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RESEARCH ARTICLE

Assessing policy robustness under the COVID-19 crisis: an empirical study of the environmental policymaking system in Ontario, Canada

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ABSTRACT

Desirable robust systems retain functional reliability and legitimacy in times of crisis and show minimal sensitivity to these events. As a multifaceted crisis, the COVID-19 pandemic posed various challenges to policymaking systems around the globe. In this study, the authors evaluate changes within the environmental policymaking system in Ontario, Canada, during this crisis and analyze them in light of the robust policy design literature and its links to the broader concept of policy design success and failure. These changes are evaluated using an empirical hypothesis testing approach designed to assess the variations of key indicators in the administrative and public participation domains of Ontario's environmental policymaking system during and before the COVID-19 pandemic. The results indicate that the system has failed to retain its functional reliability, and thus its robustness, during this crisis. The authors conclude by contextualizing these results in light of the more recent history of environmental policymaking in the province and its impacts on Ontario's environment and offering suggestions for future research building on this empirical example.

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COVID-19; environmental policymaking; policy robustness; polycentricity

Introduction

The capacity of political systems in devising timely and effective policies in times of crisis is a key factor influencing the long-term success or failure of policies adopted during these periods. However, measuring this capacity can be challenging when it relies on observations of long-term, tangible policy outcomes. Analyses are further complicated by the sensitivity of policymaking systems to variations in policy inputs. The latter has been the subject of the policy robustness discourse (Capano & Woo, 2018; Howlett et al., 2018), a relatively new and evolving body of literature addressing policymaking in times of crisis. Robustness is a fundamental concept when assessing the decisions and decisional processes from which policy outcomes emerge during times of crisis, particularly when decision-makers are called upon to devise policies during these times (McConnell, 2010).

Robustness refers to the capacity of policymaking systems to retain their legitimacy and functionality in the wake of crises without compromising the fundamental values upon which they are constructed (Goodin, 1998; Jen, 2003; Ostrom, 1990). Scholars in this field argue that a crucial element of a robust policy design process is the polycentricity of the process itself. That is, the plurality of actors in the policy design process is a necessary condition for retaining the functional reliability of policymaking systems and minimizing their sensitivity to external shocks (Blomquist, 2009; McGinnis, 1999; Ostrom, 2010).

The novel Coronavirus (COVID-19) pandemic (WHO, 2020) is a multifaceted, global crisis that is inflicting fundamental challenges upon societies. Since COVID-19 outbreaks began, the policymaking systems in the

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Global North and South alike have been grappling with a range of uncertainties and challenges created during the pandemic (Oldekop et al., 2020). The ongoing social, economic, health, and political impacts of COVID-19 are raising questions globally regarding government responses to the pandemic and both the short and long-term consequences of policies being adopted during this time (Berger et al., 2021; Chakraborty & Maity, 2020; Daniel, 2020; Greer et al., 2020; Hale et al., 2020; Hartley & Perencevich, 2020; Heymann & Shindo, 2020; Legido-Quigley et al., 2020; Van Lancker & Parolin, 2020). Of particular concern to many international institutions are economic futures at multiple scales (IMF, 2020; The World Bank, 2020; UN, 2020). These concerns are influencing domestic policies in many countries.

The Canadian provinces and territories are no exception to the COVID-19 crisis and its repercussions on social, health, and economic systems (Statistics Canada, 2021a). To contain the spread of the virus, provincial governments across Canada have declared states of emergency since March, 2020, issued several interventions (e.g. stay-at-home-orders, school closures, and temporary suspension of non-essential business activities), and gradually adjusted these measures as the situation evolved over time (Scarabel et al., 2020). Furthermore, to offset the economic burden of this crisis on society, both the federal and provincial governments devised economic plans and policies prioritizing economic recovery (e.g. Government of Alberta, 2020; Government of Canada, 2021a; Government of Ontario, 2020; Province of British Columbia, 2021).

This research is centered in Ontario, Canada. As Canada's most populous province, its largest economy (Statistics Canada, 2021c, 2021d), and home to diverse environmental resources and natural capital (Government of Ontario, 2021a), balancing social, economic, and stewardship objectives is of critical importance. Ontario has eighteen percent of Canada's forests and more than a quarter of Canada's agricultural lands (Government of Ontario, 2021a; Statistics Canada, 2018). The province also has about ten thousand miles of shoreline with the world's largest cluster of freshwater lakes and the river system connecting these lakes to the Atlantic Ocean (Government of Ontario, 2021d). Adding to this list the abundant metallic and non-metallic mineral resources such as gold, copper, zinc, sulphur, salt, lime, and gypsum (Ontario Mining Association, n.d.) and rich biodiversity consisting of more than four thousand distinct plant and animal species (Government of Ontario, 2021a), one can argue that Ontario's rich natural resources are intricately tied to its economy.

