Environmental Attitudes in Developing Countries in Light of COVID-19

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Environmental attitudes have the potential to affect environmental behaviors, which in turn can affect action toward current and future global environmental targets. Recent large-scale surveys find that developing countries, which account for most of the growth in greenhouse gas emissions, have high levels of pro-environmental attitudes. Respondents from developing countries state that they perceive climate change as a major global threat, that climate change directly influences their voting decisions, and that they consider climate change as big a risk as COVID-19. Respondents from developing countries with lower per capita emissions, more educated respondents, and those who have been exposed to extreme weather events tend to have more pro-environmental attitudes. However, high levels of pro-environmental attitudes do not translate into high levels of environmental performance for developing countries, as measured by a comprehensive environmental performance index. Respondents report changes in individual actions to limit their effect on climate change but tend to focus on easier behavioral changes that have a relatively low environmental impact.

1 Introduction

Major shocks, such as the COVID-19 pandemic, can shift attitudes by changing patterns that were once stable over time. Coupled with recent extreme weather events such as fires, droughts, and storms across the globe, COVID-19 has the potential to

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D. Zilberman et al. (eds.), *Sustainable Resource Development in the 21st Century*,
Natural Resource Management and Policy 57,
https://doi.org/10.1007/978-3-031-24823-8_12

change environmental behaviors across both developed and developing countries. Although developing countries account for most of the growth in global greenhouse gas emissions and have stronger environmental attitudes than developed countries, developing countries face financial and institutional challenges, which prevent them from translating their environmental attitudes into strong environmental actions. At the individual level, survey respondents in developing countries report changes in individual actions to limit their effect on climate change but tend to focus on easier behavioral changes that have a relatively low environmental impact.

This chapter describes recent environmental attitudes from survey respondents in developing countries. I use responses from cross-country surveys to study whether climate change is perceived as a threat by respondents from developing countries and how perceptions about climate change compare to perceptions of the risk from COVID-19. This chapter also discusses specific factors that tend to explain variation in environmental attitudes among developing countries. I then use an existing environmental performance index, which ranks countries' environmental performance to study whether pro-environmental attitudes translate into higher-performing environmental indicators. Finally, I discuss the role of individual behaviors undertaken in developing countries to limit the effects of climate change.

Survey evidence finds that climate change is seen as a top threat by most respondents and that concerns about climate change are high among respondents in developing countries. Respondents also state that climate change affects their political attitudes. Developing and developed countries vary with respect to their most important environmental concerns, and priorities tend to reflect their economic and environmental settings. For example, respondents from developing countries are more likely to think that deforestation, water pollution, and the depletion of natural resources are among the most important environmental issues facing their countries. On the other hand, respondents in developed countries are more likely to think that dealing with the amount of waste generated, the future of energy sources and supply, and the overpackaging of consumer goods are among the most important environmental issues facing their countries. Surveys also find that respondents view the risk of climate change as seriously as the risk of COVID-19.

Survey results show that environmental attitudes in developing countries are affected by country- and individual-level characteristics. For example, respondents from countries with high levels of carbon emissions per capita tend to consider climate change a less serious threat than respondents from countries with lower per capita emissions. At the individual level, the respondent's education level, political orientation, exposure to extreme weather events, gender, and age all tend to affect how concerned respondents are about the risk of climate change.

To compare environmental attitudes with environmental outcomes, this chapter discusses an existing summary measure of countries' environmental performance – the environmental performance index (EPI) – which ranks countries using a series of indicators. The EPI shows that developing countries tend to consistently rank lower than developed countries. Sub-Saharan African countries tend to score the lowest in the ranking, followed by Southern Asian and Asian-Pacific countries. Countries at the top of the EPI ranking are developed countries, which, as expected, have

the financial resources to make sustainable environmental investments. However, beyond income, indicators of good governance, such as the enforcement of the rule of law and regulations, have a strong correlation with top-tier EPI scores. Top scorers tend to have long-standing policies that protect public health, preserve natural resources, and decrease greenhouse gas emissions.

Finally, the chapter studies changes in individual behaviors undertaken to address the threat of climate change. Surveys find that most respondents state that they have made changes over the past few years regarding the products and services they buy or use, specifically out of concern about climate change. Respondents from developing countries are most likely to report having made changes to counteract climate change. Respondents from developing countries such as China and India are more likely than the average respondent to say that they will recycle materials such as glass, paper, and plastic, that they will avoid products that have a lot of packaging, or that they will save energy at home. Individual behaviors that require further effort, such as decreasing meat and dairy consumption and decreasing flying, are less likely to be undertaken.

