

Assessing the benefits of flood alleviation and land drainage schemes

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The use of systemized procedures and standardized benefit values such as presented by the Authors should certainly assist designers to optimize flood alleviation schemes on the basis of cost-effectiveness, and should enable grant-aiding bodies to compare schemes of a similar nature competing for a limited supply of money. However, I would recommend that standard data be used with great caution where the absolute value of a scheme is to be determined, i.e. when the grant-aiding agency is looking for economic justification.

59. Cost-effectiveness is not the only criterion for project selection, and in my opinion it is far from being the most important criterion used in justifying flood alleviation schemes, which have a high element of social welfare. It would be wrong to think that schemes could be selected on economic merit alone, and the Authors recognize the importance of intangible benefits.

60. A frequent instruction to land drainage engineers is of the form that 'Area A should be protected against the recurrence of the 1980 flood'. My view is that this is a more realistic approach to the justification of a scheme, encompassing as it does political and social motivation, and taking into account the actual rather than the theoretical distribution of flood water. It also takes into account the fact that flooded areas change little for floods lying within the usual range of design severity, and that above a certain limit the cost of damage is insensitive to depth of flooding.

61. The Ministry of Agriculture, Fisheries and Food suggests that cost-benefit analysis provides a useful check that public funds will be spent wisely. But does it? The answer may be different, depending on the point of view of the observer.

62. Central government, which may pay a large proportion of the direct tangible costs of the flood alleviation scheme, receives no direct tangible benefits. In this light the government's contribution could be viewed as an act of social welfare, and the scheme assessed by government in those terms.

63. The drainage authority will contribute towards the direct costs of the scheme, and will receive direct benefits in the form of rates and levies which increase as a result of the scheme.

64. The community of taxpayers throughout the country will bear part of the cost of the scheme and will receive no direct benefit. The smaller community composed of inhabitants of the drainage authority's area will bear an additional cost through their water rates. It is a still smaller community who will receive

the benefits of flood protection, and an even smaller community who will receive the further benefits of increased land value and increased profitability of farming operations.

65. Viewed in this light the scheme has aspects of social welfare and redistribution of income, and its worth depends largely on one's political inclinations.

66. My conclusion is that the decision to undertake a flood alleviation or land drainage scheme is a political act, and is best justified in those terms. The direct benefits accruing from such schemes are various, and the lumping together of benefits to various sectors of the community obscures important social and political issues. Indirect benefits of this type of scheme are usually very high but are best seen as social welfare, which makes the quantitative assessment of schemes extremely difficult.

67. If cost-benefit analyses continue to be used by such grant agencies as the Ministry of Agriculture, Fisheries and Food to justify individual schemes then strict guidelines will have to be drawn up by them to indicate which direct and indirect benefits are allowable. In such analyses the use of standard data should be made only after careful consideration of the implications.

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Mr Drayton raises many profound issues concerning the real economic value of flood alleviation and land drainage schemes, their distributional effects and the consequent problems of using standardized methods and data.

69. The intangible welfare benefits of flood protection certainly require the most careful assessment, as do the effects of land drainage on nature conservation value. A problem encountered since producing more accessible potential flood damage data¹ is that river engineers who formerly simply—and crudely—doubled tangible flood damages to account for intangibles now erroneously fail to include the latter. What is required is the most careful but necessarily qualitative assessment of intangibles²⁹ such that a full record is produced of all aspects of flood damage so that a decision is made—through the normal political processes—to allocate sufficient public funds to prevent private tangible and intangible losses. This is not easy and assumes that political pressure accurately reflects the extent of intangible damage, which may well not be the case. However, to neglect this assessment altogether can only lead to wrong decisions.

