UNIVERSITY OF GOTHENBURG

ENVIRONMENTAL PROTECTION IN AUTHORITARIAN REGIMES

Investigating the role of pluralism

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WORKING PAPER SERIES 2020:4

QOG THE QUALITY OF GOVERNMENT INSTITUTE
Department of Political Science
University of Gothenburg
Box 711, SE 405 30 GÖTEBORG
June 2020
ISSN 1653-8919

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QoG Working Paper Series 2020:4
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ABSTRACT

When and how do authoritarian states secure environmental protection? Answering this question is critical given that over half of the world's population currently live in such regimes. Furthermore, the majority of non-democracies are concentrated in the Global South, which is also home to some of world's greatest environmental challenges. Much of what we know is informed by the case of China and understands environmental protection as a strategy for constructing and maintaining regime legitimacy. Much less is known about why the degree of environmental protection varies within authoritarian settings. This is a critical oversight since environmental issues are by their nature local. As such, understanding when and how governments engage in environmental protection requires studying the incentives facing local officials. We help fill this knowledge gap with an empirical study of subnational variation in environmental protection in the authoritarian regime of Vietnam. Studying a single country allows us to isolate key features of political institutions while holding a number of other factors constant, strengthening our ability to draw credible inferences. Specifically, we study the role of pluralism at the local (district) level, and consider how the degree of pluralism relates to two key environmental outcomes: air and water quality. While pluralism has the potential to promote environmental protection by enhancing scrutiny of government actors, pluralism can also undermine commitments to pro-environment policies, given their contentious nature. We analyze data from Vietnam's 208 districts and find that greater pluralism, measured by the extent of civil society activity, electoral competition, and the degree of (corrupt) business influence is associated with worse environmental outcomes. These finding call into question received wisdom about the benefits of participation for sustainable development and highlight the importance of developing contextually appropriate strategies.

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INTRODUCTION

The past decade has been characterized by exceptional global heat, retreating ice, and record sea levels – largely as a consequence of human activities (IPCC, 2019). At the same time, rapid industrialization in the Global South has led to unprecedented levels of air and water pollution in many countries (GBD 2017 Risk Factor Collaborators, 2018). As a result, environmental issues have become increasingly difficult for governments do ignore.

There is considerable variation in terms of how governments address environmental concerns; however, scholars have begun to identify some patterns. One prominent strand of research suggests that democracies tend to perform better when it comes to reducing human-induced environmental degradation (Li and Reuveny, 2006) or improving air quality (Bernauer and Koubi, 2009). Povitkina (2018) provides further evidence that democracies perform better when it comes to curtailing air pollution, but only in contexts characterized by relatively low levels of corruption.

Considerably less is known about the conditions under which authoritarian governments secure environmental protection. Filling this knowledge gap is critical, given that over half of the world's population currently live in autocracies and that democratic backsliding threatens to constrain the advantage enjoyed by citizens in many other countries (V-Dem Institute, 2020). Furthermore, the majority of non-democracies are concentrated in the Global South, which is also home to some of world's greatest environmental challenges.

According to democratic theory, authoritarian governments should rarely if ever provide broadly beneficial social benefits – with respect to environmental protection or otherwise. However, historical experience and scholarly research suggest otherwise. In a number of stable authoritarian settings, concerns with legitimacy have been argued to promote government action in the public interest (Zhou and Ou-Yang, 2017; Dukalskis and Gerschewski, 2017). Emerging scholarship on environmental protection in China takes a similar point of departure.[1]

We build on such work to consider subnational variation in one authoritarian regime: Vietnam. Environmental issues are by their nature local, since they affect where people live and work. Thus, understanding when and how governments engage in environmental protection requires studying the incentives facing local officials. Studying a single country also allows us to isolate key features of political institutions while holding a number of other factors constant, strengthening our ability to draw credible inferences.

Our study focuses on one factor that has been argued to affect the success of environmental policies - the extent of pluralism. Pluralism has the potential to promote environmental protection by enhancing scrutiny of government actors and providing more channels to hold them accountable. This logic is akin to arguments for democracies performing better when it comes to environmental protection. However, pluralism can also undermine governments' commitments to environmental goals due to their contentious nature. Although there are widespread long-term benefits to environmental protection, policies to achieve such goals are often seen as detrimental to economic interests in the short term (Kirchgässner and Schneider, 2003). Therefore, in plu-

[1] See, e.g. Wang (2013); Ran (2013); Van Rooij (2006); Van Rooij and Lo (2010); Kostka (2016); Eaton and Kostka (2014).

ralistic settings groups representing such interests can organize and undermine environmental protection or avoid regulation – through both legal and corrupt means (Fredriksson, Vollebergh and Dijkgraaf, 2004; Lopez and Mitra, 2000).

This paper investigates various forms of pluralism at the local (district) level, including civic pluralism, electoral pluralism, and the (corrupt) influence of anti-environment business interests. We then consider how these different forms of pluralism relate to two key environmental outcomes: air and water quality. Our empirical analysis is based on data from Vietnam's 208 districts. While Vietnam is a one-party state, decentralization policies have been pursued alongside economic liberalization beginning in the mid-1980s. Furthermore, seats for local office are popularly contested and non-Party members are permitted to run. In addition, civil society participation in Vietnam is on par with democracies at similar income levels. As a result, there is considerable variation in the degree of pluralism across Vietnamese districts.

We show that districts characterized by higher levels of pluralism in its various forms also tend to have lower air and water quality. This result is consistent across a range of model specifications and estimation strategies. These findings imply that pluralism may be detrimental to environmental protection in authoritarian settings and that even mobilization of actors who would benefit from environmental protection (i.e., citizens), does not help contain air and water pollution.

This study makes a number of important contributions. To our knowledge, it is the first to systematically examine how pluralism relates to environmental protection at the local level. Furthermore, we provide insights about the dynamics of environmental protection in an authoritarian setting, adding an important perspective to a literature that to date has been dominated by China. In addition, our findings call into question received wisdom about the benefits of democratic institutions such as public participation for sustainable development. In so doing our results highlight the danger of one-size-fits-all policies aimed at promoting "good governance." They also point to the importance of rooting out local corruption as a means of promoting environmental protection and sustainable development.

This paper proceeds as follows. The following section presents our theoretical expectations regarding the dynamics of environmental protection in authoritarian regimes. Then we describe our empirical strategy and data, followed by results presentation and discussion.

ENVIRONMENTAL PROTECTION IN AUTOCRACIES

In order to understand the dynamics of environmental protection in authoritarian regimes, we first consider the broader question of what motivates such governments to enact welfare-enhancing policies at all. Such policies are frequently understood to be the exclusive purview of democracies. The basic logic is that in democracies, electoral pressures motivate more spending in the public interest, and governments face more scrutiny if they fail to meet people's basic needs. To date, there have been a number of studies that look across countries to more systematically investigate this proposition. On the whole, these studies suggest that countries governed by democratic regimes tend to spend more and to provide more basic services than their autocratic counterparts (Lieberman, 2015).

Furthermore, democracy has been argued to aid in solving both global and local environmental problems, for a number of reasons. First, democratic institutions provide relevant fora for increasing public awareness about environmental issues. Democracies are also more likely to have

environmental issues on their political agenda than authoritarian regimes due to their openness to a variety of interests. Finally, through free and fair elections, which are a necessary attribute of democracy, citizens can hold politicians accountable for not delivering on their promises to address environmental concerns (Povitkina, 2018). Leaders in non-democratic settings do not face such incentives. However, as we discuss in further detail below, they are in some cases still motivated to address environmental problems.

Environmental protection as authoritarian legitimation

The incentives that authoritarian regimes have to promote environmental protection relate to a broader set of motivations grounded in the desire for legitimacy. In general, establishing some form of legitimacy is understood as vital to the survival and durability of authoritarian rule (Brady, 2009; Kailitz, 2013; Backes and Kailitz, 2015).

Authoritarian regimes legitimize their rule in a variety of ways. On the totalitarian end of the spectrum, they rely primarily on indoctrination, employing political ideology, foundational myths, and personal charisma as a means of consolidating and sustaining their rule (Von Soest and Grauvogel, 2017). A larger number of stable authoritarian regimes have embraced some form of *procedural* legitimation, adapting institutions like parties, parliaments, courts, and elections to facilitate power-sharing and co-opt potential opponents (Boix and Svolik, 2013; Gandhi and Lust-Okar, 2009; Magaloni and Kricheli, 2010). There are distinct limits to procedural legitimation, however, as allowing too much transparency or genuine competition in elections increases the risks to autocrats of losing power.

Given the limits of ideological and procedural claims to legitimacy, scholars concur that most durable authoritarian regimes legitimate their rule through socioeconomic performance (Dukalskis and Gerschewski, 2017; Von Soest and Grauvogel, 2017). Economic development has been seen as fundamental to the creation of legitimacy and subsequent survival of military regimes in Latin America (Epstein, 1984), as well as that of authoritarian rule in South Korea (Park, 1991), Indonesia (Mietzner, 2018), and Vietnam (Hiep, 2012). Furthermore, the legitimacy conferred by economic performance has served to shield authoritarian regimes such as Rwanda and China from criticism about human rights abuses (Zhu, 2011; Straus and Waldorf, 2011; Friedman, 2012).

Beyond economic growth or public goods provision, scholars of authoritarian politics have begun to consider responsiveness to environmental concerns as well. China is the most widely studied case in this regard. For instance, Wang (2013) documents how Chinese bureaucrats began to take substantial action on environmental protection and energy efficiency during China's 11th five-year plan period (2006-2010) and argues that the use of environmental protection represented a tool for delivering on the central components of performance legitimacy. Scholars have also shown how poor air quality prompts mobilization around environmental issues in China (Deng and Peng, 2018) and lowers political support for the Chinese regime (Alkon and Wang, 2018). Therefore, for the Chinese government, improving air quality has become a question of re-establishing legitimacy (Engels, 2018).

Much less is known about the drivers of environmental protection *within* authoritarian regimes. That is, why do some localities perform better or worse than others when it comes to limiting air pollution or ensuring that water is safe for household use? In order to explain such variation, we argue that the degree of pluralism is particularly important. We spell out the intuition for this claim in what follows.

Pluralism and Environmental Protection

At a basic level, we understand pluralism as the dispersion of power among influential political actors. Pluralism takes various forms, reflecting the different ways in which diverse actors are able to promote their interests. For example, pluralism manifests in electoral terms when oppositional political organizations or candidates are able to participate in practice. Pluralism can also be achieved when citizens can organize in groups to pursue their collective interests and ideals – that is, through participation in civil society. Pluralism can also capture the ability of particular interest groups, businesses, trade unions, or environmental non-governmental organization advance their interests through lobbying or extra-legal means.

Pluralism can be helpful to ensure higher levels of scrutiny of governing actors, and more channels to hold them accountable. Pluralism also increases the chances that welfare-promoting issues will be in the interest of one of the key political actors and reach the political agenda. Such arguments are akin to those presented above to explain why democracies tend to perform better when it comes to promoting human welfare and development outcomes. However, an emerging scholarship from less democratic settings suggests that pluralism can vary significantly *within* countries, with important implications for local development. For instance, Cruz, Labonne and Querubin (2020) show that social fractionalization (measured in terms of the number of distinct clans) reduces the risk of elite capture and leads to increased public goods provision at the village level in the Philippines. In a similar vein, Gisselquist, Leiderer and Nino-Zarazua (2016) show that Zambian districts characterized by a greater degree of ethnic heterogeneity enjoy higher levels of primary school enrollment and immunization rates, and have lower under-5 mortality rates and fewer underweight children. Whereas much of the African Politics literature assumes a negative relationship between ethnic diversity and development outcomes, Gisselquist, Leiderer and Nino-Zarazua (2016) argue that in the context of neopatrimonialism, ethnic diversity can serve to reduce local capture by motivating ethnic leaders to curtail capture by the followers of their political (ethnic) opponents. Finally, Rosenberg, Kozlov and Libman (2018) consider how local pluralism affects health outcomes within Russia. Here, pluralism is understood in terms of the degree to which multiple groups of influential elites (with independent bases of economic and political support) exist and compete for control of a given region. They show that higher levels of pluralism are associated with better health outcomes – though only in rich regions.

While such examples speak to its beneficial influence, pluralism can also empower actors with divergent interests and thus potentially undermine effective implementation or the very adoption of certain policies – particularly those that are more contentious. Policies related to environmental protection are understood as particularly contentious, since government, industry, and the population at large often have competing and incompatible interests – at least in the short term. These trade-offs can be especially poignant for low-income countries, where economic development is critical for improving livelihoods but environmental degradation represents an existential threat for some communities (Nguyen and Pham, 2012). O'Rourke's (2001) study of the Tan Mai paper factory outside Ho Chi Minh City paints a vivid picture of a divided community that both depends on the factory for income and is injured by its activities. Such trade-offs can also manifest at the individual level. The 2018 PAPI survey included a conjoint survey experiment, which showed that economic considerations such as job creation or the amount of tax revenues an investment generate has a significant effect on respondents' evaluation of a proposed project. However, environmental considerations were shown to have an even stronger effect on people's evaluations of project attractiveness (CECODES, VFF-CRT, RTA & UNDP, 2018).