In the next section, I describe findings from cross-country surveys on environmental attitudes in developing countries and compare respondents' perceptions about the threat of climate change to the threat from COVID-19. Section 3 discusses factors that tend to affect environmental attitudes in developing countries. Section 4 presents an existing environmental performance index and discusses developing countries' low rankings. Section 5 studies changes in individual behaviors undertaken to limit the effects of climate change. Finally, Sect. 6 concludes.

2 Environmental Attitudes in Developing Countries: Evidence from Cross-Country Surveys

In this section, I provide a brief overview of environmental attitudes in developing countries using responses from recent cross-country surveys. First, I briefly discuss the importance of environmental attitudes with respect to environmental policies. Second, I describe survey findings on environmental attitudes from respondents in developing countries and how they have evolved in recent years. Finally, I analyze survey responses that describe the importance of climate change compared to COVID-19.

2.1 Environmental Attitudes

Environmental attitudes, broadly defined as a concern for the environment or caring about environmental issues (Gifford & Sussman, 2012), are key to climate change policies because they may affect behavior. Individuals can affect environmental outcomes through the sum of individuals' behaviors and through influence on

government action. Pro-environmental attitudes can be affected by preservation and utilization motivations, tend to adapt to current events, and are not necessarily stable over time (Gifford & Sussman, 2012).

2.2 Survey Evidence on Environmental Attitudes

Survey evidence finds that climate change is seen as a top threat by most respondents and that concerns about climate change are high among respondents in developing countries. Table 1 describes the different surveys used in this chapter.

A Pew Research Center study from 2015 analyzed respondents' concerns about climate change in 40 countries. Using a survey of 45,435 face-to-face and telephone interviews conducted from March to May 2015, Pew Research Center (2015) finds that respondents from Latin America and Africa are more concerned about climate change, compared to respondents in Europe, Asia/Pacific, the Middle East, the United States, and China. In particular, compared with other regions, a larger percentage of respondents from Latin America and Africa say that "climate change is a very serious concern," that "climate change is harming people now," and that they are "very concerned that climate change will harm me personally."

Similarly, a survey from the Pew Research Center with 27, 612 respondents from 26 countries, interviewed from May to August 2018, found that climate change was seen as a top global threat in 13 of the 26 surveyed countries, more than any other issue the survey asked about (Pew Research Center, 2019). Among developing countries, concerns are particularly high in Latin America. In Latin America, 80% of surveyed Mexicans, 73% of Argentinians, and 72% of Brazilians said climate change is a major threat.

The perceived threat of climate change also translates into political preferences in developing countries. Using data from 20,590 survey participants aged 16–74 years old from 29 countries[1] conducted in February and March 2020, IPSOS (2020b) studies respondents' support for government action against climate change. Although respondents from developing countries were in general more educated, urban, and wealthier than the general population in their countries,[2] this survey provides some insights into how respondents say they view the role of their government with respect to climate change.

[1] The countries in the study are Argentina, Australia, Belgium, Brazil, Canada, China, Chile, Colombia, France, Great Britain, Germany, Hungary, India, Italy, Japan, Malaysia, Mexico, Netherlands, New Zealand, Peru, Poland, Russia, Saudi Arabia, South Africa, South Korea, Spain, Sweden, Turkey, and the United States.

[2] A caveat to this survey is that, while 17 out of the 29 countries surveyed online generate nationally representative samples, 12 countries do not. In particular, Brazil, China, Chile, Colombia, India, Malaysia, Mexico, Peru, Russia, Saudi Arabia, South Africa, and Turkey produce a national sample that is more urban, better educated, and have higher income than the average national population.

Table 1 Summary of cited surveys

Report name	Survey name	Sample	Data collection dates	Topics
IPSOS (2020a)	Climate Change and Consumer Behavior	19,964 online adults aged 16–74 across 28 countries	October 25, 2019–November 8, 2019	Changes made in products and services used specifically out of concern about climate change
IPSOS (2020b)	2020 Worldwide Study	20,590 online adults aged 16–74 across 29 countries	February 21, 2020–March 6, 2020	Top environmental issues around the world; willingness to take personal action on climate change; climate change understanding
IPSOS (2020b)	2014 12 Country Online Study	12,135 online adults aged 18–65 across 12 countries	September 26, 2014–October 10, 2014	2014 and 2020 comparison: Willingness to take personal action on climate change; climate change understanding
IPSOS (2020b)	2020 14 Country Online Study	28,029 online adults aged 16–74 across 14 countries	April 16, 2020–April 19, 2020	Comparison of attitudes toward COVID and climate change
The Lloyd's Register Foundation World Risk Poll (2020)	2019 World Risk Poll	150,000 respondents aged 15 or above in 142 countries and territories interviewed through telephone or face-to-face	May 2019– February 2020	How serious of a threat do respondents believe climate change to be over the next 20 years
Pew Research (2015)	Spring 2015 Global Attitudes Survey	45,435 face-to-face and telephone interviews with adults aged 18 or above in 40 countries	March 25, 2015–May 27, 2015	Concern about climate change; support for action on climate change
Pew Research (2019)	Spring 2018 Global Attitudes Survey	27, 612 face-to-face and telephone interviews with adults aged 18 or above in 26 countries	May 14, 2018–August 12 2018	Perceptions of global threats, including climate change

