43. Floods–An Emerging Economic Threat Requiring Action

Description

Canada has several thousand kilometres of coastline along which communities are located. For example, the Fraser River and other rivers flow through British Columbia (B.C.) and communities that are vulnerable to flooding. Floods from rivers and oceans could destroy or affect residential, commercial, industrial, and agricultural properties as well as affect transportation means (roads, highways, bridges) and cause widespread disruption to day-to-day living requiring significant expenditure to restore areas back to pre-flood conditions.

The threat is real across Canada from the 2019 Spring Floods in Ontario, New Brunswick and Quebec to the 2024 Don River Floods in Toronto. According to Statistics Canada, 1 in 10 Canadian households are highly exposed to flooding.[248]

The damage to the economy and businesses due to floods is significant, in the hundreds of million dollars. The Fraser Valley has already experienced two catastrophic floods within a 20-year span (1990 & 2021). Flood protection structures, measures such as dikes and associated infrastructure (pump stations, flood boxes, rip rap and relief wells) throughout B.C. need to be upgraded to combat the threat of sea level rise of up to 1m by 2100.[249] Significant time-bound expenditures are needed to upgrade flood protection infrastructure throughout B.C. and Canada.

Background

Climate change leading to melting ice caps in the North and South poles is causing sea level rise. The B.C. Ministry of Environment and Climate Change Strategy has directed cities to prepare for a 1m rise in sea levels by 2100. Extreme weather events such as atmospheric rivers causing significant rainfall/snowfall and river levels rising beyond diking or natural levels are being seen in communities across Canada. Forest fires and heat domes that are experienced more often across Canada further challenge the environment and predispose land to flooding by destroying trees and vegetation that normally play a water absorption role. This can cause significant flooding of rivers flowing through highly productive agricultural and employment areas across Canada. Flooding poses catastrophic risks to Canada's economic vitality, competitiveness, the reliability of supply chains, and food security for businesses and communities.

The Federation of Canadian Municipalities estimated in 2020 that avoiding the worst impacts of climate change at the municipal level will cost an estimated $5.3 billion per year.[250]

Although cities have been directed to prepare for sea level rise and river body risks, there remains the need for significant dollars to upgrade dikes and associated infrastructure over the coming years to prepare adequately for such flooding events. There is a 0.5% chance of an extreme flood today while

[248] Statistics Canada, "Another year of catastrophic weather in Canada," October 16, 2024, https://www.statcan.gc.ca/o1/en/plus/7165-another-year-catastrophic-weather-canada.
[249] The Arlington Group Planning + Architecture Inc. et al., "Sea Level Rise Adaptation Primer: A Toolkit to Build Adaptive Capacity on Canada's South Coasts," British Columbia Ministry of Environment, 2013, https://www2.gov.bc.ca/assets/gov/environment/climate-change/adaptation/resources/slr-primer.pdf.
[250] Federation of Canadian Municipalities (FCM), "Investing in Canada's Future: The Cost of Climate Adaptation at the Local Level," February 2020. https://fcm.ca/en/resources/investing-in-canadas-future.

there is a 50% chance of an extreme flood by 2100.[251] Complete restoration of coastal and river boundary communities and infrastructure following a major flood event could take several years causing severe disruption to the economy resulting in losses of several hundreds of millions of dollars.

To help prevent damage and losses, flood prevention infrastructure across Canada must be upgraded in a timely manner and in a priority sequence.

A Community Example

The City of Abbotsford in British Columbia has long been advocating for upgrades to diking and drainage infrastructure and more predictable funding arrangements with the province and federal government, given historical flooding vulnerability from the Nooksack River and major flooding events, more recently in 1990 and with the 2021 disaster. The City of Abbotsford's key focus in the months ahead is to ensure federal and provincial support is provided to upgrade the Sumas and Matsqui dikes.

Former Abbotsford Mayor Henry Braun has warned that the disaster in Sumas Prairie will pale by comparison if the Matsqui dike breaches. The Fraser River is 10 times larger and more powerful than the Nooksack River and will wreak havoc on our economy and infrastructure if it overtops the substandard dikes that are in place. The Fraser Basin Council estimates that the economic impact of a Fraser River flood event on Matsqui Prairie to be approximately $30 billion.[252]

Current drainage infrastructure urgently requires upgrading given the time-sensitive implications with respect to sea level rise. A report (2015) released by the B.C. Ministry of Forests, Lands and Natural Resources found that 71% of lower mainland dikes were vulnerable to failure by overtopping, where floodwaters breach the top of the dike resulting in a flood.[253] Directing water out of the farmland, and out of the region depends on the effectiveness of regional drainage systems, requiring the province to approach upgrading from a regional perspective, working with municipalities. Only 4% of dikes in B.C. met provincial standards.[254]

With a focus on food security and the protection of food sources, federal and provincial governments must rethink infrastructure investments to prevent a greater disaster that may be just around the corner. Abbotsford is one of the most intensely farmed areas in North America and has the highest farm sales per hectare of any other City in Canada, directly contributing to the economy, creating jobs, and food security in the province and country.[255] In a recent report, Abbotsford agriculture was found to be responsible for $3.83. billion in economic activity, up from $1.8 billion in 2008.[256] As one of the primary employment drivers for the region, agriculture accounts for over 16,000 full-time jobs, equating to 23% of all jobs in the city. The Abbotsford case illustrates the importance of protecting our food supply and major supply chain routes against natural disaster in the interests of the entire province and country.

