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Addressing Climate Change in the Context of Nationalism: A Multilevel Action Framework

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Abstract

Despite the warnings of, and concern over, the inevitability of climate change, there has been a lack of concerted, enforceable action. Some of the predicted phenomena are already unfolding, but the international reaction remains piecemeal. In this review paper, based on grounded theory methodology, the main factors delaying or stymying an appropriate response are conceptualized: skepticism of science; its politicization and perceived conflict with neoliberalism; well-funded opposition by the fossil fuel interests; disregarding long term damage to pursue immediate gains; dimensions of culture such as individualism and attitudes to nature. This paper also posits that these factors have been exacerbated by nationalism and populism, widening the rifts among and within countries. A multilevel approach to countering these challenges is proposed. National governments need to enact appropriate policies. However, institutions (corporations and activist NGOs), transnational climate change governance, public-private enterprises, and committed individuals are crucial to have an impact on mitigation and adaptation. While the handling of the coronavirus exemplifies the fragmentation and skepticism demonstrated in dealing with climate change, it could serve as a foretaste of the disastrous outcomes of climate inaction.

Keywords

Science, politics, neoliberalism, nationalism, populism, transnational governance, public-private, coronavirus

1. Introduction: Mounting Evidence of Climate Change

1.1 Present Day Phenomena

Scientists have been warning us that average temperatures worldwide will continue their inexorable upward movement unless concerted action is taken to slow human activities contributing to global

warming (Oreskes, 2004; Cook et al., 2016; Ray & Pugliese, 2011). We now appear to be past the point when the impacts of anthropogenic climate change lie entirely in the future. As Wallace-Wells (2019), Hill and Martinez-Diaz (2019), The Economist (2019), and NASA (2020) assert, evidence that we are in the midst of an unfolding crisis are all around us. These include:

- fires, which have swept through wide swathes of California, Australia, sub-Saharan Africa, Siberia, and the rain forest regions in Indonesia and Brazil;
- floods in many parts of the world including South Asia, the American Midwest and South, Japan, China, and Australia (soon after being ravaged by fires);
- rising ocean levels and increasing acidification (sea water absorbs around 2 gigatons of carbon dioxide (CO_2) a year causing damage to coral reefs and serious harm to marine life);
- deteriorations in air quality in the world's largest cities have led to a surge in respiratory, cardiac and a host of other ailments particularly among children;
- hotter summers in tropical and desert regions (temperatures of around 120 deg. F are now commonplace in the Middle East and North Africa, and South Asia), have led to more conflicts and a sharp spike in migration, often exacerbating social and political tensions;
- habitats of numerous animal and plant species have shrunk or shifted due to human activity resulting in more zoonotic diseases (transmitted from other animal species to humans).

1.2 Potential for Catastrophic Harm

If action is not taken to limit the temperature rise to 1.5^0C (a mark which may be reached before 2030), current trends are likely to be greatly exacerbated, some irreversibly (IPCC, 2018; Ortiz & Kelly, 2019; Schlanger, 2019). For instance, global mean sea levels are projected to rise by an average of 0.5 meters, the number of invasive species and shifts in the geographic range of many insects, plants and vertebrates is likely to be further exacerbated, marine species' habitats will continue to shift, and threats to health, food and water supplies, and to economic growth will multiply (Kamal, 2017; Cockburn, 2018; Harvey, 2018; McKibben, 2019). In the event that the global average temperature increases by 2^0C or more relative to pre-industrial levels, many of these impacts will be magnified sharply, and new ones added on, such as rapid increase in the loss of tundra and thawing of permafrost, irreversible loss of marine life, a ten-fold rise in the probability of a sea-ice free Arctic, the disappearance of almost 15% of the world's sandy coastlines, and a $20 trillion reduction in GDP (Burke, 2018; Plumer & Popovich, 2018).

2. Ineffective Action, Potential Strategies

2.1 Purpose

The question that arises is this: Why is sufficient remedial action not being taken in a globally linked world, when the writing on the wall, so to speak, is clear and persuasive, and there is scientific consensus on how much worse things will get within a few decades? The purpose of this paper is to explain why efforts to address climate change have been halting and largely ineffective, and to

recommend courses of action to address the unfolding crisis. The paper draws extensively on scholarship from a variety of disciplines. The methodology employed subscribes broadly to traditional grounded theory as explicated by Glaser (1992), and refined further by Birks and Mills (2015). Numerous studies employing primary and secondary data, and theoretical formulations by experts in the field, form the bases for identifying the factors underlying the inadequate response to addressing climate change.

