

# IMPROVING COST-BENEFIT ANALYSIS FOR FLOOD RISK MANAGEMENT TO ACCOUNT FOR THE INTERESTS OF THE POOR

The mitigation of flood risks worldwide is a major challenge that will require investments totalling billions in the decades to come. Cost-benefit analyses (CBAs) are increasingly being used to prioritise investments and maximise flood risk reduction.

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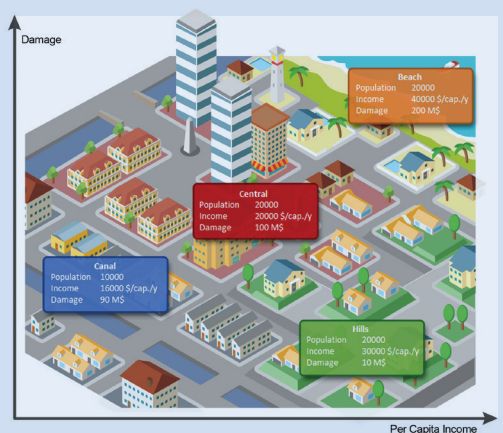
**Further reading:**

Kind et al. (2017): Accounting for risk aversion, income distribution and social welfare in cost-benefit analysis for flood risk management, WIREs Climate Change

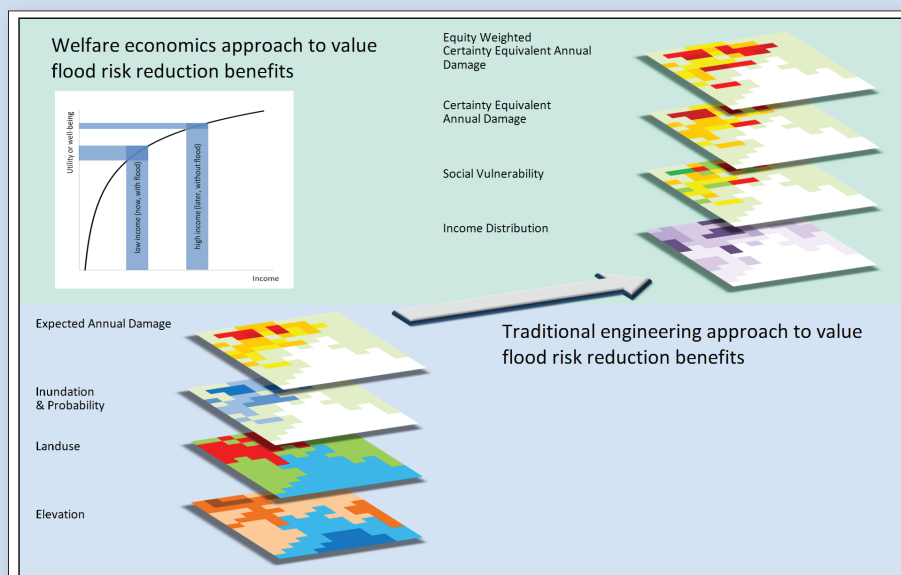
A major problem with these CBAs, however, is that they are based on over-narrow definitions of financial risks that fail to do justice to the principles of social welfare: they disadvantage poor and socially vulnerable groups, who are likely to be inadequately protected as a result. As part of its applied research programme, Deltares is looking at how to improve the existing CBA method.

In welfare economics, the social welfare value obtained from an additional euro declines as income increases. This means that an additional euro will have different values in different conditions (with and without flooding) and for different people (rich and poor). The valuation of the benefits of flood risk reduction should take not only the absolute flood damage but also the relative flood damage (as a percentage of income or consumption) into consideration. The lower the income and the higher this percentage, the higher the social welfare value of flood risk reduction. A new method was developed to include poverty and socio-economic

vulnerability in CBA for flood risk management. The method was first applied to a fictitious case, where it showed how it would change policy recommendations by comparison with the traditional method. The application of the method in practice requires an additional analysis of socio-economic data. A first test in a flood risk management case study in Colombo, Sri Lanka, revealed several practical issues. First of all, since income data was unavailable at the household level, a 'cooking method' was used as a proxy to derive income data at the district level. Secondly, current land use and building categories do not match socio-economic vulnerability since no differentiation is made between different types of residential buildings, leading to an overestimation of the damage to the houses of poor people. Deltares is working on further refining and testing the method, and including it in the standard tools for flood risk assessments as part of its applied research programme. 



In the traditional CBA approach to flood risk management, measures for the fictitious districts Beach and Central would be given highest priority. These are the districts that suffer most damage. Adopting an approach based on social welfare which also accounts for socio-economic vulnerability and differences in income leads to greater priority being given to measures for the Canal district, where total damage is lower but the damage per capita is relatively high and incomes are relatively low.



The traditional and welfare economics approaches to the valuation of the benefits of reducing flood risks