

Water Auditing of Irrigation Projects in Maharashtra: Myth & Reality

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Maharashtra is supposed to be one of the progressive, industrialized and urbanized states of India. Water Resources Development & Management in Maharashtra has been in some senses a benchmark in India's water sector. Water Resources Department (WRD), Government of Maharashtra (GoM) has initiated restructuring & reforms in water sector. Its list of achievements (Box -1) in this regard appears to be quite impressive.

Box-1: Restructuring & Reforms in Water Sector

1. Maharashtra Water & Irrigation Commission (MWIC) Report, 1999
2. Irrigation Status Reports (in September every year since 2001)
3. Benchmarking of Irrigation Projects (in March every year since 2001-02)
4. State Water Policy (SWP), 2003
5. Water Auditing of Irrigation Projects (in March every year since 2003-04)
6. Maharashtra Water Resources Regulatory Authority (MWRRA) Act, 2005
7. Maharashtra Management of Irrigation Systems by Farmers (MMISF) Act, 2005
8. Maharashtra Water Sector Improvement Programme (MWSIP), since 2006

But of late, there is a steady & continuous flow of criticism against WRD, GoM. Many things are being revealed & the department is in limelight mostly for wrong reasons. Though the charges of corruption is a not a new & surprising thing, the demand for issuance of white paper on present status of irrigation has raised many basic issues. It is quite likely that comprehensive & in-depth study of those issues may reveal the other side of the coin. It is needless to say that the irrigation scenario of Maharashtra is not up to the mark & in fact, contrary to the generally held perception. Reality appears to be significantly different than the image. Though it has now become imperative to critically study the so called achievements (Box-1) in a greater detail, this article limits its scope to a study of Maharashtra's water audit reports only, because water audit in a way reflects the state of affairs of canal irrigation.

Maharashtra initiated Water Auditing (WA) of Irrigation Projects in the year 2003-04. Secretariat for Maharashtra Water & Irrigation Commission has been converted into Maharashtra Water Resources Development Centre (MWRDC) to carry out Water Audit & Benchmarking of Irrigation Projects. Administrative details regarding MWRDC & the "how to do it" part of water audit are available in every water audit report & on official web site (www.mwrdc.org). The web site is very well developed, efficiently managed & updated regularly. All water audit & benchmarking reports published so far & corresponding data files are available on the web site. The procedure of water audit has been developed in a very systematic manner. The software, especially, is praiseworthy. Its robust design has enabled MWRDC to carry out most of its work on line. Indicators being used for water audit are given in Box-2.

Box-2: Indicators used for Water Auditing of Irrigation Projects

- I. Water availability in reservoir on 15th October
- II. % of actual evaporation to live storage & II(A) % of actual evaporation to projected evaporation
- III Target & achievement of irrigation potential utilization
- IV Water use pattern
- V Irrigation System Performance (Canals)

VI	Percentage of planned & actual non-irrigation use
VII	Percentage of un-utilized water to live storage
VIII	Conveyance efficiency of main canals
IX	Actual cropping pattern

Note: Indicators applicable as per project category are as follows

Major : all indicators; Medium : all except VIII & II(A); Minor projects: I,II,IV & V only

Water audit is a felt need of water sector. Since water audit can bring in accountability & transparency, nobody denies its necessity & importance. However, everything depends upon how exactly it is done in actual practice. And there are problems at field level! The concept of water audit is not being implemented in letter & spirit. Serious, knowledgeable, experienced observers & sincere well wishers of WRD, GoM are now whispering in private conversation that WRD is not that serious & honest about water audit. The reports are being published just as an annual ritual for image building rather than capacity building. Nothing is going to happen/change, according to them, because ground reality remains the same & nobody is accountable for whatever is published in the glossy reports with colorful graphs. Un-scientific/ unrealistic /un-measured data is casually but officially being published in the name of water audit. Is this criticism correct & valid? Is water audit in Maharashtra a myth? To answer these questions Report on Water Auditing of Irrigation Systems in Maharashtra State (2009-10) has been analyzed & the comments are given in following paragraphs.¹

Comments on Report on Water Auditing of Irrigation Systems in Maharashtra State (2009-10):

(1) Mention of **“urgency of water auditing in Non-Irrigation water use sector also”** [page-9, last line] is welcome. It needs to be introduced urgently.

