CHAPTER 3

Framing the Climate Problem

What Are the Goals?

Global Greenhouse Gas Emissions and Warming Scenarios

- Each pathway comes with uncertainty, marked by the shading from low to high emissions under each scenario.
- Warming refers to the expected global temperature rise by 2100, relative to pre-industrial temperatures.

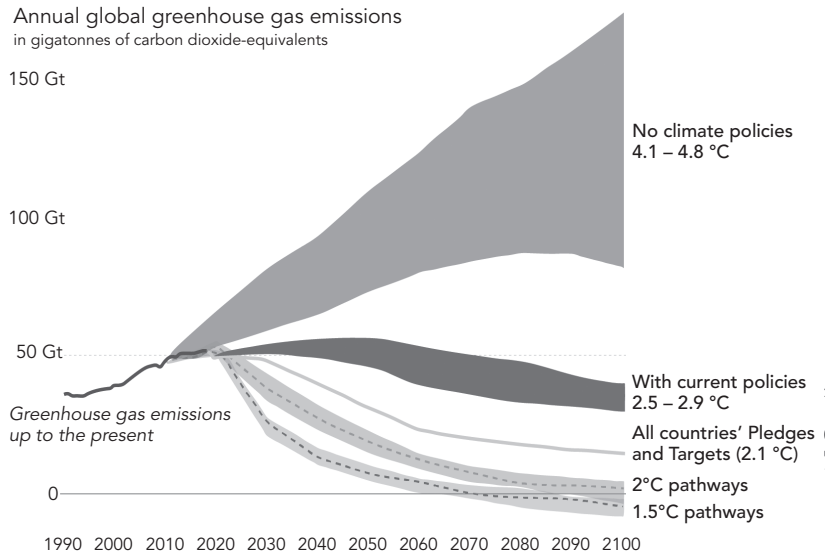


FIGURE 3.1

In what ways is anthropogenic climate change a problem? Maybe it is a whole bunch of problems. What would it mean to solve or fix the climate problem?

"Framing a problem" is the most important aspect of our critical thinking skills. It is all about meaning-making. Put differently, it is another instance of "what is" questions. When people argue about problems, it's like they are seeing different realities. When a developer, for example, wants

to build homes on their property, they talk about jobs, tax revenue, and economic growth. The people in the established neighborhood nearby, however, talk about traffic, noise, and quality of life. Someone will say, "this is really about x." Another person will say, "this is all about y." What *is* the problem? How is it decided? Who gets to decide?

When it comes to climate change, the physical sciences play an important role in framing the problem, because they are needed for accessing the reality of the climate. Modern science does so much. It gives us a coherent and detailed view of the world. It corrects pre-scientific views (about, say, the causes of climate change). Science discloses previously undetected phenomena (like the greenhouse effect or the ozone layer). And scientific laws explain how the world works (how organisms develop, how planets move, how mountains form, how diseases spread, etc.).

Yet science is insufficient for problem-oriented thinking. A problem is not something the sciences will ever detect, no matter how sensitive their instruments are. Problems are not out there in the physical furniture of the universe. They are framed, constructed, and contested. And scientific explanation only gets underway when it is clear what problem needs to be explored. Why do we care about the climate? What causes us to bring our attention to it?

It is these perspectives of care, our values, that direct our attention. They tell the sciences what to look for and they shape our interpretation of scientific findings. The sciences can't tell us what values to pursue or how to weigh competing goals. Problems entail reasoning about values; they are how ethics and politics get tangled up with the climate sciences. Problem-framing is how we organize these tangles so that we can make sense of climate change and guide our efforts to address it.

So, to have a problem, we need to have values that are not being met and might not be met in the future unless we change our ways. Indeed, problem-framing is always forward-looking, because it is about what we should do to make things better in the future. As Figure 3.1 shows, the future is uncertain and open-ended. Whether we achieve our climate goals depends partly on things we can control and partly on things we cannot.

This chapter introduces the climate literacy skills of problem-framing, laying a foundation that we will build upon for the rest of the book. We'll first practice using a tool called "the problem orientation" that comes from the policy sciences (see Clark 2002). Then, we'll use this tool to examine how the United Nations Framework Convention on Climate Change (UNFCCC) frames the problem. Here, we'll focus mainly on the goals.

With its problem framework, the UNFCCC establishes the predominant discourse, informing nearly everything that is debated and done. We'll conclude by complementing this political framework with two theories: wicked problems and collective action problems. These theoretical lenses give us further insights into how people frame climate change as a problem.