2.2 Factors Responsible

The literature suggests that the main factors which account for the inability to rein in climate change are:

- problems related to understanding the science, and hearing the message, of climate change;
- the politicization of science, and policy makers according priority to economic prosperity even at the expense of the planet's health;
- psychological factors which facilitate denial of the obvious, undervalue the power and probability of future outcomes, and even persuade us that any action we might undertake would be futile;
- a culture of individualism or in-group collectivism, of ownership being a measure of one's worth, and of Nature as being subject to human needs;
- the emergence and spread of nationalism, authoritarian tendencies and populism in many parts of the world attributable, in part, to a backlash against globalization.

2.3 Action Proposed

Drawing on certain elements of the inhibiting factors (above) themselves, and on research in the area of sustainability action and measurement, we propose initiatives at the National, Institutional, Transnational, and Individual levels to slow climate change more effectively. We now investigate each of the factors inhibiting action to tackle warming, starting with a reluctance to accept the findings of climate science.

3. Climate Science

3.1 Reactions to the Science

Despite the wide-ranging consensus that human activity lies at the root of the climate-related changes we are witnessing, and predictions of worse to come, doubters of various stripes still exist. Some outright deny, and others are skeptical of, the science and/or question the role humans have played in the deterioration in environmental conditions. Still others admit that action is needed but would like to delay action to address the obvious warming trend (Sharman, 2014; Capstick et al., 2015). Scientists have been accused by climate change deniers as being alarmists or, worse, as being motivated by personal financial gain (e.g., by garnering grant money). The pejorative label of "junk science" is often attached to any and all works which warn us of the dire consequences of not acting to reduce warming trends. Communications among scientists are closely monitored to find or concoct indications of scientists colluding to agree on a consensus or to hide inconvenient findings (Maibach et al., 2011).

3.2 Sources of Opposition

The anti-climate-science movement stems from a variety of sources. Prominent among them are firms generating or using energy derived from fossil fuels, as well as industry associations, think tanks, lobbying firms and others funded by energy businesses. The industrial revolution was powered by coal, which is still a significant source of electricity generation. Oil and natural gas are the other major energy options in addition to coal. The fossil fuel business has formed the vanguard of the opposition to climate science. Firms such as Exxon and BP, and others who have profited from oil, gas, and coal have funded efforts to delegitimize scientific research methods, question their findings, and even mount personal attacks on leading scientists (Hoffman, 2015) Joining firms and industry associations in the attempts to cast doubt on climate science have been think tanks which have proliferated over the past four decades. The Heartland Institute, Koch Industries, and the Scafe Foundation are among the numerous donors who have helped the denialist movement build a war chest of over a billion dollars (McCright & Dunlap, 2000; Dunlap & Jacques, 2013; McKibben, 2019) to not only oppose any policies aimed at reducing fossil fuel usage, but to actively promote more consumption, as well as to impede the implementation of renewable energies.

3.3 Investments in Jeopardy; Neoliberal Economics

The notion that we have to act now to avert catastrophic climate impacts in the future is an idea which arouses a viscerally hostile response from all who are economically and culturally committed to a formula which has worked successfully for over two centuries (UCSUSA, 2016). In the case of firms whose very existence depends on a fossil fuel society, the threat is dire not merely to their future success, but also to their very existence. The threat goes beyond that. As Rifkin (2019) stresses, the investments that oil, coal, and gas companies from all over the world have made in their entire value chains runs to many trillions of dollars. Limiting temperature rise to 1.5^0C could result in stranded assets (resources left in the ground and idle capacity) to the tune of over $100 trillion (OECD, 2015). Intensified lobbying, efforts to slow additions to renewable capacity, offering coal at low market prices to expand thermal power installation, and the manipulation of oil prices to discourage the diffusion of electric vehicles have been some of the strategies adopted to stall the progress of decarbonization (Mooney, 2011; Bracken, 2015).

The responsibility for our continued reliance on the carbon economy cannot, however, be attributed solely to the fossil fuel industry. Industries engaged in manufacturing, transportation, storage, online and retail sales, office work, and other phases of commercial activity are still dependent on the energy generated from fossil fuels. In turn, we as consumers with our near-insatiable appetite for all the appurtenances of modern life, essential or not, create a constantly rising need (despite the upward trajectory of energy efficiency) for energy. The hold that neoliberal economics has on policy makers in the US and many other predominantly capitalist nations, and complementary cultural traits (individualism/in-group collectivism, mastery over nature, living for the moment, a ceaseless quest for greater efficiencies) are locked in a mutually reinforcing cycle (Kuttner, 2019; Milanovic, 2020;

Perkins, 2019).

4. Politics and the Climate

With few exceptions, politicians in power-and those hoping to acquire it-adopt economic growth as a mantra and as a way of delivering a higher standard of living to their citizens. Regardless of whether the political system be democratic (of the liberal or illiberal varieties) or authoritarian, and subscribing to capitalism of the neoliberal, welfare or state varieties, typically impacts on warming are treated as constraints at best, and factors to be ignored, at worst.

