

Quantifying EF – The Way Forward

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Discussion on EF reveals some amazing terminology which even hard core water sector professionals find difficult to decipher. There is prescriptive approach, expert team approach, expert stakeholders approach, non-expert stakeholders approach. And there are different methods – hydrologic indexing methods, hydraulic rating methods, habitat simulation methods, and holistic methodologies. Each of these is a family comprising many different methods. In a paper in 2003, R E Tharme counted as many as 207 different methods (eflownet.org). That was 10 years ago, and by now the number would be much more. And yet, so far as India is concerned, not one out of these hundreds of methods is able to tell us how much should be the EF. Meanwhile, in absence of any decision, water use decisions continue to be made with nil or negligible provision for EF. The water and environment sector fraternity seems to believe :

- a) It is possible to devise some formula or some computer model that will tell us what should be the quantum of EF. All that is requires is, do research to devise that formula or model.
- b) Friends Of Environment (unfortunately, and unintentionally, that reduces to acronym ‘foe’) are the right people to conduct this research, collect data, devise the formula or model, apply the data to it, and tell us what should be the EF.

Both ideas have proved themselves to be wrong, and unless we junk them no progress will take place on quantification of and hence on maintaining, EF. Here is how.

EF can not be quantified by a formula or a model, because environmental objectives are not specified. For any given EF, there will be a corresponding status of the environment. More the water for EF, better the status of habitat. But no particular status of the habitat is specified or agreed upon as the objective. Then how does one use the formulae or mathematical models to determine the EF?

One doesn’t. The EF can not be **computed**, it has to be **decided**. Research can only paint various scenarios. But the choice of one particular scenario will have to be a political and administrative decision. This is very similar to deciding the salary for employees. Analysis can paint various scenarios of the level of standard of living of the employees, for different levels of salary. However, analysis can not help in selecting one scenario. That has to be **decided**, by the company management, keeping in view other needs for the limited finances.

Water resources are even more limited than company finances. Company management has several options to raise more finances, ranging from simple overdraft to borrowing from the market, bonds, debentures, share issue, etc. Water managers have no such options to “raise more water”. Every drop of water allocated to any one user has to be offset by an equal reduction in allocation to some other users. And these other uses are also important.

There is only one way to make allocation of any scarce resource. Make a starting allocation to each user. If this adds up to more than the resource available, which it will invariably do, then modify allocation to each, and repeat this process till the total of all allocations is equal to the resource available. Increase in allocation to any user will have to be based on increase in the benefits from that use being more than the reduction of benefits to other uses, and their relative value in the overall picture. Simple word for this is trade-off.

It follows then that the decision on EF can not be made by Friends of Environment because

a) they lack the overall perspective about water needs of other sectors and their importance in the overall scheme of things.

b) decisions can only be made by the government, and not by the NGOs.

The second of the above is clearly understood. The first needs some explanation. Ever since the environmental awakening of the society, it is now accepted that everyone has to be aware of the importance of environment, and the impact of our actions on the environment. Accordingly, our development managers are now sensitive to environmental impacts of development projects. Does the converse hold true? Are environmentalists sensitive to the development impacts of environmental decisions? “Environmental and social impacts of water resources projects” is taught in the training programs in National Water Academy. Do they teach “Adverse impact of environmental actions on development” in environment schools ?

I doubt it, but if the environmentalists outside the government are sensitive to the impacts of environmental actions on the development, it does not show up in their ideas and words and actions. But that as it may be, only the Government can make decisions, because only the Government is answerable. NGOs’ aren’t.

The difference between ‘assessment’ of EF and ‘allocation’ (of water) to EF needs to be clearly understood. ‘Assessment’ is merely a measurement. ‘Allocation’ is a decision, to be implemented. Any study for quantification of EF, a good example is “An Assessment of Environmental Flow Requirements of Indian River Basins” by Prof. Smakhtin and M Anputhas, is only a tabulation of many different options.

