



Democracy and the environment revisited: The case of African fisheries



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ABSTRACT

This article develops and tests three hypotheses concerning the effects of levels of democracy on levels of overfishing in Sub-Saharan Africa. The results show that the more democratic a country is, the more successful it is in protecting marine environments. However, this effect disappears during turbulent times and periods of rapid political change. The analysis also shows that democracy has a stronger effect on environmental performance than do levels of corruption and government effectiveness.

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1. Introduction

In a growing body of literature in the fields of political science, economics, and environmental studies, scholars debate the effect of democracy on environmental degradation. At the core of this debate is the question of whether democracy increases the likelihood of successful collective action outcomes and hence reduces environmental degradation, or rather has negative effects on the environment. Some scholars have been skeptical of the current (liberal) democracy, arguing that it is too strong; i.e., indiscriminately obeying the public's unwillingness to adopt environmentally healthy behaviors [1–4]. Others instead assert that it is too weak in the sense that it is *not* primarily guided by the will of the people but by other (read corporate) interests [5–11]. Yet other theorists claim that liberal democracy may be rather well suited to cope with environmental degradation—especially in cases in which a healthy environment is considered a citizen's right [12–15].

Empirical evidence regarding democracy's vicious or virtuous effects on the environment is conflicting, as some studies find positive effects, others reveal negative effects, and yet others find no effects at all [16–19]. Despite the conflicting results, policy makers and donors have been quick to side with the scholars emphasizing the benefits of democracy. But at the same time, even among policy makers, there are concerns that successful implementation of the instrumental mechanisms of democracy

(e.g., multi-party elections) may not automatically be accompanied with the creation or strengthening of the necessary institutions, civil society, political culture, etc., held to be indispensable to foster true accountability and political participation [20–22]. This has in turn motivated a closer look at whether democracy as an ideal should perhaps be more clearly distinguished from the process of democratization. According to such logic, democracy does not have any positive effects until it has consolidated. In fact, we should instead expect that environmental degradation remains more or less equally severe in young democracies as in non-democratic countries. In addition, such findings have influenced research not only to emphasize the *input* side of political systems but also (or in some cases almost exclusively) the *output* side [23,24]. In line with the latter, democracy should generally be expected to have a significantly weaker effect than the quality of government, an impartial bureaucracy, and other *administrative* aspects of the political system.¹

This article aims to critically examine whether any of these conflicting theoretical and empirical propositions have any bearing on the case of *over-fishing in coastal countries in Sub-Saharan Africa*.

There are several reasons for this particular focus. First of all, when it comes to democracy, many of the African countries have only quite recently undergone a transition from autocracy to democracy. While this has spurred increased optimism about the

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¹ A state normally regulates relationships with its citizens on two dimensions; first, the “input” side, which concerns issues of access to public authority, and secondly, the “output” side, which refers to the way in which that authority is exercised [23].

environment – at least in policy circles – there is clearly a lack of empirical investigation into what effects the increased levels of democracy have actually had on natural resource management in general and fisheries in particular. Hence, studying these countries over the past decades enables us not only to compare the outcome of democracy with non-democratic alternatives, but also to investigate what happens with environmental quality during such periods of transition. Second, importantly, since the democratic transition has taken place recently, data covering the period of transition are available for detailed analysis. Third, similar to other natural resources, fishery can be seen as an indicator of states' capacities to regulate the use of natural resources and to foster compliance.

More specifically, the aim of this article is thus to study what effects are found of (1) levels of democracy, (2) democratic maturity, and (3) countries' bureaucratic and administrative performance (quality of government) have on levels of overfishing in coastal countries in Sub-Saharan Africa.

The remainder of this article proceeds as follows: The next section presents the review of the political-theoretical literature on the relationship between democracy and the environment more thoroughly. Section 3 presents the time-series cross-sectional dataset used, elaborates the models and introduces dependent and independent variables. Section 4 covers the time-series-cross-section analysis performed and presents the major findings. Section 5 concludes the article by shortly summing up and discussing the main implications of the results.