It is perhaps not surprising that pluralism has been shown to impede reaching environmental goals. For example, Madden (2014) shows that OECD countries with more veto players (i.e.,

federalism, bicameralism, presidentialism, the existence of referendums, judicial review, single-member district electoral rules or pluralist form or interest-group representation) are significantly less likely to adopt climate policies. Additionally, Scruggs (1999) finds that in pluralist systems with competitive interest representation, where various interest groups stand on equal footing when lobbying their interests to the governments, environmental performance is worse than in corporatist societies. However, if the minority pro-environmental voices are included in the decision-making, for example, if green parties take seats in the national parliaments, this benefits countries' control of air pollution (Mourao, 2019).

Turning to the influence of pluralism on environmental protection *within* countries, Stadelmann-Steffen's (2011) analysis of climate change policy in Switzerland is enlightening. This study suggests that direct democracy makes it difficult to implement far-reaching climate change policies, though it can produce more incremental changes supported by a broad political elite. Schwartz (2004) argues that in China, devolving power to local authorities has been detrimental for environmental protection since local governments tend to focus on short-term economic growth. Relatedly, Van Rooij (2006) argues that weak enforcement of environmental regulation reflects conflicts of interest between national regulations and local stakeholders.

We expect that the presence of divergent interests can have an even stronger adverse influence on environmental outcomes in countries with pervasive corruption, where pro-business interests can bribe their way out of regulation, or influence political decision-making related the environment through other corrupt means. In such contexts, political leaders have incentives to engage in practices that bring private benefits from being in power in the short-term, but are detrimental to the achievement of long-term goals for the benefit of the general of population, such as environmental protection (Povitkina and Bolkvadze, 2019). For example, Eaton and Kostka (2014) illustrate how short tenure cycles in China incentivize local cadres to prioritize short-term over long-term gains, tolerating or even promoting corruption related to environmental regulation while they benefit from bribes and kickbacks. The incentives to engage in corrupt behavior frequently go beyond the desire for personal gain. For instance, Sundström's (2015) study of enforcement officials in South African fisheries illustrates the entrenched nature of environmental corruption. While local officials enjoy receiving bribes in return for lax enforcement, they also have little incentive to report violations given corruption in the judiciary and at higher levels of government. Furthermore, widespread corruption among officials has been shown to negatively impact resource users' compliance behavior when it comes to regulation of common pool resources (Sundström, 2016).

In this study we take an exploratory approach and investigate the connection between pluralism in its various manifestations and environmental outcomes (air and water quality) at the district level in Vietnam. The next section outlines our empirical strategy.

EMPIRICAL STRATEGY AND DATA

In order to minimize omitted variable bias, we limit our analysis to variation between sub-national units within a single country rather than investigate variation across countries. As such, it is more likely that the discovered associations between the variables can be attributed to the effects proposed by our theoretical framework rather than to interference of other unobserved factors excluded from the model. When choosing an appropriate context for the analysis, we sought a country with non-negligible variation in sub-national levels of pluralism and environmental conditions. Second, we were guided by data availability. Keeping these factors

in mind, we situate our study in Vietnam, an authoritarian regime where citizens have fairly restricted political rights, but enjoy some degree of civil liberties (Freedom House, 2019). The following section outlines relevant features of the Vietnam context in more detail.

Pluralism and Environmental Protection in Vietnam

The Socialist Republic of Vietnam (SRV) is a one-party state comprised of four formal structures: the Vietnam Communist Party (VCP), the People's Armed Forces, the state bureaucracy (central and local government), and the Vietnam Fatherland Front (an umbrella group for mass organizations) (Thayer, 2010). Following constitutional reforms in 1992, the unicameral, popularly elected National Assembly officially became the supreme organ of the government with exclusive powers to pass laws and oversee government. In practice, however, the VCP is still seen as playing these roles and thus the National Assembly has been understood as a rubber stamp for decisions already decided upon by the government or the party. Furthermore, close observers of Vietnamese politics hold that the central party-state leadership pre-plans the composition of the National Assembly in a "paint-by-numbers" manner (Malesky and Schuler, 2009). For instance, in the most recent (2016) National Assembly elections, VCP members won 96 percent of seats despite fielding only 89 percent of all candidates[2] (Malesky and Schuler, 2019).

Although power is centralized in terms of party politics, decentralization policies have been pursued since the *Doi Moi* ("Renovation") reforms begun in 1986.[3] These reforms serve to empower three additional tiers of government below the central government level.[4] The pace of decentralization has accelerated since the late 1990s, and local authorities have been granted increasing fiscal autonomy since the adoption of the State Budget Law (SBL) of 2002. Subnational government units are responsible for over half of total government spending; their contribution has been important and increasing with respect to recurrent spending on education, health, economic services, and public administration. Higher capacity local authorities tend to have higher levels of spending responsibilities, though districts that have more people residing in rural areas have devolved more responsibility to the district level (World Bank, 2015). When it comes to water resources management, various functions have been decentralised: for example, provincial and district authorities are responsible for service provision and infrastructure maintenance (Waibel, 2010; UNICEF East Asia and Pacific Regional Office, 2016). As a result, there are considerable differences in the degree to which different localities effectively implement environmental protection policies.

Moreover, Vietnam's subnational units exhibit variation in effective pluralism. Vietnamese citizens vote to elect their representatives in the legislative branch (the National Assembly at the central level and People's Councils at subnational levels), who in turn elect the leadership of the executive branch and appoint the heads of the judiciary. Given that Vietnam is a single-party regime, government institutions at every level are subordinate to the Communist Party. Candidates for public office are therefore vetted by Party. However, seats are contested by multiple

[2] While other political parties are banned in Vietnam, independent candidates are allowed to compete.

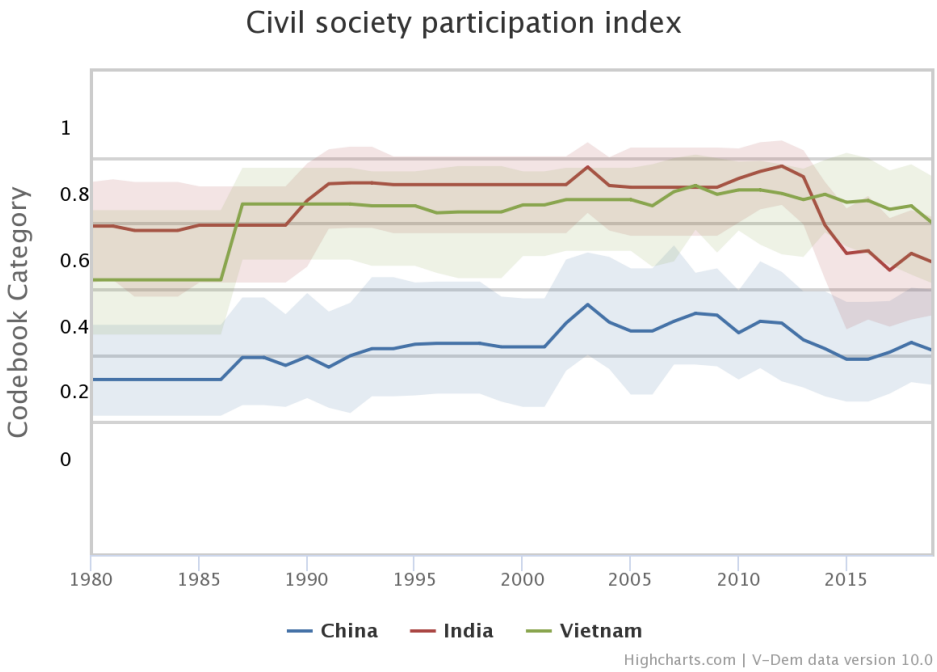
[3] These reforms sought to replace the central planning model of socialism with a "market-oriented socialist economy under state guidance" (Beresford, 2008: 221).

[4] First, the country is divided into 58 provinces; five centrally-controlled municipalities also exist at this level (Hanoi, Ho Chi Minh City, Can Tho, Da Nang and Hai Phong.) Provinces and municipalities are subsequently divided into districts, provincial cities, and district-level towns; these second-level administrative units are subsequently divided into communes, townships, and wards. For the sake of readability, and reflecting the dominant administrative unit type at each level, we refer to all first-level administrative units as provinces, all second-level units as districts, and all third-level units as communes. According to the May 2018 release (3.6) of GADM, the Database of Global Administrative Areas, Vietnam currently has 678 districts and 10,805 communes.

candidates and turnout is high, leading to considerable variation in the degree of competition in local elections (Malesky, Nguyen and Tran, 2014).

Furthermore, though Vietnam's one-party system inhibits electoral pluralism to a large extent, civic participation is relatively high. Figure 1 shows that civil society participation is rated significantly higher in Vietnam than in China, and has been on par with or even exceeded participation in democratic India.

FIGURE 1. CIVIL SOCIETY PARTICIPATION IN VIETNAM, CHINA, AND INDIA



Although mass organizations (those affiliated with the VCP) dominate civil society, the Doi Moi reforms have engendered greater diversity of civic life (Vu, 2017; Taylor et al., 2012). (Note the jump in Vietnam's civil society participation score after 1986 in Figure 1.) This has opened up more space for more non-state actors to participate in policymaking (Larsen, 2011).

Vietnam's emerging civil society has registered some important wins when it comes to environmental protection, natural resource management, and increasing transparency (Vu, 2017; Taylor et al., 2012; O'Rourke, 2001). However, some studies suggest that associational membership can exert a negative impact on outcomes such as economic growth (Pink-Harper and Duong, 2017). When it comes to environmental protection, Trang (2014) shows that the involvement of many localities and various sectors constitute a challenge for managing water quality in the Dong Nai River Basin. In addition, a number of CSOs report that it has been difficult to achieve their objectives without relying on personal connections to government officials (Taylor et al., 2012).

There are documented cases indicating that similar connections between private and state actors hamper environmental protection. As To, Mahanty and Dressler's (2014) ethnographic study of timber trade in the lower Mekong reveals, lower-status traders engaged in illicit activities are frequently protected by more powerful patrons within and outside state agencies, in exchange for financial and other gifts. More generally, Suu (2007) identifies three major areas of business influence through corrupt means in rural Vietnam: in land management and use, the construc-

tion of infrastructure projects, and financial management. All three of these are understood to facilitate water pollution as relates to the establishment of industrial zones, investment in water treatment, and fee collection.

Data and methods

We leverage data primarily from the Vietnam Provincial Governance and Public Administration Performance Index (PAPI).[5] This survey covers all of Vietnam's 63 provinces, and includes 208 districts, 414 communes, and 828 villages. Data is currently available for each year from 2011-2018. Overall, PAPI surveys around 14,000 randomly selected Vietnamese citizens each year with probability proportional to size sampling method.[6] We use PAPI data to construct district-level variables, taking the average for all responses in a given district.[7]

We analyze differences between districts using ordinary least squares regressions for the year 2018 with lagged values of the independent variables and with robust standard errors, to correct for heteroskedastisity:

$$Y_i = \alpha + \beta_1 X_i + \epsilon_i \tag{1}$$

where Y is predicted values of a dependent variable, i is a district, α is an intercept, X is a vector of independent variables, with most of them taken for the year 2016, β_1 is a vector of coefficients for the independent variables, and ϵ is the error term.

