

TD 603  
Water Resources

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Analysis Framework for the 2009 Maharashtra MWRRA Tarrif  
Document

# Vol I: The Chapters

- 1 **Preface:** Terms of Reference, brief history and brief outline.
- 2 **Chap. 1 and 2:** Introduction and Sector outline for Maharashtra. Tariff and issues.
- 3 **Chap. 3: International Experience:** Institutional framework, Principles, level of supply and tariff in various countries.
- 4 **Chap. 4:** Recommendations of various national and state committees.
- 5 **Chap. 5:** The legal framework. Provisions of various acts and policy documents.
- 6 **Chap. 6:** The structure of the tariff document and current tariffs.
- 7 **Chap. 7:** The computation of O & M norms.
- 8 **Chap. 8:** Methodology for determining tariffs.
- 9 **Appendices:** List of contents of other volumes.

# Vol II and Vol III

## Vol. II

- 1 Annexure I, Chap. 1: Bulk-water and tariffs-Principles.
- 2 Annexure I, Chap. 2: International Case Studies.
- 3 Annexure II: Report on water conservation technologies.
  - ▶ Agricultural, Industrial and Domestic
- 4 Annexure III: Water recycling technologies
  - ▶ Wastewater and Industrial water re-treatment
  - ▶ Tariff mechanism.
- 5 Annexure IV and V: Non-agricultural and agricultural tariffs.
- 6 Annexure VI and VII: M&R norms from WALMI and its implications.
- 7 Annexure VIII: Report on Field Visits.

## Vol. III: **The tariff details.**

## Vol. III first

- pg. 7: Definitions: *Collection Efficiency, Culturable Command Area*
- pg. 9: Definition of O&M costs, does not include capital, depreciation and *special repairs*.
- pg. 10: Item 8. Norms for M&R set by WALMI.
- pg. 10: Item 10. Subsidies must be explicitly mentioned.
- pg. 11: Item 12. Apportionment of Costs to sectors on the basis of *affordability, accessibility, Quantity and timeliness*.

Agriculture	Domestic	Industry
21 %	23 %	56 %

- pg. 12: Principles, *tariff will not exceed 3-5% of gross value for food crops and 8-10% for cash crops*.
- pg. 13: A **basic rate (BR)** for *rabi*. 80% for *kharif* and 120% for *hot season*. Serves as *numeraire and applicable to domestic and industry as well*.

## Concessions and Incentives as multiple of BR

<b>Agricultural Use</b>	
Marginal farmers (0-1 ha.)	50%
Small farmer (1-2 h.a)	75%
Microirrigation	50 %
<b>Domestic Use</b>	
Effluent/Sewage treatment	50 %
GP 40lpcd	75%
ULB 70lpcd	90%
> 130 lpcd	125%
<b>Industrial Use</b>	
Water as raw material	500%
Agro industry	75%
Recycling reduction to 75%	80%

# Efficiency

## Bill Collection

- Improve collection efficiency in agriculture to 75%.
- Submit circle wise collection efficiency in prescribed format.

## Irrigation system

- Attempt to achieve water use efficiency:

Year	Target ha /Mm <sup>3</sup>
2010-11	120
2011-12	125
2012-13	130

- Maintain circle-wise data on irrigated area for *rabi* and *hot weather*.

# The Actual Tariff Computation

- Separate computation sheets for Agriculture, Domestic and Industry.
- Across all sectors, a common multiplier for season.
- Within agriculture, separate for canal, private lift and GoM lift. **Grounwater use seems to be missing.**
- *For agriculture, seems to be a circle-wise tariff.*
- An efficiency of 120 Ha./Mm<sup>3</sup> for minor and 96 Ha./Mm<sup>3</sup> for Medium and Majoris assumed.
- *pg.20-22 seems to be a worksheet to calculate average volumetric tariff.*
- **Not clear that volume balance is achieved.** In other words, if  $V$  calculated in item 6 actually equals water reserved for 120 ha.
- Classification of sources into A,B,C for domestic and industrial use. This depends on the point of withdrawal. List in decreasing order of BR is **protected downstream, reservoir and unprotected downstream.**

## Finally-Annex. 5, pg. 30

A cursory directive about asset management for systems without WUA (most) and cost-sharing directive for those with WUA.