2. Democracy and the environment

Within environmentalist circles, the 1960s and 1970s are today often depicted as the “era of the apocalypse” [25,26]. This expression originated from the argument of early vindicators who claimed that, without significant changes in human behavior (e.g., in terms of industrial metabolism, agriculture, exploitation of natural resources, and birth rates), the Earth would more or less collapse within the relatively near future. In 1972, representatives of the influential environmental think tank, Club of Rome, wrote the following:

“If the present growth trends in the world population, industrialization, pollution, food production and resource depletion continue unchanged, the limits to growth on this planet will be reached sometimes within the next hundred years” [27, p. 23].

Environmental politics must thus quickly undergo dramatic shifts toward sustainable development. This will, obviously, require enormous political resources and far-reaching authorities, something that *liberal democracy* – the political system presently dominating the Western (and by far the most resource-demanding) part of world – completely lacks [28–30]. Over the years, therefore, a typical conclusion has been that democracies need to be exchanged for more authoritarian political systems with the capacity to reorient society away from large-scale environmental destruction, something citizens in liberal democracies are incapable of doing if left to act freely [1–4,31,32].

This apocalyptic and authoritarian direction has, however, been challenged by environmentalists who are also critical to liberal democracy but who plead for more rather than less democracy (founded in a genuine belief in ordinary people's willingness to contribute to a healthier environment), typically in the form of decentralized, participatory or deliberative democracy [5–11]. This is because, according to them, the problem with liberal democracy is not that it offers too much liberty for their citizens (and thus presents the option to escape individual environmental responsibility if they choose to), but that the political power within liberal

democracies is too inter-connected with industry and trade interests, implying a systematic overlooking of issues such as environmental quality. Instead, a system allowing citizens a stronger political voice is needed, since ordinary people are assumed to care more about the environment than do corporates and other business interests.

There is, however, also a limited group of theoretically oriented scholars who actually *defend* liberal democracy. They argue that liberal democracy certainly can be compatible with environmental concerns and that no other political system is better equipped to guarantee human rights. This is crucial because many of the most fundamental human rights that we associate with democracy (e.g., the right to free speech, the right to a free press, and even the right to a healthy environment) are all argued to be essential building blocks for well-functioning protection of the environment and for the generation of a sustainable development at large [9,12–15,33–36].

These different propositions have, to various degrees and on various levels, been translated into empirically testable arguments. For example, the argument that stronger political voice among citizens and interest groups leads to a better environment has undergone rather thorough empirical investigation. Research on the management of local common pool resources especially has showed that in many (but far from all) cases, increased participation among involved interests tends to result in more sustainable resource management [37–39]. Moreover, a number of macro-oriented studies have investigated the effects of democracy on the environment by using various indices of democracy and measures of environmental performance. Normally, in these large-*N* studies, the dependent variable – the environment – is operationalized as relative resource scarcity or environmental amenities; e.g., safe water [40]. Other scholars instead focus on human activities potentially detrimental to the environment. Li and Reuveny, for example, find a positive effect of democracy on five aspects of human-induced environmental degradation – carbon dioxide emissions, nitrogen dioxide emissions, deforestation, land degradation, and organic pollution in water [41]. On the other hand, using six measures of environmental protection or degradation – carbon dioxide emission, deforestation, soil erosion by water, protected land area, freshwater availability, and soil erosion by chemicals – Midlarsky finds that democracy has a positive effect only in respect to protected land area, whereas the effects on the other dependent variables are either negative or negligible [18].

Taken together, existing empirical studies display an ambivalent position in regard to democracy and environmental performance. Some argue that democracy is a plague for environmental performance, while others consider it a prerequisite. The first hypothesis to test is thus

H1. *The more democratic a country is, the more successful it is in terms of environmental performance.*

The conflicting and puzzling empirical results accounted for above have in turn spurred researchers to, on one hand, distinguish more clearly between democracy as an ideal and the process by which countries move from autocracy to democracy, and, on the other hand, distinguish between the “input” and the “output” side of the political systems.² The first strand of research argues that, in newly democratized countries, democracy is in many cases no more than an empty shell lacking the necessary (especially informal) institutional arrangements needed to foster true participation and accountability. Democratization, in terms of the

² It should be made clear that these aspects of democracy are completely neglected in the political-theoretical and principally Western-world-oriented literature on democracy and the environment that we accounted for above and could potentially expand on that debate.