Operationalizing Pluralism

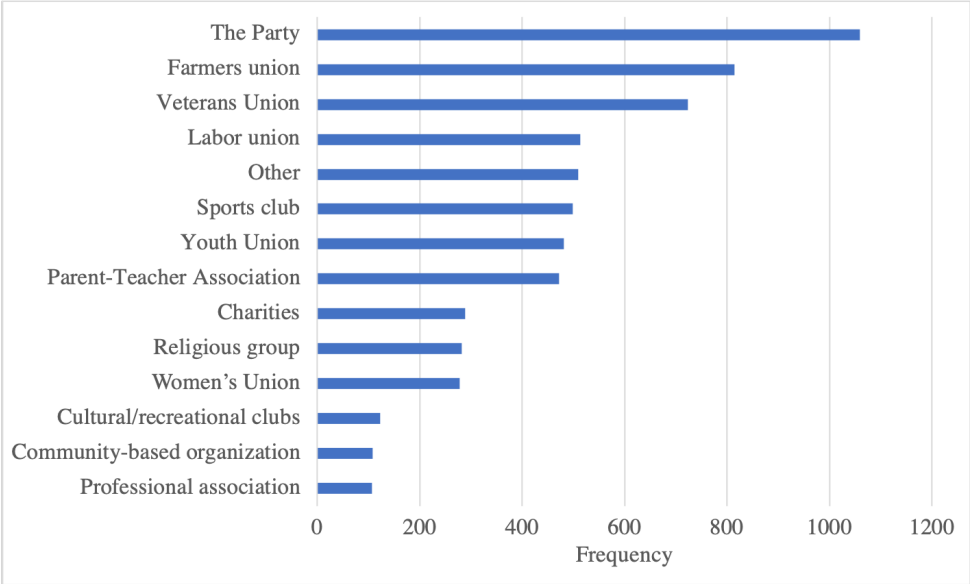
This paper attempts to capture several aspects of pluralistic politics. First, we operationalize pluralism through the degree of citizen participation in civic and political life. The measure of civic engagement is a district-average of "yes" responses to the question, "Are you a member of the Party, a Mass Organization, a professional association, cultural or social groups (for example, dance club, opera, sports team)?" Figure 2 illustrates the range of groups of which respondents to the 2018 PAPI reported being active members.

[5] PAPI survey is jointly conducted by the Center for Community Support and Development Studies (CECODES) and the United Nations Development Programme (UNDP).

[6] For more information on PAPI's sampling strategy and methodology, see `http://papi.org.vn/eng/faq` and PAPI (2011).

[7] See Appendices B and E for further details on variable construction.

FIGURE 2. TABULATION OF REPORTED GROUP MEMBERSHIP, 2018 PAPI



To capture how active citizens are in delivering their interests to the local officials, we also introduce a variable measuring whether citizens have made a proposal to the local governments. Survey respondents were presented with the statement, "Here are actions that people sometimes take as citizens. For each of these, please tell me whether you, personally, have done any of these things during the past year." and could reply yes or no on several actions, among which is "Make a proposal or suggestion to the local authorities." Our measure is a district-average of "yes" replies to this question.

Second, we operationalize the (corrupt) influence of anti-environment business interests with district-average agreement with the statement, "Companies in my district can avoid environmental regulations by paying a bribe." In the robustness checks, we also use an alternative measure of corruptive business influence from the Provincial Competitiveness Index (Malesky, 2018); however, the data are only available for at the province level and do not allow for fine-grained analysis.

Third, we examine how electoral competition, although rather limited given the one-party context, relates to environmental outcomes. We measure electoral pluralism by the presence of non-party members and self-nominated candidates in elections to commune/ward People's Councils in 2016 - the most recent election at this level captured by PAPI. We use the PAPI questions, "Of the candidates for commune-level People's Council members for selection, were there any self-nominated candidates (self-nominated candidates are those who are not introduced by the state to become candidates)?" and "Were any candidates non-Party members?" In 2016, approximately 8 percent of all respondents reported that there was a self-nominated candidate in the local elections and 14 percent reported that there were non-party members in the elections. The number of reported self-nominated candidates varies from 3 in Chau Thanh district to 37 in Thanh Tri district, while the presence of non-party members in elections varies from 3 in Chau Thanh district to 42 in Thanh Tri district.

There are a number of reasons potentially driving the motivation to run as a self-nominated candidate. Interviews conducted in relation to the 2007 elections suggest that many such candidates are motivated to run in order to raise awareness about waste and corruption in major infrastructure projects. Self-nominated candidates may perform this function through their ca-

pacity to question officials during the two-month sessions where the full body is convened. Some have also speculated that self-nominated candidates are motivated to run as a means of gaining access to central government officials in order to further their business interests (Malesky and Schuler, 2009). These diverse motivations speak to the potentially countervailing influence of pluralism on the achievement of policy goals – i.e., improving monitoring and oversight on the one hand, while potentially empowering veto players with interests that may run counter to the public good on the other. Analysis of the 2016 National Assembly results suggest that non-Party members tend to be less highly educated, hold less prestigious occupations, and occupy less high profile/powerful positions in government institutions. Furthermore, a survey experiment conducted in 2018 finds career is not correlated with party status in voters' minds (Malesky and Schuler, 2019). We expect similar dynamics to prevail at the local level when it comes to the profile of non-party candidates.

Finally, in 2016, Vietnam for the first time published vote totals for the winning and losing candidates in its 2016 National Assembly election (Schuler, 2018). We calculate the last winner/first loser ratio for each electoral district to as an alternative measure of electoral competition.

Operationalizing Environmental Protection

We measure environmental protection with two indicators: air and water quality. The SBL 2002 empowers local governments to play an influential role with respect to a number of functions related to these and other contentious aspects of environmental protection.

The Vietnamese government's expansion of export-oriented light industry, and limited capacity for environmental regulation appear to tip the balance in favor of economic development at all costs. At the same time, however, there is emerging evidence that local agencies do sometimes respond to public complaints regarding environmental quality and regulate industrial pollution (O'Rourke, 2002). As we argue above, addressing environmental concerns may also serve as a strategy of regime legitimation.

Conflict over policies to improve air and water quality also reflects their inherent complexity. Not only do urban traffic congestion and industrial pollution negatively impact air and water quality, air quality is also influenced by ground level ozone (O_3) and brick kiln emission (Nguyen, 2009), while water quality is influenced by the degree of land degradation, nutrients in soil and the health of forests surrounding the waterways.

We measure air quality by using a perception-based indicator from PAPI. Respondents were asked to rate air quality in their area on a 4-point scale, with higher values indicating better air quality. To check whether people's perceptions reflect the actual air quality, we attempt to validate our measure with the objective air quality data from the World Air Quality Index project. The objective data on air quality are available for seven stations in Vietnam in seven different districts in different parts of the country. Therefore, air quality data collected from these stations overall provide some idea of the regional differences, which we compare to those reflected in the PAPI data. Table D.1 in Appendix D shows that differences in people's perceptions of air quality between districts approximately match the differences in the objective air quality across the stations.

To measure water quality, we also use a perception-based indicator from PAPI. Respondents were first asked whether there was a waterway near their house. In case of a positive reply, the respondents were asked if the water in this waterway was clean enough to drink, swim or do laundry in. Our measure of water quality is a district-average of "yes" replies to the question on

whether the water quality in the nearby waterway is suitable for swimming. The distribution of replies on both air and water quality per district are presented in Appendix E

Control Variables

We control for the relevant factors from the PAPI dataset that could potentially explain the variation in air and water quality between the Vietnam districts, while also aiming for parsimoniousness. All models control for a measure of the district economic situation, measured by the district-average response to the question, "As for your own family, how do you rate your economic situation today?"

We also control for the extent of agriculture in each district, as we believe it can account for several important factors. First, it can show how remote the district is from the urban areas, which can affect the air and water quality. Second, more agricultural practices in a district can mean higher air and water pollution. We measure the extent of agriculture per district using a district-average response to a question from the PAPI survey on the main occupation of the respondents and code all responses mentioning agriculture as a primary source of income as 1. The variable thus varies from 0 to 1 with higher values implying more people in a district dependent on agriculture for their income.

We also incorporate data from two additional sources. First, we control for district population using data from WorldPop, since population size can affect both air and water quality.[8] We use QGIS to match district shape files with the population grids, to extract district-level estimates for population size for 2010 and 2015.

Second, we control for average night light brightness. Night lights are a frequent proxy for economic development (Henderson, Storeygard and Weil, 2012), which affects the capacity to invest in environmental protection. Night lights also reflect population density, and thus the extent of emissions from fossil fuels used for electricity generation. Our data on night-time lights comes from the United States Air Force Defense Meteorological Satellite Program Nighttime Lights Time Series and are available yearly from 1992-2013. We incorporate district-level data on average brightness of night-time lights for 2011-2013.

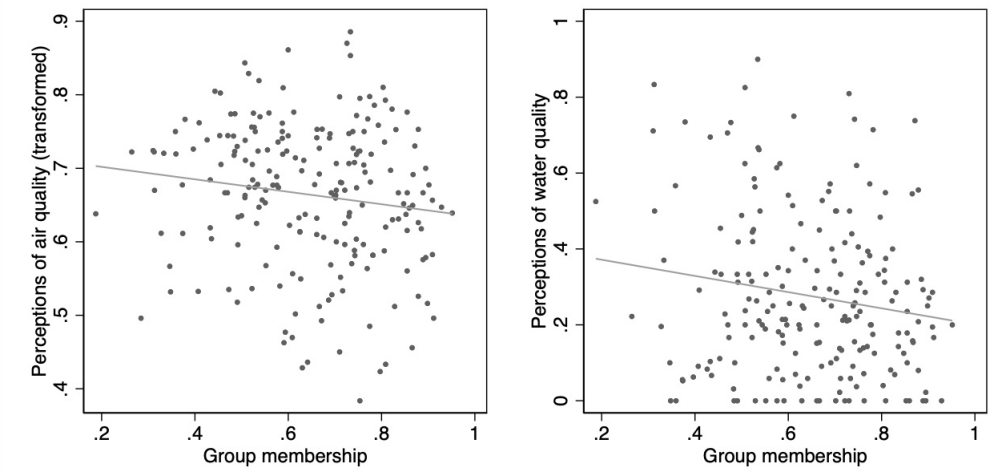
None of our selected variables correlate at a high level; therefore, we include them in the same models. Details of the construction of all variables used in the analysis are presented in Table A.1 in the Appendix. Summary statistics and correlation between all variables used in the analysis are presented in Appendix B. Distributions of observations across districts for all variables for the years when they are included in the models are presented in Appendix C.

RESULTS

Figure 3 depicts Vietnam's 208 districts ordered according to their levels of civic pluralism measured by the average self-reported membership in civic and political organizations and their air (left) and water (right) quality. The figure shows the slight negative association between group membership and the two aspects of environmental protection.

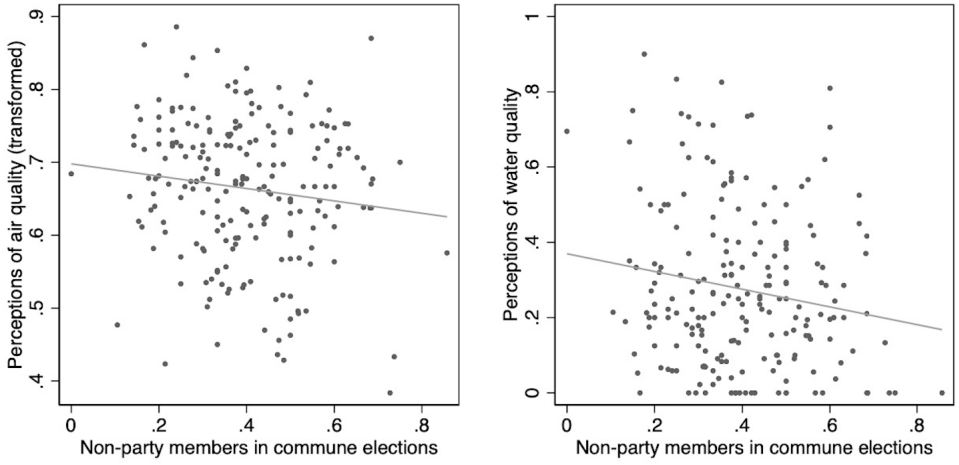
[8] WorldPop uses census, survey, satellite, social media, cellphone and other spatial datasets to generate gridded population maps, estimating population size for every 100x100m grid square. Gridded population data is available for Vietnam for 2010 and 2015. For more, see http://www.worldpop. org.uk/

FIGURE 3. VIETNAM DISTRICTS POSITIONED ACCORDING TO THEIR LEVELS OF CIVIC PLURALISM AND AIR/WATER QUALITY



In a similar manner, Figure 4 positions Vietnam districts according to their levels of electoral pluralism measured by the presence of non-party members in commune elections, and the reported air/water quality. The figure also shows a negative relationship between electoral pluralism and the selected measures of environmental protection.