## Next, Volume II

- **1.1 Bulkwater and tariffs:** description of costs and provisions, most of which have been ignored (e.g., return on investment, explicit subsidies).
- **1.2 Why tariffs:** Four primary and two secondary objectives. **Most of them are ignored.**
- **1.3-1.5 Fixed cost, marginal cost and marginal opportunity costs.** Mainly an argument on why something close to fixed costs with a separate efficiency and revenue objective (Two-part tariff) is most suitable.
- **Case Study: Brazil**
  - ▶ Abundance of fresh water: 1500 cu.m. per-capita for the arid areas. Compare with the Indian average of roughly 500 cu.m..
  - ▶ River basin authorities with wide public participation.
  - ▶ Pollution and Recycling costs clearly mentioned.
  - ▶ Revenue aimed largely at capital generation.
  - ▶ Tariffs negligible indicating low establishment costs.
- **Case Study: Melbourne Water**
  - ▶ Largely urban domestic and industrial use. Strict pollution norms.
  - ▶ Costs include about 5% return on estimated capital costs.
  - ▶ Rudimentary opportunity cost pricing and trading.
  - ▶ Tariffs roughly Rs. 2-16 per cu.m. reflecting low project and establishment costs per cu.m.

# More international cases

- **Case Study: Cape Town water**
  - ▶ Largely urban domestic and industrial use.
  - ▶ Massive investment for inter-basin transfer.
  - ▶ Capital cost recovery regime.
  - ▶ Graded household tariffs starting at Rs. 18/cu.m. (< 6 cu.m. per month).
- **Case Study: Urban China:** Fixed fraction of capital costs absorbed into tariff. Beijing at Rs. 24 /cu.m. including about Rs. 5 each towards sewage and recovery of capital costs.
- **Case Studies: Chile and Harvey water (Aus.):** Urban and semi-urban, partly opportunity costs and partly capital costs.
- **Case Studies: South Africa, Turkey Irrigation:** Generally O&M, but Turkey has some capital costs. Non-govt. irrigation has to be registered.
- **Case Studies: Mexico:** Extensive monitoring. O&M costs, monitoring and capital costs, in principle recoverable.

## Vol. II continued

- **Annexure II and III:** Well-meaning but irrelevant stuff about Water Conservation and Recycling in the three sectors.
- **Annexure IV:** Non agricultural tariffs (per cu. m.).

Use	Reservoir	Canal	River	Capital Paid
Water Ind.	19	48	7	7
Industry	3.8	9.5	1.3	1.3
Domestic	0.17	0.66	0.15	0.15

- **Annexure V:** Current Agricultural tariffs. Basic variables:
  - ▶ **Season** Kharif (70%), Rabi (100%), Hot-weather (150%).
  - ▶ **Delivery** Flow (100%), Drip (66%).
  - ▶ **Source** Canal (100%), GoM lift (100%), private lift (50%), others.
  - ▶ **Crop** food, cash, fruit, perennial, seasonal, and more.**Rabi prices below per Ha.**

Cotton, non-Kh. Rice, Groundnut	724	Wheat	476
Per. Sugarcane, Banana	6297	Onion	2519

## Vol. II Costs

- **Annexure VI**: M&R norms proposed by WALMI.
  - ▶ **Headworks** Rs. 11000 per Mm<sup>3</sup>
  - ▶ **Canal works** : Rs. 380 per Ha. of actual irrigated area.
  - ▶ **Canal works** : Rs. 190 per Ha. of area in **Culturable Command area** but not irrigated.
  - ▶ **KT weirs** Rs. 2300/1450 per sq.m. depending on existence of reservoir.
  - ▶ **Lift Irr. schemes and storage tanks** : as per actuals.
- Adjustments for age of project, hilly regions and black cotton soils.
- WALMI norms based on actual expenditure of select projects and not on *amounts demanded by the department*.
- Exact data (Annexure 2 forms, pg. 68, WALMI.pdf) from projects surveyed not available in report.
- **Is CCA the same as Developed Command Area (pg. 26, Vol. 1)?**
- **Annexure VII**: Net M&R costs: **Rs. 221 crores** or **Rs. 370/ Ha. of CCA**. KT and Lift schemes not counted, deemed too small?
- **Finally** , a report of field visits to various projects and consumer types.