With a mix of manufacturing, high-tech, natural resource extraction, and agriculture industries, Ontario's economy accounts for approximately 40% of the national GDP (Government of Ontario, 2021a; Statistics Canada, 2021d). However, the province has been a COVID-19 hotspot in the country throughout the pandemic (Government of Canada, 2021b), and its annual economic growth rate has plunged 7% as compared to the preceding annual rate (Statistics Canada, 2021b).

In response to this trend, the Government of Ontario immediately prioritized economic recovery by introducing new pieces of legislation (Government of Ontario, 2020), encouraging development and temporary suspension of environmental protection oversight in the province (McIntosh, 2020a, 2020b). These changes are raising serious concerns about the response of the environmental policymaking system in the province to the COVID-19 pandemic and the impacts of the adopted changes on Ontario's environment during this crisis (McKenzie-Sutter, 2021; Rankin, 2020; Winfield, 2020; WWF-Canada, 2020).

A review of environmental policymaking in Ontario by Winfield (2012) suggests that the province's policymaking direction, and its policy outcomes, have been adversely influenced by historical economic downturns, particularly when public concern on the environment was low and elected governments believed in their roles as facilitators of business interests, not stewards of the natural environment. Environmental disasters such as the Walkerton tragedy, a public health crisis caused by the bacterial contamination of municipal water resources in Walkerton, Ontario (Salvadori et al., 2009) or uncontrolled urban development in many areas of the province are two instances of poor policy outcomes brought about by this concurrence of events (Winfield, 2012).

Focusing on the time period during the COVID-19 crisis, our study assesses the impacts of a similar set of conditions on Ontario's environmental policymaking system: the provincial economy is influenced by a global health crisis, and the environmental credo of the current Progressive Conservative (PC) government is that of its PC predecessors – i.e. environmental measures should only be adopted to mitigate the potential consequences of economic development, not to challenge core business interests and established economic

development models (Winfield, 2012). However, in this study, our goal is to assess these potential impacts through the policy robustness lens, not by examining the actual policy outcomes. More specifically, the sensitivity of the environmental policymaking system to the economic shocks of the pandemic is the subject of our assessment. Also, since there was no official polling of public opinion about environmental concerns at the time of writing this paper, this determining factor of environmental policy direction was assessed by evaluating the number of comments from the public on environmental changes to laws, regulations, and policies in the province before and during the pandemic.

To assess the robustness of the environmental policymaking system to the pandemic, a range of established statistical techniques was performed to test the significance of variations in a set of key indicators (variables) within the administrative process and public participation domains of Ontario's environmental policymaking system. By identifying and measuring variations in these key indicators, the authors present a quantitative account of the robustness of the environmental policymaking system during the pandemic. The time interval for the analyses captures the pre-COVID-19 period, starting from July 2018 – when the current PC government was elected into power – to the end of the first ten months of the COVID-19 pandemic, starting from the declaration of the state of emergency in the province in March 2020 to the end of December 2020.

Not only does this assessment lens present an empirical guide on testing the theory of robustness in a policy system, but it also broadens our understanding of provincial policy direction on the natural environment under the COVID-19 pandemic, particularly with reference to the key environmental statutes which lay the ground rules for protecting, monitoring, and the stewardship of the natural resources across Ontario. This understanding is essential, given the massive size of Ontario's economy, the spatial distribution and the relationship between the physical and natural settings in the province, and the history of the province's environmental policymaking system in times of crisis.

The rest of the manuscript is organized as follows. In Section 2, the authors provide a brief overview of the political context relevant to the study. Section 3 describes data sources and collection and presents the conceptual framework and quantitative methods used in the study. Next, in Section 4, the authors present research findings and discuss these results in light of the environmental legislation in the province and the broader policy analysis literature. Finally, Section 5 highlights the importance of these findings and suggests further pathways for analyzing the impacts of the COVID-19 pandemic on Ontario's environmental policymaking system.

Political context

Provincial and territorial governments in Canada are the second level of a three-tiered federal system of government. Provinces are comprised of an elected legislative assembly, from which the Premiers select a governing cabinet. Premiers are the heads of provincial governments' executive branch and members of the provincial legislative assemblies. Provincial governments have decision-making and administrative authority related to public lands, natural resources, local institutions, and property rights. They also enjoy an unparalleled constitutional foundation for the management of the natural environment in their jurisdictions through environmental policies and regulations (Government of Canada, 2021c; Winfield, 2012). Environmental policies in this context are the governmental measures developed to regulate the impacts of human activities on natural settings.

In Ontario, the Ministry of Environment, Conservation, and Parks (MECP) is responsible for administering environmental legislation, enforcing compliance with these laws, and protecting natural resources, including air, water, land, and soil (Government of Ontario, 2021c). To ensure a democratic process, the provincial legislature enacted the Environmental Bill of Rights (EBR) (1993), whereby residents of Ontario became officially entitled to participate in the environmental decision-making processes related to consequential environmental proposals made by provincial ministries.

