhairavgarh in Telhara taluka of Akola district in Maharashtra State. Irrigation is the primary objective of this project. The project aims to irrigate 15100 ha (ICA) with annual irrigation potential of 19177 ha. But presently the project is irrigating only 4000-6000 ha area, though filled to its full capacity almost every year. Considering this fact diagnostic analysis of WRP was undertaken with objective to build the problem and solution tree.

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Methodology

The best way to identify the problems and constraints of a system is through the detail analysis of the whole system. System oriented diagnostic analysis approach is applied to Wan River Project, situated in Telhara block of Akola district (Fig. 1).

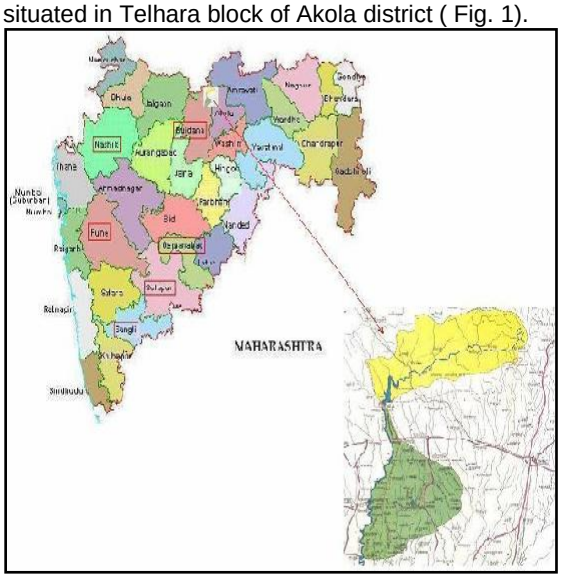

Fig. 1 The wan river project in Maharashtra

Problem identification (Diagnosis)

Only data and information which lead to the adequate definition of the problems was collected. The canal network was visited and problems were verified after personnel discussion with water users. The actual canal design and present status was thoroughly verified. To explore the problems the members of water user associations were personally contacted, in the command area of the main canal. There are total 62 water user associations in the command area. The problems faced by these members were discussed in detail through personnel meetings.

The information on problems referred by the water users was verified, by actual visiting the sites of wan river project. The data regarding the condition of the sluice gates, lining of canal, structures and the canal impaired by beneficiaries *etc* was collected. By comparing the present status with design goals, a problem tree and solution tree were built.

Results and Dicussion

Problem Faced by the Beneficiaries.

On the basis of analysis of collected data about the irrigation infrastructure and problems revealed by beneficiaries, the core problems were identified and structured as follows:

1. The core problem identified in the irrigation water supply system was inefficiency in terms of quantity, not conform to demand, causing low agriculture income.
2. The canals were found impaired at many spots by constructing temporary stone embankment so as to raise water level in the canal near the sluice gate. The door of the sluice gates also found either broken or impaired with numerous holes.
3. The unlined distributaries and minors were found crowded with many obstacles as well as weeds.

Because of these reasons, the flow of water through canal get affected and also increases the infiltration and seepage losses.

On the basis of these problems, a problem tree was prepared and depicted in Fig.2.

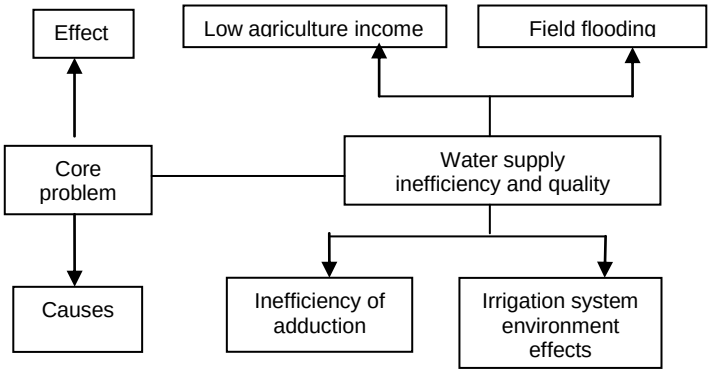

Fig. 2 General problem tree

The core problem was inefficient water supply to the lower reaches of the canal. It might be due to greediness of beneficiaries at the head reach trying to get maximum water from canal system than their share. The another cause might be inefficient management of lined as well as unlined canal. Such situation increases the gap between water user at head and tail reach of the canal. Also it may result in lower agriculture production and subsequently the income. Due to heavy infiltration and seepage losses, problem like, field flooding was observed. Cumulative effect of these things is environment degradation in the area of irrigation system.

