A Critique of the Approach Document for Fixing Bulk Water Tariffs

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1 Introduction

This note is a commentary on the technical parts of the Approach Document(see [AD]) submitted to the Maharashtra Water Resources Regulatory Authority (MWRRA). The terms of reference (TOR) for this approach document are listed at the MWRRA official web-site (see [TOR-08]).

1.1 The TOR document

The TOR invites advice on the Bulk-Water Tariffs to be imposed on all water supply from the reservoirs, rivers and streams in the control of the Water Resources Department, Govt. of Maharashtra (WRD), for all uses including agricultural, industrial and domestic consumption. For agricultural use, where Water Users Associations (WUAs) have been formed, the charge will be volumetric, while for individual farmers, it would be based on the farm-area, crops and other factors. Non-agricultural use will be billed volumetrically.

Terms in the TOR include the review and assesment of

- existing best practices, nationally and internationally.
- provisions relating to tariff in the MWRRA Act and the State Water Policy.
- inter-sectoral subsidies, and progressive tariffs for non-agricultural use.
- O&M and establishment allocations and expenses incurred by WRD.
- the productive use of water by all users and the criticality of quality of service to all users.

Details appear in Section 3 of the TOR.

Guiding principles for the above analysis appear in Annexure I of the TOR. This includes Section 11(d) and Section 11 (r) of the MWRRA Act which pertain to the recovery of O&M costs and clarity in subsidies. Besides this, Clause 4.4 of the State Water Policy is also quoted verbatim which pertains to the transparency, recuperation of capital costs, volumetric charging, and explicit subsidies for the weaker sections.

1.2 Our Main Questions

Water tariffs is an important tool in the hands of the regulator to address macroeconomic and developmental issues in the states water-security framework. We concentrate our attention on three main questions which a reasonable tariff regime must address. These are:

- Does the approach document correctly estimate the O&M expenses?
- Do the tariffs proposed incentivize best practices in agriculture?
- Do the inter-sectoral allocations of water and recovery targets correctly address the economic utility of water?

2 The investments and returns in the irrigation sector

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- Chapter 4 of the Maharashtra Development Report (Table 4.4, p. 85, [SDR4-05] mentions that at 2004 prices, the cost of creating one hectare of irrigable land was roughly Rs. 1.66 lakhs. Assuming a small fraction of 1% as the O&M costs gives us a sum of Rs. 1660 per hectare per year.
- An important component of the World-Bank sponsored MWSIP project (page 33, [WB-05]) was the *rehabilitation and modernization* of select schemes. The activities include *construction of improved canal regulation and discharge measuring structured devices, silt and vegetation removal, re-sectioning of channels and strengthening of banks, providing lining in specific reaches where justified, replacement of damaged lining, restoring free-board, repair of deteriorated structures, and construction of additional cross drainage structures etc* The projected cost of this component was USD 260 million and which would benefit 0.67 million heactares. This comes out to be (at Rs. 45 to a dollar) to be about Rs. 17000 per hectare. Assuming a 10% per year ammortization yields a sum of Rs. 1700 per hectare per year.
- Both, the Irrigation Status Report ([ISR-04]) and the Report on Benchmarking ([BM-06]) draw attention to the poor utilization (of about 57%) of irrigation potential created into actually irrigated areas. A list of the causes for this poor efficiency includes (i) thin and scattered irrigation, (ii) reduction in storage area due to silting, and (iii) poor maintenance of infrastructure due to financial constraints. All of these reasons amount to a lack of effective Repair and Maintenance regime.
- Section 9.4.2 of the Approach document ([AD]) clearly lists the methodology followed by WALMI in proposing a computation of O&M costs. This

methodology relies heavily on past allocations of funds rather than on demands by individual projects. It also points out the serious implications paucity of funds and delays in allocations have on the quality of O&M.