The Problem Orientation

To begin using this tool, let's consider a stylized personal problem and then a public one.

EXAMPLE 1: A Personal Problem

Fernando steps on the scale: he weighs 200 lb. That's not a problem, it's a number. A week ago, he weighed 190 lb, and two weeks ago he weighed 180 lb. That's still not a problem, it's a trend: 180, 190, 200. But Fernando wants to lose weight. Now we have the bare minimum for a problem: a *goal* that is not aligned with *trends*. To address this problem, he will need to consider the *causes* of the trends and his weight *projections* in the future. Perhaps most importantly, he'll need to think about the available *alternatives*: what can he do differently to accomplish his goal? This is the problem orientation framework of GTCPA:

- **Goals**: lose weight.
- **Trends**: gaining weight.
- **Causes**: too many doughnuts.
- **Projections**: increased weight gain.
- **Alternatives**: stop eating doughnuts.

Now, anyone who has thought about their weight will say that this is too simple. Let's take the goal for starters. Does Fernando have an ideal weight that could be a metric for the goal? Is weight loss the only goal? Is it the best way to characterize his goal? Maybe something like "improved physical health" is a better formulation. Weight is just one metric, after all. It is possible to get healthier and actually gain weight, say, by adding muscle mass. Most importantly, goals often conflict. Doesn't Fernando also want to enjoy

delicious foods? I mean, doughnuts are good! Are goals in conflict? How to balance them?

Next, let's turn to causes. It is rarely the case that a single cause is responsible for a trend (note how talk of causality is about responsibility). What else might explain (cause is also about explanation and diagnosis) Fernando's weight gain? Did he stop exercising? How is he sleeping? What else is he eating? So, multi-causality is almost always happening. When it comes to climate change, this is even more the case. Forest fires, for example, can be caused by lightning strikes, campfires, fire-suppression policies, development patterns, drought, invasive beetles, pyromaniacs, *and* warming trends.

Sometimes it is helpful to talk about causes that are more direct and those that are indirect. Why is Fernando eating so many doughnuts? Or you might say: what is causing this cause? Maybe Fernando has underlying metabolic issues going on, which themselves may be a complex mix of environmental and genetic causes. Or maybe a grocery store nearby went out of business, leaving him with fewer food options. Or maybe he got exposed to new doughnut ads or moved in with a new doughnut-loving roommate.

For these reasons, problem-oriented thinkers often talk about "conditioning factors" rather than "causes." This is a way to acknowledge multiple, layered, often indirect factors that shape a situation even if they are not straightforwardly *the* cause. In climate policy, people similarly talk of direct and indirect drivers of change. This makes discussions about responsibility and explanation more complex. No one straightforwardly causes climate change, which in turn does not straightforwardly cause any particular weather event. It is a tangle of conditioning factors.

Figure 3.1 illustrates projections, and we'll talk more about them later. For this example, let's turn to alternatives. Clearly, if there are multiple goals at stake and many conditioning factors at work, then the available alternatives will also be diverse and complex. That raises questions about which mix to choose. Fernando could moderate his doughnut consumption (why stop entirely?) while exercising more and sleeping better. Pursuing alternatives is all about action, which entails *will*. What is it going to take to get Fernando to adopt more healthy behaviors? Is it really that he doesn't know that doughnuts are unhealthy? Or is he suffering from weakness of will? Many smokers *know* it is unhealthy and *want* to quit, but they just can't. Is climate change like that?

EXAMPLE 2: A Public Problem

Things get really complicated when we move into the public sphere, because now there are multiple stakeholders that might each have their own way of framing the problem.

I once took part in a policy process about electricity in my home city of Denton, Texas. We have a utility called Denton Municipal Electric (DME), which serves all of our homes and businesses. DME is guided by three goals: (a) provide reliable electricity that is (b) affordable and (c) sustainable.

DME was doing pretty well on the first two goals. However, our community had expressed a collective desire to move rapidly toward 100 percent renewable electricity. At the time, DME was supplying electricity from the Texas grid, which was about 70 percent fossil-fuel generated. Renewables like wind and solar were displacing some of this fossil energy, but not rapidly enough for our ambitions. DME came up with an alternative: we could buy electricity via power purchase agreements (PPAs) directly from wind and solar generators. That is, we could avoid buying from the dirtier grid by entering into contracts with specific renewable energy producers.