4.1 Distraction and Disinformation

In the US there is a long tradition of climate denialism and dismissal of science, dating back at least to the early 1980s based, in part, on social constructionism and ideology (Prasad, 2019; Andrews, 2012; Mooney, 2005). As the evidence of a worsening of the situation (e.g., ocean warming and acidification at a higher rate than had been forecasted) has mounted, the reaction to climate science and, in fact, to science in general, has become more virulent. Politicians, with the support and financial backing of major influence groups, have routinely referred to warming evidence and projections as "junk science", contrasting it with their own "sound science" (McKibben, 2019; Mooney, 2005). Hearings have been held in which voices of dissent (though they comprised only about 3% of the scientific community) were given equal time as, and often higher billing than, distinguished climate scientists (Lundberg, 2016). The disinformation propagated on social media, as is the case with the coronavirus, has successfully sowed confusion, while reinforcing the beliefs of climate denialists, skeptics, and delayers (Prasad, 2019; Tucker, 2016).

4.2 Scientists as Part of the "Elite"

Scientists and the processes of science have routinely been maligned by some politicians, think tanks, and by some corporate and religious leaders. For instance, peer review has been painted as a transactional system of mutual favors, presenting alarming findings as a way to attract more grant money, and viewing all climate researchers as being complicit in a giant graft scheme (Laframboise, 2016). The damage done to science in general is incalculable particularly in the eyes of those who have little background in the area. What makes it worse is that it feeds into the narrative that scientists are part of an elite who seek to entrench the power they enjoy by dint of their knowledge. At a time when many middle income workers in the developed world are facing unemployment or underemployment arising from outsourcing or, more importantly, technology, the notion of a science-based elite making vital decisions, further feeds the angst in societies where inequalities are widening (Aronoff, 2017).

4.3 Dealing with the Coronavirus and Climate Change: Some Similarities

The initial, and lingering, skepticism surrounding the Coronavirus has been characterized by the same cherry picking of data, confirmation bias, and branding of scientists as alarmists as has been the case in attempts to debunk climate science (Shepherd, 2020). Scientists, in this telling, are in league with, or are being exploited by socialists who wish to curb freedoms and to undermine an economic system

which has brought prosperity to many. Our single-minded focus on economic growth led us to oppose "social distancing" ostensibly on the grounds that it would curb individual freedoms (Prasad, 2020). The lack of a national policy in the United States for nearly a year apparently also stems from liberty being considered a cardinal virtue.

Compared with the Coronavirus outbreaks, climate change is a relatively slow-acting phenomenon, with clusters of sudden eruptions. As is true of pandemics, the effects of warming will continue to worsen (unless addressed quickly) on a global scale. In reacting to the global virus, there has been little coordination among countries (even within the EU), which has meant delayed reactions and a repetition of other nations' costly failures (Lederer, 2020). One might hope that the response to Covid-19 has taught us a valuable lesson on the need for nations to collaborate in responding to threats facing the planet as a whole. However, given ideological differences, the tendency to value today over tomorrow, the unwillingness to abandon deep-rooted economic shibboleths and divergent cultural mindsets, our ability to come together to ensure our common wellbeing remains in doubt.

5. The Psychology behind our Weak Response

5.1 The "Swing" Segment

In a study conducted in the US, the UK, and Australia (countries which hew most closely to neoliberal economics and its attendant culture), around 20% felt that climate change was real and needed to be addressed with an equal proportion expressing their skepticism of the phenomenon (Pew Research, 2016). The middle 60% who were not quite sure were divided into the "concerned" and "cautious" groups, both of which were comprised of individuals who believed that the earth was warming due to human activity, but did not give it much thought. The "cautious" were more likely to attach less importance to taking ameliorative action than the "concerned". Barasi (2018) views addressing these two groups' (the "swings") climate apathy as crucial to success in combating global warming. Much of the support for addressing global warming comes from Millenials and Gen Z, and is found predominantly among progressives (Pew Research Center, 2020).

5.2 Communication of the Need for Immediate Action

The reluctance to mount a coordinated national response to the coronavirus in the US eerily parallels, in a compressed time-frame, the institutional dysfunction and response to global warming (Patrick, 2020). The virus' rapid spread did not afford us the luxury of waiting to take action. Delays of even a week have meant increased infection and fatalities (Young, 2020). Persuading more of the "undecided" to mask and socially-distance might have shortened the duration, and reduced the magnitude of impact, of the virus. In this connection, the wait-and-see stance to climate change proposed by the so-called "climate delayers" (Wallace-Wells, 2019) is likely to mean that, around 2030, we will be almost constantly reacting to more intense climate-related disasters.

