Managing Canada's Floods: *Strengthening Canada's adaptation to climate change by increasing flood resiliency*

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Introduction

The High Economic and Social Costs of Flooding

Flooding has been cited as "Canada's most significant climate change risk" (Thistlethwaite, Henstra, Ziolecki, 2020). According to Public Safety Canada (2015), floods are the most costly natural disaster to affect Canadians in terms of damage to property. Based on current mitigation and adaptation trajectories, studies suggest that flooding costs to urban areas could reach as high as $8.2 billion in the next ten years (Rabson, 2020). When major flooding events hit, the federal government assists provinces and territories through Disaster Financial Assistance Arrangements (DFAA) transfers (Public Safety Canada, 2020a). While $100 million was set aside annually between 2009-2015 for federal assistance, actual DFAA transfers were much higher. Between 2013-2014 the Government of Canada transferred $1.02 billion to the provinces through the DFAA (Story, 2016). With climate change causing more severe and frequent flooding, Canadians will continue paying these high costs (Intergovernmental Panel on Climate Change, 2014; Public Safety Canada, 2020b).

In addition to the financial costs, flooding also brings significant social costs. According to Chakraborty et al. (2020), certain groups of people in Canada are more socially vulnerable to flooding than others. This includes Indigenous communities, visible minorities, and the poor (Chakraborty et al., 2020). It is more difficult for these groups to cope with the effects of flooding as well as access resources to mitigate and recover from floods. An added issue is that inequalities are not mutually exclusive. Income inequality, for example, is tied to health inequality and stratified by gender and race (Chetty et al., 2018; Heisz, 2016; Pickett & Wilkinson, 2014;). Geography also plays a role. Certain areas in Canada, such as in the Atlantic provinces, contain a higher number of socially vulnerable communities than others (Chakraborty et al., 2020). Increasing resilience to flooding is thus imperative as it will reduce the heavy financial and social burden that confronts millions of Canadians.

Policy Context: Canada's Flood Risk Management Strategy

Currently, jurisdiction over flood risk management is shared between the federal, provincial, and municipal orders of government (Thistlethwaite, Golnarghi et al., 2020). While the provinces and territories are largely responsible for delivering emergency support to Canadians in the aftermath of a disaster, the federal government steps in when costs have reached a certain threshold (Public Safety Canada, 2020a). The federal government supports the provinces and territories by providing DFAA transfers, however, these transfers often act as a "moral hazard that limits incentives for investment in risk mitigation, relocation and purchasing flood insurance" (Thistlethwaite, Golnarghi et al., 2020, p. 48). The increasing liabilities of these transfers in

recent years, as well as the continued development in areas that are prone to flooding, and a lack of intergovernmental coordination have caused many experts in the field of climate change adaptation to point out that Canada's current approach to flood risk management is outdated and in need of reform (Thistlethwaite, Golnaraghi et al., 2020).

Canada used to be a leader in flood management. Throughout the 1970s and up until the 1990s, Canada was considered a role model by the global community, with many countries relying on Canada's expertise for floodplain mapping (Shrubsole, 2000). In 1975 Canada implemented the Flood Damage Reduction Program (FDRP) which enabled over 800 communities to be mapped (Shrubsole, 2000). But by the 1990s the federal government reassessed its role in flood management and decreased its financial support of the successful FDRP (Shrubsole, 2000). The lack of national flood management has since led to a large increase in disaster payments as many communities are unaware of their flood risks and require federal assistance to rebuild after major floods (Story, 2016).

However, recent government action suggests that there is an open policy window for substantial reform to take hold in Canada. For example, in November 2020 the federal government created a task force on flood insurance and relocation (Public Safety Canada, 2020c). The federal government also committed to updating all of Canada's outdated flood maps, and in October 2020 it renewed the National Disaster Mitigation Program (Public Safety Canada, 2020b).