So, here was the way DME thought about the problem:

- **Goals**: (a) reliability, (b) affordability, (c) sustainability.
- **Trends**: (a) aligned, (b) aligned, (c) out of alignment—too much fossil-fuel generated electricity and transition to renewables is not quick enough.
- **Conditioning Factors**: for (c) = buying electricity from a grid that is dominated by natural gas and coal.
- **Projections**: if we maintain status quo systems and decisions, for (c) = continued reliance on fossil fuels longer than the community desires.
- **Alternatives**: PPAs to directly buy wind and solar energy.

Sounds great, right? Well, there was a catch. Buying the PPAs carried with it financial risk. Being very cognizant of goal (b) affordability, DME didn't think they could responsibly adopt this alternative course of action without some kind of financial hedge to lower the risk of rate hikes. They decided that the only viable path would be to build a natural gas-fired electricity generator that they would own and operate. That way, under the right market

conditions, DME would be able to sell electricity from the gas plant, thereby defraying the costs and mitigating the financial risks of the renewable PPAs.

This is where things got controversial. Some residents were opposed to the gas plant. A few of them were worried about the debt required to build the plant, but most had climate-motivated reasons: they insisted that climate action means no new fossil fuel infrastructure. Period. Not under any circumstances could this be morally justified. Others, however, noted that any electricity sold from the new natural gas-fired power plant would displace dirtier electricity on the grid. Plus, it was a financially secure way to make huge strides toward our 100 percent renewable electricity goals. The opposition, however, asked how a city could claim to be 100 percent renewable while operating fossil infrastructure. What do the goals of 100 percent renewable and sustainability really mean in this case?

The politics got heated. Some friendships fell apart, even though people shared the same three goals! Questions were raised about whether DME could be trusted. An independent consulting agency was hired to review the proposed plan. Competing analyses got complex as different assumptions and methods generated different outcomes. Concerned residents kept asking about other alternatives. Could we, for example, purchase grid-scale batteries to store electricity rather than build the gas plant? DME concluded that would be cost prohibitive, but others disagreed. Who were the real experts? What's the right decision?

The Predominant Climate Change Problem Framework

That's just a gloss of one small instance of climate politics to show how the GTCPA framework can organize our thoughts, but also how there is no formula to make hard decisions easy. What we need to see now is how the Denton case—like all of climate politics—is situated within a broader global discourse that is anchored in a predominant problem framing.

Adopted in Rio de Janeiro in 1992 by 154 nations, the UNFCCC coordinates the political, social, and economic responses to climate change on an international level. It acts like a bridge between the IPCC's scientific assessments and international political treaties such as the 2015 Paris Agreement. The UNFCCC's framing of the problem largely establishes the parameters for climate politics and policy from the local level to the international level.

Let's use the problem orientation to break it down. In this chapter, our focus will be on the goals—what they are and how they are measured and pursued. The remainder of the book will cover data on trends and projections and survey debates about conditioning factors and alternatives.

The UNFCCC states that the goal is to achieve:

> stabilization of greenhouse gas concentrations in the atmosphere at a level that would prevent dangerous anthropogenic interference with the climate system. Such a level should be achieved within a timeframe sufficient to allow ecosystems to adapt naturally to climate change, to ensure that food production is not threatened and to enable economic development to proceed in a sustainable manner. (UNFCCC, Art. 2, 1992)

There are basically *two big goals*, safety and well-being:

1. Safety: reduce the risks and impacts of anthropogenic climate change
    a. Mitigation: prevent and minimize dangers by reducing GHG emissions (and by increasing carbon sinks)
    b. Adaptation: increase security and resilience to withstand climate dangers
2. Well-being: continue with economic development

Note the vital point: *Goal 2 has long been in opposition to Goal 1*. Indeed, with its GHG emissions, development (2) is the key conditioning factor of climate dangers (1).

As the economist Robert Mendelsohn puts it, the challenge is creating a future with a nineteenth-century carbon footprint without backsliding into nineteenth-century standards of living (in Shannon 2022). Can you picture what this might look like? Are there models of this kind of life in existence now? Note that this framing of "nineteenth-century standards of living" assumes a developed world perspective—what about people who still live at or below those standards?

The UNFCCC says that we want to improve the standards of living for billions of people but to do so in ways that are climate safe. Up to this point, gains in human development have largely come from fossil fuels and indus-

trial agriculture, that is, activities that emit GHGs. In the future, this predominant problem framing says that we want to keep development going, but with other energy sources and technological means such as solar panels, wind turbines, and electric vehicles. We'll see the key term here is *decoupling*: to have both goals, we need kinds of development that are no longer linked to dangerous climate risks and impacts.