Participants from developing countries are more likely to agree with statements of a desire for government action to combat climate change, such as "if [Country]'s government does not act now to combat climate change, it will be failing the people of [Country]." For example, while 87% of Colombians, 84% of South Africans, and 83% of Chileans agree with this statement, 68% of all respondents do. In addition, respondents from developing countries have a higher share of participants who agree with statements on the role of climate change in shaping their political party support, such as "If a political party's policies don't deal seriously with climate change, this would put me off voting for them." For example, 75% of Indians, 72% of Colombians, and 71% of Peruvians agree with this statement, compared to 57% across all respondents.

Beyond climate change, developing and developed countries vary with respect to their most important environmental concerns. For example, respondents from developing countries surveyed in IPSOS (2020b) are more likely to think that deforestation (e.g., 59% in Russia), water pollution (e.g., 45% in Peru), the depletion of natural resources (e.g., 45% in Chile), and overpopulation (e.g., 31% in India) are among the most important environmental issues facing their countries. On the other hand, developed countries tend to have a larger share of respondents who think that dealing with the amount of waste generated (e.g., 60% in South Korea), future energy sources and supplies (e.g., 36% in Sweden), and the overpackaging of consumer goods (e.g., 35% in Belgium and Germany) are among the most important environmental issues facing their countries.

2.3 Changes Over Time

Surveys find that concerns about climate change have increased in the last few years. In particular, the share of people concerned about the threat of climate change around the world has increased since 2013. In 2013, when the Pew Research Center first asked respondents whether they think climate change is a major threat to their countries, a median of 56% of respondents from 23 countries stated that climate change was a threat, whereas in 2018 the median was 67% in the same countries. Some developing countries experienced sharp increases. For example, 52% of respondents in Mexico said global climate change is a major threat to their country in 2013, while 80% did so in 2018, a 28 percentage point increase (Pew Research Center, 2019).

On the other hand, based on a sample of 10,504 adults aged 16–74 years old from 12 countries, surveyed in February and March 2020 and September and October 2014, IPSOS (2020b) finds a change in the understanding of the causes of climate change since 2014. While in 2014, 83% of respondents worldwide strongly agreed or tended to agree with the statement "human activities contribute to climate change," 75% did in 2020, an 8 percentage point decrease. Decreases were sharp in developing countries, with the percent of respondents strongly agreeing or tending to agree with the statement "human activities contribute to climate change"

decreasing from 94% in 2014 to 77% in 2020 in Brazil, a 17 percentage point decrease, and from 92% in 2014 to 76% in 2020 in China, a 16 percentage point decrease. This trend is also present in some developed countries (e.g., agreement fell by 14 percentage points in Germany and by 9 percentage points in Italy). However, this decrease over time should be taken with caution because the profile of the online population answering the survey changed between 2014 and 2020. In particular, there was an increase in the proportion of older respondents who are online in the sample, and age tends to be negatively correlated with seeing climate change as a threat (Gifford & Sussman, 2012).

2.4 Comparison with COVID-19

The COVID-19 pandemic has led to dramatic changes in economic and social patterns across the globe and highlighted the role of interdependence across countries. It also has led to a decrease in carbon emissions, especially during the first half of 2020, due to worldwide lockdowns (Le Quéré et al., 2020). In this context, using a survey with 28,029 online respondents from 14 countries conducted in April 2020,[3] IPSOS (2020b) studies how the world views climate change compared to COVID-19. The survey finds that most (71%) of respondents worldwide agree with the statement "In the long term, climate change is as serious a crisis as COVID-19" and that respondents in developing countries tend to agree more with the statement. For example, 87% of respondents in China, 84% in Mexico, and 81% in India agreed with the statement, while 76% did in France, 66% in Great Britain, and 59% in the United States.