While the COVID-19 pandemic has put Canada into a major recession, with deficit estimates for 2020-2021 at $381.6 billion (Department of Finance, 2020), ineffective flood management will only add to the current deficit. Taking into account the high costs and disproportionate effects of flooding on vulnerable Canadians, this paper proposes three policies to increase resiliency and improve Canada's flood management strategy.

Three Policies

Through their desired outcomes, these policies (Table 1) aim to increase the economic and social well-being of Canadians as well as support long-term policy change. The overarching goal of these initiatives is to increase Canada's resilience to flooding. This will ultimately strengthen Canada's adaptation to climate change which, in addition to mitigation, is a key component of tackling the climate crisis (Intergovernmental Panel on Climate Change, 2014).

Table 1
Summary of Policy Proposals

Policies	Desired Outcome	Objective
1. Central Portal for a National Flood Map	Increase flood risk awareness	Reduce financial costs of flood damage to Canadians, thereby increasing overall economic well-being
2. Canada Buyout Fund	Provide a reliable source of funding for local and socially vulnerable communities to implement buyout programs	Increase social well-being of Canadians who are exposed to flood risk
3. Floods Canada Forum	Support intergovernmental collaboration for flood risk management	Long-term fundamental policy change that will reduce the overall cost of flood management and improve the economic and social well-being of Canadians

Policy 1: Create a Central Portal for a National Flood Map

Background

More than 10% of Canada's 10.9 million private residences are at a high risk of flooding, and over the next twenty years a portion of those homes will face a "very high risk of repeated flooding" (Insurance Bureau of Canada, 2019). The costs associated with such events are high. In April and May 2017, for instance, major storms in Quebec and Ontario led to more than $277 million in insured losses (Thistlethwaite, Golnaraghi et al., 2020). In order to reduce these costs, governments and individuals have certain tools at their disposal.

Flood mapping is a key tool not only for educating Canadian homeowners, buyers, developers, and insurers about flood risks, but also for reducing and preventing future risks from occurring (Thistlethwaite, Golnaraghi et al., 2020). Flood mapping is regarded as a non-structural measure for reducing risk, since it does not have to do with building physical flood barriers, and is a key element to any effective flood risk management strategy (Thistlethwaite, Golnaraghi et al., 2020). Up-to-date, accurate, easily accessible maps are vital for Canadians to have the knowledge necessary to make informed decisions about housing and development. In Canada, ineffective flood risk communication has been identified as a key barrier to proper flood risk reduction and prevention, according to a 2020 report on the current state of flood risk management in Canada (Thistlethwaite, Golnaraghi et al., 2020).

Canada's flood maps are currently out of date and ineffective, with at least half of the maps more than 18 years old (Thistlethwaite, Golnaraghi et al., 2020). Rather than a national approach to producing and making these maps available, the current approach is decentralized, spearheaded by local municipalities and conservation authorities which often lack sufficient resources for producing the maps. Flood maps also tend to be highly technical and not easily accessible to the average Canadian (Thistlethwaite, Golnaraghi et al., 2020).

In light of this context, the Liberal Party of Canada, during its 2019 campaign, committed $150 million of funding to update flood maps in all provinces and territories (Lowrie & Rabson, 2019). While this is a step in the right direction, questions remain concerning the accessibility of the maps, as well as their level of centralization. Up-to-date maps are essential, however, they cannot effectively communicate flood risks to Canadians if they are difficult to access and interpret.

Policy Proposal

The federal government, in collaboration with the provinces, territories, Indigenous communities, the private sector, and academia should create a centralized portal for an integrated, interactive flood map of Canada. This online portal would be located on a government website and would house an interactive flood map of the entire country. Users would be able to enter their postal code and see the level of past, present, and future flood risk associated with the area in a user-friendly, interactive map. They would also be able to see different types of flood sources, such as rainfall, river level, and storm surge flooding, and different levels of flood risk, as well as easily identifiable landmarks and street names for easy navigation. Through this online portal, Canadians would be able to easily access up-to-date flood risk information, allowing prospective and current homeowners, renters, developers, insurers, real estate agents, and city planners to make informed, calculated decisions about whether or not to buy a home in a high-risk zone, whether or not to develop properties in high risk zones, or what type of insurance to purchase.