If we didn't care about development, we could just decommission power plants and pipelines. Yet, the economy would tank, causing mass suffering. If we didn't care about climate risks, we could just keep going with status quo energy and agricultural practices. Yet, extreme weather events would multiply, causing mass suffering. We need to attend to both goals. That's why climate politics is hard. People, for example, can't stop using natural gas appliances in their homes overnight. Yet we also must find ways to quickly transition. Those phrases "overnight" and "quickly" resonate with the UNFCCC's emphasis on "time-frame." What is the right pace of climate action? This also factors into debates between those "concerned" about *climate change* and those "alarmed" about the *climate crisis* like we saw in the Introduction.

Measuring the Goals

A problem occurs when trends (and/or projections) and goals are misaligned. To know whether that is the case, we need to specify the goals in ways that are measurable. That gives the sciences the guidance they need to look for the relevant trend data. As we'll see, this is fraught, but first let's briefly look at each goal in turn.

GOAL 1A. MITIGATION: Prevent and Minimize Dangerous Interference in the Climate System

What counts as "dangerous interference"? The UNFCCC has measured this in terms of temperature targets. Article 2 of the Paris Agreement states that the goal is to hold the increase in global average temperature "to well below 2°C above pre-industrial levels." In the following years, the international consensus has largely settled on 1.5°C as the threshold for "dangerous interference." The 1.5°C goal is highly ambitious; frankly, it is unrealistic. As emissions continued to rise after the Paris Agreement, it became clear

that we are almost certainly going to exceed the 1.5°C goal (see Hansen et al. 2023). This does not mean that civilization will suddenly collapse when we hit 1.51°C. Rather, it means that each additional increment of warming is more and more dangerous: 1.6°C is better than 1.7°C and so on.

From the pre-industrial period to 2024, global mean temperature already increased 1.2°C. This is at the heart of the climate problem: temperature is trending toward the danger zone.

The safety mitigation goal (1a) is also quantified in two other important ways.

- *Net Zero*. The goal by 2050 is to negate GHGs through emissions reductions and carbon capture. This is what it would take to stay under the 1.5°C threshold: not just eliminating emissions but also pulling carbon out of the atmosphere. The term "net zero" means that any remaining human contributions of GHGs are negated by human activities that remove the same amount of GHGs from the atmosphere. Effectively, we will need to increase carbon sinks. It's likely that some sectors of the economy will be very hard to decarbonize, so it looks increasingly important to develop carbon capture technologies in order to reach net zero (see Chapter 12). This is especially true given the fact that total GHG emissions continued to climb long past the Paris Agreement.

- *Carbon Budget*. Since temperature increase is driven in large part by carbon emissions, you can think of a total amount of carbon that can be burned before crossing the 2°C threshold. Figure 3.2 shows the carbon budget from 2013 for a 50 percent chance of remaining under 2°C of warming. It shows that most fossil fuel reserves have to stay in the ground (unless we get really good at pulling carbon out of the atmosphere). As emissions continue to climb, the budget shrinks.

There are numerous other metrics for "dangerous interference" including sea-level rise, ocean acidification, and extreme weather events like heatwaves. These are all vital to monitor, and many are trending in the wrong direction. The point here is that on a global level, all of these metrics are conditioned by temperature increase, which is conditioned by GHG emissions.

Global Carbon Budget for a Two-Degree World

The carbon budget refers to the maximum quantity of carbon (in billion tonnes) that can be released to maintain a 50 percent probability of global average temperature rise below 2°C (the target set by the UN Paris climate agreement). This has been measured relative to the quantity of carbon released if all fossil fuel reserves were burned without using carbon capture and storage (CCS) technology. The difference between the two is defined as 'unburnable carbon'.

