

Managing Flood Risk: Carlisle Case Study

How does benefit-cost analysis help make decisions about flood management?

The Environment Agency uses benefit-cost analysis to help decide whether it is worthwhile to undertake a scheme and the best solution. For each project a series of possible options will exist, including doing nothing.

- If the decision is 'do nothing', work to maintain any flood defences ceases, allowing nature to take its course.
- Benefits and costs for all 'do something' options need to be compared to those of the baseline 'do nothing' case.

For each option (including 'do nothing'), an assessment of the value of the damages caused by flooding is made. The benefits are then worked out as the difference between the 'do something' and 'do nothing' damages, i.e. the damage avoided by implementing a scheme ('doing something'). Each 'do something' option will have costs, to implement the scheme initially and then to continually maintain it, whereas the 'do nothing' option has no costs.

Example	Costs and benefits £000				
	Do nothing	Do minimum	Option 1 Small project	Option 2 Medium project	Option 3 Large project
Standard of protection			1 in 25 years	1 in 50 years	1 in 100 years
Total costs	0	750	2,000	4,500	25,000
Value of damage	25,000	15,000	12,000	6,000	3,000
Value of benefit			8,000	17,500	24,000
Net present value (benefit - cost)			6,000	13,000	-1,000
Benefit/total cost ratio			4.0	3.9	1.0

Activities

- The example shows how looking at the benefits and costs helps make a decision. The best solutions have the highest ratio of benefits to benefits, and the highest present value. Which option/s would you choose from the example above?
- Now study the flood management plan for Carlisle. Set up a spreadsheet like the one below, then use the data to work out the best solution.

Costs and benefits of the options for Carlisle

	Costs and benefits £000					
	Option 1 Do nothing	Option 2 Do minimum	Option 3a	Option 3b	Option 3c	Option 3d
			Rebuild/raise the defences to different standards			
Standard of protection	Under 50 years	Under 50 years	50 year	75 year	100 year	200 year
Total costs						
Value of damages						
Value of benefit						
Net present value (benefit - cost)						
Benefit/total cost ratio						