To facilitate public participation, the MECP established the Environmental Registry of Ontario (ERO), a searchable database that lists key environmental proposals, including notices regarding Acts, regulations, policies, and other legal instruments (e.g. permits and orders), documents, and actions that might affect the environment. Acts, in this context, are the laws, legislation or statutes enacted by the provincial legislature;

regulations are the guidelines describing how certain parts of an Act should be enforced; and policies refer to the rules or principles developed to guide the decisions under each Act and its associated regulations. Acts and regulations are both legally binding. Policies, on the other hand, are not. Furthermore, instruments enable the government to allow, require, or prohibit certain activities (Government of Ontario, 2021b).

Ontarians can use ERO to learn about the latest changes to key environmental decisions in the province and comment on proposed changes made to the Acts, regulations, and policies influencing the environment. ERO serves as the only means of administrative communication on matters related to environmental decision-making in the province. Ontarians can submit their comments on environmental notices directly through the portal, by email, or in writing to the designated contact listed for each posted notice. However, they might only be consulted on certain instruments and may be given legal means to appeal some (Government of Ontario, 2021b).

Ministries identified in the EBR are required to give residents at least thirty days to submit their comments on environmental postings. After this time, the comments must be reviewed, and changes to the proposals need to be communicated with the public (Government of Ontario, 2021b). Until 2019, the EBR also included the Environmental Commissioner of Ontario, a role responsible for monitoring the prescribed ministries' use of ERO. This fundamental pillar of EBR was dissolved under the PC government, and its responsibilities were transferred to the provincial Environment Minister and the Auditor General (Bill 57, 2018; Syed, 2019; Walker, 2020).

Methods

This section of the paper contains detailed information about the type and sources of the data used in our analysis and a complete description of the framework developed to conceptualize Ontario's environmental policymaking system. It also includes further explanation about the indicators of interest, their meanings within the constituent domains of Ontario's environmental policymaking system, and the statistical hypothesis testing techniques utilized to examine their sensitivity to the COVID-19 crisis.

Data collection

Data was collected from the ERO portal (https://ero.ontario.ca/). The authors searched for all notices of environmental legislative changes posted on the ERO website between July 2018 and December 2020. For each proposal, the posting date, the status (i.e. whether or not a decision has been made for a given proposal), the decision date, the number of comments received (by mail, email and through the ERO website), and the consultation period (i.e. the number of days specified for commenting on the posted proposals) were collected. The decision date and the number of comments were only available for proposals with decisions. The three types of proposals included in the analysis are Acts, regulations, and policies. The data includes changes to the current and new environmental Acts, policies and regulations.

The search was then expanded to include the Minister's Zoning Orders (MZOs), issued or filed during the periods under study. As per the provincial Planning Act (1990), an MZO controls land use across the province and sets specific requirements for new development, including but not limited to lot sizes, frontage, access, and servicing requirements. Certain types of developments may also be restricted by a zoning order. As MZOs are not covered under the EBR., there are no proposal and consultation stages for these orders, and they cannot be appealed (Government of Ontario, 2021b). Traditionally, the use of MZOs has been limited to emergencies or to the advancement of projects with provincial significance (Gray, 2020). Including these orders in the analysis will enable us to assess whether there has been a meaningful change to their number during the pandemic. To systematically retrieve all the information regarding the MZOs, the authors searched the word 'MZO' and the phrase 'Minister's Zoning Order' on the ERO website. To triangulate the search results and ensure that all the MZOs were captured, the authors also searched the related news coverage (e.g. Crawley, 2020; Gray, 2020; Paling, 2020). For each MZO, the extracted data included the filing and issue dates.

Conceptual framework and hypotheses development

To analyze the impacts of the COVID-19 pandemic on the environmental policymaking system in Ontario, a system of two hypothesized relationships was developed. These hypotheses assess the response of a set of indicators within the two domains of the province's environmental policymaking system. These domains are the administrative (governmental) and public participation processes of the environmental decisional structure.

The indicators considered within the administrative sphere of the provincial policy structure are the number of proposals/MZOs and the processing time for these notices. The indicators specified within the public participation domain are the number of comments and the consultation period during which the public can make comments on the notices posted on the ERO portal. Figure 1 illustrates a conceptual diagram of these hypotheses.

The impacts of the COVID-19 pandemic on the environmental policymaking system in Ontario were assessed by analyzing the changes made to each of these indicators during the period under study. The two investigated hypotheses are:

H1: The COVID-19 pandemic has influenced the administrative domain of the environmental policymaking system in Ontario.

H2: The COVID-19 pandemic has influenced the public participation domain of the environmental policymaking system in Ontario.