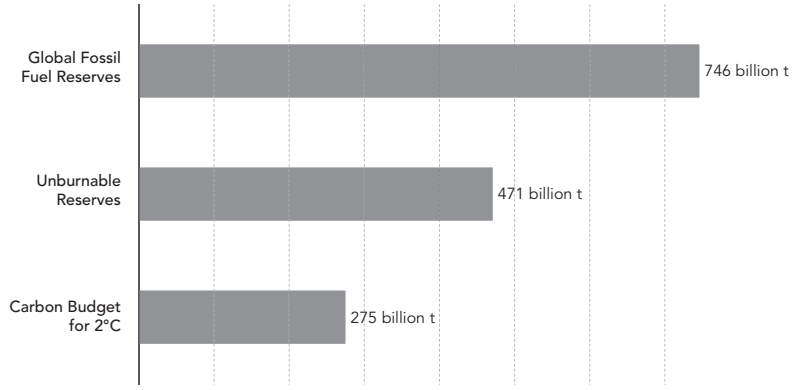


FIGURE 3.2

GOAL 1B. Adaptation and Resilience

It is too late to prevent some impacts from anthropogenic climate change. Plus, climate dangers will always exist, even in the absence of anthropogenic GHG emissions. Thus, another major goal is to get stronger in the face of danger. The IPCC defines adaptation as "the process of adjustment to actual or expected climate and its effects." And it defines resilience as "the capacity of social, economic, and environmental systems to cope with a hazardous event or trend or disturbance." When resilience increases, vulnerability decreases.

More resilient systems have a higher threshold for danger, because they are more capable of functioning under duress. After all, what we really care about are the abilities of systems (living or artificial) to function or flourish. Indeed, whether severe weather can be attributed to anthropogenic climate change or not, it is still a commonsense idea to reduce vulnerability. Implicit in this goal is also diversity, because extinction is what happens when things are unable to adapt, and because diversity tends to increase resilience for systems.

That we are dealing with diverse systems means that the metrics and trends here will largely be context dependent. Indeed, the IPCC struc-

tures its reports on adaptation and impacts around several key systems, including terrestrial ecosystems, cities, healthcare, oceans, agriculture, and water. We might, for example, examine trends in the health of coral reefs and associated marine biomes.[1] Or we could look how individual species or even entire forests are migrating with increasing temperatures. For human systems, we can examine trends in the development of and equitable access to vulnerability-reducing infrastructure[2] and services.

The ongoing development project can make this confusing, because it is putting more people, wealth, and infrastructure in harm's way. Imagine, for example, that the exact same hurricane (size, strength, speed, etc.) crosses Florida in 1944 and again in 2022. The second one will cause significantly more damage, not because of climate change (in this thought experiment, they are the same storms), but simply because there is more stuff in the storm's path—bigger cities, more roads, etc. One way to account for this is to "normalize" trends in damage through methods that model how costly storms in the past would have been had they occurred under present development conditions (see Weinkle et al. 2018). Resilient and adaptive development, then, means building human systems capable of withstanding extreme weather events. It means that, over time, human well-being (however defined!) increases even in the face of hardships.

And there is evidence that this is happening. Consider, for example, Figure 3.3, which shows deaths from all types of natural disasters. Development has generally made people safer from climate and weather extremes (with some important exceptions for those who have been displaced, disposed, and marginalized[3] by development). The big question, of course, is whether this trend will continue or whether increasing climate dangers will reverse it.

GOAL 2. Well-Being

As noted in Chapter 1, Gross Domestic Product (GDP) is the common metric used for economic development and its underlying goal to improve human well-being. This has certainly been on an increasing trend, though *crucially* standards of living are far from equitably distrib-

1 The plant and animal community of a major climatic region or type of habitat.

2 The permanent subordinate physical or structural parts of something—in this case, the parts necessary for the functioning of a community: e.g., water ducts, waste disposal facilities, roads, buildings, power supplies.

3 Treated as insignificant, or ignored.

Global Deaths from Disasters over More Than a Century

The size of the bubble represents the estimated annual death toll. The largest years are labeled with this total figure.

