**Drinking Water
Engineering and Science
Discussions**

Interactive
Comment

Interactive comment on "Rapid evaluation of water supply project feasibility in Kolkata, India" *by* K. Dutta Roy et al.

K. Dutta Roy et al.

b2981975@yahoo.co.in

Dear Reviewer, Thanks for your critical comments on the paper. Please find the responses to your observations and comments about this article:

Observation 1: Emphasize those aspects of the paper that are unusual

Response: A methodology for rapid cost-benefit assessment suitable for Kolkata has been proposed in the paper. A flow diagram prepared at the advice of the Reviewer 1 (Fig. 1, P: C5 of the earlier author comment) has been again presented in Fig. 1. It would emphasize the point that the methodology rather than the individual tools are important for the paper. In addition, the results of the study have been presented in Fig. 5 (P: 104 of discussion paper) and in Table A1 (P: 99 of the discussion paper) which

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would show the net present values of booster pumping station at different alternatives for the city of Kolkata. These are also important points of the paper.

Observation 2: Why power drawn by the pump station did not enter in the costing

Response: Some typical values of the power drawn for the pump stations are presented in Table 3 (P: 95 of the discussion paper). They have been included in the operating cost estimates of Equation 3 (Art.: 3.2, P: 71, Ln: 13 of the discussion paper) and capacity-cost curves of Fig. 2. (P: 101 of the discussion paper). The energy cost for pumping has not directly appeared in the artificial neural network (ANN) but its impact as well as the pipeline costs has been covered in the 'distance from treatment plant' factor which has been included in the artificial neural network.

Observation 3: How neural network method is faster than the engineering costing

Response: The development of the artificial neural network (ANN) for the study area is not faster than that of the traditional engineering costing method for an individual booster pumping station. However, once the ANN has been developed for the study the model may be used to rapidly estimate the costing of any proposed booster pumping station within the study area as shown in Fig. 4 (P: 103 of the discussion paper) and the accuracy of the ANN estimates should be acceptable as found in Fig. 3 (P: 102 of the discussion paper).

Observation 4: Comments about the use of willingness-to-pay method

Response: The reviewer has rightly pointed out that the willingness to pay (WTP) method is not found to be convergent for the study area. These WTP studies were made in different time periods, sample size and localities within Kolkata. These differences perhaps have caused the variations in the results. Therefore, the variations in findings have been accommodated by using Monte Carlo's simulation method. At any rate, the effect of the variation of WTP on net present value is relatively small as found from the sensitivity analysis presented in the tornado diagram and sensitivity graph of

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WTP in Fig. 6 (P: 105 of the discussion paper).

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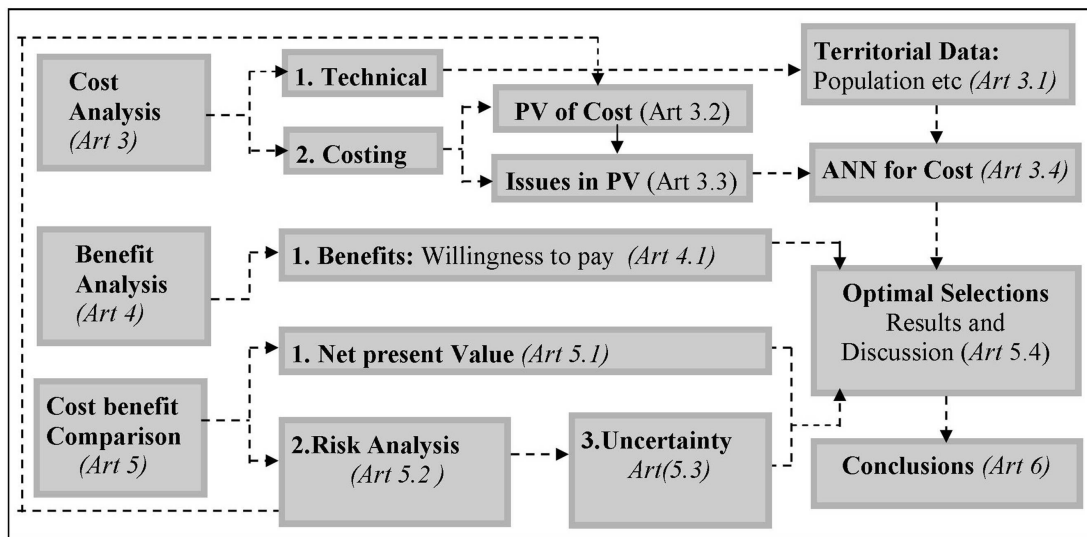
Fig. 1. Flow Diagram of the Cost benefit Analysis