Hypotheses testing

Hypothesis testing is a statistical technique utilized to determine if and how the available data support a given hypothesis. The selection of an appropriate statistical test depends on the research design and distribution of the data in hand (Ivanković & Tiljak, 2006). Figure 2 depicts the simplified picture of the indicators (dependent variables) used in the statistical analyses within the administrative and public participation domains of the environmental policymaking system in Ontario. In this context, the COVID-19 period is considered an independent dichotomous variable (divided into the pre and during COVID-19 categories) whose impact is measured on the dependent variables within each of the quadrants in this illustration. The choice of

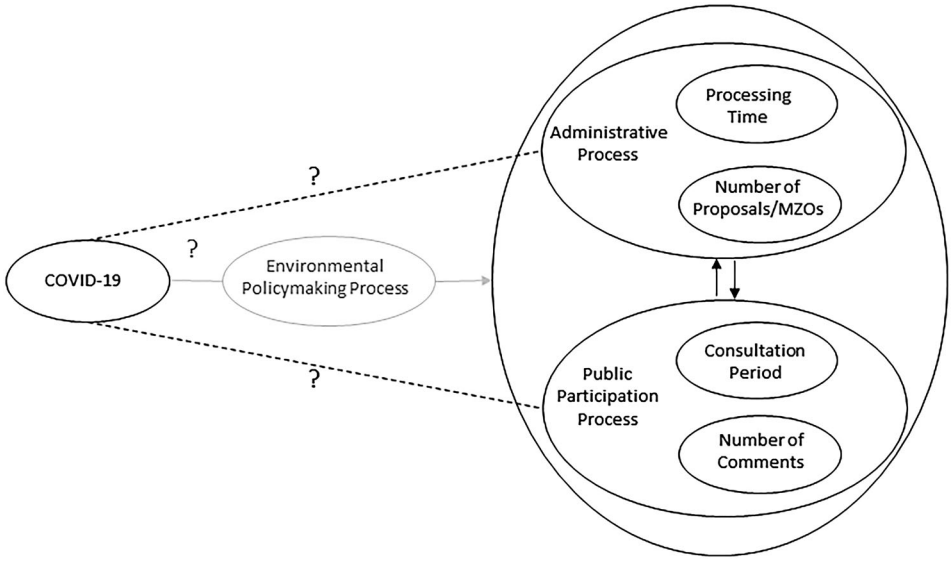

Figure 1. Conceptual framework illustrating the environmental policymaking system in Ontario and the two hypothesized relationships designed to assess the impact of COVID-19 on the administrative and public participation domains of this system.

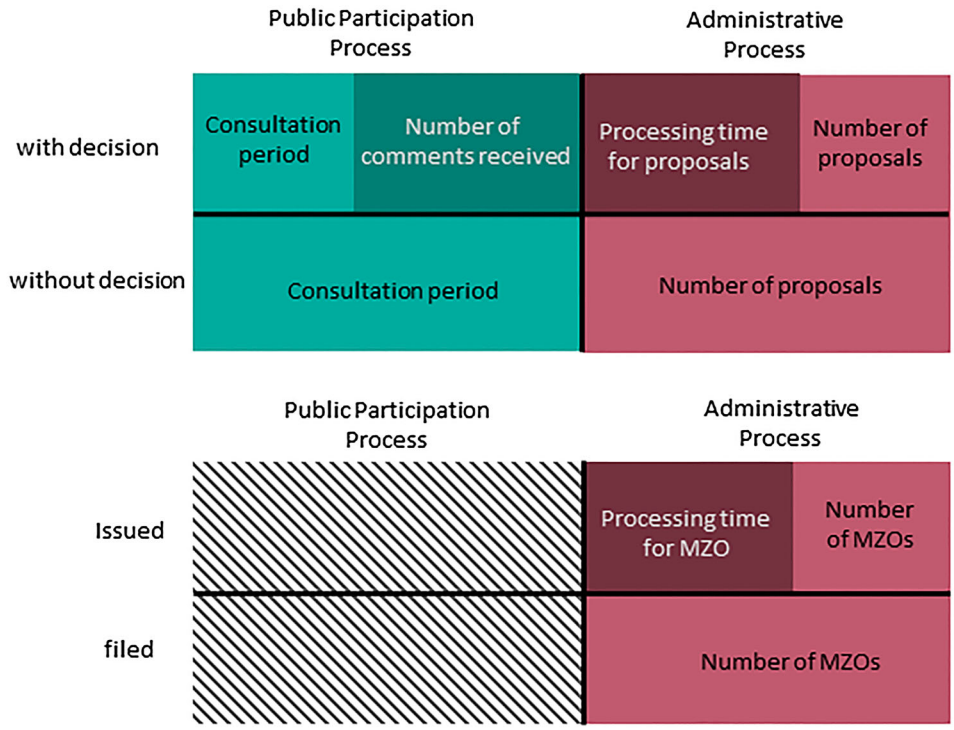

Figure 2. The dependent variables considered for statistical analyses in the study. The MZOs enable the Minister of housing to approve developments without the usual procedure required for public consultation, thus eliminating the chance for municipalities, citizens, and environmental groups to appeal an MZO.

dependent variables to measure the robustness of the system in this assessment scheme is based upon the temporal and numerical properties that these indicators represent.

For example, the indicators within the first quadrant of this illustration were used to statistically assess if and how the number of proposals with a decision and the processing time for these proposals have changed over time within the administrative process domain of the environmental policymaking system in Ontario. In this case, we used the point-biserial correlation and independent-sample t-test to assess the impact of COVID-19 on the number of proposals and their processing time, respectively.