The federal government should act as the lead partner on this initiative, given its already defined institutional role in supporting Provinces, Territories, and local governments in their flood adaptation efforts by providing geospatial data for flood maps (Thistlethwaite, Golnaraghi et al., 2020). However, collaboration with other orders of government and non-government partners will be necessary, for various reasons. For instance, many of the historical and current flood maps are under the authority of local governments and conservation authorities. In addition, the technical expertise of academics and private sector geospatial map developers is required for input into the design and functionality of the integrated, interactive map, as well as for running the site.

There are several examples of jurisdictions and organizations that have a centralized portal for accessing flood risk information via interactive maps. At the provincial level, the Government of

Quebec recently created a new interactive map using satellite imagery, where users can type in an address in a search box and view current flood zones (Ministère de la Sécurité Publique, 2021). Brisbane City Council's Flood Awareness Map (2020) is a user-friendly, interactive map of Brisbane and allows residents and developers to view historic floods, different flood sources, and the likelihood of future flooding (ranging from 'very low likelihood 0.05% Annual Chance' to 'high likelihood 5.0% Annual Chance').

Justification and Considerations

Cost: The estimated costs of creating and sustaining an online portal for an interactive flood map of the country are not of major concern, considering that in 2019 the Liberal Party of Canada, which now forms a minority government, pledged $150 million to update all of the flood maps in the country (Lowrie & Rabson, 2019). Some of the extra costs of hiring a technical team to create and upkeep the platform can be subsumed under this federal funding. Any extra costs can be absorbed by the savings from the predicted reductions in federal disaster assistance transfers to the provinces and territories. This projected reduction in federal disaster transfers stems from the anticipated success of the desired outcome of this policy, namely that increased flood risk awareness will reduce flood damages by providing Canadians with the knowledge necessary to make informed decisions about flood prevention. In addition, the federal government renewed the National Disaster Mitigation Program (NDMP) in October 2020 (Public Safety Canada, 2020b). This federal program funds provincial and territorial projects that include flood mapping. During its first five years, between 2015-2020, the NDMP program was granted $183.8 million to fund cost-shared projects. Any extra costs of this policy can be covered by this renewed funding. In 2020, the Quebec government announced $29.8 million spread out over five years to cover the costs of updating its flood maps (Luft, 2020).

Political Feasibility: Intergovernmental collaboration is required, as is collaboration with the private sector in order to ensure that the flood portal is high functioning, user friendly, and remains up-to-date. There is political will for this initiative, given the federal government's recent commitment to collaborate with the provinces, territories, and Indigenous communities on completing their flood maps (Lowrie & Rabson, 2019).

Desired Outcome: Ineffective flood risk communication has been cited as a key barrier to the effective management of flood risk, due to the highly decentralized nature of both the development and dissemination of flood maps (Thistlethwaite, Golnaraghi et al., 2020). A central portal for an interactive national flood map will improve Canadians' access to accurate, up-to-date information about flood risk, and will result in property owners, developers, and others having the ability to manage their own flood risk. This will reduce the heavy financial burden borne by individuals, insurers, and governments brought on by costly flood damage, and bring about one of the overall objectives of this policy agenda, namely the increased economic well-being of Canadians.

Policy 2: Create the Canada Buyout Fund

Background

Increased flood risk and the ineffective nature of current adaptation measures, such as financial assistance to rebuild, has led governments to reconsider their approach to flood management (Thistlethwaite, Henstra, Ziolecki, 2020). In November 2020, the federal government created a Task Force on Flood Insurance and Relocation (Public Safety Canada, 2020c). The type of relocation that this task force is addressing is something called “managed retreat”, a specific tool for managing climate change risk that is gaining political momentum in Canada and that has been used in the United States for decades (Moore, 2020). Managed retreat is the “deliberate unbuilding of vulnerable areas and the subsequent relocation of people, homes, businesses, and infrastructure” (Moore, 2020). Managed retreat entails careful policy design that must take into account risk, the perspectives of key stakeholders, and the long-term effects of relocation on social and economic well-being.