introduction of formal institutional arrangements and multiparty elections, as conceived of here, potentially opens up yet other arenas for patronage and clientelism [20,22,42,43]. In line with the warnings of the “fallacy of electoralism”, young democracies and their formal institutions thus risk falling prey to the elite’s preference for providing goods and benefits to its closest supporters, rather than more broadly improving the quality of public policy and public goods (such as the regulation of natural resources) [44,45]. In this regard, it has been found that young democracies are particularly vulnerable to such tendencies. For example, they have been shown to have weaker protection of property rights [46] and to be more corrupt [47]. According to Philip Keefer, this can be explained by the lack of credible pre-election promises: In young democracies, politicians have had less chance to develop policy reputations and therefore rely on their history of personal interaction with voters [20]. This in turn makes them more likely to provide fewer public or broadly available goods and more targeted goods. Similarly, Larry Diamond asserts that, before democracy can spread further, it needs to take deeper root where it already exists [45]. If this is not the case, elites tend to use their consolidated power to generate profits that benefit themselves rather than society at large, which in turn transforms competitive elections into zero-sum struggles in which everything is at stake and no one can afford to lose. The purpose of holding office in such systems is hence not to produce public goods (such as protection of natural resources) but rather to generate private or club goods for government officials and their families and political allies, according to the logic that “it is our turn to eat” [48].

To conclude, the literature concerned with countries’ capacities to generate and distribute public goods implies that young democracies and democracies in transition are particularly fragile and less likely to provide public goods. If this fragility is valid for the provision of many other public goods, it is reasonably also adequate in cases in which young and vulnerable democracies must manage and provide environmental public goods such as sustainable fish stocks. Based upon the findings regarding democratic maturity and public goods in general, we can formulate a more environmentally specific hypothesis as follows:

H2. *In young democracies, the effect of democracy on environmental performance is negative or non-existent.*

As mentioned, scholars have quite recently also begun to pay attention to whether the “output” or “input” side of the political system actually drives predatory tendencies in society at large. In other words, perhaps factors such as corruption and government effectiveness, rather than democracy, matter for producing successful collective action outcomes and sustainable management of natural resources. The growing literature on the role of quality of government seems to support such a statement [24,49]. More specifically, this literature holds that it is not issues concerning access to power (i.e., democracy) but rather levels of impartiality in the exercise of public authority that constitute the essence of high-quality institutions.³ The full line of reasoning is thus that impartial institutions and whether or not citizens perceive the bureaucracy and the administrative aspects of the state to be uncorrupt contribute to impressions of credibility and legitimacy and hence for fostering compliance with government regulation and long-term productive activities [23]. Democracy might hence be insufficient if the output side of the political systems works unsatisfactorily. This is well captured by Larry Diamond: “There is a specter haunting democracy in the world today. It is bad

governance... that is drenched in corruption, patronage, favoritism, and abuse of power” [44].

To capture this latter proposition, the third and final hypothesis is formulated:

H3. *Corruption and government effectiveness have stronger effects on environmental performance than do levels of democracy.*

3. Data and methods

In order to systematically test the hypotheses, a time-series cross-section analysis is employed. This is the statistical method most often used in a comparative political economy when data consist of comparable time series data observed for different countries and when we observe annual data on a variety of political and economic variables for each country. In order to consider problems of heteroskedasticity and serial correlation, we employ panel-corrected standard errors with Prais–Winsten transformations [50]. The model is specified as follows:

$$MTI_{it} = \alpha_i + \beta_1 D_{i,t} + \beta_2 C_{i,t} + \beta_3 O_{i,t} + \beta_4 P_{i,t} + \beta_5 G_{i,t} + \beta_6 A_{i,t} + \beta_7 I_{i,t} + \varepsilon_{it}$$

where i corresponds to each country in the sample and t refers to the year covered in the study. MTI_{it} corresponds to the change in the Marine Trophic Index for a given country in a given year, α_i is an intercept term for i , β_j ($j=1, 2, 3, 4, 5$) denotes the coefficients which are to be estimated, D_{it} is a Freedom House/Polity index for democracy for a given country in a given year, C_{it} is the WBGI measure for corruption (country, year), O_{it} stands for openness to trade (country, year), P_{it} is a measure for population size for a certain country in a given year, G_{it} refers to real GDP per capita of each country per year, A_{it} is the age of democracy of each country for a certain year, I_{it} is a dummy variable indicating if the country is an island and ε_{it} is an error term for each unit of analysis.