Table 1 lists the statistical tests, the indicators evaluated by these tests, and the associated policymaking domains. The t-test, the Mann–Whitney U test, the Chi-square test, and the point-biserial correlation were the statistical tests used in this study to investigate the two main hypotheses.

The independent t-test (also referred to as the two-sample t-test or the independent sample t-test) is a parametric statistical test that determines whether there is a statistically significant difference between the means of two independent groups. From the assessment of sample statistics, analysts estimate the population

Table 1. The statistical tests used in the study.

Statistical test	Indicator	Policymaking domain
Independent sample t-test	Processing time for proposals Processing time for MZO	Administrative process
Point Biserial correlation	Number of proposals Number of MZOs	Administrative process
Non-parametric Mann-Whitney U test	Number of comments	Public participation
Chi-Square test	Consultation period	Public participation

parameters, and that is why parametric tests are considered strong inferential assessment techniques in statistics (De Veaux et al., 2014).

When essential parametric assumptions (e.g. normality or homogeneity of variances) are violated, non-parametric (distribution-free) tests could provide a meaningful inference about the population. The Mann–Whitney U test is a non-parametric alternative to the independent t-test (Ivanković & Tiljak, 2006). The non-parametric Chi-square test of independence (also known as the Pearson Chi-square test, or simply the Chi-square test) is another useful statistical tool for testing hypotheses when the variables are nominal. It also enables analysts to evaluate dichotomous independent variables and multiple groups (Mchugh, 2013).

A point-biserial correlation assesses the strength and direction of the association between one continuous variable and one dichotomous variable. The correlation coefficient for point-biserial correlation, r_{pb}, ranges from −1 to +1, representing perfect negative and positive relationships between the variables, respectively (Sheskin, 2003).

The authors also explored how the two determining indicators of the administrative process domain (i.e. the number of proposals and the number of MZOs) changed throughout the study period. To this end, the trends of these indicators were depicted in two distinct time series plots, illustrating the variations of these indicators in monthly time steps during the study period. To better understand the underlying trends, the period under study was divided into three equal intervals, consisting of two ten-month periods prior to the outbreak and the subsequent ten months during the pandemic.

Results

Rates of change in policy interventions

Figure 3 illustrates the variations of environmental proposals in Ontario during the period under study. The underlying trend for the total number of environmental proposals in the province illustrates a positive rate of change throughout the study period. Yet, the rate of change for this indicator during the COVID-19 pandemic is higher (slope = 1.09) than its variation during the two preceding periods. This changing pattern could partly be attributed to an overall increase in the number of proposals without a decision (i.e. the number of postings),

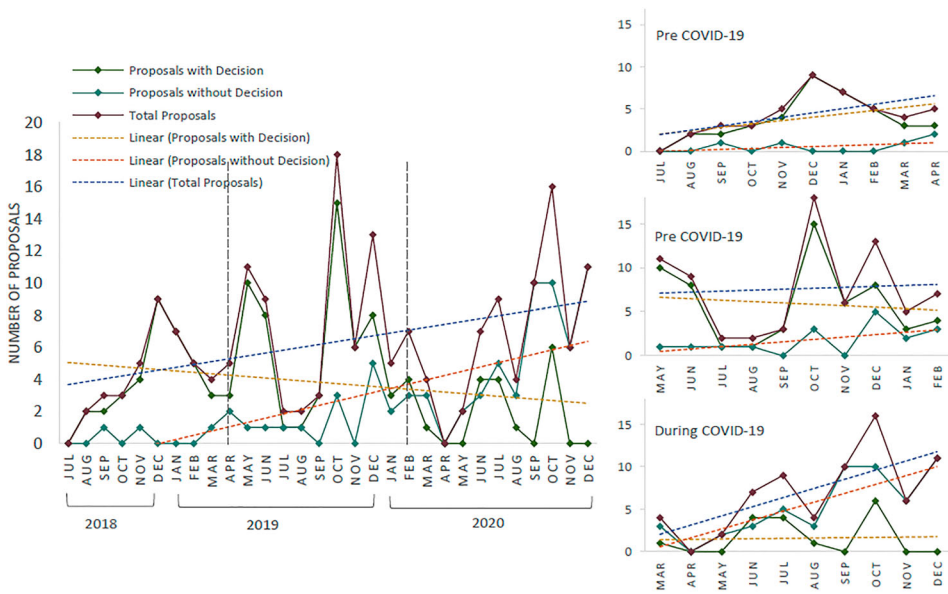

Figure 3. Time series plots of proposals.

illustrated with a slightly positive trend (slope = 0.12) in the first period, a moderate positive rate (slope = 0.27) in the second period, and a rapid growth (slope = 1.05) during the COVID-19 pandemic. It could also be ascribed to an overall negative trend observed in the number of proposals with a decision. Despite the observed positive trend in the first period (slope = 0.4), the rates of change in the subsequent periods (slope = −0.16 for the second period and slope = 0.04 for the third period) has influenced the overall pattern and changed it to a negative trend for these proposals.