The Approach Document approach is to compute a target revenue as follows:

1. Appeal to Section 11(d) of MWRRA and ignore Clause 4.4 of State Water Policy.
2. Ignore capital costs and use WALMI estimates (Annexure VI) to arrive at a sum of Rs. 221 crores for R&M expenses.
3. Divide this number by the Culturable Command Area of 59.91 lakh hectares to arrive at Rs. 370/ha. Note that the area actually irrigated is merely 18.35 lakh ha.
4. Estimate establishment costs at Rs. 360 crores from existing expenditures or roughly Rs. 820 per ha of potential created.
5. Arrive at the sum of Rs. 605 crores or Rs. 971 per ha as the **target revenue**.

In our opinion, the amount of Rs. 370/ha is an inaccurate estimate of the actualR&M expenditure required for the proper maintenance of the irrigation system. The above amount is a mere account of what has been expended in the past few years and ignores the poor performance of the system. As we have indicated, an amount closer to Rs. 1600/ha is required in the yearly R&M so that it performs to expectations.

3 Incentivization of best practices

It is clear that the bulk water prices are an important signal for the efficient use of water. In this section, we will look primarily at the agricultural sector. The TOR is noticeably weak in stressing the connection of the price mechanism in incentivizing good practices. Item 3 (7) of the TOR which requires the consultant to *review and assess the water use and tariff assesment and collection in the last 5 years in the state separately for agriculture, industry and drinking water*. Also relevant are Items 3 (11-13) which relate to assessing the Irrigation status reports and agricultural practices. Section 12(4) of the MWRRA Act does recommend the promotion and implementation of sound water conservation and management practices in the state, but *it does not find explicit mention in the TOR*.

This weakness may be based on the assumption that a volumetric charge for agriculture will automatically ensure efficiency in water consumption. Whence, we must examine how much of the water supplied to agriculture is actually charged volumetrically. Data about this is not available to us (and nor is it presented in the Approach Document), however, we may assume that volumetric charging, if at all, must be through Water Users Associations (WUAs). The

MDR 2005 (see [SDR4-05]) report highlights that in 2003 about 0.16 million hectares were covered by operational WUAs. This represents about 10% of the total irrigated area. Of these WUAs, exactly what fraction is indeed charged volumetrically, is a question.

We may thus assume that for the next decade, a substantial part of bulk water for agriculture will only be billed by acreage, i.e., per hectare. This immediately necessiates a complicated table of tariffs based on crop, season, agricultural practices and so on. Thus, assuming the premise of volumetric billing, we must, for every situation, construct a volumetric equivalent and bill accordingly.

The Approach Document makes no mention of this calculation, relying on the soundness of the *existing schedule*, which has some glaring short-comings. Firstly, as the MDR 2005 points out, there is the pre-ponderance of sugarcane on irrigated lands. Given the water requirements of this crop and the method of irrigation, there is the question whether the current rates match the volumetric calculation, and whether they incentivize efficient use of water. As per MDR 2005, the Drip Method of Irrigation (DMI) is an increasingly effective option for efficient use of water. In 2002, about 0.21 million hectares (irrigated and non-irrigated) of farms in Maharashtra are under DMI. Of this, about 0.08 million hectares fall under irrigated lands, i.e., roughly 5% of irrgated lands. The report also notes that with DMI, the water savings range from 40-80% and a productivity increase of about 19-29%.

It is clear that there should be considerable reduction in area-tariffs for farmers practising DMI, if not even an incentive. However, we see that the rebates for DMI is a mere 33% which practically overcharges the DMI farmer.

The Approach Document should throw some light on the specifics of this problem.

4 Inter-sectoral issues and Externalities

Chapter 10 of the Approach Document deals explicitly with the computation of volumetric tariffs for each of the three sectors, viz., agriculture, industry and domestic use. Apportionment of the revenue requirement, i.e., explicit revenue targets for the three sectors is computed in sections 10.3 and 10.4. Once sector-wise targets are achieved, in section 10.8 volumetric consumption for each sector is computed and a bulk-water tariff is finally arrived at.