A buyout, the public acquisition of a property located in a high risk area, is the principle means through which managed retreat is implemented. Buyouts are effective tools at managing flood risk and are gaining political support in Canada (Thistlethwaite, Henstra, Ziolecki, 2020). In 2019, the Quebec government launched a buyout program that offers homeowners and renters a maximum of $200,000 to relocate to areas outside the flood zone (Ministère de la Sécurité Publique, 2019). Up until now, buyout projects in Canada have largely been ad hoc and reflexive, lacking in careful policy design (Thistlethwaite, Henstra, Ziolecki, 2020). However, the federal government’s task force as well as Quebec’s new program suggest that there is an open policy window to shift the approach of flood risk management away from traditional, now ineffective, measures of structural flood defences and federal financial disaster transfers towards more preventative, non-structural measures, such as long-term buyout programs.

While buyouts are effective tools at reducing the financial costs associated with flood risk, when designed carefully they also play an important role in reducing the level of social vulnerability associated with flood risk. Studies show that there are certain social indicators of flood vulnerability, and that certain individuals and communities are more socially-vulnerable to flooding compared with others, such as the poor, minorities, children, and the elderly (Chakraborty et al., 2020). Chakraborty et al. (2020) identify geographical places in Canada where certain socially vulnerable communities are disproportionately affected by flooding, such as in Atlantic Canada. Their study identifies nine indicators of social vulnerability to flooding, including the ability of a community to cope with and respond to the aftermath of a flood, type of household structure, ethnicity, visible minority status, education, and access to wealth (Chakraborty et al., 2020). Some of the socioeconomic variables that represent the social vulnerability indicators include psychological and physical disabilities, single parent family structures, identifying as Indigenous, dwelling value, and low income status (Chakraborty et al.,

2020). Buyout programs must take into account place-based social vulnerability to flooding in order for them to be socially just (Chakraborty et al., 2020).

Policy Proposal

The federal government should create the Canada Buyout Fund (CBF). This fund would be administered by Public Safety Canada and would provide funding to the provinces and territories to support buyout programs at the provincial, territorial, and municipal levels. While provincial and territorial governments would be the only eligible recipients for the funding, they could redistribute it to local governments. The CBF would be cost-shared with the provinces and territories and follow the same costing model as the National Disaster and Mitigation Program (NDMP) for administrative ease, where up to 50% of costs are shared by the federal government for the provinces and up to 75% of the costs are shared for the territories. In order for the CBF to support local buyout programs, applicants must demonstrate that their buyout program meets certain criteria (Table 2). These are explained in more detail below.

Table 2
Canada Buyout Fund Eligibility

Criteria for Eligible Buyout Programs	Rationale
Voluntary programs, but if turned down then eligible for 50% of federal assistance	Voluntary programs are more politically feasible and socially acceptable. Limiting future assistance if buyouts are turned down increases participation (Thistlethwaite, Henstra, Ziolecki, 2020).
Compensation level is pre-flood market value	Offering compensation at pre-flood market value is more socially acceptable (Thistlethwaite, Henstra, Ziolecki, 2020).
Eligible properties must have flood costs that exceed 50% of home value or reach $100,000	Modelled after Quebec's buyout program (Ministère de la Sécurité Publique, 2019). Including homes that have $100,000 in damage avoids disproportionately targeting lower-income homes.
Programs must demonstrate use of place-based socioeconomic status index	Chakraborty et al., (2020) developed an index to identify geographic places in Canada that have more socially vulnerable people regarding flood risk. Buyout programs must prioritize reducing risk for these vulnerable communities.
Programs must restrict future development in high risk areas	Limiting or prohibiting development in high-risk areas is essential for effective flood risk management (Government of Canada, 2020).