6. Cultural Issues

6.1 Attitudes to Nature

The notion of taking what nature offered, using only what was needed while minimizing damage to, and avoiding depletion of, the earth's resources, was gradually abandoned after the industrial revolution. Catering to the needs of the mass market, new modes of transportation, and a rapid expansion in the construction of houses, hotels, commercial buildings, and other such taken for granted accoutrements of modernization, required vast amounts of energy. Coal and oil were burnt as fast as they could be extracted, minerals were dug up and consumed in production, and finished goods were often discarded when newer versions became available. Nature was viewed as no more than a bountiful source for serving our needs and as a sink for receiving our trash (Wallace-Wells, 2019; Kingsnorth & Hine, 2009). As property ownership has become increasingly divorced from nature, our ties to the earth and all it stands for have become more tenuous. Living out in the country with few modern conveniences instils a very different view of our connection with the natural world than a technology-rich urban life would (Turner, Nakamura, & Dinetti, 2004). Stock ownership creates an even wider separation between people and nature since it reduces corporations, as they deplete resources, use more energy, and affect ecological equilibrium, to mere abstractions (Botha, 2020).

6.2 Caring for the Common Good

While individualism has been viewed as a factor contributing to and worsening global warming (Chepaitis & Panagakis, 2010), it may be noted that even collective societies are not immune to the growth compulsion inherent in capitalism. With in-group collectivism, for instance, whether the unit be the family, the region or the nation, groups compete with one another, and demonstrate an attitude toward nature similar to that seen in individualistic nations (Steele & Lynch, 2012). In fact, Brooks (2020) argues that the predominance of the nuclear family in many industrialized parts of the world has diminished a sense of caring for the common good, which includes "caring for our common home" as Pope Francis terms it in his encyclical, Laudato Si' (2015).

In combination with the widespread belief that animals, plants, and inanimate objects exist to serve our ends, this has resulted in the deeply embedded assumption that control over, and the exploitation, of the natural world are our inalienable prerogatives (Martin, Maris, & Simberloff, 2016; Moore & Nelson, 2011).

7. Nationalism and Populism

7.1 The Rise of Nationalism

For over thirty years well into the first two decades of the twenty first century, the process and ethos of globalization seemed to be widely embraced and deeply entrenched (Rodrik, 2019). Early predictions of a borderless world, of an acceleration in the flow of products, services, ideas, knowledge and even people across nations appeared to be a fait accompli. It appears, looking back, that governments, academics, corporations, and policy makers ("the elites") were concerned primarily with wealth

creation and national prestige in a knowledge economy, while significant proportions of the population in many countries were more concerned about the shrinking prospects faced by those unable to measure up to the needs of fast-changing economies (Stockemer, 2019; Zakaria; 2016). Among some wealthy nations, a sense that numerous concessions made to less developed countries (LDCs) have resulted in the latter gaining unfairly at the expense of their own working class, has gained ground (Gardels & Berggruen, 2019a). In countries such as France, the US, Britain, and Italy, for instance, anti-globalization sentiments are gaining ground (Gardels & Berggruen, 2019b; Green & White, 2019). Trade and international relations are reverting to being viewed as zero-sum, not positive sum (as it was during the brief shining moment of globalism) games. Anti-immigrant sentiments are common in these countries (as well as in Russia), in part arising from the decline in middle income jobs, and the entry of immigrants from Central America, the Middle East and North Africa (one of the knock on effects of climate change), though issues of race and ethnicity are also part of the mix.

There appears to be a sense that, even in democracies, the people's voice is not heeded by the elites who make policy decisions (Panno, Carrus, & Leone, 2019; Lockwood, 2018).

7.2 Populism

Nationalism's re-emergence has been facilitated by the growth of populist movements. In countries like India, Turkey, Brazil, Hungary, Poland, and the Philippines, the growing nationalist tendency is reinforced by a perception (whether imaginary or real is immaterial) that the existence of serious internal and/or external threats calls for solidarity and coalescing around a common identity (Stanley & Czesnik, 2019). In China, nationalism is centered around the perception of China's historic importance and expanding military and economic power, and cemented by the Communist party's tight grip on information and communications in society (Babones, 2019). The role played by social media in democratizing information magnifies skepticism of governance and creates the impression among users that they are fully informed on most, if not all, relevant issues. The populist agenda is typically founded on an "us" (the common people) versus "them" (specialists and experts, globalists, "deep state" bureaucrats, immigrants, and so on) mentality (Stockemer; 2020; Harari, 2017). Populists adamantly refuse to believe what "they" say, and maintain that "our" leader reflects the nation's will.

