

Title: Choices we make: rethinking decision-making in the context of climate crisis

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Abstract: Leaders are failing to respond to the climate and environmental urgency the world is facing. A growing action gap, clearly visible during the recent CoP25, has been fueled by leaders' inability to respond efficiently to the mounting threats scientists—and increasingly society—are concerned about. Bridging this gap and tackling the growing polarization within society calls for leaders to accept the full complexity of the issues the world is facing. This will require them to question their understanding of these geopolitical affairs and embrace the dynamics at play, and avoid falling back on simplistic cognitive models. We propose a heuristic to convey the pathways available to decision-makers to make their way out of the current inaction impasse. By breaking free of this deadlock, a social transition will have the potential to take place, helping us to avoid crossing the climate system tipping points.

Body Text:

1. We are in trouble

Scientific evidence reports on alarming levels of Earth's climate system. Earth is risking irreversible planetary tipping points with melting ice sheets, retreating glaciers, thawing permafrost, forest fire and pest regimes, increasingly severe El Niño events, and extended drought spells (Lenton et al. 2019). The magnitude of the change is proving that if anything, science was conservative. These signals are more severe than anticipated and point to our responsibility as sentient beings to consider the impacts of our actions. The most salient human drivers underlying these trends are increasing human and livestock populations, dietary habits, continued fossil fuel consumption, and global tree cover loss (Hoegh-Guldberg et al. 2019, Rippel et al. 2019).

A few sectors of society are vociferously sounding the alarm, demanding that political leadership recognises climatic and environmental changes as a global emergency. Most notably, a global youth movement spearheaded by Greta Thunberg has been demanding action from governments and corporations. The strike on 20 September 2019, a few days before the United Nations Climate Action Summit in New York City, saw an estimated 4 million people taking to the streets across over 150 nations. Other parallel initiatives include Extinction Rebellion, and Peoples' Climate Movement.

2. A world divided

In December 2019, the Conference of the Parties to the United Nations Framework Convention on Climate Change UNFCCC (CoP25) in Madrid hosted more than 27,000 delegates from close to 200 countries. The urgency to up national ambitions in cutting emissions has never been higher. CoP25 was the last opportunity to establish clear rules on the implementation of the Paris Agreement before coming into force in 2020. Nations needed to present their Nationally Determined Contributions to keep the planet's temperature below 2°C, and agree on definitions for Article 6 of the Paris Agreement. This critical article should define rules for carbon markets and other forms of international cooperation to create incentives for nations to cut carbon emissions. It is the last item of the Paris regime to be resolved after the rest of its "rulebook" was agreed upon during the CoP24 in Poland (Schneider et al. 2019).

The outcomes of the CoP25 were disappointing for many. Little suggests that political leaders share the sense of climate emergency held by a significant proportion of the people they represent. The most important decisions, including those on Article 6, were postponed to 2020. Such 'non-outcomes' are symptomatic of an action gap. The CoP25 failed to increase national carbon reduction pledges. It did not resolve Article 6. Moreover, Australia, with large coal and gas reserves, Brazil, with the largest intact primary forests, and Saudi Arabia with the largest oil reserves, managed to have notions concerning human, Indigenous, and gender rights removed from the rulebook, in the name of national sovereignty issues. Smaller developing countries, civil societies, and Indigenous groups are now left without safeguards against the possible impacts of carbon trading.

Politics underlies this action gap. China and India, among the largest of global polluters, insisted that wealthy nations declare the promised funds before agreeing to any new pledges. Vulnerable small developing countries insisted on "loss and damage" compensations for climate impacts that cannot be addressed by adaptation measures, to be drawn from the Green Climate Fund established in 2010. With the USA exiting the Paris Agreement in 2020, it is unclear whether the largest emitter of greenhouse gases per capita will contribute anything.

3. Increasing action gaps

Climate emergency is a geopolitical affair clearly reflected in fossil fuel supply and consumption and ongoing deforestation. Global growth keeps rising and has reached new heights exceeding 120 trillion USD in 2019 (Jackson et al. 2019). Since the New York Declaration on Forests' inauguration in 2014, tropical primary forest loss has accelerated by 44% compared to the baseline of 2002–2013, translating into 4.3 million hectares per year (NYDF Assessment Partners 2019). The anthropogenic pressures on biodiversity has sharply increased since the 1970s with one million species estimated threatened with extinction (Díaz et al. 2019). Fossil carbon emissions in 2019 are projected to be over 4% higher than the year of the Paris Agreement (Friedlingstein et al. 2019). The fossil fuel industry is planning to invest 1.4 trillion USD into extractive projects between 2020 and 2024, thereby increasing the production gap. Governments globally are planning to produce 120% more fossil fuels than required to keep global warming within the 1.5°C bounds by 2030 (SEI et al. 2019).