Thistlethwaite, Henstra, and Ziolecki (2020) outline important considerations to take into account when designing effective buyout programs. These considerations include coerciveness, compensation, and eligibility. The extent to which a buyout program is coercive has to do with whether the program is voluntary or mandatory. Voluntary buyouts are more politically feasible and socially acceptable, since the decision to relocate ultimately rests with homeowners/renters. However, participation rates in voluntary buyouts tend to be low, with many property owners declining to sell their homes and move. This leads to voluntary programs being less effective at reducing flood risk (Thistlethwaite, Henstra, Ziolecki, 2020). In order to balance this trade-off, eligible buyout programs for the CBF must meet certain criteria. They must be voluntary, but with the condition that homeowners who turn down the offer will only be eligible for 50% of any future federal financial support, such as DFAA transfers. The voluntary nature of the programs means that they will be politically feasible and socially acceptable, but the condition of reduced future financial aid for repairing flood-damaged properties if owners refuse the buyout incentivizes individuals to participate, which increases the effectiveness of the program at reducing flood risk.

The level of compensation is also a key consideration. Programs that offer compensation at the post-flood market value tend to be less expensive and thus more politically feasible (Thistlethwaite, Henstra, Ziolecki, 2020). However, public backlash to buyouts usually stems from residents feeling like they are not getting a fair deal, as was the case in Grand Forks, British Columbia and with Quebec's buyout program which offers a maximum compensation of $200,000 (Bruemmer, 2019; Edwards, 2019). Offering compensation at the pre-flood market value is more expensive but more socially acceptable, and will likely lead to higher participation rates, making the program more effective overall. To that end, buyout programs eligible for the CBF must offer compensation at the pre-flood market value.

In terms of which properties are eligible for buyouts, criteria for the CBF will follow the Quebec model (Ministère de la Sécurité Publique, 2019). If damages to the home exceed 50% of the home's value or surpass $100,000, then that property is eligible for the buyout. Buyouts that only consider homes that have damages that exceed a certain threshold, such as 50% of a home's value, risk disproportionately targeting lower-income communities, since lower valued homes will more likely reach that 50% threshold (Thistlethwaite, Henstra, Ziolecki, 2020). Offering buyouts to homes that have flood damages that exceed $100,000 can reduce this risk.

Social vulnerability to flooding is another key consideration. As Chakraborty et al. (2020) highlight in their study, social vulnerability to flooding is stratified by geography in Canada. In order to address this issue, their study proposes a place-based socioeconomic status (SES) index in order to assess which areas in Canada are more socially at risk of flooding. Recognition of socially vulnerable communities can inform policymakers of the communities that should be prioritized in terms of risk reduction (Chakraborty et al., 2020). Thus, another criteria of the CBF

is that eligible buyout programs must demonstrate that they have been designed with the place-based SES index in view.

A final key consideration for eligible buyout programs funded under the CBF is future development in high-risk areas. A buyout program that does not restrict future development in high-risk zones will not be effective at reducing flood risk in the long-term (Government of Canada, 2020). Thus, the CBF will fund buyouts that restrict or prohibit future development from occurring in the same high-risk areas that have been targeted by the buyouts. Regulatory tools such as zoning laws and development permits can be used by local governments to restrict development.

In the United States, one of the most successful buyout programs has been New Jersey's Blue Acres buyout program (State of New Jersey, 2021). To date, the program has purchased around 1,000 properties at a cost of USD $375 million (Moore, 2020). Properties are demolished six to twelve months after the buyout process has closed.