Local governments simply cannot afford to fund what is needed to upgrade such critical infrastructure. For example, $1 billion is needed to rebuild both dikes in Abbotsford to today's standard.[257] Similar upgrade

[251] Natural Resources Canada, "Case Studies on Climate Change in Floodplain Mapping," Government of Canada, 2018, https://natural-resources.canada.ca/science-data/science-research/natural-hazards/flood-mapping/case-studies-climate-change-floodplain-mapping.
[252] Fraser Basin Council, "Lower Mainland Flood Management Strategy: Phase 1 Summary Report," May 2016, https://floodwise.ca/wp-content/uploads/2020/03/FBC_LMFMS_Phase_1_Report_Web_May_2016.pdf.
[253] Ibid.
[254] Ibid.
[255] Abbotsford Chamber of Commerce, "Canada's Agricultural Hub – An Economic Analysis of Agriculture in Abbotsford," May 25, 2022, https://www.abbotsfordchamber.com/canadas-agricultural-hub-report-2022/.
[256] Ibid.
[257] Global News, "Abbotsford Mayor Warns of Disaster if province and feds don't pitch in for dike repair," December 10, 2021, https://globalnews.ca/video/8442039/abbotsford-b-c-mayor-warns-of-disaster-if-province-feds-dont-pitch-in-for-dike-repair.

requirements and high costs have been identified in municipalities from Richmond to Chilliwack, and in a number of northern communities with similar flood potential.

It is understood that dike inventory maps, designs, etc. have been prepared by the Provincial Government and that funding for upgrades from both the federal and provincial governments has arrived in pockets over the years since at least 2014.

However, as stated previously, long-term funding certainty is required and significant and strategic funding and planning to study flooding patterns of rivers, understand climate change implications with respect to sea level rise especially time sensitivities, as well as improve and upgrade flood protection measures throughout B.C. A report (2015) released by the B.C. Ministry of Forests, Lands and Natural Resources found that 71% of lower mainland dikes were vulnerable to failure by overtopping, where floodwaters breach the top of the dike resulting in a flood.

There is also a significant risk associated with “orphaned” infrastructure. Flood infrastructure currently built and relied upon has no jurisdiction responsible for maintenance or upgrade. Much of the infrastructure built in past flooding emergencies has no “owner” and is still critical to providing flood protection on the Fraser River (and tributaries). Any effective provincial diking program must address the challenge of orphaned infrastructure.

Natural disasters such as floods pose a huge economic risk when key supply chain and transportation routes are impacted. It is of paramount importance to protect our trade-enabling infrastructure as well as the connectivity of people and goods in B.C. and Canada.

The impact of the flooding in Abbotsford, the epicentre of the recent flood disaster in B.C., is a critical example of how, as a result, B.C. and regions within the province were disconnected from each other to agri-foods and the rest of the lower mainland due to the floods. This impacted food security, trade and connectivity among people. With the Lower Mainland being the Asia Pacific Gateway, the consequences of poor infrastructure and emergency preparedness come at a high economic and human cost. The Port of Vancouver trades approximately $200 billion in goods with more than 170 trading economies. The Port of Metro Vancouver is the #1 in Canada and #2 in terms of total foreign exports.

The 2021 Context

B.C. experienced severe weather patterns in 2021 that resulted in devastating flooding across the province. Vital road, rail, and port links were severed for weeks, and farms, homes and businesses were destroyed. It is estimated that 15,000 people were forced to evacuate their homes, countless crops were lost, and over 600,000 farm animals perished. In addition, the Trans Mountain Pipeline was shut down, resulting in a fuel shortage in the Lower Mainland. Sections of Highway 1 and other areas across the province were closed to traffic, supplies and people. Ken Peacock, former Senior Vice-President and Chief Economist at the Business Council of B.C., estimated that the weather disaster resulted in lost economic output for the province ranging from $250 million to $400 million.

In the B.C. flood disaster of November 2021 that impacted communities across the province, the City of Abbotsford’s Sumas Prairie was hardest hit with the impact of a record-breaking atmospheric river that fell on Southern B.C. and caused Washington State’s Nooksack River to overflow across the border into the Sumas Prairie.

Following the 2021 floods, A joint application was submitted for $1.7 billion to the Federal Government Disaster Mitigation and Adaption Fund (DMAF). Abbotsford had applied for $1.6 billion, with Princeton applying for $55 million and Merritt $48 million. Those funds were entirely denied by the federal government, and no funding has been approved to-date.

DMAF is a national, competitive, and merit-based contribution program requiring communities to apply for funding through a competitive applications process

This federal government disaster mitigation program was created in 2018 with $2 billion, and another $1.375 billion was added in 2021. At the end of 2022, Ottawa announced an additional $489 million for the fund.

The economic toll of the major flooding events is still not fully quantified. However, data collected from the Abbotsford flooding disaster from impacted farmers and businesses revealed millions of dollars in damages and long-term damage, particularly in the organics and berry sectors. There was little in the way of a coordinated approach to minimize the damage from the floods. The weaknesses of the flood mitigation strategies have been exposed, and it is evident that when a disaster occurs, a federal-provincial-municipal response is needed.

Recommendations

That the Government of Canada:

1. Increase Disaster Mitigation and Adaptation Fund (DMAF) capacity, given that current $3.9 billion national allocation is insufficient when individual critical projects require over $1 billion.
2. Modernize the federal emergency flood mitigation program by revising DMAF criteria to better accommodate large-scale infrastructure projects, in consultation with local governments, provinces, and the business community.
3. Champion formal discussions with the United States on coordinated cross-border flood risk mitigation.