The validity of this statistical analysis is, of course, crucially dependent on how well the theoretical concepts of interest can be operationalized and measured statistically. Given the complex biological processes and abstract causal theory under scrutiny in this article, this is a huge challenge. However, the literature does in fact contain a number of proxy measures for the concepts of interest here. In addition, since all of the data are in open access, the study can easily be replicated and improved.

The dependent variable in this analysis is the marine trophic index, ranging from 0 to 5, where a higher number indicates a healthier marine environment. As previously spelled out, this index is used as a proxy for the degree to which countries are “fishing down the food chain”; i.e., catching smaller and smaller fish within their exclusive economic zones. These data are taken from the Sea Around Us Project, which is a scientific collaboration between the University of British Columbia and the Pew Environment Group.⁴ The index is generally considered to be an adequate measure of overall ecosystem health and stability and in several articles even serves as a proxy measure for overfishing, for which a low score means that catches consist of smaller fish [51–55]. Yet, its catch-based measurement has recently been argued to imply that it does not adequately reflect the dynamics of marine ecosystems at large, and there is substantial controversy in the literature regarding the extent to which trophic levels really can be taken as an indicator of ecosystem health and stability [56,57]. However, while the critique might deserve some merit, the marine trophic index is still the most widely used biodiversity indicator regarding marine resources.

³ Impartiality is here understood as follows: when implementing laws and policies, government officials shall not take into consideration anything about the citizen/case that is not beforehand stipulated in the policy or the law [23].

⁴ See www.seaaroundus.org for a full data description.

With respect to the independent variables, it is beyond the scope of this article to provide a comprehensive and final definition and measure of democracy. Thus, when the first hypothesis is tested, levels of democracy across countries are estimated simply by existing democracy indices, measuring the competitiveness of political participation, the openness and competitiveness of executive recruitment, constraints on the chief executive, and civil liberties. One of the most established measures is the imputed Freedom House/Polity score, ranging from 0 to 10, where 0 corresponds to the least democratic countries and 10 to the most democratic regimes.⁵ In order to test the hypothesis about whether the output side of the political system matters for levels of overfishing, a measure of Control of Corruption from the World Bank Governance Indicators is included.⁶ In addition, standard control variables in the literature on the effect of democracy on the environment (i.e., openness to trade, population size, GDP/capita, age of democracy and geographical dummies) are present in the model.

4. Analysis

Table 1 presents the results for the effect of level of democracy on the marine trophic index. Panel-corrected standard errors are in parentheses, and the asterisks reveal whether the effects are statistically significant at the 0.10, 0.05, or 0.01 level ($p < 0.10$, $p < 0.05$, $p < 0.01$). The first model tests the effect for all years for which data are available; i.e., from 1970 to 2006. As in all of the models, the unit of analysis is country-year, and the sample includes coastal sub-Saharan African states.⁷ In this model, democracy has a significant effect and the overall model explains 81% of the variation in the marine trophic index. The coefficient for democracy tells us that a one-unit increase in democracy produces a 0.01 increase in the score on the marine trophic index. A move from total autocracy (score 0 on the Freedom House/Polity measure) to liberal democracy (score 10 on the Freedom House/Polity measure) thus increases the marine trophic index by 0.1.

The second model includes a dummy for whether or not the country is an island. A quick look at summary statistics shows that island states tend to have higher scores on the marine trophic index, and since countries such as Mauritius and Seychelles also are rather well-developed democracies, we would like to make sure these countries do not drive the results. Including an island dummy increases the overall explanatory power to 84%, and democracy is still significant at the 0.05 level.