In addition, the survey finds that most respondents tend to think that climate change considerations should be part of the economic recovery following COVID-19. A larger share of respondents from developing countries strongly agree or tend to agree with the statement "In the economic recovery of COVID-19, it's important that government actions prioritize climate change." While 65% of respondents in all countries surveyed agree with this statement, 81% did in India and 80% did in Mexico and China. As a comparison, 64% of respondents in Japan agreed with the statement, and 57% did in Germany and in the United States.

The survey also finds that around half (51%) of respondents think that COVID-19 will lead to increased environmental activism, but there is large variation in this belief across countries. A larger percentage of respondents from developing countries strongly agree or tend to agree with the statement "We will see more people fighting for changes to protect the environment [as a result of the Coronavirus]." For example, 77% of respondents strongly agreed or tended to agree with the statement

[3] The countries surveyed are Australia, Brazil, China, Canada, France, Germany, Great Britain, India, Italy, Japan, Mexico, Russia, Spain, and the United States.

in India, 74% did in China, and 66% in Mexico, compared to 42% in Great Britain, 41% in the United States, and 36% in Germany.

However, the importance given to climate change does not necessarily take precedence over the economic recovery following the COVID-19 pandemic. Across all countries surveyed, 44% of respondents strongly agree or tend to agree with the statement "government should focus on helping the economy to recover first and foremost, even if that means taking some actions that are bad for the environment," while 48% strongly disagree or tend to disagree. Developing countries such as India and Russia have the largest share of respondents who strongly agree or tend to agree with the statement, 63% and 55% respectively, compared to respondents in the United States (47%), Germany (36%), or Japan (35%).

3 Factors Affecting Environmental Attitudes in Developing Countries

This section describes factors that affect individuals' environmental attitudes. As discussed in the previous section, surveys show that the majority of respondents in developing countries consider climate change a threat. However, environmental attitudes vary by specific respondent characteristics. Earlier academic literature shows that, beyond cross-country differences, environmental concerns vary by age, gender, socioeconomic status, political orientation, direct experience with nature, education, and environmental knowledge (Gifford & Sussman, 2012). Using a survey conducted by the Brazilian Senate in 2012 and linear and logistic regressions with state fixed effects, Aklin et al. (2013) also find that education, and in particular the completion of secondary education, consistently explains pro-environmental attitudes. The authors find no significant effect of income on pro-environmental attitudes. Recent cross-country survey evidence provides support for many of these factors. Surveys show that whether a respondent's country is a large carbon emitter, and respondent's education, political orientation, exposure to extreme weather events, gender, and age, all affect individuals' environmental attitudes.

3.1 Carbon Emission Levels

Lloyd's Register Foundation (2020) surveyed 150,000 people in 142 countries and found that residents of top carbon-emitting countries tend to be skeptical of climate change risk. For example, only 23% of the survey's respondents in China, the world's largest carbon emitter, said climate change was a "very serious" threat. However, a significant share (30%) of Chinese respondents did not express an

opinion[4] on the threat of climate change.[5] Respondents from the third-largest carbon emitter, India, had levels of skepticism about climate change that were similar to respondents in the United States. While 35% of respondents from India said climate change is a very serious threat, 19% said climate change is not a threat at all.

Pew Research Center (2015) also finds that respondents in countries with high levels of carbon emissions per capita tend to consider climate change a less serious threat than respondents from countries with lower per capita emissions. For example, only 18% of Chinese respondents (and 45% of Americans) state that climate change is a very serious problem, compared with a global median of 54%. Relatedly, around 40% of respondents overall say that climate change will harm them personally, but this percentage is only 15% for Chinese respondents and 30% for American respondents.

3.2 Education

Pew Research Center (2019) finds that education plays an important role in how respondents from developing countries assess the threat from climate change. Respondents from Latin American countries show large differences across education levels in perceptions of whether climate change is a threat to their countries in the next 20 years. For example, in Brazil, 84% of respondents with a secondary education or higher say climate change is a major threat, compared with 62% of those with less education, a 22 percentage point difference. Similarly, this difference is 18 percentage points in Mexico (91% versus 73%) and 17 percentage points in Argentina (88% versus 71%).

A similar pattern is also present among respondents of the Lloyd's Register Foundation (2020) survey. Across both developed and developing countries, a person's perception of climate change as either a very serious threat or not a threat at all changes with an individual's educational background, holding factors such as gender or age constant. Higher education levels are associated with a perception of a greater risk of climate change. For example, a larger share of respondents with the highest level of education (16+ years) say climate change is a very serious threat to their countries in the next 20 years (54%), compared to those with the lowest education level (0–8 years) (30%), a 24 percentage point difference. Similarly, a larger share of individuals with the lowest education level say that climate change is

[4] Among Chinese respondents, 23% thought climate change is a very serious threat, 36% said it is a somewhat serious threat, 12% believed it is not a threat at all, and around 30% said they did not know.