As for the variations in the number of MZOs, the overall positive trend in the number of zoning orders is predominantly attributed to the rates of filed (slope = 0.23) and issued (slope = 0.54) MZOs during the COVID-19 pandemic, both illustrating abrupt positive shifts compared to the preceding periods (Figure 4).

Statistical inference

The impacts of COVID-19 on the Administrative Process Domain (H1)

A Point-Biserial correlation test was carried out to assess the association and statistical significance between the number of proposals and the COVID-19 period, our dichotomous independent variable. Samples were selected from the posted proposals covering the period from March to December 2020 (i.e. during COVID-19) and from March to December 2019 (the corresponding pre-COVID-19 period). There were no outliers in the selected samples; both were normally distributed ($p > 0.05$ for a Shapiro–Wilk test), and they had equal variances ($p > 0.05$ in the Levene's test for homogeneity of variances). This test showed a weak positive association between the number of proposals and the COVID-19 pandemic, but this association was not a statistically significant one ($r_{pb} = .023$, $n = 20$, $p = .924$). The results are listed in Table 2.

To test whether the COVID-19 pandemic has made a meaningful impact on the processing time of proposals, the authors conducted a t-test on two independent samples, considering the processing time (for proposals with a decision) during and prior to the COVID-19 pandemic. To meet all tests assumptions, the extreme outliers ($x < Q1–3*IQR$ or $x > Q3 + 3*IQR$) were removed from the samples, and a sample size large enough ($n = 50$) was considered to bypass the deviations from normality – t-test is considered robust to the violation of the nearly normal condition when sample sizes are larger than 20 (De Veaux et al., 2014). Since the samples' variances were not equal, the results of the Weltch-t-test was considered. The results

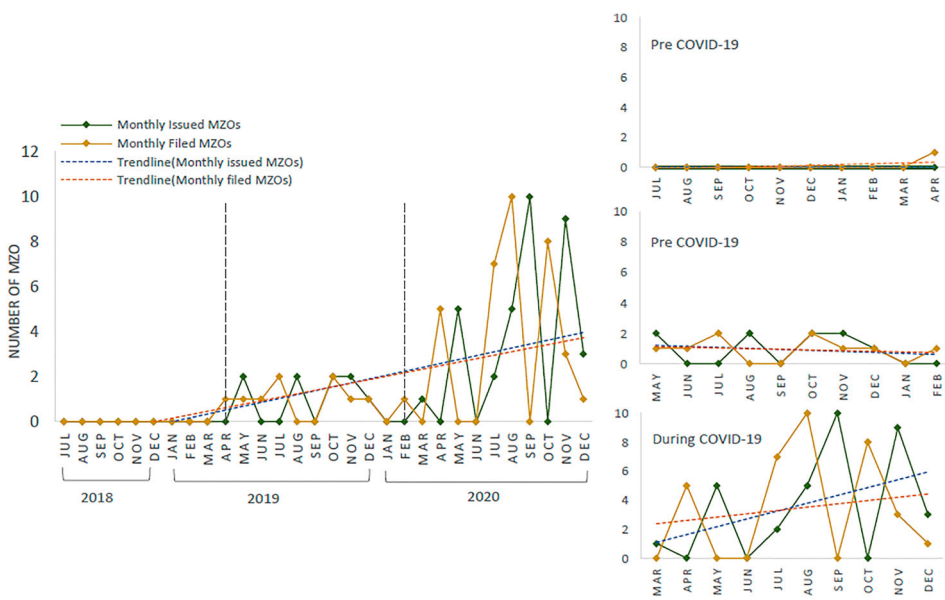

Figure 4. Time series plots of MZOs.

Table 2. The results of the point-biserial correlation tests between the number of proposal /MZOs and the COVID-19 pandemic.

			COVID-19 Pandemic
Proposals	Number of posted (total) proposals	Pearson Correlation	.023
		Sig. (2-tailed)	.924
		N	20
MZOs	Number of issued MZOs	Pearson Correlation	.452*
		Sig. (2-tailed)	.045
		N	20

* Correlation is significant at the 0.05 level (2-tailed).

(Table 3) illustrated that the time spent on decision-making on proposals prior to the pandemic (126.54 ± 75.37 days) was significantly lower than the time spent on decision-making during the pandemic (269 ± 197.945 days), $t(98) = -4.756$, $p = .00001$.

To assess the association between the number of MZOs and the COVID-19 pandemic and determine whether this association is statistically significant, a Point-Biserial correlation test was carried out, considering the number of MZOs within the two corresponding periods before and during the pandemic. None of the samples considered included an outlier value. Since the samples' skewness values were small, the data were considered to be nearly normal (De Veaux et al., 2014). Also, given the equal size of the samples, the test's results could be considered robust against the violation of the homogeneity of variances condition required for this statistical assessment (Delacre et al., 2017). The results illustrated a statistically significant positive association between the number of MZOs and the COVID-19 pandemic ($r_{pb} = .452$, $n = 20$, $p = .045$) (Table 2).