FIGURE 4. VIETNAM DISTRICTS POSITIONED ACCORDING TO THEIR LEVELS OF ELECTORAL PLURALISM AND AIR/WATER QUALITY

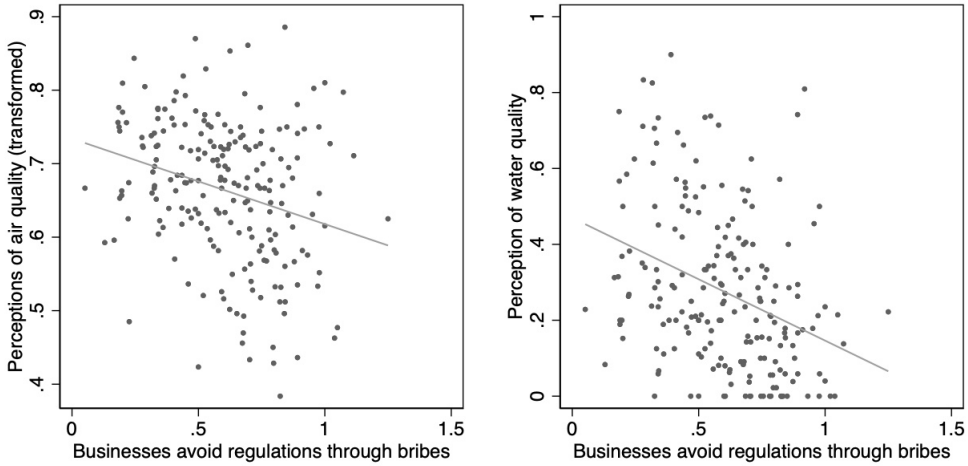


Finally, Figure 5 shows that the (corrupt) influence of business interests is linearly and negatively associated with air quality: districts with greater business influence on average tend to have lower air and water quality, as perceived by the residents of these districts.

The trends in all three figures indicate a negative association between pluralism and environmental protection. While the associations between the variables do not appear very strong, districts with higher pluralism do tend to perform worse on both environmental indicators.

We proceed by investigating these associations in a greater detail by controlling for the relevant factors that might explain the variation in air and water quality between districts in a number

FIGURE 5. VIETNAM DISTRICTS POSITIONED ACCORDING TO THEIR LEVELS OF BUSINESS CORRUPTION IN THE ENVIRONMENTAL SECTOR AND AIR/WATER QUALITY



of regressions. Table 1 shows the relationship between our different measures of civic pluralism and air/water quality in Vietnam's 208 districts. In Models 1, 2, 5 and 6, we operationalize civic pluralism as group membership, while in Models 3, 4, 7 and 8, we use the average number of citizen proposals to the local governments. Models 1, 3, 5 and 7 show bivariate relationships, while Models 2, 4, 6 and 8 account for the influence of the control variables.

Models in Table 1 show that the association between civic pluralism and air/water quality is negative and significant. Overall these results imply that districts with higher civic participation have lower air and water quality, which provides support for the "citizens as veto players" hypothesis outlined in the theory section. Similarly, higher number of proposals to the governments is associated with lower water and air quality across districts, although the result for air quality is only significant at 10 percent.

TABLE 1. THE RELATIONSHIP BETWEEN CIVIC PLURALISM AND AIR/WATER QUALITY ACROSS VIETNAM DISTRICTS

	Air quality				Water quality			
	1	2	3	4	5	6	7	8
Group memb.	-0.085*	-0.132***			-0.213*	-0.336***		
	(0.038)	(0.038)			(0.098)	(0.094)		
Gov. proposal			-0.008	-0.111†			-0.111	-0.514**
			(0.054)	(0.065)			(0.148)	(0.154)
Econ. sit.(ln)		0.232***		0.216***		0.284*		0.303*
		(0.058)		(0.061)		(0.136)		(0.141)
Agriculture		-0.066*		-0.074*		-0.050		-0.055
		(0.033)		(0.034)		(0.063)		(0.064)
Night lights(ln)		-0.016**		-0.017**		-0.046***		-0.054***
		(0.005)		(0.005)		(0.009)		(0.010)
Pop. size(ln)		-0.026*		-0.022*		-0.034†		-0.028
		(0.010)		(0.011)		(0.018)		(0.019)
Constant	0.719***	0.865***	0.666***	0.784***	0.414***	0.692**	0.307***	0.545*
	(0.025)	(0.124)	(0.016)	(0.130)	(0.069)	(0.211)	(0.046)	(0.219)
Observations	208	203	208	203	204	199	204	199
R-squared	0.020	0.145	0.000	0.115	0.026	0.187	0.003	0.182

Cross-district regression for the year 2018. Robust standard errors in parentheses. $^{***}p<0.001$, $^{**}p<0.01$, $^{*}p<0.05$, $^{\dagger}p<0.1$. All Independent variables are lagged 2 years. Night lights are for the year 2013. Population size is for the year 2015. Abbreviations: memb. = membership; ln = natural logarithm; Econ.sit. = economic situation; Pop. = population.

Table 2 shows the relationship between our different measures of electoral pluralism and air/water quality in the 208 Vietnam districts. We operationalize electoral pluralism in terms of the presence of non-party members in commune elections (in Models 1, 2, 5 and 6) and the presence of self-nominated candidates (in Models 3, 4, 7 and 8). Similarly to the previous table, Models 1, 3, 5 and 7 show bivariate relationships, while Models 2, 4, 6 and 8 account for the effect of the control variables. The association between electoral pluralism and air/water quality across districts in Vietnam is again negative and significant in most models. Districts with more non-party members competing in the commune elections have significantly lower air and water quality. The same result for air quality also holds in models with self-nominated candidates as the measure of electoral pluralism.

TABLE 2. THE RELATIONSHIP BETWEEN ELECTORAL PLURALISM AND AIR/WATER QUALITY ACROSS VIETNAM DISTRICTS

	Air quality				Water quality			
	1	2	3	4	5	6	7	8
Non-part memb.	-0.085†	-0.084†			-0.235*	-0.198†		
	(0.047)	(0.045)			(0.101)	(0.101)		
Self-nom. cand.			-0.152**	-0.141**			0.051	0.186
			(0.053)	(0.053)			(0.138)	(0.134)
Econ. sit.(ln)		0.202***		0.169**		0.210		0.204
		(0.058)		(0.059)		(0.144)		(0.147)
Agriculture		-0.072*		-0.101**		-0.067		-0.062
		(0.033)		(0.034)		(0.067)		(0.068)
Night lights(ln)		-0.014**		-0.015**		-0.042***		-0.044***
		(0.005)		(0.005)		(0.009)		(0.009)
Pop. size(ln)		-0.021*		-0.016		-0.023		-0.024
		(0.010)		(0.010)		(0.020)		(0.020)
Constant	0.698***	0.792***	0.696***	0.769***	0.370***	0.501*	0.266***	0.407†
	(0.019)	(0.132)	(0.013)	(0.126)	(0.045)	(0.230)	(0.032)	(0.231)
Observations	208	203	208	203	204	199	204	199
R-squared	0.017	0.119	0.034	0.129	0.028	0.148	0.001	0.139

Cross-district regression for the year 2018. Robust standard errors in parentheses. $^{***}p<0.001$, $^{**}p<0.01$, $^{*}p<0.05$, $^{\dagger}p<0.1$. All Independent variables are lagged 2 years. Night-time lights are for the year 2013. Population size is for the year 2015. Abbreviations: Non-par. mem. = non-party members in elections to communes; Self-nom. cand. = self-nominated candidates in elections to communes; Econ.sit = of economic situation in the district; Pop.=population; ln = natural logarithm

Finally, Table 3 presents the results for the association between the influence of corruptive business interests and air/water quality across the Vietnam districts as well as results for the tests when all three measures of pluralism are included in the same model. Models 1 and 4 present results from the bivariate regressions, Models 2 and 5 account for the control variables, and Models 3 and 5 combine our main measures of civic and electoral pluralism (group membership and non-party members competing in commune elections) with the measure of business corruption against the environment, accounting for the relevant control variables. The results show that districts where corruptive business interests are more influential have lower air and water quality and this relationship is statistically significant across all models. Analyzing the

findings presented in models 3 and 6, the corruptive influence of business interests seems to be the strongest predictor of air and water quality across districts, compared to civic and electoral pluralism. The previously discovered result for electoral pluralism loses its statistical power, while the measure of civic pluralism (group membership) is still significant when it comes to explaining variation in water quality.

TABLE 3. BUSINESS INTERESTS AND AIR/WATER QUALITY ACROSS VIETNAM DISTRICTS

	Air quality			Water quality		
	1	2	3	4	5	6
Business influence	-0.116***	-0.117***	-0.092*	-0.323***	-0.286***	-0.222***
	(0.029)	(0.030)	(0.036)	(0.064)	(0.063)	(0.062)
Group membership			-0.063			-0.168†
			(0.044)			(0.092)
Non-party members in elections			-0.035			-0.075
			(0.046)			(0.096)
Economic situation (ln)		0.163**	0.194**		0.117	0.195
		(0.056)	(0.061)		(0.129)	(0.134)
Agriculture		-0.107**	-0.091**		-0.150*	-0.109
		(0.033)	(0.035)		(0.063)	(0.067)
Night lights (ln)		-0.014**	-0.014**		-0.042***	-0.043***
		(0.005)	(0.005)		(0.009)	(0.009)
Population size (ln)		-0.020†	-0.023*		-0.019	-0.028
		(0.010)	(0.010)		(0.019)	(0.018)
Constant	0.734***	0.861***	0.904***	0.470***	0.680**	0.788***
	(0.017)	(0.124)	(0.127)	(0.043)	(0.208)	(0.206)
Observations	208	203	203	204	199	199
R-squared	0.075	0.175	0.186	0.121	0.221	0.237

*Cross-district regression for the year 2018. Robust standard errors in parentheses. ***p<0.001, **p<0.01, *p<0.05, †p<0.1. All Independent variables are lagged 2 years. Night-time lights are for the year 2013. Population size is for the year 2015. Abbreviations: ln = natural logarithm*

Robustness checks

To query the robustness of our results, we perform a number of additional tests. First, we use alternative measures of the dependent variables: the perceived change in air and water quality. We analyze district-average responses to the questions "How does the air quality compare with three years ago?" and "How does the water quality compare with the three years ago?". The findings are presented in Table F.1-F.3 in Appendix F and similarly to the main models indicate that all aspects of pluralism are associated with the perceptions of negative air and water quality change across districts, with the results being even stronger than in the main models.

Second, we test for potential reverse causality. In principle, our results could indicate that people in districts with poor air and water quality tend to organize more and thus are characterized by more active memberships in civil society groups to attract attention to environmental pollution. To address these concerns, we estimate regressions with our measures of civic pluralism as dependent variables and air and water quality as independent variables using the fixed effects specification. This helps us estimate if the change in the air/water quality perception is associated with the change in the reported group memberships and the average number of proposals made to local governments per district. The results, presented in Appendix K, are insignificant implying that there is no association between the change in water/air quality and the change in civic pluralism. This alleviates some concern about reverse causality.

Third, we analyze the proposed relationships between various aspects of pluralism and air/water quality across Vietnam provinces (the administrative unit above the district), which allows us to control for additional relevant factors for which data are unavailable at district level. These include an alternative measure of business corruption from the Vietnam Provincial Competitiveness Index (Malesky, 2018), a measure of income per capita, the degree of industrial production, and population density from the official Vietnam statistics (General Statistics Office of Viet Nam, 2019). In the province-level analysis, we similarly use the perceptions of air and water quality as dependent variables but aggregate them up to the province level, instead of per district. The results reflect those in the main analysis: provinces that exhibit a higher degree of pluralism also tend to have lower air and water quality. We note that the results for water quality are weaker; this could be explained by the aggregation of more water sources on the province level, creating more noise in our analysis. Notably, the result for the alternative business corruption indicator is also negative and significant, just as in the main analysis.

Fourth, we re-run our analyses using an alternative measure of electoral pluralism: competition in the 2016 National Assembly elections. The results are presented in Appendix H and are insignificant, implying that it is more relevant to analyze the participation of alternative candidates with possibly independent voices in local elections rather than the degree of competition between the candidates. This likely reflects the "paint-by-numbers" nature of electoral competition in Vietnam noted above (Malesky and Schuler, 2009).

Fifth, we estimate a series of models that capture changes within districts over time. Here our analysis is restricted to those indicators of pluralism that vary within districts according to available data: civic pluralism and the corrupt influence of business interests. We lag all independent variables two years assuming it takes some time before they exert an effect on air and water quality. We also interpolate missing years for night lights and population size assuming steady linear growth within districts. We estimate both fixed effects models and a pooled time-series regression with panel corrected standard errors, lagged dependent variable and Prais-Winston transformation to eliminate auto-correlation. As tables in Appendices I and J show, we find significant results only in a pooled regression with panel corrected standard errors.

The results, nevertheless, reflect those in the main models: higher pluralism is associated with lower air and water quality.

DISCUSSION

Our analysis provides insight into the relationship between pluralism and environmental outcomes in authoritarian regimes. We show that pluralism, whether it manifests through civil society activity, electoral competition or business interference, is detrimental for such contentious issues as air and water quality. The results are robust to alternative specifications and various estimation strategies, being particularly strong in models that include business influence as a measure of pluralism. These findings indicate that in contexts where business interests have enough power to bribe public officials in order to avoid environmental regulations, air and water quality may be particularly harmed.