[5] As a comparison, the United States, the second-biggest carbon emitter in the world, had the highest percentage of climate change skeptics among developed countries. Twenty-one percent of people surveyed in the United States viewed climate change as "not a threat at all."

not a threat at all (17%), compared to those with the highest education level (9%), an 8 percentage point difference.

Lloyd's Register Foundation (2020) also studies the characteristics that most affect the likelihood of regarding climate change as either a serious threat or not a threat at all. The analysis uses a multilevel logistic regression to control for country characteristics (e.g., region, country income), individual characteristics (e.g., gender, education, age, religion, perceptions of whether their household income is enough to live comfortably, and numeracy), and other relevant information (e.g., how satisfied a person is with air and water quality in the area where they live and whether a person has experienced harm due to severe weather events). Lloyd's Register Foundation (2020) shows that higher educational attainment is the top significant predictor for thinking that climate change is a very serious threat and lower educational attainment is the top significant predictor for thinking that climate change is not a threat at all.[6] In particular, the average probability of saying that climate change is a very serious threat is 67% for respondents with 16+ years of education, while it is 55% for respondents with 0–8 years of education, a 12 percentage point difference. The average probability of saying climate change is not a threat at all is 6% for respondents with 16+ years of education, while it is 13% for respondents with 0–8 years of education, a 7 percentage point difference.

Beyond education, other factors that affected respondents' views about climate change risk in the multilevel logistic regression study are numeracy, the quality of air and water, and household income. Respondents who answered a numeracy question correctly were more likely than others to think that climate change is a serious threat to people in their country in the next 20 years. Respondents who were not satisfied with the quality of air and water in their country were more likely to consider climate change a threat than those who were satisfied. However, respondents who stated that they are living comfortably on their household income were less likely to say climate change is a serious threat than people who stated they were living less comfortably. Relatedly, respondents with higher perceived household income were more likely than others to state that climate change is not a serious threat at all.

3.3 Political Orientation

Pew Research Center (2019) finds that political affiliation can also affect respondents' environmental attitudes. The survey finds that respondents from Europe and North America from the political left are more concerned about climate change and that the percentage of respondents who consider climate change a major threat can vary widely between those on the right and left of the political spectrum (from a 9 percentage point difference in France to a 56 percentage point difference in the

[6] Respondents who said they did not know or had no opinion were not included in this analysis; this group accounted for 18% of the weighted sample.

United States). Differences by political orientation are also found in developing countries. For example, the survey finds that 85% of Brazilian respondents from the political center are concerned about climate change, versus 74% of those on the left and 69% of those on the right (an 11 percentage point and 16 percentage point difference, respectively).

3.4 Extreme Weather Events

Pew Research Center (2019) shows that extreme weather events, such as floods or violent storms, seem to sensitize respondents to the threat of climate change and shape environmental attitudes, beyond income and education. For example, in Kenya, where droughts and extreme weather events have negatively affected agriculture, 71% of survey respondents say climate change is a major threat. This finding is consistent across gender, age, income, and education in Kenya.

Lloyd's Register Foundation (2020) also finds that views on climate change are influenced by being personally harmed by severe weather events, such as floods or violent storms. In particular, over half of respondents (53%) who said they (or somebody they know) had experienced harm from severe weather events in the past two years believed that climate change is a very serious threat to their countries in the next 20 years. Thirty-eight percent of respondents who said they did not experience harm from severe weather events thought climate change is a very serious threat, a 15 percentage point difference.

3.5 Gender

Lloyd's Register Foundation (2020) finds that, across age groups, men are more likely than women to say that climate change is "not a threat at all." This is particularly true for older men. For example, 17% of men aged 65 years or older say climate change is not a threat at all, compared to 12% of women in the same age group, a 5 percentage point difference. However, the study finds no significant difference by gender in stating that climate change represents a "very serious" threat. Pew Research Center (2019) also finds that women are generally more concerned than men about climate change. For example, 47% of women in Russia think climate change is a major threat to their country, compared to 37% of men, a 10 percentage point difference.

3.6 Age

Lloyd's Register Foundation (2020) shows that the perceptions of the threat posed by climate change to people's countries in the next 20 years also vary by age. Older respondents have a lower likelihood of considering climate change a very serious threat. For example, 42% of respondents aged 15–29 years old think climate change is a very serious threat, compared to 38% of respondents aged 65 years or more, a 4 percentage point difference. Among men, 43% of respondents aged 15–29 years old think climate change is a very serious threat, compared to 37% of respondents aged 65 years or more, a 6 percentage point difference.