The approach of 10.3-10.4 is patently wrong. Three attributes of water are proposed, viz., quality (Q), reliability (R) and economic utilization (E). A table (Table 10.2) is constructed which allocates the relative importance of each

attribute to each sector. This table is reproduced below:

(a)	(b)	(c)	(d)	(b+c+d)/3	Weightage
Sector	Qua.	Relia.	Eco.Use		
Industry	3	3	5	3.67	48%
Domestic	2	3.5	1	2.17	28%
Agriculture	0.5	2.5	2.5	1.83	24%

Here is the quote from Section 10.5:

> The weightages work out as 48%, 28% and 24% for industry, domestic and agriculture category, respectively, which have been used for apportioning the O&M costs.

Thus the allocation of revenue targets is done by the above table **without considering sector-wise consumption at all**. For example, if there were to be a single industrial house in Maharashtra consuming exactly 1 cubic meter, then it would pay a whopping 48% of the total revenue target, i.e., roughly Rs. 300 crores for a single cubic meter.

This leads one to believe that the table and the calculation is purely so that the computed allocations match the *status quo*, i.e., roughly 50% , 30% and 20% for industry, dometic use and agriculture respectively (see Section 2.4 of the Approach Document).

It is clear that this calculation is central to revenue apportioning and must be done with due care. Clear policy directives at this point, either from the MWRRA Act or the State Water Policy, or from any other source, are essential to form a basis for the allocation. As an example, the proposed volumetric charge for domestic use is roughly Rs. 0.48/ cu. m. This compares very favourably with the investments made in rural drinking water projects. For example, Jal Swarajya expends about Rs. 60-Rs. 100 per cubic meter of capital costs and about 5% of this, i.e., Rs. 3-5/cu.m. In short, resourcing drinking water from irrigation water instead of Jal Swarajya schemes seems to be highly economical. The proposed allocation to domestic use (again, Approach Document Section 10.8) is 2.6 billion cubic meter as opposed to 16.4 billion cubic meters for agriculture. In short, a 10% increase in the efficiency of agricultural use could yield very significant benefits to rural drinking water. Note that roughly 0.6 billion cubic meters suffice for the city of Mumbai at roughly 200 liters per person per day (as opposed to the Jal-Swarajya norm os 40 liters). Thus a 10% savings, i.e., 1.64 billion cubic meters will go a long way in providing an important livelihood resource for the people of Maharashtra. In view of this, we expect the approach document to clearly argue why a different apportionment of water should not be done.

Finally, the obvious externality is non-irrigated agriculture (NIA). Anectodal evidence points to a severe economic disincentive for NIA in the non-monsoon season. Only when water is free, i.e., when it is raining, is it worthwhile to plant anything. In the non-monsoon months, the huge subsidy that irrigated lands gets and the consequent effect on the prices of agricultural produce, forbids

the NIA farmer from entering the market. Thus the story is of the irrigated land farmer using water profligately, while the NIA farmer is beaten out of the market. The true price of agricultural produce is never discovered.

5 In Conclusion

We have the following recommendations to make. **The Approach document needs to be re-worked and re-submitted after accounting for the following deficiencies in the current version**.

- There must be a better calculation of O& M expenses per hectare than merely basing it on a sample of past allocations. A mis-calculation here has grave consequences for the health and efficiency of the state's irrigation system.
- There is no algorithm presented for calculating area-wise charges from a calculated volumetric charge for agricultural consumption. This needs further work, since, e.g., it provides an inadequate incentive to use water efficiently. For example, a 33% discount in area charges to drip irrigation seems an inaccurate estimate of the water saved.
- **The calculations of 10.3 and 10.4 are patently wrong**. A clear rationale must be provided for the allocation of revenue targets for various sectors.
- The Approach document also assumes a sector-wise allocation of water. No basis for this is provided. The approach document should consider the possibility that the demand for water for domestic use may rise.

References

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