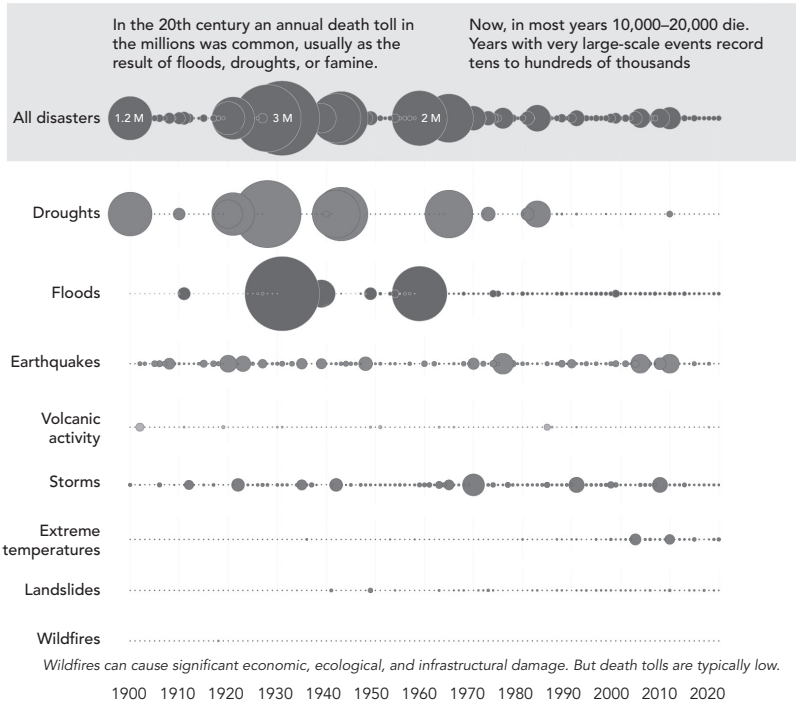


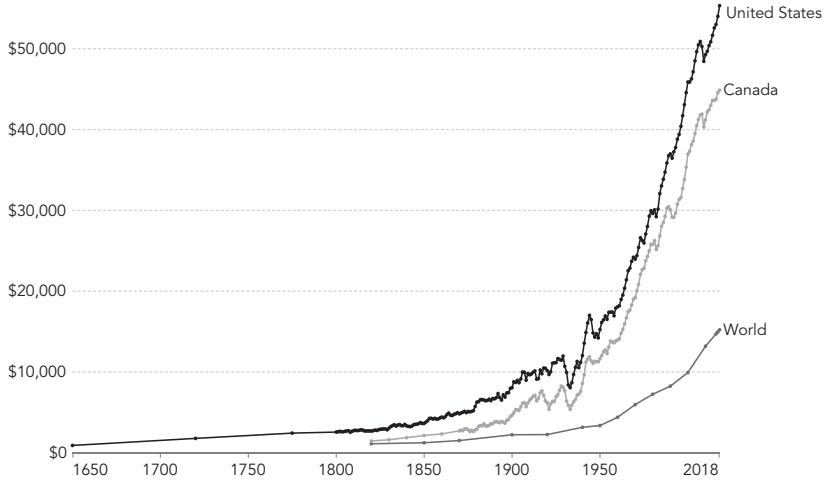
FIGURE 3.3 Data Source: EM-DAT, CRED/UCLouvain Brussels, Belgium, www.emdat.be (D. Guha-Sapir), OurWorldInData.org

uted across the globe (see Figure 3.4). We also noted that perhaps "sustainable" development means using metrics beside GDP growth to track progress. The UN Sustainable Development Goals (SDGs) account for a wider range of metrics. Maybe we should be tracking happiness, sharing, enlightenment, or human harmony with nature. After all, happiness does not continue trending upward after a certain level of GDP per capita has been secured. Perhaps the development that matters is spiritual or about one's character. All of this is harder to measure, of course. Still, though, it gets you wondering: what are the trends that really matter when it comes to human development or progress? What does the goal of well-being really *mean*?

We noted above how this goal (2) has been in opposition to goal 1a. Development means GHG emissions, which mean danger. But that's not

GDP Per Capita, 1650 to 2018

This data is adjusted for inflation and for differences in the cost of living between countries.



Note: This data is expressed in international-$[1] at 2011 prices.

1. International dollars: International dollars are a hypothetical currency that is used to make meaningful comparisons of monetary indicators of living standards. Figures expressed in international dollars are adjusted for inflation within countries over time, and for differences in the cost of living between countries. The goal of such adjustments is to provide a unit whose purchasing power is held fixed over time and across countries, such that one international dollar can buy the same quantity and quality of goods and services no matter where or when it is spent. Read more in our article: What are Purchasing Power Parity adjustments and why do we need them?

FIGURE 3.4

the whole story, because development also can mean resilience, goal 1b. People with access to infrastructure and services are better equipped to handle climate extremes. As noted, natural disaster costs increase every year, because the technosphere[4] is growing due to development, thus, more valuables are exposed to harm. However, the costs as a percentage of global GDP have actually been decreasing, which is one way to say that the total system is more resilient: it can withstand losses at a lower cost to the whole (see Pielke 2019). There is truth in the saying that wealthier is safer.

So, the goal of development is manifold and it is in a complex relationship with the goal of safety. For example, consider how the development of new technologies like genetic engineering can help adapt our food systems to a changing climate. Development both causes climate change (exposing us to new risks) and shelters us from the impacts of climate change (reducing vulnerability). This is an important tension to keep in mind. Finally,

4 That part of the environment modified by human action.

note that the goal of development is open-ended in a way that the temperature target is not. Do we ever have enough, or too much, development? We'll take this up in the next chapter.