Current geopolitical disruptions including climate change, growing inequalities, and political and ideological polarization between and within countries (Selby 2019), are undermining multilateral efforts such as the UNFCCC, the CBD Aichi Targets or the UN SDGs, risking accentuating disruptions in the transition towards global sustainability. This is ultimately putting the climate, biodiversity, and millions of people's livelihood and health at risk (Díaz et al. 2019). We are observing a breakdown of institutionalized forms of collective action across scales (e.g., CoPs) at the same time as we see the emergence of spontaneous forms of collective action (e.g., protests).

This is not the first time that political leaders have failed to respond to mounting scientific evidence and social clamour to address climate urgency. The sheer scale of the disconnect—action gap—is, however, unprecedented. Why do leaders seem to ignore the growing protests? We see three possible explanations. Leaders do not hear the call, they do not share the concern, or they do not know how to respond. Behind this apparent simplicity lies the core of the argument we are making (Fig. 1). The first hypothesis is unlikely given the media coverage of the protests. With the second hypothesis, leaders either reject the reality of the claims, or dismiss them as irrelevant. Some outspoken world leaders clearly do not share the concern. For good reasons, since voters (or shareholders) still favour short-term economic growth and job creation over action on climate change. The USA and Australia are cases in point. It is more difficult to gauge how concerned other less vocal leaders are. With the third hypothesis, some leaders undoubtedly care, meaning for them, the root cause of the action gap lies in their inability to respond effectively. Because of these three pathologies of collective action, we see a world increasingly falling back on national interests and geopolitics—an institutional form of the appeal to privacy fallacy, or “mind your own business”.

4. Overcoming the gaps

Climate change, deforestation, and any related issues are complex problems. People typically think they understand complex problems far better than they do (Fernbach et al. 2013). Their perception of the problems is shaped by personal attitudes, motives, past experiences and expectations. Planting trees is a cognitive shortcut to a systemic problem (“The Concerned” in Fig. 1). Ignoring the problem and investing in coal plants rather than renewable energy technologies is the mirror image at the other end of the spectrum, equally simplistic, misguided and prone to backlash (“The Lobbyist” in Fig. 1). The current polarization we see within society encourages such cognitive shortcuts (Selby 2019). To make matters worse, polarity reinforces itself. How do we break free from this tug of war?

By helping decision-makers—which we all are—embrace complexity through the inclusion of the very sources of said complexity in the analysis: causal relationships, agency and bounded rationality, multiple feedback loops and heterogeneity. The first step is therefore to shatter the illusion of understanding held by the decision-makers by inviting them to develop plausible,

mechanistic narratives of future developments. This will reduce polarization (Fernbach et al. 2013). The second step is to enrich their mental model—bringing in the elements that generate complexity. A better representation of the physical and natural processes at play (e.g., climate-forest-food nexus), of the strategies and agency of the stakeholders involved and of their own capabilities and interests will help decision-makers develop more pragmatic and resilient strategies (Fig. 1).

Finally, we must understand that the climate urgency requires a social transition, not an ecological one, with growing calls for greater democratic voice and involvement in decision-making (Healy et al. 2017). Creating collective emotions (e.g., collective intentions—“we want to act and change”, or expectations and concerns—“climate change is getting more tangible and is a threat”) can promote solidarity, or spur conflicts (von Scheve 2017). Our behaviour depends on what we think others will do or think. Changing these expectations is a powerful lever to change behaviours (Nyborg et al. 2019). Interventions and policies will be more efficient if they aim at shifting our expectations of other people’s behaviours, rather than persuading us to change our own core values (Nyborg et al. 2019).