We also find strong evidence that more civic group membership and more proposals to local governments are related to lower air and water quality, suggesting that citizens can act as veto players and promote their interests favoring economic growth at the expense of environmental quality. However, it is difficult for us to eliminate the possibility of reverse causality, given data availability. Given the exploratory nature of this analysis, we still find this result interesting. It indicates that no matter what the nature of the civic group memberships are, and regardless of the direction of the causality, civic pluralism may not benefit air and water quality in lower income authoritarian settings.

Our findings thus offer an important nuance to previous research on the benefits of participation and oversight for achieving environmental goals. The effects we find are rather small and we expect this may be due to our focus on an authoritarian regime, where the meaning of pluralism might differ from that in democracies. It is likely that civic groups as well as non-party members and self-nominated candidates do not have as strong voice or influence on decision-making and implementation as opposition parties and interest groups in democratic regimes. However, the fact that we find an effect in an authoritarian setting where the level of pluralism is minimal suggests that the role of pluralism in achieving various policy goals is worth investigating in democracies, and that the results might even be stronger.

Finally, our study highlights the pernicious influence of corruption on environmental protection. Whereas reforms to liberalize Vietnam's economy have facilitated the country's transition from one of the world's poorest countries to its current lower middle-income status, these same reforms have also empowered business actors to further their interests – in some cases through corrupt means (Gainsborough, 2003). This complicates the acknowledged tension between economic development and environmental protection. Future research is needed to identify the most effective means of resolving such tensions in order to achieve sustainable development.

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A DESCRIPTION OF THE VARIABLES

TABLE A.1. DESCRIPTION OF THE VARIABLES: DATA SOURCES AND CONSTRUCTION

Variable	Source	Method of construction
Air quality	PAPI	Average responses to the question: "Could you please rate the air quality in your area?" Responses are given on 4-point scale: 1 "Poor", 2 "Poor on most days", 3 "Good on most days", 4 "Good". The measure is negatively skewed. We reverse it to achieve positive skewness and then take an inverse.
Water quality	PAPI	Average of "yes" responses to the binary question: "Is the water clean enough to swim", which is a follow-up to the question "Is there a waterway near your house?"
Air quality change	PAPI	Average responses to the question "How does the air quality compare with three years ago?". Responses are given on a 3-point scale: 1 "worse", 2 "same", 3 "better".
Water quality change	PAPI	Average responses to the question "How does the water quality compare with the three years ago?". Responses are given on a 3-point scale: 1 "worse", 2 "same", 3 "better".
Group membership	PAPI	Average of "yes" responses to the binary question "Are you a member of the Party, a Mass Organization, a professional association, cultural or social groups (for example, dance club, opera, sports team)?"
Made a proposal	PAPI	Average of "yes" responses to the binary question "Here are actions that people sometimes take as citizens. For each of these, please tell me whether you, personally, have done any of these things during the past year: Make a proposal or suggestion to the local authorities"
Non-party members in elections	PAPI	Average of "yes" responses to the binary question: "Were any candidates non-Party members?" as a follow up to the question "Has election for Members of commune/ward People's Council been held in your locality in 2016?"
Self-nominated candidates in elections	PAPI	Average of "yes" responses to the binary question: "Of the candidates for commune-level Peoples Council members for selection, were there any self-nominated candidates (self-nominated candidates are those who are not introduced by the state to become candidates)?" as a follow up to the question "Has election for Members of commune/ward Peoples Council been held in your locality in 2016?"
Business influence	PAPI	Average agreement with the statement "Companies in my district can avoid environmental regulations by paying a bribe." The responses are given on a 3-point scale: 2 "agree", 1 "somewhat agree", 0 "disagree"

Economic situation	PAPI	Average response to the question: "As for your own family, how do you rate your economic situation today? Is it ...?". The responses are given on a 4-point scale: 4 "very good", 3 "good", 2 "neither good or bad", 1 "bad", 0 "very bad". The variable is negatively skewed. We reverse it to achieve the positive skewness, take the natural logarithm, and then reverse it back for higher values to mean better economic situation
Agriculture	PAPI	Average responses "01 Agriculture" to the question "In which sector is your current primary occupation [was your last job if retired]?"
Education	PAPI	Average responses to the question: "What is your highest level of education?" The responses vary from 1 "no formal education" to 10 "post-graduate degree"
Business corruption*	PCI	Total percentage of responses "agree" or "totally agree" to the statement "Enterprises in my line of business usually have to pay for informal charges"
Population size	WorldPop	District shape files matched with the gridded population data from 2010 and 2015. We fill in missing values assuming constant linear population growth. We use a natural logarithm of the variable due to its positive skewness
Night-time lights	DMSP-OLS	Average brightness of nighttime lights for 2011-2013. We fill in missing values assuming constant linear growth within districts. We use a natural logarithm of the variable due to its positive skewness
Industrial production*	Vietnam National Statistics	We calculated the measure of industrial production using yearly growth data in per cent relative to the base year (2010) and the data on the price of the gross industrial output in billion dong in current prices in the base year. We use a natural logarithm of the variable due to its positive skewness
Population density*	Vietnam National Statistics	people/km2. We use a natural logarithm of the variable due to positive skewness
Income per capita*	Vietnam National Statistics	In thousand dong, at current prices. We use a natural logarithm of the variable due to positive skewness
Competitiveness	Vietnam National Election Council	First loser-last winner ratio of the number of votes per candidate

B SUMMARY STATISTICS AND CORRELATIONS

TABLE B.1. SUMMARY STATISTICS

Variable	Obs	Mean	Std. Dev.	Min	Max
Air quality	208	3.46	0.26	2.39	3.87
Air quality (transformed)	208	0.66	0.10	0.38	0.89
Water quality	204	0.28	0.21	0.00	0.90
Member of political or civic group	208	0.65	0.16	0.19	0.95
Made a proposal to a local government	208	0.27	0.11	0.07	0.62
Business corruption	208	0.60	0.23	0.05	1.25
Non-party members in elections	208	0.40	0.15	0.00	0.86
Self-nomin. candidates in elections	208	0.21	0.12	0.00	0.65
Economic situation	208	2.00	0.15	1.23	2.30
Economic situation (transformed)	208	1.01	0.14	0.43	1.36
Agriculture	208	0.38	0.26	0.00	0.94
Night lights	203	16.52	18.09	0.00	63.00
Night lights (ln)	203	1.74	1.99	-4.33	4.14
Population size	203	141323.50	98306.05	7916.77	751977.10
Population size (transformed)	203	11.63	0.71	8.98	13.53

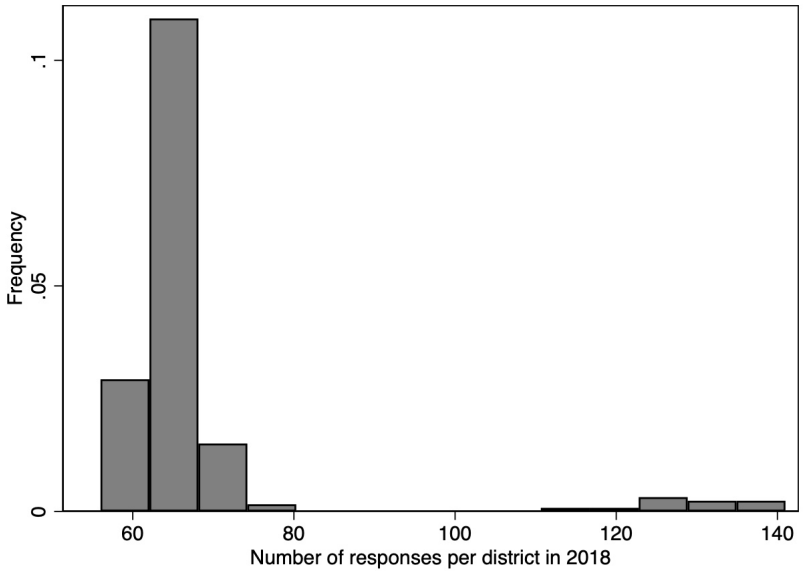
TABLE B.2. CORRELATIONS BETWEEN VARIABLES

	Air qual.	Water qual.	Group mem	Prop osal	Corr upt	Non par	Self-nom	Eco sit	Agric	Lights	Pop.
Air quality	1.00										
Water quality	0.17	1.00									
Group memb.	-0.15	-0.16	1.00								
Made a proposal	-0.02	-0.06	0.66	1.00							
Business corruption	-0.28	-0.34	0.35	0.12	1.00						
Non-party members	-0.11	-0.15	0.27	0.26	0.20	1.00					
Self-nomin. candid.	-0.17	0.04	-0.05	0.00	0.10	0.12	1.00				
Econ. sit.(ln)	0.13	-0.07	0.11	0.05	-0.02	0.12	-0.01	1.00			
Agriculture	-0.05	0.14	0.20	0.32	-0.24	0.09	-0.29	-0.33	1.00		
Night lights (ln)	-0.12	-0.33	-0.14	-0.36	0.15	0.04	0.16	0.48	-0.63	1.00	
Pop. size (ln)	-0.14	-0.19	-0.19	-0.23	0.06	-0.04	0.20	0.35	-0.33	0.41	1.00

B.1 Average number of observations per district

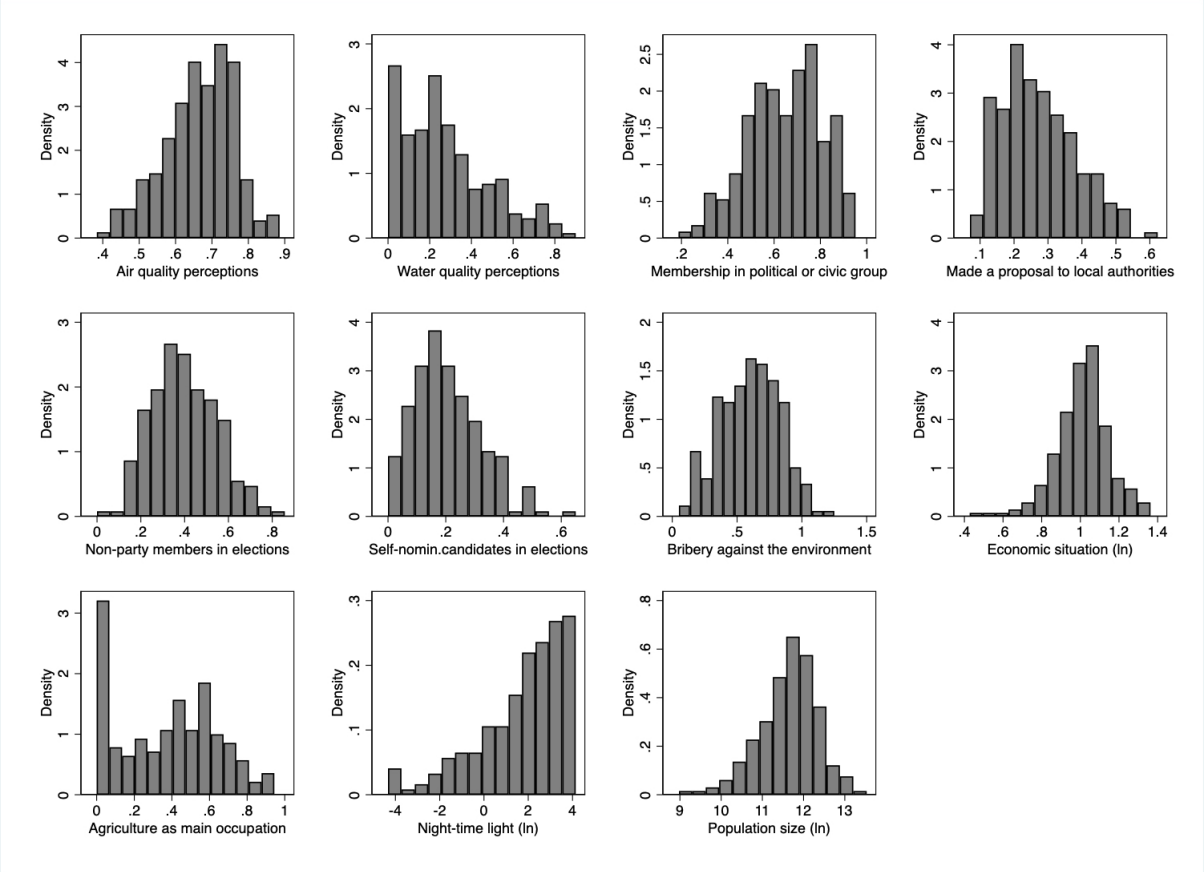
The number of responses per district on each of the variables varies depending on the district population and land area size. For example, in 2018, the number of respondents per district varied from 56 in sparsely populated Tay Tra to 141 in highly populated Hoc Mon, as shown in Figure B.1.

