

CHAPTER - 2

SCOPE OF THE STUDY

2.1 TERMS OF REFERENCE

Terms of Reference for the Pilot Study would be as under :-

- (i) An overall evaluation of the performance of the UGC project vis-à-vis the benefits envisaged at the planning stage.
- (ii) Review of the past studies, if any, carried out to evaluate the water use efficiencies of the project.
- (iii) Carrying out Pilot studies on water use efficiency and overall project efficiency of the project taking into consideration, inter alia, the following main aspects:
 - (a) Water losses in the main canals, branch canals, distributaries /minors, field channels etc.
 - (b) Water losses in the field
 - (c) Operation of conveyance and distribution systems
 - (d) Conjunctive use of surface and ground water
 - (e) Water application to important crops in Kharif, Rabi and Hot Weather
 - (f) Comparison of the evaluated water use efficiency in each case with those presently in vogue based on various empirical methods.
- iv) Recommendations for specific measures to improve efficiency, structural and non structural measures, system improvement e.g. lining of canals, introduction of rotational water supply, improvement in field applications and overall improvement in water management etc. together with development of water for commercial purposes.
- v) Indicating the likely expenditure on remodelling / modernisation; Water management measures through integration of various irrigation delivery and application system including drip; micro-irrigation.

2.2 APPROACH AND METHODOLOGY

2.2.1 Study of the releases

The ultimate aim of attaining an optimum or reasonably achievable water use efficiency on system is to obtain maximum coverage of area under irrigation per unit volume of water. It goes without saying that water deliveries shall be based on water allowance, intensities designed for various channel system depending upon cropping pattern; net-irrigation water requirement after taking into consideration of soil characteristics; rate of infiltration; residual moisture content at the time of sowing; rainfall; sub-soil water level etc. Thus the efficiency on the Irrigation water use will be related to quantum of water released at head of canal to the water delivered at the field turn-out for application on the farm for maturity of crop. The loss on the field shall depend on field application practices, layout of field, slope or topography, soil profile.

2.2.2 Components of various losses

The following approach has thus been traced to work out losses.

Losses on the canal network,

- (a) Conveyance System i.e. Main Canal
- (b) Distribution System ; Branches /Sub-branches; Disty. and Minor which have direct offtakes.
- (c) Water courses below the outlet
The above system is generally unlined on UGC
- (d) Losses in the laterals reaching the fields through turn-outs.
- (e) Field application losses

This study is to work-out percentage of water actually reaching the field at turnout for raising of crop; remainder being lost in transit due to

evaporation; seepage; infiltration; absorption loss; wastage, over use etc.

(f) Water use pattern study over space and time

- (i) Water use study on various channels of same system
- (ii) Water use study on various channel of various systems on UGC.

2.2.3 Delta Analysis

The additional approach to study is the analysis of actual Delta. i.e. depth of water over area irrigated, observed or achieved against the delivery of water released for irrigation. This has been detailed on selected commands .

A study has been done for actual delta figure worked out on the basis of water deliveries on various sub-systems.

2.2.4 Equity in distributions

Study has been done on the deliveries of supply along the canal in head reach, middle reach & tail reaches. Analysis in Chapter 4 depicts the scenario.

2.2.5 Avoidable loss

- (i) Water loss due to leakages
- (ii) Water loss in escapes : run to waste at Tails; due to faulty regulation or lag or lack of communication.
- (iii) Excessive Water Allowance
(No longer rational as per soil characteristics; sub-soil water level conditions).

- (iv) Scenario of some existing features
 - i) Lack of Drainage / sub-surface drainage.
 - ii) Conjunctive use or availability and use of ground water.

2.3 DATA AVAILABILITY

The following details have been collected in respect of study.

1. Discharge data of UGC and releases from Headworks. Compiled for various seasons: Kharif 1999, Rabi 1999-2000, Kharif 2000 and Rabi 2000-2001 (Annex 4.9).
2. Discharge releases into various canal network system of UGC Main Canal; Branches, Sub Branches
3. Discharge escaped into drain / river from UGC.
4. Supplies released during various seasons into offtakes d/s Main Regulation point on UGC.

| | | |
|-------|--------------------------|-------------|
| (i) | Offtakes of UGC | Annex - 4.9 |
| (ii) | Offtake of UGC | Annex - 4.9 |
| (iii) | Offtakes of Jewer Disty. | - |
| (iv) | Mat Branch | - |
| (v) | Lower Mat Branch | - |

5. Longitudinal section of Jewer disty.
6. Comprehensive data of a large set of Channel system on irrigation deliveries made crop-wise in cusec days and Delta.
7. History and development and innovation of various type of outlets and modules on UGC.
8. Available supplies and Rotational Programme.
9. Canal legislation relating to implication on cropping pattern.
 - (i) Losses in transit on conveyance system i.e release from Head Works to first Control Point Dhanauri.
 - (ii) On UGC Dhanauri to Belra
 - (iii) On UGC - Belra to Newari
 - (iv) On Jewer Disty. System

- (v) On Baldeo Disty.
- (vi) On Jatari Disty.

2.4 PROJECT SITE VISITS

Site visits to the following canal network of UGC was carried out in commission will freed observation.

| PLACES VISITED | DATE |
|--|-----------------|
| Meerut | April, 2001 |
| Meerut, Haridwar, Muzaffarnagar, Roorkee | 4-5 July, 2001 |
| Delhi and Wazirabad, Okhla Headworks & WTP Wazirabad | 5 Sept. 2001 |
| Agra canal system, Jewer Disty, Mat Branch, Aligarh, Mathura, Tail reach of Mat Branch, Baldeo Disty, Mahavan Disty. | 16-17 Jan, 2002 |

During the above period, officers undertook visit to chaks of outlets on Jatari Mr, Baldeo Disty; Hathin Disty; etc.

Discussion with officers :

Chief Engineer, Upper Ganga Canal (U.P.) at Meerut; SE Upper Ganga Canal Meerut, SE UGC, Aligarh, SE UGC Mathura, SE UGC , Asstt Engineer, Jewar, Asstt Engineer, Mathura Divison for inspections of Mat & Baldeo Disty etc.