(2) Analysis done in “Chapter-2: Annual Water Accounts 2009-10” should have been **plan- group-wise / river sub basin-wise** & in fact, as per percentage storage-wise too [table on page-1]. That would have been more logical & internally consistent.

(3) Data on Water Availability in Reservoirs are not scientifically correct because encroachment of **sedimentation** on live storage has not been studied in majority of the projects. Wherever the same has been studied, it has not been used [Para. 2.3.0, page-20, 21].

(4) Similarly, water audit would simply be a farce if **Preliminary Irrigation Program - PIP** (a water budget!) itself is either not prepared at all (Indicator-III, pages 111 to 113 & 157 to 163) or has not been officially approved and not actually used in irrigation scheduling

(5) Data on **Evaporation** from Reservoir are not scientifically correct because there is no arrangement to actually measure the same. Moreover, appropriate coefficients [namely “open pan to mesh” & “pan to lake”] have mostly not been applied. There are reasons to believe that reported evaporation is exaggerated in many projects because unauthorized water use & unreasonable wastage of water are reportedly generally “accommodated” in so called evaporation.

(6) **Created potential** needs to be urgently corrected project-wise considering mostly the adverse effects of less yield of water due to up-stream abstractions; encroachment on live storage due to

¹ The author was one of the members of a study group constituted by MWRDC in 2005 to prepare Manual on Water Audit. He was also associated with the workshops & training programs on water audit conducted by WALMI, Aurangabad since beginning. He had officially submitted his comments given here to WRD, GoM & had, in fact, suggested that “it would be prudent to officially withdraw the water audit report” in Aug 2011 when he was still in service. Of course, nothing happened. The author, after taking voluntary retirement, has continued the follow up through RTI & by writing articles & letters in state level Marathi news papers.

sedimentation; diversion of water from irrigation to non-irrigation; low kharif utilization; more than assumed conveyance & reservoir losses; changed cropping pattern; tendency to declare potential as 'created' even without construction of field channels; substantial increase in area under lift irrigation on reservoirs, rivers & canals; area irrigated in influence zone (pl. refer Maha. Water & Irrigation Commission Report, 1999); ever increasing conversion of irrigated command area into Non Agriculture (NA) area, etc. In fact, WRD had issued instructions to carry out "Revision of Irrigation Potential" some time back. Many Irrigation Divisions had actually done that exercise & submitted revised [read 'reduced'] irrigation potential for approval. It is not known why that exercise was not taken to its logical conclusion. To say the least, the reported figures of potential created are far from the reality. Any comparison of actual irrigated area with those figures is bound to be misleading. And more over, there is hardly any measurement of actual irrigated area also! So the credibility of the whole exercise / report is highly questionable.

(7) Concept of **Rabi Equivalence** was used for quite some time by WRD to address the issue of gap between created & utilized potential. Water Audit is strangely silent about it.

(8) Data on Water Use Pattern is not scientifically correct simply because it is not based on **actual measurement**; virtual absence of functioning water measuring devices in case of flow irrigation & water meters in case of lift irrigation & non-irrigation being the main bottleneck. Rampant use of unrevised Capacity Tables further adds to the confusion.

(9) It is strange & even shocking that "**unauthorized water use** for both irrigation & non-irrigation" has not been reported at all as a separate category under Water Use Pattern. Does it mean that there was no unauthorized use at all? Were there no '*panchnamas*' at all & hence, no penal charges? Why deny the **theft of water** when it is so rampant & so visible?

(10) Criticism regarding **Irrigation System Performance [ISP]** is serious & well known since beginning. Ha /Mcum is not a scientific criterion because it does not consider crop, crop-wise irrigation requirement, Irrigation Interval & number of rotations.

Moreover, for the sake of internal consistency, whatever is provided for in the Water Budget [PIP] should only be considered in Water Audit. Well - irrigation / percolation is not provided for in Water Budget & hence, area irrigated on well- irrigation / percolation should not logically be considered in Water Audit.

It would be interesting to check what ISP is assumed in PIP? Is it as per state norm? If not, then analysis done in para. 2.2.5 / page19 needs to be changed.

Assuming a same ISP criterion irrespective of regional variation [soil-crop-climate] is not only a mistake but it does gross injustice to paddy growing areas

ISP criterion for Kharif & LIS has not been yet fixed.

According to the feedback received time & again in WALMI training, **actual Crop-Area measurement has virtually stopped** since long in many of the projects & hence, the so called figures of actual irrigated areas do not have any scientific & credible basis.

