

ARE DISPROPORTIONATE COSTS AN ISSUE? A COST-BENEFIT ANALYSIS OF WATER FRAMEWORK DIRECTIVE IMPLEMENTATION IN DENMARK

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The European Union's Water Framework Directive (WFD) is a legislative basis for water policy action in the European Union. The aim of the WFD is to achieve good ecological status of water bodies by 2015 and no later than 2027. The WFD accepts exemptions to the environmental objectives in cases where achieving good ecological status is disproportionately costly when compared to the environmental benefits. In such cases the WFD accepts extension of the deadline or the achievement of less stringent objectives. What can be considered as disproportionately expensive is a political judgement. The WFD guidelines indicate that such a judgement should be informed by an economic analysis of the costs and benefits of achieving good ecological status of a water body. More specifically the guidelines indicate that cost-benefit analysis (CBA) could provide a useful tool for assessing whether costs are disproportionate.

This paper addresses the issue of identifying disproportionate costs of achieving good ecological status of water bodies in Denmark. Specifically, we conduct a CBA within each of the 23 water catchment areas in Denmark. The purpose is to establish if there are catchment areas where the costs of achieving good ecological status outweigh the benefits and therefore may be considered as disproportionate.

For each catchment area the current water quality status is identified and the costs of achieving good ecological status are determined. The cost estimates include control of non-point pollution (agriculture), urban wastewater and aquaculture. Benefit assessment is based on a primary valuation study conducted in one of the catchment areas, the Odense River basin. For the other catchment areas benefits estimates are obtained through benefit transfer from the Odense River study. In the primary valuation survey the choice experiment technique was applied to estimate willingness-to-pay for the environmental improvements associated with realization of the WFD objectives. A simple mean value benefit transfer approach was used to assess the benefits of achieving good ecological status in the remaining 22 catchment areas in Denmark.

The WFD guidelines emphasize that, given the uncertainty around estimates of costs and benefits, disproportionality should not begin at the point where measured costs simply exceed quantifiable benefits. Accordingly, we take a cautious approach in the CBA using values from the lower and the upper end, respectively, of the spectrum of likely values for benefits and costs.

The results of the CBAs indicate that in some of the catchment areas costs may be disproportionate in terms of the Net Present Value (NPV) of the cost and benefit flows being negative. The main analysis is supplemented with a range of sensitivity analyses, especially for the areas where the main analysis suggests disproportionate costs. While the sensitivity analyses generally increase NPV, the overall conclusion remains.

Our results present a first effort to assess whether the costs associated with implementing the WFD in Denmark may be considered as disproportionate. The outcome could have important consequences as they may be used as arguments for

postponement or even exemption from the WFD requirements in some water bodies. However, we suggest that more detailed analysis should be conducted for these areas to obtain more precise estimates. Specifically, considering the level of uncertainty inherent in benefit transfer approach, site-specific primary valuation benefit estimates would seem necessary for a CBA to be accepted as a juridical argument. Likewise, an assessment of costs and benefits at sub-catchment levels may be required for a CBA to qualify as a decision making basis accepted by the EU Commission.