Justification and Considerations

***Cost*:** The cost of the Canada Buyout Fund is expected to be around $500 million. This is based on the cost of Quebec's total investment of $473 million into flood mitigation measures outlined in its 2020-2021 budget (Gouvernement du Québec, 2020). This cost is also similar to the Blue Acres program, which has cost USD $375 million since the program's inception (Moore, 2020). Federal taxes may have to be raised in order to pay for this program, but research on public attitudes suggests that Canadians may be willing to tolerate higher taxes if policymakers set out a clear rationale (Genest-Grégoire et al., 2020). In addition, studies demonstrate that the benefits of current investments in climate change adaptation outweigh the costs by a ratio of 6 to 1 (Martinez-Diaz, 2018).

Political Feasibility: There is political momentum for relocation programs, given the federal task force that was created in 2020 which had the goal of providing options for relocation of high-risk properties (Public Safety Canada, 2020c). There may be some pushback from local governments since buyouts could lead to a loss of property tax revenue (Thistlethwaite, Henstra, Ziolecki, 2020). But this can be addressed at the local level by ensuring that buyout programs are designed with incentives that encourage people to relocate within the same municipality (Contant, 2019). Provinces and local governments can also choose to invest in sustainable, affordable housing units in the same municipalities that administered the buyouts in order to provide buyout participants with meaningful housing options and minimize loss of tax revenue.

Desired Outcomes: This national buyout fund invests in the long-term resiliency of local communities by funding provincial, territorial, and local buyout programs that take into account the social dimensions of climate change, namely the social vulnerability certain communities face with regards to flooding. One of the desired outcomes of this proposal is that it breaks the

inefficient cycle of depending on federal financial assistance to rebuild properties that are at high risk of repeat flooding. As a result, this will save money in the long-term. In addition, having a national buyout fund provides a reliable source of funding for many local communities that struggle with limited financial resources. A national buyout fund also ensures that communities that are socially vulnerable to flooding have the support they need for reducing their risk. Since social vulnerability to flooding is geographically stratified in Canada, as Chakraborty et al. (2020) outline, it is not enough to leave flood risk management up to local communities and provinces. Varying degrees of provincial capacity and interest in flood management means that vulnerable communities across Canada are at risk of being disproportionately exposed to flooding (Thistlethwaite, Golnaraghi et al., 2020). The Canada Buyout Fund provides a reliable source of funding so that provinces and territories can take a preventative approach to flood risk planning and ultimately increase the social well-being of vulnerable Canadians.

Policy 3: Launch the Floods Canada Forum

Background

In Canada, responsibility for flood risk management is shared between the federal, provincial/territorial, and local governments (Thistlethwaite, Golnaraghi et al., 2020). But although there is shared jurisdiction, a lack of coordination between and among the orders of government has been highlighted as a key barrier to effective flood management in Canada (Story, 2016; Thistlethwaite, Golnaraghi et al., 2020). A report from the Parliamentary Budget Officer specifically emphasizes a lack of interprovincial coordination as a key consideration for effective floodplain management (Story, 2016). This is an important consideration given that some rivers cross multiple provincial boundaries, as is the case with the Saskatchewan River (Story, 2016).

Federalism in Canada means that multilateral collaboration is sometimes difficult to achieve. Some scholars highlight the frequent situation of a “jurisdictional wasteland” in Canada, where blurred lines over jurisdiction results in each level of government having “the ability [...] to deny that they hold legislative authority” (Scott, 2018, p. 23). But there is precedent in Canada for multilateral collaboration on emergency management. For example, since 2007 the Emergency Management Framework for Canada has guided federal, provincial, and territorial collaboration on mitigating, responding to, and recovering from disasters, such as hurricanes, floods, and fires (Public Safety Canada, 2019). A study by Schertzer et al. (2016) found that, in the Canadian context, the existence of norms and institutions for intergovernmental relations supports multilateral collaboration and hinders governments’ attempts at unilateral action. This means that the presence of existing multilateral frameworks, such as the Emergency Management Framework, makes effective multilateral collaboration on flood risk management all the more possible.