(11) **Analysis of planned & actual non-irrigation use** [Para 2.2.6/page19] does not offer any explanation. Only table is given. Following questions merit serious attention:

- What is the basis of “planned non-irrigation use as per PIP”?
- Does it include non-irrigation use officially permitted by Govt. only or does it also include reservation done as per District Collector’s order?
- Whether PIPs were officially approved by Superintending Engineers as per GR on PIP?
- Why actual non-irrigation is significantly more than assumed in PIP? Is it a case of bad governance or are there any genuine practical difficulties?
- Why percentage of actual non-irrigation with that of provided for in project report is as great as 913% in case of Aurangabad region? How come the report is silent about such a serious matter?
- When there are no water meters in most of the cases & when water is indirectly measured [pumping capacity & pumping hours] & recorded by water user himself [& not by service provider], what is the reliability of data on non-irrigation water use?

(12) It is necessary to verify whether un-revised/ obsolete/wrong Capacity Tables have contributed in the phenomenon of so called **un-utilized water**.

Non-development of command area, lack of field channels, deep black cotton soils, assured rainfall zone, better availability of ground water, lack of awareness campaign, time required for transition from dry land agriculture to irrigated agriculture, socio- economic and or administrative hurdles in not getting the water, poor physical status of canal systems & poor management of irrigation, absence of management staff, etc could separately or jointly be the reasons behind the so called “unutilized water”.

One more possibility also needs to be checked. As compared to day to day irrigation management, management of non-irrigation is easy. Moreover, assessment & recovery of water tariff is also comparatively better in case of non-irrigation. Hence, some canal officers now a day reportedly prefer increase in water use for non-irrigation. They even at times, it seems, discourage water use for irrigation. That perhaps leads to “unutilized water”. Showing unutilized water creates ground/ justification for more diversion of water from irrigation to non-irrigation. If this is true, then it is a sinister design against the “irrigation”. Report on Water Audit should not knowingly or un-knowingly/ directly or indirectly help such anti-social elements & be a party to their sinister design.

(13) Para.2.2.8 [page-20] gives only well known theoretical information about **Conveyance Efficiency** of Main Canals. It is strangely silent about reported conveyance efficiencies [pages 133 to 135]. Following points need serious & urgent consideration:

- Only major projects have been considered.
- Only main canals of major projects have been considered.
- Out of total 57 major projects, approximately 50% projects have reportedly submitted inconsistent data & hence, it is not considered for analysis.
- Data considered as “consistent” by MWRDC reveals following:
 - i) There is significant season-wise variation in the efficiency of the same canal. In case of some canals, efficiency in hot weather is more than that in rabi season
 - ii) Conveyance Efficiency of Main Canal has been reported [in 27 projects] as low as given below:

Efficiency (%)	Projects
Less than 10	Bor, Upper Penganga
11 to 20	Wan, NM Weir
21 to 30	Kadwa, Kanher, Kal-Amba
31 to 40	Bhima- Ujjani, Jaykwadi-II, Bhandardara, NMweir, Ghod, Chaskaman, Dhom, Kanher
41 to 50	Bhima-Ujjani, Jaykwadi-I, Bhandardara, Gangapur, NM weir, Ghod, Chaskaman, Khadakwasla, Neera, Dhom, Kanher, Surya

If the reported low efficiencies are true, then the matter is really serious. If Conveyance Efficiencies of Main Canal itself are so low, what will be the Overall Project Efficiencies?

If one believes WA report then are these projects need to be simply abandoned? Or they need to be classified only as "water recharge projects"? Something is seriously wrong in WA Report because many of these projects are contributing significantly in irrigated agriculture & state's economy. Is it correct to officially report unbelievable efficiencies in case of such projects?

MWRDC & in fact, now WALMI should have given more serious thought to this conveyance efficiency part particularly when WRD has now entrusted the responsibility of determining Conveyance Efficiencies of 12 projects to WALMI.

Determining efficiency is a tricky & hence, challenging issue. Comprehensive & in- depth analysis in mature manner is urgently called for. Over simplistic approach in case of a very complex situation leads to absurd results.

- In case of Bhandardara Project, the explanation for low efficiencies given below needs to be checked: " this is because of the water is let out through canals from ozar pick up weir, 85 km D/s of Bhandardara dam" [page-38]. How this fact affects the conveyance efficiency of main canals from pick up weir?