7.3 The Paradox of, and Risks Inherent to, Populism

In many instances, the paradox of populism is that its adherents in Australia, Britain, and, in particular, the U.S., support neoliberalism and a minimal role for government, but are not equipped to be active participants in the knowledge economy (Iversen & Soskice, 2019). Such attitudes are likely to widen the knowledge and income disparity which is partially responsible for the rise of populism in these nations.

With some exceptions (such as Britain and France), populists view nature as belonging to the nation. Environmental issues, therefore, must be decided with the wellbeing of the country's citizens, particularly those who comprise the in-group, in mind. This, combined with neoliberalism, institutional degradation, and creeping authoritarian tendencies, makes for a toxic mix in which environmental and

related social issues are decided based on how they benefit the populist leader's base of support (McCarthy, 2019; Knuth, 2019). Whether in a minority or majority, populists tend to reinforce the resistance to domestic and international collaborative actions which are imperative to counter climate change (Lockwood, 2019).

8. A Multilevel Action Framework

Since the challenges involved in combating global warming are multidimensional, the response requires concerted action on many fronts. One way of framing an effective response is to pursue an amalgam of diverse, multilevel initiatives. Based on the work of Rezaee and Homayoun, (2017), and Epstein (2008), the levels of analysis we propose are the National, Institutional, Transnational, and Individual. A focus on these four levels will help deal with the forces impeding climate action discussed in earlier sections. We start with the nation as the unit of analysis since most modern nation states exercise sovereignty within their borders, which has been accentuated by rising nationalism and recently reinforced by the chinks in globalism made clear by the pandemic.

8.1 National Level

8.1.1 Investments in New Technologies

As noted earlier, air quality improved significantly in regions affected by the coronavirus. In addition, authoritative studies have found that one of the factors related to an increased severity in respiratory ailments caused by the virus is the pre-existing density of particulate matter, especially $PM_{2.5}$ (Wu et al., 2020). Though this might seem like an ideal time to minimize carbon and particle emissions in highly industrialized countries, the need to grow GDP as rapidly as possible, regardless of the environmental consequences, might seem like a *sine qua non* for economic revival, perhaps even survival. The need to restore economies to their former health might seem irreconcilable with the need to tackle climate change despite the clear benefits of action on the latter. However, the presumed tension between science and business is as false a dichotomy post-coronavirus as it was before the pandemic disrupted everyday life (Klein, 2019).

8.1.2 Mitigation Technologies

For instance, investment in renewable energies does not necessarily mean that outputs, employment, or incomes will decline. As with many technologies, certain jobs are replaced by new ones. The latter, naturally, require different skills, but that has rarely been an impediment to innovation. Already, solar and wind energy employ around half a million people in the US alone, and contributed to over 4% of all new jobs added in 2018 (Marcacci, 2019). The sharp decline in the costs of installing utility-scale solar and wind makes renewable energy a viable alternative to gas-powered stations (EIA, 2020). Incentives (e.g., tax credits), regulations (average fleet mileage for vehicle manufacturers), and subsidies (e.g., cost sharing) offered by national governments would stimulate mitigation initiatives. Another area in which infrastructure needs improvement is wider availability of charging stations to meet the expected boom in supply of (and presumably, demand for) electric vehicles (EVs). The need

for EV maintenance and repair facilities is also likely to grow, offsetting employment losses in fossil fuel vehicle firms. Carbon Capture &Storage research focused on extracting carbon from the atmosphere seems to be making halting progress, and may not be a worthwhile destination for public funds. The moral hazard attached to the technology ("the more we extract, the more we are tempted to emit") also makes it a far from ideal solution. However, fostering work in minimizing carbon emissions from processes such as steel and cement production, could prove beneficial and, is, in fact being pursued (Margolies, 2020; The Economist, 2018).

8.1.3 Adaptation Strategies

Adaptation strategies are particularly important for governments to focus on since actions aimed at preventing, and recovering from, climate disasters are generally not rewarding enough for business firms. Regulations for buildings in coastal areas and flood-/fire-prone regions, preparing for disaster-relief by keeping resources handy, providing advice to farmers on changes needed in crop mix, protection from damage, enhancing nutritional value, and so on, are new roles that governments could play as warming exacts a heavier toll.

8.1.4 Government Policies

As Fukuyama (2020) notes, the sentiment that the government's role in public affairs ought to be kept to a minimum, and that governments create problems rather than solve them, may have run its course. Post pandemic attitudes to the state are likely to be changed considerably, giving way to an increased acceptance, even expectation, of more government intervention (and investment) in matters affecting national wellbeing and security.

