COST BENEFIT ANALYSIS IN COASTAL MANAGEMENT - USEFUL OR FLAWED?

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Cost Benefit Analysis (CBA) has become an important tool for evaluating coastal management actions in Australia, and various coastal CBA studies have been completed. However, some of these studies have produced contradictory outcomes, and some assumptions on which they were based have been questioned. In the presentation, various assumptions frequently used in coastal CBA's are considered and assessed with reference to specific case studies.

In the coastal context, CBA has been used in Australia to inform decisions on what coastal management option to adopt (do nothing, which is maintaining the status quo, or undertaking variations of protect or retreat), and the optimal timing of these decisions. It has also been used to evaluate merits of investments that improve community amenity (eg a surf lifesaving club). Distributional Analysis has been used in conjunction with CBA to understand impacts of decisions on different parts of the community, eg to inform decisions on the relative proportion of public/private funding for projects.

The inputs into coastal CBA's have typically been in the form of annual probabilistic coastal hazard lines in the context of coastal erosion/recession (see example in Figure 1). In assessing the impact of hazards on built assets, CBA requires consideration of the stream of benefits and costs in each year over a defined planning period, weighted by the probability of incurring these benefits/costs. The probabilistic inputs into CBA must include considerations of climate change and could also be in respect of other hazards, eg inundation.

The introduction of CBAs into the coastal management decision-making process offered the hope of an objective, rational and quantitative method for comparison of options. It also provided the allure that funds (both public and private) were not being "wasted" or spent on non-viable options.

As with the broader practice of economic modelling, the complexity of the process involves many assumptions, which are often embedded deep within the workings and may strongly influence the end results. The technical details of the assumptions and their influence are rarely understood by anyone except the person doing the economic modelling.

CBA results which are counterintuitive to practitioners and stakeholders have created a perception in some parts of Australia that CBA in coastal management is an unreliable tool that is over-emphasized, can give biased outcomes and is diverting funds away from and delaying useful coastal management actions.

Figure 1 - Example of probabilistic coastal hazard lines in an erosion/recession context, for a particular year (for CBA, these discrete probabilities would most conveniently be provided to the economist as a continuous relationship between landward distance and probability)

So, is CBA in coastal management useful or flawed?

To be useful, factors that are considered to be key to a successful coastal CBA include:- correctly defined probabilistic coastal hazard lines; close collaboration between the coastal engineer and economist to ensure that hazard risks are correctly reflected and applied in the CBA; framing the CBA so as to avoid bias (from diverse stakeholders); recognizing information limitations; and conducting sensitivity testing of assumptions to understand the robustness of conclusions.

Australian experience would suggest that flaws arise where the above are not followed, where there are significant information gaps and in not recognizing that CBA results need to be supplemented by other qualitative information.

These factors will be described in detail in the presentation. The presentation will also consider whether alternative evaluation frameworks are more robust than CBA.