This study, which can be downloaded from the IWMI website, defines six classes, ‘A’ to ‘F’ of environmental management and the EF required for each, for major river basins of India. For example, for Krishna it ranges from 62.5% of MAF for Class ‘A’ to 1.5% of MAF for Class ‘F’. Now it is for the Government to factor in other requirements of water in Krishna basin, and make a decision as to how much water Krishna basin can ‘afford’ for EF. If the Government does not like the IWMI study, they can use some other study, or commission one of their own. But eventually the Government has to make a decision.

That is not happening. Not only there is no decision on quantum of EF, but the discourse is not showing any signs of convergence. There are some other issues too, viz. constitutional and legal provisions. Considering all this, a change in approach is suggested in form of some principles, to help reach a decision on quantification of EF.

1. Accept that the quantum of EF can not be determined by research. It has to be an administrative decision, because it involves making trade-off decisions with other uses.
2. Quantum of EF can not be decided ‘a-priory’, in isolation of other demands. All demands have to be considered together, and adjusted in an iterative process within the limits of available water.
3. For this to succeed, it is necessary that the advocates of environment appreciate the importance of economic development and infrastructure building, just as water managers are expected to appreciate the importance of ecology.
4. Utilizable quantity of water is 1123 bcm, and the projected demand is anywhere between 1000 to 1400 bcm. Therefore, the allocation process can reach some conclusion only if the advocates of environment restraint their expectations to realistic limits.

5. For example, no one suggests that terrestrial life forms be preserved on every square KM of land area. Such a thing is clearly impossible. It is accepted that terrestrial life forms can only be preserved in some islands of protection, like the game sanctuaries, reserved forests, etc. and not all over the landmass. How realistic is the idea that aquatic life forms are to be preserved in entire reaches of rivers?
6. “Sustainable Development” has always been, and is, unclear and vague. The original Brundtland definition stands rejected long time ago. And current definitions like “overlap of environmental, social, and economic concerns” are too vague to be of any use. Environmental objectives have to be stated in clearer terms.
7. And have to be justified in more convincing terms than presently. Suppose allocation making is in progress and there is a contest for, say, 1 mcm of water. The advocate of hydro-power will justify his claim in terms of million units of energy generated, secondary benefits from this energy, employment generation, etc. The advocate of irrigation will justify his claim in terms of hectares of area irrigated, additional agricultural produce, increased rural incomes, etc. Advocate of environment will have to match his claim with equally convincing arguments. A lecture on importance of biodiversity won’t do.
8. All resource allocations are always as quantities, and not as use rates. For water, it means allocations are in volume of water, and not as flow rate. EF can not be any different. At the point of control whether allocation for EF is 315 mcm in a year, or whether it is 10 cumecs all through the year, it is one and the same thing.

But seeking a certain minimum flow rate (in cumecs) throughout a given reach of the river, leaves it open ended how much water will have to be released in the river for EF and how much will be available for other uses. Accountants call this “undefined liability”. Any attempt to create undefined liability on water resources of a basin, will not work.

9. Interstate water dispute are resolved either by a Tribunal or by an agreement amongst the party states. The decision of the Tribunal or the agreement signed at the political level, is final and can not be modified by Executive order. If the water allocated for EF at this stage is not sufficient, it can not be changed by Executive order. Therefore, Environment will have to enter the scene as a claimant and appear before the Tribunal or the committee assisting a political agreement, and plead their case and seek water for EF like all other claimants do.
10. Large storages of water by construction of large dams is the only way to release water for EF during the lean season. Of course, the dam has some other environmental impacts. Advocates of environment will have to accept these as “cost of EF”. There is no free lunch.
11. Urging the farmers to save water has not worked. Out-of-the-box ideas, like purchasing water from farmers, to be used for EF, may have to be considered. For this a more pragmatic approach is required towards water rights and use entitlements.

But all this will take time. In 2004 the MoEF had constituted a committee to evolve guidelines for quantifying the EF. The present author was a member of that committee. The committee submitted their report in 2005. But, for reasons not clear, it seems the MoEF has not taken a decision on these recommendations. That was 8 years ago. If a better set of recommendations has not emerged in 8 years, then the MoEF may consider accepting these recommendations to start with. Something is better than nothing. Projects may be planned with EF as per these recommendations, which can always be revised as the discussion on quantifying EF progresses.