The third model is designed to test the second hypothesis—that during times of transition and in young democracies, democracy might produce somewhat different results. For this reason, the model runs from 1990 to 2000; i.e., a period certainly characterized by turbulent political changes. In the five years prior to 1990, multi-party elections were held in nine African countries. This number, however, more than quadrupled to 38 multi-party elections from 1990 to 1994 [59]. Isolating the 1990s thus enables us to

⁵ This measure is constructed by taking the average of Freedom House's measures for political rights and civil liberties and Polity IV. The imputed score in addition has imputed values for countries where data on Polity is missing constructed by regressing Polity on the average Freedom House measure. Hadenius and Teorell show that this average index performs better both in terms of validity and reliability than its constituent parts [58].

⁶ The data for this indicator is only available from 1996 onward.

⁷ The countries included are Angola, Benin, Cameroon, Cape Verde, Comoros, Congo, Democratic Republic of Congo, Djibouti, Equatorial Guinea, Gabon, Gambia, Ghana, Guinea, Guinea-Bissau, Cote d'Ivoire, Kenya, Liberia, Madagascar, Mauritania, Mauritius, Mozambique, Namibia, Nigeria, Sao Tome and Principe, Senegal, Seychelles, Sierra Leone, Somalia, South Africa, Togo, Tanzania, and Sudan. Eritrea is excluded due to lack of data.

focus more explicitly on the interactions between the environment and the political transitions in sub-Saharan Africa of that period and also shows the interactions between the environment and democratization rather than between the environment and democracy. Interestingly enough, democracy no longer has a significant effect. The overall explanatory power, however, is still strong at 90%. The results also remain robust when including an island dummy. However, as can be seen in Model 5, after 1995 the effect of democracy is significant again, and now at the 0.01 level. Moreover, the effect is stronger than in Model 1 with a coefficient of 0.027, and the model explains 94% of the variation in the marine trophic index.

The second hypothesis is also tested in Model 3, in which a variable for age of democracy is included. This variable simply measures for how long a particular country has been a democracy.⁸ This model supports the findings in Model 2; i.e., the age of democracy has a significant effect on marine trophic levels while at the same time making the other significant effects disappear.

Finally, by including measures of Control of Corruption taken from the World Bank Governance Indicators, Models 6 and 7 test the third hypothesis concerning whether it is the output side of the political system that matters for environmental performance rather than the input side. Model 6 reveals that Control of Corruption has a significant effect on marine trophic levels. Yet, when including democracy in Model 7, this effect disappears. In sum, the results are clearly in favor of refuting the hypothesis that the output side is the one that matters. In fact, while the effect of the corruption measure becomes insignificant when including democracy, democracy has an even stronger and more significant effect.

5. Conclusions

On theoretical and empirical grounds, this article develops and tests three hypotheses concerning the effects of levels of democracy on levels of overfishing in Sub-Saharan Africa. First, we show that the more democratic a country is, the more successful it is in environmental performance. Democracy consistently has a significant effect on levels of overfishing, and the effect of moving from total autocracy to full-fledged democracy ranges from 0.032 to 0.418 on the 5-point marine trophic index. However, as expected, the age of democracy has a significant effect on marine trophic levels, indicating that democracy does not have a positive effect during turbulent times and periods of rapid political change. Finally, the analysis shows that control of corruption and government effectiveness do not have stronger effects on environmental performance than do levels of democracy.

What are the implications of these results? First, the article contributes to the scholarly debate about democracy's potentially virtuous and vicious effects and gives support to researchers emphasizing that giving citizens a political voice decreases the likelihood of overexploitation of natural resources. While the causal mechanisms certainly need to be explored further, the literature on social contracts to some extent helps us interpret the results [60]. According to this literature, the results support the theoretical claim that a social contract between the government and its citizens is of crucial importance for fostering collective action, compliance, and long-term productive activities. More specifically, social contract theories predict that fostering compliance only through repression is a costly endeavor, and instead, rulers are likely to encourage semi-voluntary compliance by

⁸ Normally defined as having a value above 7.5 on the imputed Freedom House/Polity score.

Table 1

The effect of democracy on marine trophic levels in Sub-Saharan African coastal states. Time-series cross-section analyses with panel-corrected standard errors and Prais–Winsten estimation.