Pursuing the Goals: Justice and Finance

We've seen how not all people are equally responsible (conditioning factors) for climate dangers. The developed world has generated the vast majority of emissions and the developing world is generally most vulnerable to the resulting dangers. This basic asymmetry is the unfairness at the heart of climate justice.

This is why the UNFCCC notes in Article 2 of the Paris Agreement that climate decisions should be "implemented to reflect equity and the principle of common but differentiated responsibilities and respective capabilities." Everyone should contribute to solving the problem in ways proportionate to their responsibilities and capabilities. We all live on the same planet in common and, thus, we all have responsibilities, but those who have contributed most to the problem (created the most GHG emissions) have the greatest moral responsibility and have the greatest capabilities to help. In metaphorical terms, we are not all in the same boat—some have yachts and others only have a plank of wood to hold onto. Yet we are all in the same storm. Of course, in this metaphor, we have to also imagine that those with the yachts are making the storm worse!

Climate change responsibility often boils down to money: the polluter should pay. That's why the same article states that achieving the goals of mitigation and adaptation will require "making finance flows consistent with a pathway towards low greenhouse gas emissions and climate-resilient development." We'll return to this in later chapters on climate ethics and policy with regard to loss and damage, climate justice, and climate reparations.

It's important to emphasize here the ethics and justice dimensions of defining climate goals with simple temperature targets like 1.5°C. Consider three key issues:

- First, we are almost certainly going to exceed the 1.5°C target well before 2100 (Brahic 2022). Should scientists and journalists even openly state this honest truth? What will it mean to miss such a symbolic target? Will people understand that "dangerous climate interference" never

really could be defined and measured as a specific number and continue to work toward preventing 1.51°C or 1.52°C? Will people be discouraged? Will the UNFCCC suffer damage to its credibility if we pass the goal but the world doesn't collapse? Or maybe this will spur more emphasis on important adaptation measures.

- Second, targets can be meaningless if specific measures are not put in place. Setting targets does not, by itself, reduce emissions. There have to be policies in place that are politically acceptable and cost-effective. Without those, all the temperature targets and climate pledges are just talk and empty promises.

- Third, and related, a focus on simple end targets distracts from crucial questions about the means, that is, about the pathways to the goal and who is included on those paths. This limits definitions of "success" in problematic ways: there is far more to a thriving future than one temperature target. How we get to our goals matters a great deal—we need to employ means that are fair and compassionate. This is why the focus on equity and justice is vital. "Success" can't mean getting to 1.5°C in ways that leave millions of people in poverty (Hulme 2020).

Consider the unprecedented Canadian wildfires in 2023. Certainly, aggressive mitigation efforts to limit warming will help reduce the risks of extreme fire weather. But so much else is needed on the ground, including firefighting resources and forest management changes. Given that climate change is tangled up with so much, like wildfires, "success" will mean lots of things with many targets.

Climate Change as a Wicked and Collective Action Problem

This predominant problem framing of safety and development establishes the structure of political discourse. It also indicates why climate politics is so messy—because there are multiple goals that are open to different interpretations by a variety of stakeholders using an abundance of trend data from many sources. We can gain a better understanding of this messiness with the aid of a couple of theories.

Climate Change as a Wicked Problem

Design theorists Horst Rittel and Melvin Webber coined the term "wicked problem" to characterize complex social policy problems. Unlike "tame" problems, wicked problems don't have a straightforward technical or scientific solution. They involve more than just, say, straightening a bent pipe or replacing a damaged part.

Wicked problems cannot be described in linear terms, because the conditioning factors and their symptoms are vast and entangled. Complexity allows for multiple ways of defining the problem (what are the goals, what vision of the future are we pursuing?) and locating the problem (where, in the vast causal networks, does the problem lie?). Given this, Rittel and Webber conclude, "the problem of identifying the actions that might effectively narrow the gap between what-is and what-ought-to-be" becomes very difficult (1973, 159).

For a wicked problem, part of the problem is knowing what the problem even *is*! To make the problem even more wicked, interventions in systems (social or natural) will have unintended consequences, the people causing the problem have a vested interest in manipulating its formulation to perpetuate the status quo (do you think oil companies want to leave all their profits in the ground?!), and the stakes are extremely high.