4 Environmental Performance in Developing Countries

This section studies whether developing countries' high levels of pro-environmental attitudes translate into strong environmental performance. First, I describe a summary index which assesses and ranks countries' environmental performance across a series of policy objectives and environmental categories. Second, I discuss the factors that differentiate top scorers from lower scorers.

4.1 Environmental Performance Index (EPI) Findings

Cross-country differences in data collection, reporting, and analysis make international environmental performance comparisons challenging. Using data from trusted third-party sources like international governing bodies, nongovernmental organizations, and academic research centers, the environmental performance index (EPI)[7] uses established peer-reviewed or internationally endorsed data collection methods to rank 180 countries.

The EPI seeks to assess how close the countries are to meeting established international environmental policy targets. The EPI is composed of two policy objectives: ecosystem vitality and environmental health. Ecosystem vitality is composed of seven category scores: biodiversity and habitat, ecosystem services, fisheries, water resources, climate change, pollution emissions, and agriculture. Similarly, environmental health is composed of four category scores: air quality, sanitation and drinking water, heavy metals, and waste management. To create the performance index, 32 indicator scores are aggregated into 11 category scores, issue category scores are aggregated into two policy objective scores, and policy objective scores are aggregated into a final EPI score. Although subject to data

[7] Additional information on Yale University's EPI indicator is available at https://epi.yale.edu/

limitations and subjective aggregation and weighting across its components,[8] the index provides a useful summary indicator, which can be used to make country and regional comparisons.[9]

Developed countries lead the EPI ranking. In particular, European countries, Japan, Australia, New Zealand, Canada, and the United States have the top 25 scores. Developing countries in sub-Saharan Africa, Southern Asia, and Asia-Pacific have the lowest 25 scores. The EPI score ranges from 0 to 100. Denmark has the highest score, 82.5. Denmark performs strongly across most issue categories but scores the highest due to its strong policies to decarbonize its economy and, in particular, its electricity sector. The second, third, fourth, and fifth top scorers are Luxembourg (82.3), Switzerland (81.5), the United Kingdom (81.3), and France (80.0), respectively. Top scorers all score well on environmental health, but their performance on ecosystem vitality varies. France and the United Kingdom perform highly in the establishment of protected areas and in species protection.

Developing countries consistently have lower scores than developed countries, and sub-Saharan African countries have the lowest regional scores, occupying 32 of the bottom 50 rankings. Large population growth and rapidly growing urban centers in sub-Saharan Africa put significant pressure on environmental infrastructure, basic water and sanitation services, and limited natural resources, leading to the lowest scores. Southern Asia countries have the second-lowest regional ranking on the EPI. Pollution from solid fuels, coal and crop residue burning, and poorly regulated motor vehicles are significant challenges for air quality. Of particular importance due to its population size, India ranks 106th in the world on climate change mitigation, and its emissions continue to increase. Although Asian-Pacific developing countries tend to have higher scores than sub-Saharan Africa and Southern Asian countries, they have low overall rankings and large variation within the region. In particular, developing countries in the Asia-Pacific region have experienced rapid urbanization, population growth, weak environmental governance, and biodiversity loss.

The former Soviet states tend to have higher scores than sub-Saharan African, Southern Asia, and Asian-Pacific countries. However, former Soviet states tend to score poorly in biodiversity and habitat as well as in waste management. They also have the lowest average regional score for fisheries. In the Middle East, wasteful energy use and high levels of greenhouse gas (GHG) emissions per capita linked to

[8] The EPI weights each level (indicator scores, issue category scores, and policy objective scores) and aggregates the levels into the final EPI score. For transparency purposes, a simple weighted arithmetic average is used at each aggregation level. The weights used to calculate EPI scores reflect a mixture of emphases determined by subjective judgment, data quality, and analysis of global trends. In addition, the relative weight given to each policy objective (ecosystem vitality and environmental health) is informed by the variance of each. For example, the 2020 EPI gives a weight of 60% to ecosystem vitality and 40% to environmental health.

[9] The 2020 EPI does not reflect recent events such as the large decrease in air pollution due to the COVID-19 pandemic in 2020 or the increase in greenhouse gas emissions from the 2019 Amazon fires.

large fossil fuel subsidies and economic dependence on oil and gas production led to low EPI scores. Latin American and Caribbean countries tend to be distributed over the middle half of EPI scores, after most developed countries and before most other developing regions. However, Latin American and Caribbean countries have room for improvement in areas such as air and water pollution, biodiversity protection, and the transition to clean energy.