Policy Proposal

The federal, provincial, and territorial governments should launch the Floods Canada Forum (FCF). The FCF would be a multilateral forum for federal and provincial/territorial ministers of the environment and/or public safety to meet and design a coordinated, pan-Canadian strategy for flood risk management. The FCF would meet once a year and would also provide an opportunity for other partners, such as municipal planners and Indigenous leaders, to meet and get involved in the design of the strategy.

The rationale behind this policy is that it fills a large gap in current Canadian flood risk management. While responsibility is shared between each level of government, and while there is some level of coordination, as highlighted by the Emergency Management Framework, fragmentation occurs at the provincial level since capacity for and interest in flood management varies by province (Thistlethwaite, Golnaraghi et al., 2020). Creating a multilateral forum with the purpose of convening key government actors in flood management can address this fragmentation by building and sustaining an agenda of shared goals among the provinces as well as between the provinces and federal government. This is much needed in Canada, where homeowners are often confused over which level of government is responsible for managing flood risk and communicating that risk to Canadians (Bruemmer, 2019).

One example of a similar initiative is that of the Gilbert F. White Flood Policy Forum (Association of State Floodplain Managers, 2021). The Forum was initiated by the Association of State Floodplain Managers (ASFPM) Foundation, a United States-based organization that fosters research and education to support flood management. The Forum convenes flood management experts every few years, such as civil engineers, municipal officials, and academics, to explore emerging issues and produce reports that inform policy-making (Association of State Floodplain Managers, 2019). In Canada, an example of a structurally similar intergovernmental forum to the proposed FCF is that of the Forum of Labour Market Ministers (FLMM) (Forum of Labour Market Ministers, n.d.). Since 1983, the FLMM has been a platform for collaboration between the federal, provincial, and territorial governments and has allowed ministers to cooperatively develop strategic plans that identify priority areas (Forum of Labour Market Ministers, n.d.). The FLMM is co-chaired by the federal government and a rotating lead province. The proposed FCF could be organized in a similar manner.

Justification and Considerations

Cost: The costs associated with creating the Floods Canada Forum are low. They would include administrative and personnel costs of organizing and running the annual Forum.

Political Feasibility: Given the precedent in Canada for multilateral collaboration on emergency management, as well as the acknowledged gap in coordinated governance of flood management, the proposed policy of creating an annual forum for ministers to meet will likely face minimal political resistance. Some resistance might stem, however, from provinces that have a low

interest in flood management or that already have their own strategies in place and do not see a need in collaborating on a united strategic vision.

Desired Outcomes: Ineffective intergovernmental coordination is a key feature of Canada's approach to flood management. Creating a multilateral forum to convene ministers provides an opportunity for governments to cooperatively align their policy agendas, identify common challenges, and develop shared goals regarding managing flood risks. Creating an institutional mechanism to foster multilateral collaboration is key to achieving durable policy change and the long-term goal of fundamentally shifting the way that Canada manages its flood risks. More frequent and severe storms means that Canadians are becoming exposed to increasing flood risk (Insurance Bureau of Canada, 2019). Traditional dependence on financial transfers from the federal government to rebuild homes and structures is not a sustainable solution to managing flood risk given the escalating costs of the DFAA transfers which cost an annual average of $360 million between 2011-2016 (Thistlethwaite, Golnaraghi et al., 2020). The proposed FCF aims to encourage intergovernmental coordination which is needed to support long-term policy change that will ultimately reduce the costs of flood management at the federal level and improve the economic and social well-being of Canadians.

Conclusion

Climate change is bringing more frequent and severe flooding events to Canada. And Canadians will continue to feel the economic and social repercussions of increased flooding given that flood risk is increasing. It is imperative that governments at all levels work together and collaborate with Indigenous communities, private sector entities, and the academic community in order to address the complex challenge of flood risk management. Creating a central portal for a national flood map, creating a federal buyout fund, and launching an intergovernmental forum for ministers to collaborate on flood management will increase the economic and social well-being of Canadians and ultimately increase Canada's overall resilience to flooding.

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