What is the critical mass needed to change a social norm? How many more people need to change their perceptions towards climate urgency and deforestation to establish a new global environmental norm? The Arab Spring, which started in the early 2010s, showed that social norms and uprising can lead to changes at the highest political echelons. It also shows that the result can be a lose-lose scenario. Unless we reform the process of decision-making, we risk remaining trapped in a zero-sum game between humanity and nature (Fig. 2). Targets matter less now than actions. Intentions less than efficiency. Objectives less than pathways. Policies and decisions have shown their efficacy, as exemplified by the rates of deforestation in Brazil under Lula’s administration. Between 2005 and 2013, deforestation was reduced by over two thirds compared to the average level of 1996–2005, while growth of the soybean and cattle industries continued (Nepstad et al. 2014).

5. What we can do

While forests only account for a small proportion of emissions, they currently represent the cheapest and most efficient way of sequestering carbon (Busch et al. 2019, Doelman et al. 2019, Roe et al. 2019). The biggest issue remains fossil fuels. Averting the climate system's tipping points will require the world to break free of its dependence on these energy sources. To do so, actions need to be taken on all fronts: society, science, corporations, financial institutions, and governments.

The silver lining behind the climate urgency is that more and more people will have first-hand experience of the impacts—thus self-organizing and auto-creating a collective emotion—rapidly increasing the ranks of protesters. All likelihood points towards the irreversible change in our collective understanding of climate change and its causes. The year 2019 was already marked by extremes: deadly heat waves across Europe, cyclones in southwest Africa, haze and smog in Malaysia and Indonesia, flooding in Iran, and extreme temperatures and wildfires in the USA and Australia.

Science to date is not well equipped to enrich the mental models of decision-makers. Science is best placed to provide information. Science does not give meaning or sense. How decision-makers build their own internal narratives about the future is critical. Scientists have to be clear about what people can and cannot do. Science needs to develop value neutral counterfactuals, helping citizens and policy-makers visualize the long-term impacts and risks of changing climates, and clearly depict short-term vulnerabilities. The quantitative models proposed by scientists must assess and explain the costs of anthropogenic climate disasters so that the needed changes in everyone’s behaviour become self-evident.

At the corporate level, decarbonisation, halting deforestation, and equity must become the new standard in commodity production. Marc Carney—the new UN Special Envoy for Climate Action and Finance—is urging for risk calculations to not only consider profit and loss, but also incorporate the threats of climate change. Exposure to fossil fuel industries is a major concern, as Carney explained in July 2019: “Companies that don’t adapt—including companies in the financial system—will go bankrupt without question.” We propose they might not, unless we make it so.

In essence, all these changes can only stem from a reform on how decisions are made. This involves making the mental models behind decisions transparent and subject to public debate. Our climate system and Earth crisis are a global affair, which do not stop at political boundaries nor follow ideological graben. Like it or not, we are all in this together.