To test whether the processing time for MZOs presents meaningful differences, a t-test was performed on two independent samples selected from the number of issued MZOs prior to and during the pandemic. Since there were only eight issued MZOs prior to the pandemic, this number was considered to be sufficient for the size of samples selected from the two intervals. The authors calculated the processing times (i.e. the time between filing an MZO and issuing one) and tested the means of the two groups to determine whether there is statistical evidence that the associated population means are significantly different.

Except for the no outlier condition, all the other test's assumptions were met. To address the no outlier condition, all the extreme cases were removed from the analysis. The results of the test illustrated that prior to COVID-19, the processing time of MZOs was significantly lower (17.5 ± 9.783 days) than the processing time of these orders during the COVID-19 period (29.63 ± 2.925 days), $t(14) = -3.359$, $p = 0.005$ (Table 3).

The impacts of COVID-19 on the Public Participation Domain (H2)

To ascertain whether there was a meaningful difference between the number of comments received prior to COVID-19 and the ones received during the pandemic, a non-parametric Mann–Whitney U test was conducted on the random samples selected from the number of comments received for proposals with a decision in the two time periods. To reduce the type II error, the extreme outliers were removed from the analysis, and since the samples ($n = 35$) had similar distributions, the medians were considered for the analysis. The result clearly illustrated that the number of comments in the pre-COVID-19 (Mdn = 90) period was significantly higher ($p = 0.011$) than the number of comments during the COVID-19 period (Mdn = 32).

To determine whether the consultation period for proposals was affected by the COVID-19 pandemic, the authors first calculated the average consultation period prior to this crisis (42.81 days), and then categorized the consultation periods into two groups: the proposals with extended consultation period and the ones with a shorter period than the calculated mean. A chi-square test was then carried out on the proportions of these

Table 3. The results of independent samples t-tests for processing time of proposals/MZOs.

	t	df	Sig. (2-tailed)
Processing time for proposals (in days)	−4.756	62.916	.00001
Processing time for MZOs (in days)	−3.359	14	.005

The significance level is .05.

categories between the two intervals. The aim was to build a basis to compare the sample data when the no outlier condition was violated for a two independent samples t-test – the data presented cases of extreme values, even when transformed using the square root transformation function.

The results of the chi-square test illustrated a statistically significant difference between the proportions of the two categories of consultation periods prior to and during the COVID-19 pandemic ($\chi(1) = 12.111$, $p = .001$, as per the Fisher's Exact test). The strength of this association was significant, as well (phi = 0.257 and $p = 0.001$) (Table 4). According to the analysis, 62.3% of the total proposals were proposed prior to the COVID-19 pandemic. Of these, 39.3% had an extended consultation period (i.e. consultation period >42.81 days), and 23% had a shorter consultation period. Of the total proposals, 37.7% were proposed during the COVID-19 pandemic. While only a small proportion of these proposals (4.9%) had a consultation period shorter than the calculated average, a significant majority of these proposals (32.8%) had an extended consultation period.

Discussion

The results suggest that the COVID-19 pandemic has considerably influenced the environmental policymaking system in Ontario. Except for the number of proposals, all the other indicators of the administrative process domain have shown statistically significant differences between the two considered periods. Despite illustrating a positive trend during the pandemic, changes in the total number of proposals are not statistically significant. The results have also shown meaningful differences in the evaluated indicators within the public participation domain, albeit in different directions, in the two considered periods. While the consultation period has been considerably higher during the pandemic, the number of comments received by the ERO has decreased significantly during this crisis.

The observed dissonance between the changes in the number of proposals and MZOs illustrates that these counterbalancing indicators of the administrative process domain have followed different trajectories in the wake of the pandemic. Simply put, while both have shown increasing trends during this time, the changes observed in the number of proposals fall behind the meaningful increase of the MZOs. The consequences of these patterns may be impactful, particularly when seen in line with Bill 197, COVID-19 Economic Recovery Act, 2020 and Bill 229, Protect, Support and Recover from COVID-19 Act (Budget Measures), 2020, both proposed by the government in response to the COVID-19 crisis.

New provincial acts initiated during the COVID-19 pandemic contain schedules further restricting the requirement for environmental impact assessments to designated sites, giving the Minister of Housing the unparalleled power to use MZOs (even in non-emergency circumstances), and eviscerating local conservation authorities from their mandate to manage and protect local watersheds in the province (Bill 197, 2020; Bill 229, 2020). These observations illustrate a unilateral approach to regulating environmental assessment in the provincial context (Hickey et al., 2010) and should be seen in the light of the chronology of events under the PC administration, particularly in reference to the changes made to environmental statutes, policies, and regulations in the province and the dissolution of a determining environmental watchdog (Walker, 2020).