- **Preface:** 13 points, broad overview.
  - ▶ To fix tariff towards O&M, explicitize subsidies and cross-subsidies and to review every three years.
  - ▶ Most industrial and domestic volumetric, only 10% of agricultural is so.
  - ▶ Arguing the three attributes of affordability, accessibility, quality and timeliness.
  - ▶ Comments on the high establishment costs, hopes WUAs will reduce costs.
  - ▶ Comments on low water use efficiency in the agricultural sector.
- **Chapter 1:** outline of the report.
- **Chapter 2:** The bulkwater system.
  - ▶ Total 18157 Mcu.m., of which 3700 to domestic, 630 to industry and 18100 to agriculture.
  - ▶ Net command area developed is 43 L.Ha of which 32 through major and medium and 11 through minor schemes. **Utilized is only 28.**
  - ▶ The institutional framework.
  - ▶ rules concerning WUAs and MIDC.
  - ▶ Tariff levied: 328 crores from industry, 172 from domestic and 113 from agriculture.
  - ▶ **Collection only 36 crores from agriculture.**
  - ▶ All the same, collections roughly match O&M.

## Chap. 2,3 and 4

- **2.5.8:** the difficulty of investments in O&M. *Yet past expenditure is the basis for estimating future O&M.*
- O&M costs roughly Rs. 0.3-0.4 per cu.m.
- **Chapter 3:** International experience. *A summary table.*
- **Chapter 4:** Recommendations of past committees.
- **NCAER 1959.**
  - ▶ Social and economic benefits.
  - ▶ *tariffs not on cost but on benefit to farmer!*
  - ▶ Tariffs must cover debt charges.
- **Barve Committee 1962.** Much of what is now the format.
  - ▶ Tariffs to amount to 6-12% of crop price.
  - ▶ Tariffs must cover depreciation.
- **Jakhade Committee 1988.** Specified norms for O&M and establishment.
- **Vaidynathan Committee 1992.** The modern perspective: subsidies, financial well-being, cost recovery etc

## Chapter 4 cont., Chapter 5

- **Chitale Commission, 1999.** Exhaustive study of Maharashtra. circle.
  - ▶ Brought O&M and tariff parity
  - ▶ Pointed out M&R vicious circle.
  - ▶ Stressed on capital investments/recovery for non-irrigation use.
  - ▶ Pointed out that private lift irrigation farmers were ready to pay 3-10 times canal flow charges.
  - ▶ Wells within command area to be charged. Adjoining areas to be charged after investigation.
- **Chapter 5:** Legal framework.
- **Tariff provisions in MWRRA:**
  - ▶ O&M recovery, promote and fix efficient use, determine cross-subsidies, and finally review.
- **Provisions in MMISF, 2005.**
  - ▶ Lots on WUA.
  - ▶ confusion from MIA, 1976: *wells outside 35m limit excused, but non-irrigated lands to pay!*
  - ▶ However 2009 GR allows all well-irrigated lands to be tariff-free.
- **National Water Policy (5.6.1):** *rates directly linked to QoS.*

# Chapters 6,7 and 8

- **Chapter 6:** Present tariffs. State-wise comparison.
- **Chapter 7:** O&M norms. Estimating M&R and establishment.
  - ▶ The WALMI methodology: selected projects.
  - ▶ *difficult to correlate demand, actual expenditure with irrigation system performance!*
  - ▶ norms < expenditure < grants < demands
  - ▶ *projected M&R roughly in line with past expenditure/demand.*
  - ▶ Establishment costs Rs. 325 crores of a total bill of Rs. 490 crores, way above Jakhade committee norms.
  - ▶ Cost per Ha. of Rs. 787.
- **Chapter 8:** Setting tariffs-the three attributes.
- Current irrigation costs 0-6 % of APMC rates for non-cash/non horticulture crops.
- Apportionment of costs and setting of tariffs.
- **Section 8.18:** Responsibilities.
  - ▶ Improving collection efficiency, tail-to-head water access.
  - ▶ Water use efficiency: 120-130 Ha. per Mm<sup>3</sup>, in 3 years!