While government spending would naturally rise accompanied by some loss in revenues, it should boost economic growth, create hundreds of thousands of well paid, high skill jobs, and facilitate technological leadership in emerging energy and transportation industries (Rifkin, 2019). Reducing the subsidies given to oil and gas would offset, in part, the rise in government spending. The levying of a carbon tax, an action supported by a range of economists, policy makers, and businesses, would bolster investment in battling climate change, help lighten the burden on taxpayers and provide funding for investing in crucial industries of the future (Baker, Schultz, & Holstead, 2020; Parry, 2019). If not imposed in the near future, the price of carbon could rise rapidly, reaching around $75 per ton, per some estimates, by 2030 (Mooney & Freedman, 2019). The revenues generated by a carbon tax should be deployed to build resilience to tackle the short term risk, and to enhance mitigation capabilities as well. Strategies like the carbon tax and establishing fuel economy standards for cars clearly need to be applicable nationwide to avoid regions opting out to gain an edge. It should be noted that such policies, while appearing to be punitive, are meant to spur innovation to lower emissions. Some countries may seek to lower costs and gain an unfair advantage by not pricing carbon. In this eventuality, differential tariffs would be essential to compensate for the lower rate of carbon tax (or lack thereof) in other countries (Nordhaus, 2020).

Actions taken by governments (such as closing off areas to automobile traffic) in the wake of Covid-19, could, if made permanent, help reduce carbon emissions (Walt, 2020). Lowering or eliminating the sales tax on refurbished equipment, funding for incubators focused on sustainability, and subsidizing rebates for products which substantially reduce lifetime energy use are some of the policies worth exploring (The Economist, 2019). The swelling coffers of activists and candidates dedicated to countering climate change suggests a level of commitment to the cause hitherto rarely seen (Friedman, 2020). More generally, as Wright (2020) and The Economist (2020(a)) argue, societies might be radically transformed post-Covid-19, just as the plague radically changed 14th century Europe by contributing to the decline of feudalism and the advent of the Age of Reason.

8.2 Institutional

Though nation states are pivotal to developing effective policies to counter global warming, institutions in diverse fields such as business, finance, pension funds, education, religion, and environmental activism play an influential role both in the formulation and successful implementation of climate strategies. National policies without institutional cooperation may remain on the drawing board, while the reverse would result in a piecemeal approach lacking direction.

8.2.1 Corporate Strategies

Business firms have been actively engaged in sustainability-driven innovation for over a decade (Schaltegger, Horisch, & Freeman, 2017; Williams, 2015). Such strategies include generating electricity through renewable sources, electric vehicles with more efficient batteries, durable products consuming less energy over their usable life, recycling, refurbishing, and remanufacturing, and supply chain auditing for carbon usage. Surveys of CEOs generally indicate that sustainability, and increasing "circularity" are among their top priorities (Nguyen, Stuchtey, & Zils, 2015; McKinsey, 2014). Increasingly, firms are basing some of their strategic goals on guidelines provided by the Sustainable Development Goals (SDGs), the UN Global Compact, and the Global Reporting Initiative (GRI), and many compile annual Sustainability Reports specifying in detail their targets and progress toward achieving them. However, there is only so much corporations can do when sustainability typically involves raising short term costs with no guarantee of future returns. Fortunately, there are indications that customers are beginning to demonstrate a clear preference for products made sustainably and are willing to pay more for them. Business leaders are consequently likely to push forward on sustainable products without alienating shareholders (CGS, 2019; Rosmarin, 2020).

8.2.2 Investors and Financial Institutions

There are also signs that shareholder perceptions of sustainability's impact on the bottom line and stock prices are changing, which may, in part, be due to findings that, at the very least, the stocks of firms committed to sustainability did no worse than the rest of traded shares (Bernow, Goodsall, Klempner, & Merten, 2019). Perhaps equally significant is the fact that some institutional investors, like the mammoth private equity firm Black Rock, have decided to gradually decrease their financial stake in oil and gas partly because the industry has underperformed the market, and also because the firm,

which has over $7 trillion in assets, sees rough times ahead for fossil fuel businesses as a group (Sorkin, 2020). There is a possibility that capital flight from carbon-intensive industries might gradually gain momentum with the potential reduction, even withdrawal, of financial support from the fossil fuel industry, by pension funds, which control a total of over $12 trillion in investments (The Economist, 2020 (b)). Climate Action 100+, which controls nearly half of all capital invested worldwide, has persuaded numerous fossil fuel firms to set emission targets, and has prevailed upon numerous major corporations to set deadlines for achieving carbon neutrality (Henderson, 2020).