4.2 Comparison with Developed Countries: Factors Affecting Environmental Performance

EPI rankings consistently show that developed countries score higher than developing countries, with substantial variation in rankings among developing countries. The high levels of pro-environmental attitudes found in surveys do not translate into high environmental performance for developing countries. Figure 1 plots gross domestic product (GDP) per capita and EPI scores.[10] As expected, higher EPI scores are associated with higher income; the EPI shows a positive and strong correlation ($r = 0.80$) between environmental performance and GDP per capita. Countries that score the highest are able to invest in all areas of sustainability.

However, the correlation goes beyond country wealth. Top scorers tend to have long-standing policies that protect public health, preserve natural resources, and decrease GHG. Using six indicators of good governance from the World Bank's World Governance Indicators (WGI) (Kaufmann et al., 2010),[11] the literature finds that most of the WGIs are significantly and positively correlated with the EPI and its subcomponents (Wendling et al., 2020). In particular, control of corruption, governmental effectiveness, rule of law, and voice and accountability have a strong and positive correlation with the EPI. However, this is not always the case. When analyzed in a multivariate regression framework that may include correlations among variables (e.g., among government effectiveness and political stability), some WGIs have a negative correlation with the EPI (Wendling et al., 2020).

[10] GDP per capita data are for the year 2018 at 2010 constant USD and values are logged. GDP per capita data come from the World Bank, available at: https://data.worldbank.org/indicator/NY.GDP.PCAP.KD. EPI scores are for the year 2020, and data are available at https://epi.yale.edu/downloads

[11] The six WGIs are voice and accountability, political stability and absence of violence/terrorism, government effectiveness, regulatory quality, rule of law, and control of corruption.

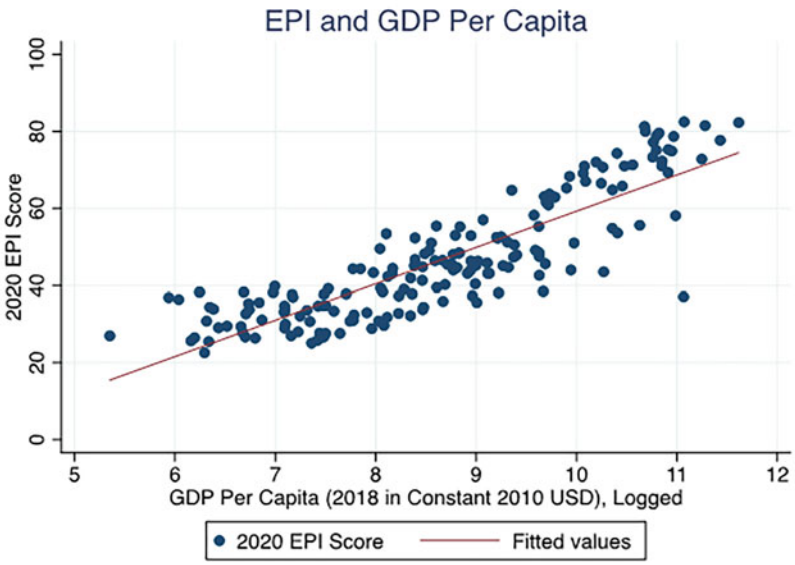

Fig. 1 2020 EPI and GDP per capita. (Note: GDP per capita is for the year 2018 in constant 2010 USD and values are logged. GDP per capita data come from the World Bank. The EPI score is for the year 2020. Each observation is a country and fitted values are shown. EPI data are freely available at the EPI website, epi.yale.edu)

5 Changes in Individual Behaviors to Reduce the Effects of Climate Change

This section describes reported changes in individual behaviors to reduce the effects of climate change and how these reported changes have evolved in recent years. Individual behavior can affect environmental outcomes through collective behaviors and through influence on governmental policies. Individual behaviors that have the potential to decrease individuals' impact on climate change include having a more plant-based diet and eating less meat and dairy, limiting flying, taking public transportation, recycling, and voicing environmental concerns to elected officials (Grantham Institute, 2019). In addition, having one less child is an individual action that has the potential to significantly decrease individuals' impact on climate change (Wynes & Nicholas, 2017).

5.1 Change in Individual Behaviors

Most survey respondents recognize the need to change individual behavior in order to reduce the effects of climate change. A global median of 67% of respondents in Pew Research Center (2015) state that people will have to make major lifestyle

changes to reduce the effects of climate change. A median of only 22% state that technology can solve the problem of the effects of climate change without major changes.