FIGURE B.1. NUMBER OF RESPONSES ACROSS VIETNAM DISTRICTS



C FREQUENCIES ACROSS DISTRICTS

FIGURE C.1. DISTRIBUTION OF OBSERVATIONS ON THE ORIGINAL VARIABLES ACROSS DISTRICTS



Note: the frequencies for air and water quality are taken for the year 2018; for night-time lights - for the year 2013; population size - for the year 2015, and the rest of variables - for 2016.

D AIR QUALITY VALIDATION

Air quality index is available for seven stations in Vietnam located in different parts of the country. The stations collect data for the concentration of $PM_{2.5}$, PM_{10}, SO_2, NO_2, O_3 and CO hourly. Historical data on the concentration of these pollutants are available daily, for some stations since 2014, with large gaps. For more information about the index, please visit https://aqicn.org/.

We checked the date when PAPI survey took place in each of the districts in 2018 and evaluated the general trends in air quality measures during the closest months to the survey in 2018 or closest years available from the World Air Quality Index project. Historical records on air quality also summarize the number of days per month, when the air quality was good, moderate, unhealthy or hazardous. In Table D.1, we summarize our observation of trends for the months closest to the PAPI survey in the respective districts and compare the air quality index data with the district-average perception of air quality from PAPI survey.

TABLE D.1. AIR QUALITY VALIDATION

Station /district	**Month of PAPI survey**	**Perception of air quality (PAPI2018)**	**Air quality index trends**
Viet Tri	July	3.28	good**
Hanoi	October	2.83	unhealthy on most days
Ha Long	October	3.49	good*
Ho Chi Min	November	3.24	good-moderate on most days
Nha trang	November	3.51	good*
Da Nang	August	3.50	good*
Hue	August	3.66	good**

*Note: * - trends for respective months in 2019; ** - trends for respective months in 2015*

E RESPONSES ON AIR AND WATER QUALITY ACROSS DISTRICTS

FIGURE E.1. DISTRIBUTION OF RESPONSES ON AIR QUALITY PER DISTRICT

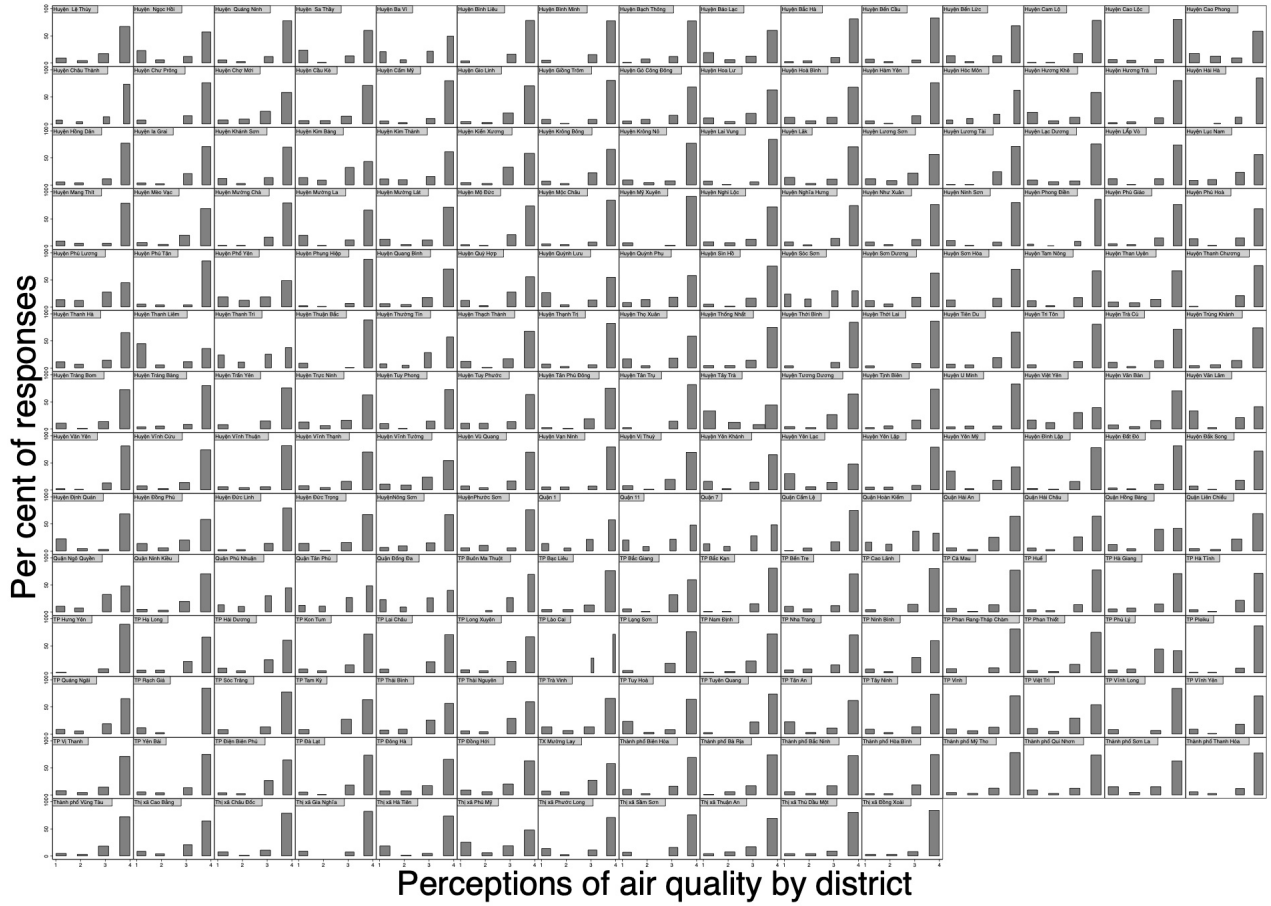
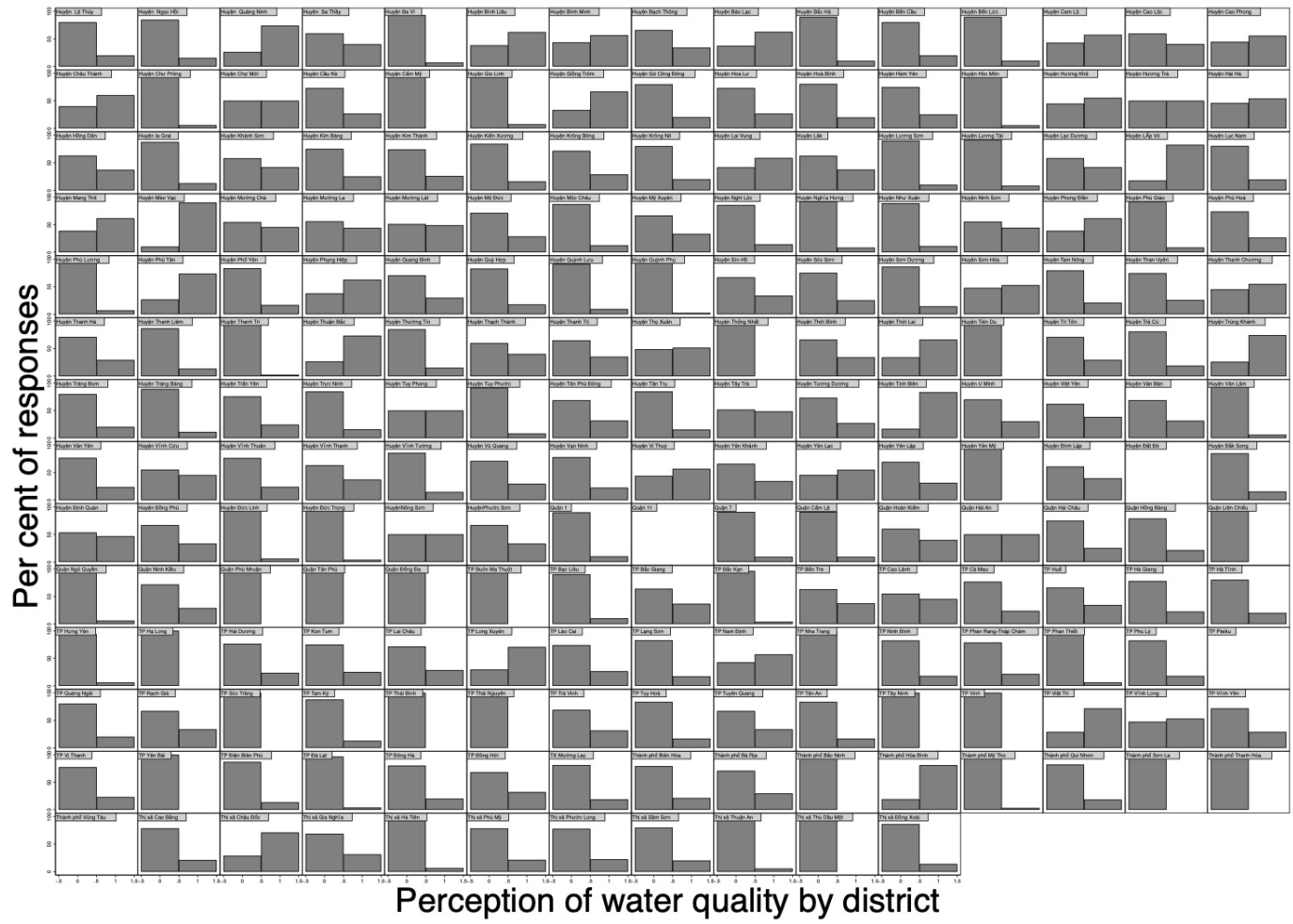


FIGURE E.2. DISTRIBUTION OF RESPONSES ON WATER QUALITY PER DISTRICT



F ROBUSTNESS CHECKS. ALTERNATIVE DEPENDENT VARIABLES

TABLE F.1. THE RELATIONSHIP BETWEEN CIVIC PLURALISM AND PERCEPTIONS OF AIR/WATER QUALITY CHANGE ACROSS VIETNAM DISTRICTS

	Change in air quality				Change in water quality			
	1	2	3	4	5	6	7	8
Group memb.	-0.329***	-0.382***			-0.749***	-0.644***		
	(0.082)	(0.086)			(0.138)	(0.135)		
Made a proposal			-0.429***	-0.651***			-1.023***	-0.855***
			(0.121)	(0.133)			(0.193)	(0.211)
Econ. sit.(ln)		0.222†		0.257*		-0.135		-0.128
		(0.115)		(0.115)		(0.184)		(0.183)
Agriculture		-0.123		-0.127†		-0.341***		-0.358***
		(0.075)		(0.075)		(0.092)		(0.098)
Night lights (ln)		-0.025*		-0.036**		-0.006		-0.019
		(0.012)		(0.013)		(0.014)		(0.015)
Pop. size (ln)		-0.042†		-0.036		0.024		0.037
		(0.023)		(0.022)		(0.031)		(0.034)
Constant	2.230***	2.614***	2.136***	2.459***	2.030***	1.961***	1.827***	1.649***
	(0.055)	(0.275)	(0.038)	(0.263)	(0.096)	(0.336)	(0.062)	(0.350)
Observations	208	203	208	203	204	199	204	199
R-squared	0.064	0.119	0.050	0.131	0.146	0.221	0.125	0.191

*Robust standard errors in parentheses, ***p<0.001, **p<0.01, *p<0.05, †p<0.1. All independent variables are lagged 2 years. Night lights are taken for the year 2013; population size is taken for the year 2015. Abbreviations: memb. = membership; econ. sit. = economic situation; ln = natural logarithm; pop. = population*

TABLE F.2. THE RELATIONSHIP BETWEEN ELECTORAL PLURALISM AND PERCEPTIONS OF AIR/WATER QUALITY CHANGE ACROSS VIETNAM DISTRICTS

	Change in air quality				Change in water quality			
	1	2	3	4	5	6	7	8
Non-part. mem.	-0.344***	-0.316***			-0.472***	-0.376**		
	(0.093)	(0.092)			(0.128)	(0.136)		
Self-nom. cand.			-0.180	-0.184			0.460*	0.168
			(0.120)	(0.127)			(0.230)	(0.212)
Econ. sit.(ln)		0.144		0.071		-0.275		-0.313†
		(0.116)		(0.122)		(0.184)		(0.188)
Agriculture		-0.133†		-0.193*		-0.373***		-0.391***
		(0.074)		(0.080)		(0.101)		(0.101)
Night lights (ln)		-0.020		-0.024†		0.001		-0.003
		(0.013)		(0.013)		(0.015)		(0.015)
Pop. size (ln)		-0.031		-0.020		0.045		0.047
		(0.023)		(0.024)		(0.035)		(0.033)
Constant	2.155***	2.433***	2.056***	2.322***	1.733***	1.595***	1.450***	1.429***
	(0.040)	(0.267)	(0.028)	(0.263)	(0.054)	(0.373)	(0.047)	(0.363)
Observations	208	203	208	203	204	199	204	199
R-squared	0.061	0.093	0.011	0.053	0.051	0.158	0.031	0.130