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Figures and captions

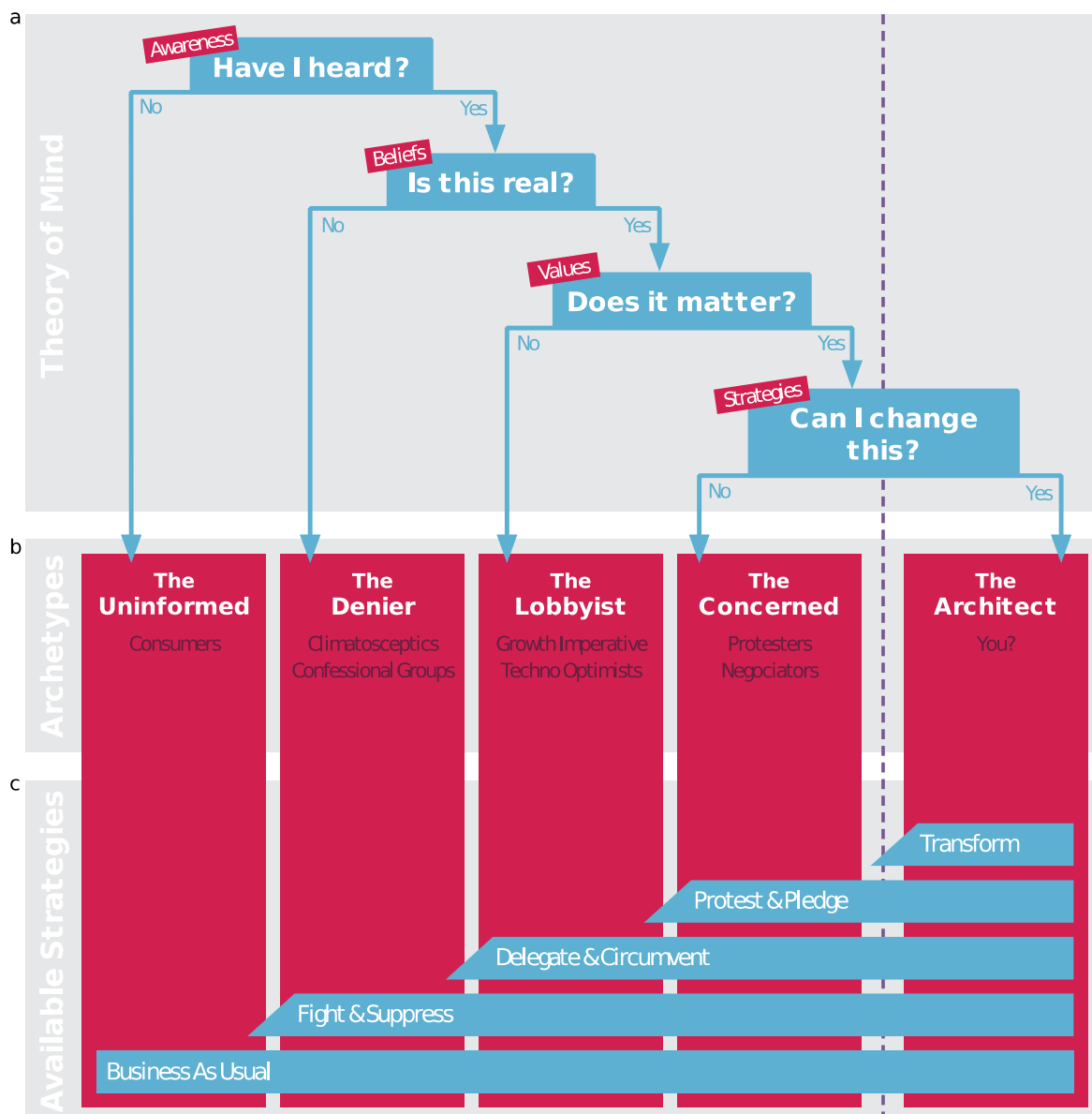


Fig. 1. Choices we make: a heuristic. On what basis will a stakeholder make a decision? (a) The theory of mind begins with the individual becoming aware of the issue. From awareness comes belief, value judgment and finally the capacity for taking action. At every step, the individual can branch out, leading to the identification of 4 archetypes. (b) The Uninformed have not heard about the issue. The Denier and the Lobbyist do not share the concern. The Concerned don't know how to curb the trend. We call for the identification of a fifth archetype, the Architect, aware of the issue, concerned and able to develop effective strategies. (c) The strategies one adopts are the choices we make about the system. Business as usual means ignoring the issue and not changing behaviour in any way. Fighting and Suppressing refer to tactics adopted to kill the messenger, not to address the message. Delegate and Circumvent refer to delaying tactics and exploiting loopholes to avoid changing. Protest and Pledge are acknowledgment of the immediacy and severity of the issue, without translating in observable change in the trend. Transformation is what will happen when we collectively address the issue efficiently and close the action gap. Some of these strategies are costlier than others. People have free-will and every archetype has freedom to decide which strategy to adopt, but as with power, some have more choices than others.



Fig. 2. The solution space (a) is another heuristic to represent the development pathways each archetype is ready and willing to explore. Without awareness, there is no mental model of the problem and no solution space. If the causal links between human action and natural process are in doubt, the solution space is unidimensional. The other archetypes perceive and recognize the interactions between humanity and the natural system. This creates 4 sub-spaces: (1) Humans win at the expenses of Nature; (2) Win-win pathways; (3) Nature wins at the expenses of Humanity and (4) All loose. Values define the quadrants one is prepared to explore. An archetype is adverse to explore dark grey quadrants, favourable to light grey quadrants and does not consider crossed quadrants as possible. A decision is represented by a vector whose length relates to the power of that stakeholder (b) The pathway the system will follow results from the sum of all individual vectors. This represents the tug of war we want to break away. The Architect can help move the system towards new directions. The playing field however is not level. There are physical and natural constraints that we do not address here.