IPSOS (2020a) uses a sample of 19,964 adults aged 18–74 years old from 28 countries, surveyed in October and November 2019, to study the extent to which consumers state they changed their behavior in response to climate change. The survey finds that around two-thirds (69%) of adults surveyed across the 28 countries state that they have made changes regarding the products and services they buy or use over the past few years, specifically out of concern about climate change. Respondents from developing countries (with the caveat that they are more urban, educated, and/or wealthier than the general population in their countries)[12] are most likely to report having made changes to counteract climate change. For example, 88% of respondents say they have done so in India, 86% in Mexico and Chile, and 85% in China and Malaysia.

Among respondents who state they made any changes specifically due to concerns about climate change, some actions are more widely cited in developing countries than the global average. For example, changes in the amount of water used at home are cited by more respondents in South Africa (78%), changes in the mode of commuting to and from work are more cited in China (51%), and changes in the size, fuel type, and energy use of motor vehicle types are more cited in India (40%).

IPSOS (2020b) also finds that respondents from developing and developed countries vary with respect to the changes they state they are likely to make within the next year to limit their own contributions to climate change. For example, respondents from developing countries, such as China and India, are more likely than the global average to say that they will recycle materials such as glass, paper, and plastic (74% and 59%, respectively), that they will avoid products that have a lot of packaging (71% and 60%, respectively), that they will save energy at home (69% and 52%, respectively), that they will avoid buying new goods by mending what they have or buying used products (59% and 54%, respectively), that they will avoid flying (59% and 53%, respectively), or that they will eat less meat (58% and 47%, respectively).

Although most respondents state that they have made changes over the past few years regarding the products and services they buy or use, specifically out of concern about climate change, some changes in behavior may be harder to undertake in the future. Respondents who are more concerned about climate change may have been undertaking some changes already, leaving less room for change in the future. For example, a large percentage of respondents in IPSOS (2020b) from both developing and developed countries state that they are doing as much as they possibly can with respect to changing specific behaviors. Respondents state that they are already doing as much as they can with respect to recycling (40%), saving energy at home (37%), and saving water at home (33%).

[12] As with IPSOS (2020b), the samples from Brazil, Chile, China, India, Malaysia, Mexico, Peru, Russia, Saudi Arabia, South Africa, and Turkey are not nationally representative.

Across both developing and developed countries, respondents surveyed in IPSOS (2020b) are more likely to plan to take actions which are easier to achieve and have lower environmental impact than they are to undertake actions that require additional effort, such as making changes to their diet or avoiding flying. For example, 57% of respondents say they would avoid products which have a lot of packaging within the next year to limit their contribution to climate change. Similarly, 52% say they would reduce their purchases of new goods, 50% would save energy at home, and 49% would recycle and save water at home. However, around half (49%) of respondents state they are unlikely to eat fewer dairy products, 39% state they are unlikely to eat less meat, and 33% state they are unlikely to avoid flying.

5.2 Changes Over Time

Although most respondents state that they are likely to make changes to their own behavior to limit their personal contribution to climate change, the proportion saying they are likely to make such changes has not varied much across the 12 countries where trend data are available since IPSOS's last survey on the topic in 2014 (IPSOS, 2020b).

Areas that show small variations since 2014 are changes in diet, such as reducing meat and dairy consumption. For example, 18% of respondents in 2020 state they are reducing meat consumption as much as they can, compared to 14% in 2014, a 4 percentage point increase. The percentage of respondents who say they are unlikely to make this change has also decreased from 44% in 2014 to 39% in 2020, a 5 percentage point decrease. Similarly, the percentage of respondents who say they are unlikely to reduce their dairy consumption in the next year decreased from 55% in 2014 to 49% in 2020, a 6 percentage point decrease.

6 Conclusion

Responses to large-scale surveys show that environmental attitudes and, in particular, the perception that climate change is a risk to one's country are high in developing countries and often higher than in developed countries. A summary environmental index shows that developing countries' environmental attitudes do not match their environmental performance and that developing countries consistently have lower environmental performance than developed countries. Beyond income, good governance is key to improving environmental performance. At the individual level, changes in behaviors to limit the impact of climate change can play an important role. However, changes that go beyond the "easier" actions and have higher positive environmental impact, such as decreasing meat and dairy consumption, decreasing flying, and having one less child, are becoming increasingly necessary to achieve environmental targets. Major "shocks," such as the COVID-19 pandemic, that change economic and social patterns can change attitudes and have the potential to reverse previous trends.

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