Robust standard errors in parentheses, $^{***}p<0.001$, $^{**}p<0.01$, $^{*}p<0.05$, $^{\dagger}p<0.1$. All independent variables are lagged 2 years. Night lights are taken for the year 2013; population size is taken for the year 2015. Abbreviations: non-part. memb. = non-party members in commune elections; self-nomin. cand. = self-nominated candidates in commune elections; econ. sit. = economic situation; ln = natural logarithm; pop. = population

TABLE F.3. THE RELATIONSHIP BETWEEN BUSINESS INFLUENCE AND PERCEPTIONS OF AIR/WATER QUALITY CHANGE ACROSS VIETNAM DISTRICTS

	Change in air quality			Change in water quality		
	1	2	3	4	5	6
Business influence	-0.336***	-0.358***	-0.283***	-0.132	-0.263*	-0.056
	(0.063)	(0.064)	(0.075)	(0.110)	(0.104)	(0.111)
Group membership			-0.154			-0.555***
			(0.096)			(0.150)
Non-party members in elections			-0.173†			-0.223†
			(0.090)			(0.124)
Economic situation (ln)		0.016	0.109		-0.393*	-0.138
		(0.103)	(0.112)		(0.186)	(0.183)
Agriculture		-0.247***	-0.194*		-0.472***	-0.339***
		(0.073)	(0.075)		(0.095)	(0.092)
Night lights (ln)		-0.021†	-0.020†		-0.001	-0.003
		(0.011)	(0.012)		(0.015)	(0.014)
Population size (ln)		-0.024	-0.034		0.052	0.023
		(0.021)	(0.022)		(0.033)	(0.031)
Constant	2.220***	2.622***	2.748***	1.624***	1.680***	2.030***
	(0.036)	(0.242)	(0.254)	(0.063)	(0.362)	(0.347)
Observations	208	203	203	204	199	199
R-squared	0.137	0.191	0.218	0.009	0.161	0.233

*Robust standard errors in parentheses, ***p<0.001, **p<0.01, *p<0.05, †p<0.1. All independent variables are lagged 2 years. Night lights are taken for the year 2013; population size is taken for the year 2015. Abbreviations: ln = natural logarithm*

G ROBUSTNESS CHECKS. PROVINCE-LEVEL ANALYSIS

In order to allow for alternative control variables, we conduct the analysis comparing Vietnam provinces instead of districts, as there are more data available on the province-level. When comparing provinces, we measure corruption using the data from Vietnam Provincial Competitiveness Index on informal charges that businesses have to pay when conducting their operations in different provinces in Vietnam (Malesky, 2018). The data are based on a large-scale survey of business representatives in the entire country and our measure is a total percentage of affirmative responses with the statement "Enterprises in my line of business usually have to pay for informal charges" by the survey respondents.

The measures of income per capita, the level of industrial production and population density come from the National Statistics of Vietnam (2019). We calculated the measure of industrial production using yearly growth data in per cent relative to the base year (2010), available from the national statistics, and the data on the actual level of production levels in the base year. The results are presented in Tables G.1 - G.3

TABLE G.1. THE RELATIONSHIP BETWEEN CIVIC PLURALISM AND AIR/WATER QUALITY ACROSS VIETNAM PROVINCES

	Air quality				Water quality			
	1	2	3	4	5	6	7	8
Group memb.	-0.160*	-0.172*			-0.161	-0.229		
	(0.064)	(0.066)			(0.157)	(0.150)		
Made a proposal			-0.125	-0.239*			0.071	-0.096
			(0.086)	(0.096)			(0.228)	(0.250)
Income/cap (ln)		0.050		0.047		-0.219*		-0.208*
		(0.043)		(0.045)		(0.100)		(0.100)
Agriculture		-0.028		-0.030		-0.047		-0.097
		(0.064)		(0.064)		(0.115)		(0.131)
Ind. prod. (ln)		-0.009		-0.006		0.011		0.013
		(0.009)		(0.010)		(0.020)		(0.021)
Pop. dens. (ln)		-0.033*		-0.040*		0.011		0.004
		(0.015)		(0.016)		(0.040)		(0.039)
Constant	0.767***	0.667*	0.697***	0.659*	0.394***	2.007**	0.270***	1.842**
	(0.042)	(0.281)	(0.026)	(0.281)	(0.111)	(0.656)	(0.072)	(0.657)
Observations	63	63	63	63	63	63	63	63
R-squared	0.102	0.273	0.023	0.230	0.022	0.126	0.002	0.090

Robust standard errors in parentheses, $^{***}p<0.001$, $^{**}p<0.01$, $^{*}p<0.05$, $^{\dagger}p<0.1$. All independent variables are lagged 2 years. Night lights are taken for the year 2013; population size is taken for the year 2015. Abbreviations: memb. = membership; income/cap = income per capita; ln = natural logarithm; ind. prod. = industrial production; pop. dens. = population density

TABLE G.2. THE RELATIONSHIP BETWEEN ELECTORAL PLURALISM AND AIR/WATER QUALITY ACROSS VIETNAM PROVINCES

	Air quality				Water quality			
	1	2	3	4	5	6	7	8
Non-part memb.	-0.309**	-0.269*			-0.309	-0.277		
	(0.113)	(0.116)			(0.219)	(0.218)		
Self-nomin. cand.			-0.187*	-0.179*			0.398	0.452*
			(0.093)	(0.083)			(0.248)	(0.193)
Income/cap (ln)		0.068		0.055		-0.196*		-0.184†
		(0.041)		(0.042)		(0.097)		(0.101)
Agriculture		-0.045		-0.105†		-0.080		-0.060
		(0.058)		(0.055)		(0.131)		(0.127)
Ind. prod. (ln)		-0.011		-0.005		0.009		0.006
		(0.009)		(0.010)		(0.022)		(0.022)
Pop. dens. (ln)		-0.031*		-0.039*		0.012		0.005
		(0.014)		(0.016)		(0.040)		(0.037)
Constant	0.786***	0.535†	0.699***	0.572*	0.413***	1.819**	0.211***	1.578*
	(0.043)	(0.279)	(0.020)	(0.254)	(0.093)	(0.600)	(0.051)	(0.629)
Observations	63	63	63	63	63	63	63	63
R-squared	0.129	0.263	0.041	0.206	0.028	0.108	0.039	0.134

*Robust standard errors in parentheses, ***p<0.001, **p<0.01, *p<0.05, †p<0.1. All independent variables are lagged 2 years. Night lights are taken for the year 2013; population size is taken for the year 2015. Abbreviations: non-part. memb. = non-party members in commune elections; self-nomin. cand. = self-nominated candidates in commune elections; income/cap = income per capita; ln = natural logarithm; ind. prod. = industrial production; pop. dens. = population density*

TABLE G.3. THE RELATIONSHIP BETWEEN BUSINESS CORRUPTION AND AIR/WATER QUALITY ACROSS VIETNAM PROVINCES

	Air quality			Water quality		
	1	2	3	4	5	6
Business corruption	-0.158***	-0.168***	-0.134**	-0.359**	-0.345**	-0.366**
	(0.043)	(0.040)	(0.048)	(0.111)	(0.118)	(0.132)
Group membership			-0.035			0.052
			(0.072)			(0.152)
Non-party members in elections			-0.128			0.000
			(0.106)			(0.244)
Income per capita (ln)		0.079*	0.076†		-0.167†	-0.161
		(0.038)	(0.039)		(0.096)	(0.100)
Agriculture		-0.102†	-0.069		-0.160	-0.178
		(0.052)	(0.061)		(0.114)	(0.125)
Industrial production (ln)		-0.007	-0.009		0.013	0.014
		(0.009)	(0.008)		(0.018)	(0.019)
Population density (ln)		-0.043**	-0.038**		-0.005	-0.007
		(0.014)	(0.013)		(0.034)	(0.036)
Constant	0.756***	0.489*	0.546*	0.502***	1.767**	1.714**
	(0.024)	(0.240)	(0.266)	(0.073)	(0.580)	(0.627)
Observations	63	63	63	63	63	63
R-squared	0.173	0.362	0.387	0.190	0.258	0.260

Robust standard errors in parentheses, $^{***}p<0.001$, $^{**}p<0.01$, $^{*}p<0.05$, $^{\dagger}p<0.1$. All independent variables are lagged 2 years. Night lights are taken for the year 2013; population size is taken for the year 2015. Abbreviations: ln = natural logarithm

H ROBUSTNESS CHECKS. ALTERNATIVE MEASURE OF ELECTORAL COMPETITIVENESS

We calculate the measure of electoral competitiveness using the publicly available data on vote numbers for all winning and losing candidates in the Vietnam latest elections in 2016, available from the Vietnam National Election Council. We calculate the first-loser-to-last-winner ratio in order to capture how much division there was among the electorate when choosing their representatives to the government. The data are available for electoral districts, which include several administrative districts. We imputed the data for districts according to which electoral district they belonged to. This means that administrative districts belonging to the same electoral district have similar competitiveness values.

TABLE H.1. THE RELATIONSHIP BETWEEN ELECTORAL COMPETITVENESS INDEX AND AIR/WATER QUALITY ACROSS VIETNAM DISTRICTS

	Air quality		Water quality	
	1	2	3	4
Competitiveness	0.007	0.026	0.019	0.110†
	(0.029)	(0.029)	(0.062)	(0.059)
Economic situation (ln)		0.188**		0.172
		(0.058)		(0.140)
Agriculture		-0.081*		-0.087
		(0.034)		(0.065)
Night-time light (ln)		-0.016**		-0.047***
		(0.005)		(0.009)
Population size (ln)		-0.021*		-0.024
		(0.010)		(0.020)
Constant	0.660***	0.760***	0.265***	0.425†
	(0.019)	(0.127)	(0.038)	(0.231)
Observations	208	203	204	199
R-squared	0.000	0.107	0.000	0.144

Robust standard errors in parentheses, $^{***}p<0.001$, $^{**}p<0.01$, $^{*}p<0.05$, $^{\dagger}p<0.1$. All independent variables are lagged 2 years. Night lights are taken for the year 2013; population size is taken for the year 2015. Abbreviations: ln = natural logarithm

I ROBUSTNESS CHECKS. FIXED EFFECTS

We also check whether the relationships we found in the cross-sectional analysis, manifest themselves in the analysis of short-term changes within districts. We perform the analysis over 2011-2018 keeping the differences between the districts constant using a fixed-effects specification:

$$Y_{it} = \alpha_i + \beta_1 X_{it-2} + \epsilon_{it} \tag{2}$$

where t is a year and α_i is an unobserved time-invariant individual effect (fixed effect) or a separate intercept for each district. Tables I.1 and I.2 present the results.

TABLE I.1. THE RELATIONSHIP BETWEEN CIVIC PLURALISM/BUSINESS INFLUENCE AND AIR QUALITY ACROSS VIETNAM DISTRICTS. FIXED EFFECTS MODELS

DV: air quality	Model 1	Model 2	Model 3	Model 4	Model 5
Group membership	-0.014	-0.031†			-0.001
	(0.015)	(0.016)			(0.043)
Business influence			0.003	0.007	0.007
			(0.027)	(0.030)	(0.031)
Economic situation (ln)		0.018		0.040	0.040
		(0.031)		(0.047)	(0.047)
Agriculture		0.006		0.041	0.042
		(0.035)		(0.061)	(0.061)
Night-time light (ln)		0.008		0.015	0.015
		(0.009)		(0.011)	(0.011)
Population size (ln)		-1.048**		-0.696	-0.696
		(0.336)		(0.659)	(0.661)
Constant	0.675***	12.835**	0.664***	8.681	8.677
	(0.010)	(3.913)	(0.016)	(7.674)	(7.689)
Observations	618	603	416	406	406
R-squared	0.002	0.024	0.000	0.011	0.011
Number of districts	208	203	208	203	203

Robust standard errors in parentheses, $^{***}p<0.001$, $^{**}p<0.01$, $^{*}p<0.05$, $^{\dagger}p<0.1$. All independent variables are lagged 2 years. Business influence is lagged 1 year due to data availability. Abbreviations: ln = natural logarithm

TABLE I.2. THE RELATIONSHIP BETWEEN CIVIC PLURALISM/BUSINESS INFLUENCE AND WATER QUALITY ACROSS VIETNAM DISTRICTS. FIXED EFFECTS MODELS

DV: water quality	Model 1	Model 2	Model 3	Model 4	Model 5
Group membership	-0.012	-0.003			-0.067
	(0.027)	(0.031)			(0.077)
Business influence			0.062	0.094	0.099
			(0.056)	(0.060)	(0.060)
Economic situation (ln)		0.006		0.060	0.074
		(0.059)		(0.072)	(0.075)
Agriculture		-0.047		0.153†	0.160†
		(0.085)		(0.091)	(0.092)
Night-time light (ln)		-0.011		0.028†	0.030†
		(0.013)		(0.016)	(0.016)
Population size (ln)		1.008		1.942	1.992
		(0.828)		(1.530)	(1.547)
Constant	0.277***	-11.410	0.237***	-22.514	-23.075
	(0.019)	(9.612)	(0.032)	(17.772)	(17.973)
Observations	604	589	407	397	397
R-squared	0.000	0.009	0.008	0.038	0.041
Number of districts	204	199	204	199	199

Robust standard errors in parentheses, $^{***}p<0.001$, $^{**}p<0.01$, $^{*}p<0.05$, $^{\dagger}p<0.1$. All independent variables are lagged 2 years. Business influence is lagged 1 year due to data availability. Abbreviations: ln = natural logarithm

J ROBUSTNESS CHECKS. PANEL-CORRECTED STANDARD ERRORS

We also perform the over-time analysis for the pooled sample using panel-corrected standard errors (Beck and Katz, 1995) with Prais-Winston transformation (Tables J.1 and J.2) and lagged dependent variable included in the list of the predictors (Tables J.3 and J.4) to correct for first-order auto-correlation.