	Model 1. 1970–2006	Model 2. 1970–2006	Model 3. 1990–2000	Model 4. 1970–2006	Model 5. 1996–2006	Model 6. 1996–2006	Model 7. 1996–2006
Democracy	.0105** (.0046)	.0097** (.0043)	.0037 (.0068)	.0032 (.0048)	.0272*** (.0070)		.0418*** (.0006)
Openness to trade	.0001 (.0003)	.0002 (.0003)	.0000 (.0004)	.0002 (.0003)	.0008*** (.0002)	.0005*** (.0002)	.0006*** (.0002)
Population size	–2.5e–09** (1.17e–09)	–9.54e–10 (.9.46e–10)	–1.91e–09** (1.48e–09)	–8.16e–10 (9.04e–10)	–3.31e–09*** (5.36e–10)	–2.98e–09*** (3.50e–10)	–3.45e–09*** (3.91e–10)
GDP per capita	.0000** (.0000)	.0000* (.0000)	.0000*** (.0000)	.0000 (.0000)	.0000** (.0000)	.0000*** (6.77e–06)	.0001*** (6.12e–06)
Island state, dummy		4958*** (.0808)	.6403*** (.0441)	.4993*** (.0794)	.5752*** (.0411)		
Age of democracy				.0156*** (.0050)			
Control of corruption						.1093*** (.0335)	.0305 (–0364)
Constant	3.3856***	3.3034***	3.3590***	3.3145***	3.3135***	3.5306***	3.2693***
Probability > chi ²	.0024***	.0000***	.0000***	.0000***	.0000***	.0000***	.0000***
R²	.81	.84	.92	.84	.94	.95	.94
N	1062	1062	295	1057	330	231	231

Comment: Robustness checks have been performed by lagging the independent variables, but this did not change the results to any great extent. All data for the independent variables are taken from the Quality of Government Database, <http://www.qog.pol.gu.se>.

establishing democratic governance and giving up some power in exchange for the trust of the people as well as for a share of the outcome from their productive activities [46]. Without such a contract, the dominant equilibrium is one in which the government does not enforce fisheries regulations, and resource users engage in overfishing. In addition, another task for future research is to focus explicitly on the role played by other more specific features of democratic systems, such as freedom of press, speech, association, and vote [16]. Such features might make citizens in democracies better informed about environmental problems as well as better able to easily organize themselves and express their environmental concerns and demands. Politicians operating in a competitive political system might in turn respond positively to citizen demands, while in non-democratic systems, environmental concerns and demands might rarely be voiced and, as argued by Chadwick, “Environmental signals and concerns which conflict with state development plans may be silenced, and state managers may even fool themselves into thinking such concerns do not exist” [61, p. 575].

Moreover, the findings suggest that it is important to distinguish between levels of democracy and the process of democratization. The results clearly indicate that, during turbulent times, democracy does not have the same effects as during more stable times; i.e., the age of democracy has a strong effect on marine

trophic levels. This in turn supports arguments claiming that new democracies are more vulnerable to patronage politics and clientelism and, as such, would rather provide private goods to their supporters than public goods to citizens. Hence, these results also show the importance of sequencing and consolidation; i.e., that the question is not only *if*, but also *when* democracy is good for the environment. Moreover, future research ought to focus on why some democracies manage to turn the state into an instrument of collective action and protector of the environment while others fall back into political systems where “The police do not enforce the law, judges do not decide the law, customs officials do not inspect the goods, manufacturers do not produce, bankers do not invest, and borrowers do not repay. Every transaction is manipulated to someone’s immediate advantage” [45].

Finally, the findings presented in this article also contribute to the growing debate on whether the output or the input side of the political system matters most for fostering compliance and collective action. Since the results of the analysis show that democracy is more important than corruption, there are no strong reasons to downplay the importance of citizens’ access to political power in relation to the exercise of public office.

Appendix. Correlation matrix.

	Marine trophic level	Democracy	Openness to trade	Population size	GDP per capita	Island state, dummy	Age of democracy	Control of corruption
Marine trophic level	1							
Democracy	.28	1						
Openness to trade	.16	–.11	1					
Population size	–.25	.00	–.23	1				
GDP per capita	.27	.16	.50	–.17	1			
Island state, dummy	.57	.41	.09	–.19	.18	1		
Age of democracy	.38	.65	.06	–.14	.29	.17	1	
Control of corruption	.28	.56	.04	–.23	.35	.31	.51	1

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