70. Designing flood alleviation schemes to protect against the recurrence of the 1980 event is economically dangerous. Flood damage to particular properties may well be insensitive to depth above a certain limit, but this does not apply to flood areas. For example, further properties may be affected and roads may be progressively disrupted by more extensive flood waters such that considerable extra benefit may accrue from a small increase in a scheme's design capacity, above that of the recently experienced event, at only marginal extra cost.³⁰ Similarly, better value may be obtained by designing for lesser events than have been experienced. The marginal increase in benefits from protecting to the 100 year rather than the 50 year event may not be worth the necessary extra costs: engineers must resist pressures for 'complete' protection and therefore very high expenditure for protecting a small number of properties. Indeed it is the task of the river engineer to protect people from the excesses of their immediate impressions and the inadequacies of their imperfect memories of flood events;

only a full analysis of costs and benefits for a range of possible schemes will indicate which of those yield the best return from the money available.

71. This is not to deny the political character of decisions to provide flood protection and land drainage and Mr Drayton illustrates some of the distributional effects of such works. In this context one argument against standard flood damage data (or gross margins) is that individual cases may be allocated excessively high or low benefits and therefore the analysis may be inaccurate. As a result the nation, through grant aid and local contributions, may allocate the wrong amount of expenditure for the particular flood protection or agricultural drainage works.

72. However, there are several arguments in favour of standard and average data. First, standard data prevent the community from overspending to protect wealthy individuals from flood damage and therefore have a redistributional effect. Those with extraordinarily valuable house contents are allocated no more benefits than the average. The extra flood damage that the wealthy might suffer is thus not taken as the nation's responsibility but is left to the individual. Those with few possessions to be damaged by floods are rewarded by benefits which more than compensate for their potential losses; this is particularly appropriate where houses and contents are of low value precisely because they are prone to flooding. Such redistribution in the agricultural context can be problematic because it rewards agriculturally inefficient enterprises by allocating them average gross margins and depresses those with high returns. The effect of this is to raise the calculated cost-effectiveness of draining poorly managed land and to depress the calculated enhanced value of draining land which hitherto is being farmed to the limit despite poor drainage.

73. Secondly, flood alleviation schemes are designed to protect property over their full lifetime. The peculiarities of the economic wealth of individuals who now occupy flood-prone properties is not the best criterion for long-term economic analysis. Properties are better allocated average potential damage figures, because during 50 years of scheme life different people will occupy those premises and therefore the national average damage for that type of property best approximates its long-term benefit of flood protection.

74. Thirdly, site specific surveys of individual properties are highly problematic and prone to error. Much building fabric damage goes unnoticed for months after flood events, whereas inventory damage can easily be exaggerated immediately after a flood. Standard potential flood damage data—even given its imperfections—produce a fuller account of flood damages. The only alternative is time-consuming house-to-house surveys by loss adjusters or quantity surveyors which, if including properties hitherto not flooded to evaluate properly the full range of potential schemes, can provoke alarm which is perhaps best avoided.

75. The important distributional effects of land drainage and flood alleviation works do not remove the necessity for some form of economic evaluation. From the nation's point of view floods may cause little real economic damage. The losses of the flood victims are at least in part and perhaps wholly offset by the gains of those replacing damaged goods and repairing flooded property. In reality public funds are allocated to reduce private loss because of political pressure for this type of social security or insurance. Public funds in the land drainage field are given to promote more profitable farming and hence reduce food imports, again as a result of political decisions.³¹ In both cases the level of expenditure to be made needs evaluation irrespective of who gains and who losses by the installation of the resulting schemes. Cost-benefit analysis is useful in this respect³²

and does not *per se* embrace value judgements, except in accepting that the social value of commodities can be measured accurately through market mechanisms. However, every input to cost-benefit analysis has inbuilt value judgements about economic worth. These judgements may well have distributional and thus political significance and these need to be separated and weighed. However, to base land drainage expenditure merely on political decision making—particularly when all evidence points to almost universal bewilderment at probability concepts—is as unwise as the promotion of cost-benefit analysis as an exact science.

References

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