TABLE J.1. THE RELATIONSHIP BETWEEN CIVIC PLURALISM/BUSINESS INFLUENCE AND AIR QUALITY ACROSS VIETNAM DISTRICTS. PANEL-CORRECTED STANDARD ERRORS WITH PRAIS-WINSTEN TRANSFORMATION

DV: air quality	Model 1	Model 2	Model 3	Model 4	Model 5
Group membership	-0.078**	-0.096*			-0.095†
	(0.028)	(0.038)			(0.052)
Business influence			-0.151**	-0.165**	-0.132*
			(0.056)	(0.061)	(0.054)
Economic situation (ln)		0.106**		0.069†	0.106*
		(0.034)		(0.041)	(0.042)
Agriculture		-0.070***		-0.095***	-0.082***
		(0.013)		(0.025)	(0.021)
Night-time light (ln)		-0.009***		-0.008***	-0.009***
		(0.002)		(0.001)	(0.002)
Population size (ln)		-0.014*		-0.015*	-0.019***
		(0.006)		(0.006)	(0.004)
Constant	0.719***	0.833***	0.753***	0.916***	0.966***
	(0.018)	(0.049)	(0.034)	(0.027)	(0.026)
Observations	618	603	416	406	406
R-squared	0.644	0.638	0.538	0.452	0.521
Number of district	208	203	208	203	203

Panel corrected standard errors in parentheses, $^{***}p<0.001$, $^{**}p<0.01$, $^{*}p<0.05$, $^{\dagger}p<0.1$. All independent variables are lagged 2 years. Business influence is lagged 1 year due to data availability. Abbreviations: ln = natural logarithm

TABLE J.2. THE RELATIONSHIP BETWEEN CIVIC PLURALISM/BUSINESS INFLUENCE AND WATER QUALITY ACROSS VIETNAM DISTRICTS. PANEL-CORRECTED STANDARD ERRORS WITH PRAIS-WINSTEN TRANSFORMATION

DV: water quality	Model 1	Model 2	Model 3	Model 4	Model 5
Group membership	-0.054†	-0.081†			-0.195***
	(0.030)	(0.047)			(0.034)
Business influence			-0.212†	-0.183†	-0.131†
			(0.111)	(0.100)	(0.079)
Economic situation (ln)		0.027		-0.021	0.055
		(0.051)		(0.069)	(0.063)
Agriculture		-0.010		-0.032	-0.009
		(0.023)		(0.033)	(0.025)
Night-time light (ln)		-0.031***		-0.026***	-0.029***
		(0.001)		(0.002)	(0.001)
Population size (ln)		-0.020**		-0.028**	-0.036***
		(0.007)		(0.010)	(0.008)
Constant	0.307***	0.590***	0.394***	0.775***	0.889***
	(0.027)	(0.053)	(0.064)	(0.110)	(0.098)
Observations	604	589	407	397	397
R-squared	0.082	0.158	0.103	0.180	0.195
Number of district	204	199	204	199	199

Panel corrected standard errors in parentheses, $^{***}p<0.001$, $^{**}p<0.01$, $^{*}p<0.05$, $^{\dagger}p<0.1$. All independent variables are lagged 2 years. Business influence is lagged 1 year due to data availability. Abbreviations: ln = natural logarithm

TABLE J.3. THE RELATIONSHIP BETWEEN CIVIC PLURALISM/BUSINESS INFLUENCE AND AIR QUALITY ACROSS VIETNAM DISTRICTS. PANEL-CORRECTED STANDARD ERRORS WITH PRAIS-WINSTEN TRANSFORMATION AND LAGGED DEPENDENT VARIABLE

DV: air quality	Model 1	Model 2	Model 3	Model 4	Model 5
Group membership	-0.001	-0.017			0.002
	(0.041)	(0.052)			(0.048)
Business influence			-0.044*	-0.043	-0.043**
			(0.023)	(0.026)	(0.014)
Economic situation (ln)		0.024		0.015	0.015
		(0.048)		(0.045)	(0.048)
Agriculture		-0.009		-0.021	-0.021
		(0.014)		(0.019)	(0.015)
Night-time light (ln)		-0.003		-0.003†	-0.003
		(0.002)		(0.001)	(0.002)
Population size (ln)		-0.009†		-0.009†	-0.009
		(0.005)		(0.005)	(0.006)
LDV	0.728***	0.721***	0.674***	0.673***	0.673***
	(0.170)	(0.182)	(0.183)	(0.189)	(0.197)
Constant	0.182	0.290†	0.242†	0.346*	0.345†
	(0.128)	(0.164)	(0.129)	(0.155)	(0.181)
Observations	416	406	416	406	406
R-squared	0.604	0.648	0.560	0.592	0.592
Number of district	208	203	208	203	203

*Panel corrected standard errors in parentheses, *** $p<0.001$, ** $p<0.01$, * $p<0.05$, † $p<0.1$. All independent variables are lagged 2 years. Business influence is lagged 1 year due to data availability. Abbreviations: ln = natural logarithm*

TABLE J.4. THE RELATIONSHIP BETWEEN CIVIC PLURALISM/BUSINESS INFLUENCE AND WATER QUALITY ACROSS VIETNAM DISTRICTS. PANEL-CORRECTED STANDARD ERRORS WITH PRAIS-WINSTEN TRANSFORMATION AND LAGGED DEPENDENT VARIABLE

DV: water quality	Model 1	Model 2	Model 3	Model 4	Model 5
Group membership	-0.049	-0.103*			-0.092*
	(0.045)	(0.049)			(0.042)
Business influence			-0.050	-0.046	-0.018
			(0.037)	(0.037)	(0.032)
Economic situation (ln)		0.073***		0.025	0.065*
		(0.013)		(0.030)	(0.025)
Agriculture		-0.020		-0.035*	-0.023
		(0.015)		(0.014)	(0.015)
Night-time light (ln)		-0.009*		-0.008*	-0.009*
		(0.004)		(0.003)	(0.004)
Population size (ln)		-0.014		-0.010	-0.014
		(0.010)		(0.011)	(0.010)
LDV	0.810***	0.772***	0.798***	0.775***	0.763***
	(0.143)	(0.158)	(0.149)	(0.158)	(0.165)
Constant	0.088	0.246*	0.088	0.204	0.259†
	(0.068)	(0.125)	(0.060)	(0.127)	(0.135)
Observations	406	396	406	396	396
R-squared	0.652	0.661	0.654	0.660	0.655
Number of district	203	198	203	198	198

*Panel corrected standard errors in parentheses, *** $p<0.001$, ** $p<0.01$, * $p<0.05$, † $p<0.1$. All independent variables are lagged 2 years. Business influence is lagged 1 year due to data availability. Abbreviations: ln = natural logarithm*

K ROBUSTNESS CHECKS. REVERSE CAUSALITY

TABLE K.1. THE RELATIONSHIP BETWEEN AIR/WATER QUALITY AND CIVIC PLURALISM. FIXED EFFECTS MODELS

	Group membership				Made a proposal			
	1	2	3	4	5	6	7	8
Air quality	-0.026	-0.038			-0.074	-0.087†		
	(0.072)	(0.072)			(0.050)	(0.049)		
Water quality			-0.015	-0.008			-0.004	0.003
			(0.034)	(0.036)			(0.027)	(0.025)
Education		0.043**		0.042**		0.044***		0.044***
		(0.015)		(0.016)		(0.011)		(0.011)
Econ. sit. (ln)	0.154***	0.127**	0.153***	0.127**	0.156***	0.129***	0.153***	0.126***
	(0.042)	(0.041)	(0.041)	(0.041)	(0.036)	(0.036)	(0.036)	(0.035)
Agriculture	0.098	0.172*	0.098	0.171†	0.093†	0.168**	0.098†	0.175**
	(0.083)	(0.086)	(0.083)	(0.088)	(0.051)	(0.053)	(0.051)	(0.054)
Night lights (ln)	-0.014†	-0.018*	-0.014†	-0.017*	0.014*	0.010†	0.014*	0.010†
	(0.008)	(0.009)	(0.008)	(0.009)	(0.006)	(0.006)	(0.006)	(0.006)
Pop. size (ln)	0.453	0.422	0.566	0.511	-0.728*	-0.759*	-0.597†	-0.655*
	(0.422)	(0.428)	(0.442)	(0.455)	(0.323)	(0.310)	(0.337)	(0.323)
Constant	-4.761	-4.621	-6.074	-5.657	8.570*	8.713*	6.993†	7.435*
	(4.908)	(4.969)	(5.125)	(5.259)	(3.757)	(3.601)	(3.909)	(3.736)
Observations	609	609	595	595	609	609	595	595
R-squared	0.042	0.060	0.044	0.060	0.069	0.103	0.067	0.101
Number of district	203	203	199	199	203	203	199	199

Robust standard errors in parentheses, $^{***}p<0.001$, $^{**}p<0.01$, $^{*}p<0.05$, $^{\dagger}p<0.1$. Abbreviations: econ. sit. = economic situation; ln = natural logarithm; pop. = population

TABLE K.2. THE RELATIONSHIP BETWEEN PERCEPTIONS OF THE CHANGE IN AIR/WATER QUALITY AND CIVIC PLURALISM. FIXED EFFECTS MODELS

	Group membership				Made a proposal			
	1	2	3	4	5	6	7	8
Air qual. change	0.014	0.026			0.027	0.040†		
	(0.031)	(0.031)			(0.024)	(0.024)		
Water qual. change			-0.014	-0.011			-0.008	-0.005
			(0.019)	(0.018)			(0.014)	(0.013)
Education		0.045**		0.041**		0.045***		0.044***
		(0.015)		(0.016)		(0.011)		(0.011)
Econ. sit. (ln)	0.151***	0.122**	0.153***	0.126**	0.148***	0.118**	0.153***	0.125***
	(0.041)	(0.041)	(0.041)	(0.041)	(0.036)	(0.036)	(0.036)	(0.035)
Agriculture	0.099	0.175*	0.101	0.173*	0.098†	0.175**	0.100†	0.175**
	(0.082)	(0.085)	(0.082)	(0.086)	(0.050)	(0.053)	(0.051)	(0.054)
Night lights (ln)	-0.013	-0.016†	-0.014†	-0.017*	0.016*	0.012*	0.014*	0.010†
	(0.008)	(0.009)	(0.008)	(0.008)	(0.006)	(0.006)	(0.006)	(0.006)
Pop. size (ln)	0.486	0.472	0.591	0.536	-0.637*	-0.651*	-0.578†	-0.637*
	(0.417)	(0.421)	(0.450)	(0.459)	(0.308)	(0.295)	(0.331)	(0.320)
Constant	-5.185	-5.286	-6.346	-5.925	7.413*	7.309*	6.782†	7.230†
	(4.829)	(4.865)	(5.206)	(5.301)	(3.583)	(3.427)	(3.836)	(3.704)
Observations	609	609	595	595	609	609	595	595
R-squared	0.042	0.061	0.045	0.061	0.067	0.103	0.068	0.101
Number of district	203	203	199	199	203	203	199	199

Robust standard errors in parentheses, $^{***}p<0.001$, $^{**}p<0.01$, $^{*}p<0.05$, $^{\dagger}p<0.1$. Abbreviations: qual. = quality; econ. sit. = economic situation; ln = natural logarithm; pop. = population