Indeed, others have argued that climate change is a "super wicked problem" (see Levin et al. 2012). They argue that in addition to everything noted above:

- Time is running out (e.g., the 1.5°C goal is fast slipping out of reach).
- Those who cause the problem also seek to provide a solution (fossil fuel companies, for example, increasingly claim to be driving a grand energy transition and to be "carbon neutral" via often dubious carbon credit schemes).
- The central authority needed to address the problem is weak or non-existent (the UNFCCC has no real political authority over nation states or corporations).
- Policy actions are irrationally discounting the future[5] (arguably the impacts of climate change on future generations are being vastly under-estimated).

5 Counting harms (and benefits) as less important as they are farther away.

I would add to this the fact that humans are just not evolutionarily adapted to think on global scales and centuries-long timeframes.

Climate Change as a Collective Action Problem

Your personal GHG emissions cause real harm, which is often described as the "social costs of carbon" though they are ecological costs too. The philosopher John Broome (2012) estimates that the monetary value of the harm you cause over a lifetime ranges between $19,000 and $65,000. These are "externalities," meaning you don't actually pay this money. They are costs you impose on other, innocent, people. Your lifetime emissions wipe out more than six months of a healthy human life.

These harms, however, are diffuse, indirect, and imperceptible. Meanwhile, the benefits you derive from the activities that produce the emissions are direct and tangible. You get the electricity, the heat, the travel, the food, etc. As you enjoy these benefits day-to-day, you can forget about the miniscule, invisible harms that come with them. Moreover, you can tell yourself that you are not causing climate change. You could eliminate your emissions entirely and it would not change the situation at all. It doesn't make sense to sacrifice for the greater good, because the sacrifice doesn't matter in the scheme of things.

So, why should you stop eating meat, forego flying, or take shorter showers … especially when others are not doing these things? Indeed, why should the state of California or New York implement costly policies to slash GHG emissions if other states don't do the same? The entire nation of France could eliminate all their emissions and that would just be a 0.8 percent reduction globally. If it caused them economic hardship to do so, why would they?

A collective action problem is a situation in which all individuals would be better off cooperating but fail to do so. Rather, individuals pursue their own short-term gain at the expense of the group's best long-term interests. Like public radio, we all benefit from a habitable climate whether we help support it or not. Thus, there is a strong incentive to act as a "free rider," taking advantage of the public good without taking responsibility for sustaining it. Modern societies tend to prioritize individual liberty, free markets, and state sovereignty, which means they find it difficult to implement the restraints on freedom and to foster the cooperation needed to tackle collective action problems. A commitment to personal freedom and

state sovereignty above all else makes it very hard to form a collective will that is strong enough to address climate change.

This is why collective action is imperative—relying solely on individual virtue is almost certainly doomed to failure. Besides, individuals are severely constrained in the choices they can make to achieve the goals of mitigation and adaptation. In a world powered by fossil fuels and fed by industrial agriculture, it is sometimes impossible to opt out just with individual choices. Other choices are sometimes only attainable to those with sufficient means to afford greener alternatives.

What kind of collective decisions to make? That is a question to take up in later chapters on the politics and policy of alternative courses of action.

Conclusion

We might say that climate change is a wicked, collective action problem that requires making the ongoing global development project "climate safe." This will take mitigation, that is, rapidly reducing our GHG emissions. And it will necessitate more adaptation and resilience. These activities should be done and paid for in ways that are consistent with the principle of "common but differentiated responsibilities." Altogether, this is "sustainable development" where the first goal of safety is what "sustainable" means and the second goal of well-being is what "development" means. Another term for it is "green growth." Can we really continue growing the economy while stewarding a safe climate? Because that is such a central question, we'll end the first section of the book by examining it.

Activities and Questions

1. Perhaps the most famous expression of the collective action problem in environmental terms is the ecologist Garret Hardin's 1968 essay "The Tragedy of the Commons." After reading that, look up the work of the economist Elinor Ostrom. How does her work enable us to critique some of Hardin's assumptions and arguments?

2. What problems related to climate change are being debated in your local community? How are they being framed by different stakeholders and

how do they fit (or not) into broader UNFCCC framing? Can you use the GTCPA framework to analyze the decision process and even offer advice to the stakeholders?

3. What are other examples of wicked problems and how can we relate the concept of a wicked problem to hyperobjects?

4. What criticisms can you offer of the way the UNFCCC has framed climate change as a problem? Read the full text of the Paris Agreement. Do you think I have adequately represented the way it defines the problem?

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