The problem of the inefficiency was due to side and bed discontinuity that causes the water leaking. The second cause might be the nonfunctioning of the distribution and derivation gates, causing not exact module diverting. On the other hand, the inefficiency of the canal network was strictly related with sedimentation phenomena. The first cause of canal silting was the input of solid material from slopes upon the canal; the second one is the use, made by the farmers, of the canal as drainage system. Moreover, the poor maintenance activities resulted to store up thick sand layer in the canal. The effects of inefficiency of the canal were, obvious: about 30% water leakage along the canal reach, the water was not enough for all the farmers and the ratio between irrigated and irrigable area was very low.

On the basis of these observations, canal problem tree was built as shown in Fig.3.

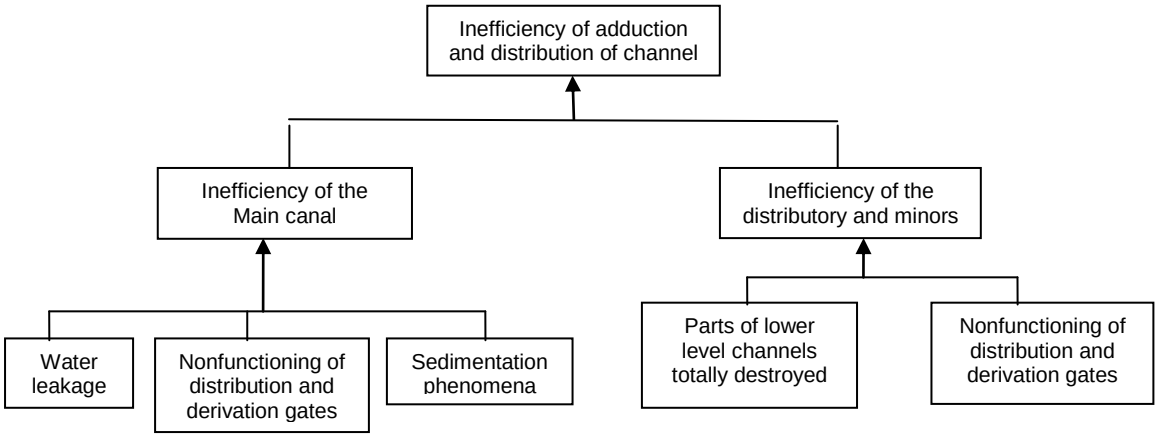

Fig.3 Canal problem tree

The problem tree was transformed in solution tree where effect becomes goal and causes become means. The result of analysis allows identifying the specific goal, efficiency of adduction and distribution channel and controls the environmental effects of the irrigation system. The solution tree was prepared as presented in Fig.4.

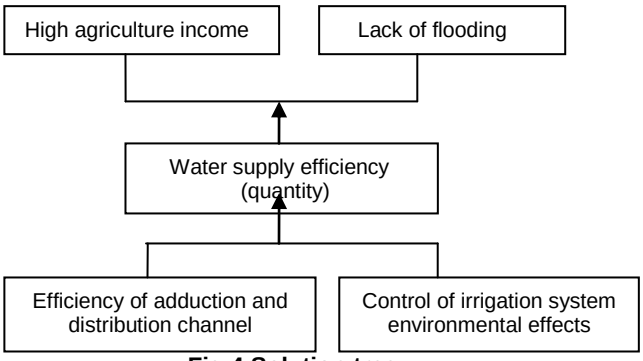

Fig.4 Solution tree

The actual possibility of achieving these objectives was evaluated in following phases.

1) Restore side and bed discontinuity in the main canal
2) Restore the functioning distribution and derivation gates of main and minor canal
3) Cleaning of canal silting tunnel
4) Rehabilitation of the drainage network
5) Reinforcement of user organization to guarantee an efficient maintenance program on irrigation infrastructure after rehabilitation.

Conclusion

The solution tree confirmed the need of reinforcement of user organizations to guarantee an efficient maintenance program on irrigation infrastructure for improved performance of irrigation system.

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