8.2.3 Stranded Assets; Activism

While the post-virus recovery might be driven by low prices for traditional fuels, it is also quite possible that habits instilled during the lockdown (work from home, less air travel, the need to be prepared for future similar crises) could result in a permanently lower demand for energy. At any rate, the longer prices and demand remain low, the sharper the reduction in exploration for new sources and investment in new capacity. In addition, as Rifkin (2019) argues, the continued decline in prices of solar and wind energy, and the increased capability and availability of storage and complementary devices, could mean that the value of stranded assets in fossil fuels could be immense running into hundreds of billions of dollars, casting a bigger shadow over investors' assessments of the industry's prospects. Decisions by oil firms such as Shell and BP to leave a significant part of their petroleum assets in the ground and redirect their investment to alternative forms of energy speaks to the gathering momentum for decarbonization (The Economist, 2020 (b); Reed, 2020). As the IMF warns, investors need to fully factor in the risks posed by climate change to economic, political, and social stability in the years ahead (Grippa, Schmittmann, & Suntheim, 2019; Eckhart, 2017). Insurance companies are, to be sure, factoring in the most likely disasters based on historical data. Warnings by reinsurers have also led some insurance firms to assess premiums based on climate projections even in the absence of an established record of such hazards. The increasing concern demonstrated by millennials and, in particular, by Gen Z over the world being bequeathed to them might be a harbinger of more attention being directed to climate risks by lenders, investors, insurers, and other players in the financial services industry. Lawsuits filed by NGOs and activists against governments and corporations are putting a price tag on inaction, and such legal avenues are likely to be pursued more intensely in the coming years (The Economist, 2020 (b)).

8.2.4 Public-private Partnerships

As noted by Orsini, Morin and Young (2013), Keohane and Victor (2011), and Abbott (2014), regime complex issues call for orchestration to address them. That is, the complexity (arising from the number of forces and the interactions, overlaps, and convergence among them) of the problem posed by climate change requires the marshalling of diverse resources. Public-private partnerships (PPP), by bringing multiple stakeholders together, are emerging as an effective method to tackle both resilience and mitigation (World Bank, 2016). As Scotti (2020) notes Swiss Re (a large reinsurance company) provides an instance of a working PPP by collaborating with the Nature Conservancy and a regional

government in Mexico to preserve a coral reef so as to reduce/avoid coastal damage. PPPs are being implemented in fields as diverse as agriculture, microgrids and street lighting, infrastructure projects, and cocoa supply chains (Climatelinks, 2018). PPPs formed to combat climate change, as with most other PPPs, enjoy access to more and varied resources (information, experience, financial), do not require as high an outlay on the part of taxpayers, and are more likely to deliver the results promised.

8.3 Transnational Entities

Another form of alliance to deal with partially overlapping non-hierarchic institutions in a regime complex is through orchestration among transnational actors. The latter may be comprised of a mix of various levels of government, NGOs, business interests, foundations, and community groups (Andonova, Hale, & Roger, 2017). Transnational Climate Change Governance (TCCG) encompasses cities across the world connected with one another, as well as with firms like Siemens and NGOs such as Local Governments for Sustainability, to set goals for, and assess progress toward, greater sustainability (Lin, 2018; Portney, 2013).

8.3.1 Characteristics of TCCGs

TCCG is based on the assumption that international decision-making, capability-building, and action should not be dependent on governments alone. Competing national interests, domestic economic and political pressures, and bureaucratic wrangles often stand in the way of progress. The major functions of TCCGs are information-sharing, capacity building, direct action, and target setting. The efforts are focused mainly on energy, carbon markets/finance, infrastructure, and forestry. Bulkeley et al. (2014a) provide numerous examples of TCCG. However, as Bulkeley et al. (2014b) note, TCCG is focused more on mitigation than on adaptation.

8.3.2 Adaptation and TCCG

With the growing realization that mitigation strategies alone are not enough and that preparedness to deal with frequent climate emergencies is imperative, adaptation is likely to garner more attention and resources from TCCG arrangements. Since TCCG involves entities which are most affected by issues related to warming, waste disposal, water distribution, and resource constraints, strategies for adaptation, being of immediate concern, are likely, in the coming years, to be tackled more effectively than they have been in the past. Not being subject to the external and internal pressures exerted on national governments, transnational entities have greater leeway for action even if their membership includes governments at various levels. Equally important, by virtue of encompassing diverse entities across national borders, TCCG offers a method of overcoming the barriers erected by the forces of nationalism, and the growing tendencies to populist rule (Busby, 2018).

9. Individual Responsibility

Though action by governments and other institutions is imperative, individuals can make a significant difference. Darr (2017) explores the issue in some detail, arguing that dealing with climate change is a moral responsibility, and that the inability to take effective action is a moral failure.