Coupled with the results of our analysis for the two countervailing indicators of the administrative process domain, the observed decline in the number of comments on the posted proposals could be conceived as a failure in consultation and thus in policy design (Pawson, 2006; Schneider & Ingram, 1997; Taylor & Balloch, 2005). This could also be seen at the failure end of the policy process success-failure spectrum (McConnell,

Table 4. The results of the chi-square test.

	Value	df	Asymptotic significance (2-sided)	Exact Sig. (2-sided)	Approximate significance
Pearson Chi-Square	12.111[a]	1	.001		
Continuity Correction[b]	10.956	1	.001		
Fisher's Exact Test				.001	
Phi	0.257				0.001

[a]0 cells (.0%) have expected count less than 5. The minimum expected count is 19.23.
[b]Computed only for a 2 × 2 table.

2010). In this context, the statistical significance of the extended consultation period will fail to keep the system in equilibrium, and the extended duration of processing proposals and MZOs could only be seen as a reactive measure to offset the negative impacts of the telecommuting condition, brought about by the COVID-19 remote work measures, on routine administrative tasks (Glenn Dutcher, 2012). Altogether, these changes have weakened the links between the administrative and public participation domains of the environmental policymaking system in Ontario.

Assessed from a robust policy design perspective (Capano & Woo, 2018; Howlett et al., 2018), the results illustrate a significant deviation from the polycentric decisional process required for retaining functional reliability and legitimacy of the environmental policymaking system in the province. More specifically, the changes to indicators considered for assessing the robust policy design process in this context failed to materialize what McGinnis (1999), Blomquist (2009), and Ostrom (2010) perceived as the enabling power of plurality, particularly in reference to the systemic capacity that enables problem definition and reassessment in a policy context in times of crisis. The reliance of the policymaking system on a single narrative – in this case, economic recovery at the expense of environmental protection – might yield potentially negative outcomes for Ontario's natural environment in the long term, adding further complexities to a system wherein the adopted environmental policies and their associated impacts on natural settings could be distant in time and space (Winfield, 2012).

It is necessary to emphasize that the results of this study merely represent the changes, over a short period of time, in the number and duration of the indicators defined to evaluate the decisional process associated with environmental policymaking in Ontario. Furthermore, this analysis sheds light on the variations of the data collected from the ERO website and does not delve into its content, except for clarification purposes (e.g. the overall objectives of the enacted Bills). Therefore, future research should shed light on the content of provincial environmental Acts and regulations to better understand the long-term impacts of the policy decisions made during the COVID-19 pandemic on Ontario's environment.

During times of crisis, it is easy to prioritize decision-making efficiency over participatory and transparent processes. A sense of emergency and urgency can be harnessed to legitimize the cessation of debate and draw attention away from the long-term consequences of policy choices. This work pushes against that narrative, placing scrutiny on the capacity of institutions and processes to maintain core commitments to administrative accountability and participatory obligations. The criteria examined imply, by design, that a democratic government that cannot maintain the functionality of its core democratic values amid crisis is on the failure end of the success-failure spectrum.

While governments around the world are grappling with COVID-19 and its interrelated crisis, more emergencies associated with the cascading impacts of climate, ecological, and social change are on the horizon. Thus, building and maintaining the robustness of key processes is an obligation of governments and the institutions through which they materialize their mandates. This work is predicated on the belief that this is important not outside of crises but also within them.

The reduction in the number of comments received for proposals in the ERO suggests that the capacity of individuals to engage in participatory processes is, understandably, diminished during crises. In these situations, the public relies on institutions to protect their interests and maintain their role in a democratic society. This means that instead of diminishing governments' accountability to deliberate participatory decision-making, crises make this accountability all the more important. Therefore, preparations for building and safeguarding polycentricity in times of crisis are paramount for retaining the functional reliability of the policymaking systems around the globe.

Conclusion

The robustness theory suggests that only robust policy systems withstand crises and show minimal sensitivity to these events. When crises occur, these systems retain their functional reliability by prioritizing core values and promoting plurality. This would, in turn, result in the long-term success of the policies devised in these systems during crises. We empirically tested this theory on Ontario's environmental policymaking system

during the first ten months of the COVID-19 crisis. This was done using a system of two hypothesized relationships, evaluating the pandemic's impacts on several key indicators within the administrative process and public participation domains of Ontario's environmental policymaking system.

Study results indicate that the system has failed to retain its functional reliability during the COVID-19 crisis. More specifically, the two counterbalancing indicators of the administrative process domain, namely the number of proposals and the number of MZOs, have increased disproportionately during the pandemic, with the latter showing a statistically significant increase. Furthermore, the number of public comments on environmental notices, a critical component of the public participation domain of the province's environmental policymaking system, has plunged dramatically during the pandemic.

The results suggest that the immediate consequence of the COVID-19 pandemic on the system has been a regression from its underpinning principles, statutes, and values. More specifically, the links that must be retained throughout the policymaking process between the administrative and public participation domains are debilitated in the wake of the pandemic. This outcome is neither desirable nor aligned with the provincial mandates for protecting natural resources across Ontario.

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