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# Associated benefits and costs of the Canadian Flood Damage Reduction Program

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## Abstract

Canada's Flood Damage Reduction Program (FDRP), launched in 1975, initiated a national shift away from reliance on flood control structures such as dams to the use of non-structural measures, including floodplain mapping and zoning. Previous evaluations of the FDRP have not captured the full range of benefits and costs associated with it. This paper reports on a systematic assessment of associated benefits and costs of the FDRP in the province of Ontario (that is, benefits and costs that are not related to the programme's primary objectives.) Using a two-round policy delphi survey involving 50 panellists with pertinent expertise, a broad range of associated benefits and costs was identified, relating to four broad areas (environmental protection, land-use planning, floodplain management and 'other'). Panellists decided collectively that benefits such as improved administration of zoning in hazard areas and protection of important environmental features could be credited to the FDRP. In contrast, most of the additional costs – such as increased expenses for developers – were not considered important by the group. The paper concludes that the federal government's decision to wind down this important non-structural floodplain management initiative – based on the argument that it was a narrow, single-sector initiative – was lamentable. © 2001 Elsevier Science Ltd. All rights reserved.

*Keywords:* Flood Damage Reduction Program; Floodplain management; Ontario, Canada; Policy delphi; Programme evaluation

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## Introduction

Until the early 1970s, floodplain management in Canada was dominated by a structural approach that used engineering works such as dams, dikes and diversions to regulate hydrologic systems (Environment Canada, 1993a). These demanded substantial government investment. For instance, between the 1950s and the 1970s, and to a lesser extent during the 1980s, the Canadian federal government allocated millions of dollars for joint federal–provincial projects to build flood control works (Pentland, 1990; Environment Canada, 1993a). Although providing some benefits, the overall cost-effectiveness of this structural approach was questionable, since payments for flood damage assistance continued to escalate (Bruce, 1976). To make matters worse, some structures increased flood damage potential, since they were perceived as providing greater security and, consequently, encouraged development along flood-prone waterways (Freshwater & Arthur, 1985).

Extensive flooding during 1974 clearly demonstrated that a new approach to reducing flood damage in Canada was needed. This led to the initiation of the federal–provincial Flood Damage Reduction Program (FDRP) in 1975 (Bruce, 1976). This represented a significant change in the national approach to floodplain management in Canada – from an ad hoc response using physical structures to a more proactive, nationwide ‘non-structural’ approach. Non-structural floodplain management approaches use a variety of measures, including *floodplain mapping and zoning*, to ensure that new development does not take place in the floodplain, and *flood-proofing* (e.g. elevating structures, sealing openings), to reduce the vulnerability of existing structures (Alexander, 1993; Environment Canada, 1993a). While some Canadian provinces, notably Alberta, British Columbia and Ontario, were already exploring non-structural floodplain management measures prior to 1975, the FDRP laid the foundation for a consistent, national approach (Watt, 1995). The programme is described in detail elsewhere (Environment Canada, 1993a,b; Watt, 1995; de Loë, 2000). Hence, the following paragraph offers only a brief overview.

The FDRP had three primary objectives: (1) to reduce loss of life and suffering; (2) to reduce escalating disaster assistance payments to victims of flooding events, and (3) to decrease the need for costly structural flood control works (Environment Canada, 1993b). These objectives were met through a cost-shared programme of floodplain mapping, followed by the designation of areas vulnerable to flooding. Central to the programme were agreements established between the federal government and participating provinces/territories, whereby development in flood-prone areas was discouraged, and disaster assistance was withheld from new development in designated areas. Local governments were key partners, in that they were encouraged to zone land uses on the basis of flood risk. In Ontario, conservation authorities also played a key role in delivering the programme.

With the exception of Prince Edward Island and Yukon Territory, all provinces and territories entered into FDRP agreements with the federal government. Under these agreements, mapping and designation of 265 flood risk areas took place in 780 communities. These designations affect decision-making with respect to real estate

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