9.1 Customers' and Citizens' Choices

As Mark (2019) of the Sierra Club notes, while collective action by powerful institutions is essential, individuals, in their lifestyle choices (flying or driving less, using less energy, favoring energy-efficient products and services) could influence the behavior of institutions. In market economies, where suppliers respond to changes in the quantity and nature of demand, customers' choices do make a difference. For instance, new markets may open up for refurbished products, sustainable design could result in lower operating costs for appliances, and clothing made of organic materials could appeal to a wider range of customers, all of which could create a "sustainability pull" effect. In democratic societies, and even in some authoritarian ones, citizens' opinions and sources of discontent (e.g., with excessive pollution, health hazards, climate disasters) can result in policy changes and shifts in institutional trajectories. Such bottom up pressures for change would be invaluable complements to a top down regimen.

9.2 Cultural Transformation

Undoubtedly, a cultural transformation with a diminishing emphasis on oneself and more caring for others, a rising recognition of the need for harmony with, rather than domination over, nature, and a sense of identity distinct from material wealth and ownership needs to occur (Running, 2013). Education is critical to counter climate change denial, skepticism, and delay. Emphasizing the positive outcomes of action rather than dwelling on the potential risks of inaction, and finding methods to overcome inertia, "scientific reticence", and the belief that any action would be futile are some of the ways in which individual perceptions might be changed (Barasi, 2018).

Scientists clearly have a singular role to play in communicating the existential threat that warming poses to life on the planet. Unlike most scientific research, climate science and its conclusions are viewed as conflicting with national economic wellbeing, corporate profits, and consumers' preferences. Without a majority of individuals in their various roles in society (citizens, customers, employees, parents, students, etc.) buying into the need for action, top down decision-making is likely to prove insufficient.

9.3 Coordinated Bottom-up Action

Simplifying the conclusions of scientists to be more accessible to the average citizen, incorporating sustainability courses in curricula, corporations communicating their sustainability criteria to customers and enforcing them with their suppliers, financial institutions publicizing their conclusions concerning the risks posed by warming, and media working to bring the scientific facts to the public's attention, could go a long way to transforming individuals' perceptions on this vital issue. Some of these steps have already been adopted. For instance: numerous books (fiction and nonfiction) and articles on climate change accessible to the general public are being published (The New York Times, 2020); business schools are adding courses and programs in Sustainability (Murray, 2019), an indication that future corporate leaders might be increasingly sensitized to the need to integrate ecological and social concerns in the pursuit of profits; financial institutions are making clear that they view global warming

as a rapidly intensifying risk (Papageorgiou, Schmittmann, & Suntheim, 2019); and there is a rising tide of climate activism across much of the world bringing much more attention to the issue and public involvement in bringing change (Morris, 2019). The progressively greater concern over warming demonstrated by millennials and Gen Z, particularly when compared to the boomers, suggests that demography could well augur a welcome inflexion point in the fight to preserve life on the planet.

10. Conclusion

Globalism was an integral part of the world order established by the United States and its allies during the second half of the 20th century, and it seemed to accelerate with the opening up of China and, later, the collapse of the Soviet Union. In spite of the multilateral arrangements and compromises intrinsic to the globalizing process, agreements to curb climate change proved difficult to arrive at. Meetings of the Conference of Parties (COPs) such as those held at Kyoto, Copenhagen, and Durban failed to reach agreements or resulted in agreements which were not implemented (CFR, 2020). COP21 held in Paris in 2015 seemed to mark a turning point in that countries like China and India, which had held out for major concessions from early industrializers, consented to be signatories while stipulating certain conditions. However, even that agreement lacked specific commitments by countries and was short on enforcement mechanisms, leaving it moribund even before it became operative. Nations experiencing early indicators of global warming have shown some urgency in calling for concerted action, but achieving any sort of international order based on common interests appears to have become a monumental task. The lack of an internationally coordinated response to the coronavirus pandemic (Patrick, 2020) speaks to how the forces of nationalism and populist fervor have dented if not destroyed the spirit of globalism, a fragmentation which could have devastating results for developing and developed nations alike. Even if national leaders decide that working together to address problems common to all humanity and, indeed, the planet itself, is essential, other challenges will still need to be overcome. The false binary choice between climate and the economy, the vilification of corporations for bearing sole responsibility for the warming crisis, viewing science as fungible with political ideologies or religious beliefs, valuing continuity despite the potential for catastrophic future losses, and the sense that any action to counter climate change will be futile, are among the many challenges to be overcome in coming to grips with the threat posed by climate change to life on the planet. Dependence only on a top down approach based on international treaties might mean no more than reacting to, not moderating or even averting, extreme events on a year-round basis a decade or so from now. A multipronged approach, as developed in this paper, might not prevent further warming from occurring, but might be offer a path to limit the damage to manageable proportions in the short run, while moderating the long-term impacts of climate change.

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