CHAPTER 2

Climate Change and Climate Justice

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Introduction

From 1994 to 2015, I have been deeply involved in the IPCC process as one of the lead author of the second and third reports and then as a bureau member for the fourth and fifth reports. My own field of research is about the reconstruction of past climate changes largely from the study of deep ice cores drilled in Antarctica and Greenland. In turn, my involvement with the IPCC was mainly at the level of working group I, dealing with the physical basis of climate change. Naturally, I have had during these 20 years—and still have—a profound interest for other aspects of climate change as assessed by working groups II about impacts, adaptation and vulnerability, in which these aspects dealing with inequalities are treated, and working group III which addresses mitigation of climate change. Moreover, I have had the opportunity to attend the sessions during which the summaries for policymakers of these reports have been approved.

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In fact, over the last 30 years, the IPCC has given increasing attention to the fact that risks associated with anthropogenic climate warming are unequally distributed and are generally more significant for underprivileged communities and people at all levels of development. In its fifth report (IPCC 2014), it has concluded that "people who are socially, economically, culturally, politically, institutionally, or otherwise marginalized are especially vulnerable to climate change and also to some adaptation and mitigation responses". One year later, this clear statement was echoed in the Paris Agreement (2015) though in a very weak manner simply noting "the importance for some of the concept of climate justice, when taking action to address climate change" and stating that this agreement "will be implemented to reflect equity… in the light of different national circumstances". Risks of inequalities associated with anthropogenic climate change are further explored in the IPCC special report "Global Warming of 1.5 °C" (IPCC 2018) with a dedicated chapter "Sustainable Development, Poverty Eradication and Reducing Inequalities" and, again, resounding statement: limiting global warming to 1.5 °C rather than 2 °C would make it markedly easier to achieve many aspects of sustainable development, with greater potential to eradicate poverty and reduce inequalities.

Indeed, there is little doubt that inequalities associated with climate warming will increase along with its amplitude. In this context, one can choose to define "climate justice" as aiming to do everything possible to stop global warming from increasing these inequalities (Jouzel and Michelot 2016). Obviously, given climate science, one should limit long-term future global warming well below 2 °C above preindustrial levels and pursue efforts to limit this temperature increase to 1.5 °C above preindustrial levels, the objective of the Paris Agreement. However, even limited to 2 °C, global warming will have consequences which our society will have to adapt to with, in the absence of measures, the risk of increasing inequalities between those who have the means to adapt and those who do not. In turn, for a successful well-being transition, the focus of this book, this objective of the Paris Agreement should be pursued in a spirit of "climate justice" this notion being defined as above, for example, with the objective to avoid increasing inequalities.

My participation in the French Economic, Social and Environmental Council (ESEC) gave me another opportunity to address this issue of climate justice. The IPCC and numerous other reports make us well aware of the vulnerability of certain countries and populations who hardly

contribute to greenhouse gas emissions. But vulnerability also concerns developed countries in which the poor strata of populations could be the most vulnerable to climate change (IPCC 2014). Along with my colleague Agnès Michelot, an environmental law specialist, we attempted to analyze this risk of global warming through the lens of increasing inequalities within France and produced, on behalf of the section of Environment, the ESEC's opinion entitled "Climate justice: challenges and prospects for France" (Jouzel and Michelot 2016).

It is along these two lines, the IPCC assessments at the international level and the ESEC's opinion, at the national level, that I will examine in this chapter the link between climate change and climate justice.

Climate Change and Inequalities: A Global Perspective

Changes in climate have already caused impacts on all continents and across the oceans and, with no surprise, future impacts and their consequences will be more important for larger warmings. This is clearly illustrated in IPCC (2014) that adopts a global perspective on climate-related risks under five categories associated with different "reasons for concern". For each of them additional risk due to climate change, when a temperature level is reached and then sustained or exceeded, ranges from undetectable to very high risk with intermediate levels, moderate and high.[1] All have impacts on human systems either directly or through their impact on natural systems which provide services for livelihoods. For example, there are risks due to storm surges, coastal flooding and sea level in low-lying coastal zones and small island developing states and other small islands, and due to inland flooding in some regions potentially affecting large urban populations. Risks also result from extreme weather events leading to breakdown of infrastructure networks and critical services such as electricity, water supply, and health and emergency services. Periods of extreme heat are associated with increased mortality and morbidity particularly for vulnerable urban populations and those working outdoors in urban or rural areas while risk of food insecurity and the breakdown of food systems are linked to warming, drought, flooding and precipitation variability and extremes, particularly for poorer populations in urban and rural settings.

[1] The definition of these five categories is fully explained in IPCC (2014) in which key risks are identified which contribute to one or more "reasons for concern".

Another example concerns the risk of loss of rural livelihoods and income due to insufficient access to drinking and irrigation water and reduced agricultural productivity, particularly for farmers and pastoralists with minimal capital in semi-arid regions.

Higher warming increases the likelihood of severe, pervasive and irreversible impacts. Global climate change risks are high to very high with a global mean temperature increase of 4 °C or more above preindustrial levels for all categories of risks. They include severe and widespread impacts on unique and threatened systems, substantial species extinction, large risks to global and regional food security, and the combination of high temperature and humidity compromising normal human activities, including growing food or working outdoors in some areas for parts of the year. The risk associated with crossing multiple tipping points in the earth system (thresholds for an abrupt and irreversible change) or in interlinked human and natural systems also increases with rising temperature.

The Paris Agreement has opened the possibility to avoid long-term global warming reaching up to 4 °C to 5 °C above preindustrial level but this is not warranted yet. And, even if all nationally determined contributions (NDCs) were fulfilled during the period covered by this agreement (2020–2030), this long-term warming could exceed 3 °C. Reaching the 2 °C objective will only be possible if these NDCs were globally multiplied by 3 over the coming 10 years, and by 5 for 1.5 °C. And carbon neutrality is required to stabilize global warming, between 2070 and 2080 for the 2 °C objective, and as soon as 2050 for 1.5 °C.

Even if limited at 2 °C above preindustrial levels, some risks are considerable and in this respect each half degree counts (IPCC 2018). Limiting warming to 1.5 °C rather than 2 °C could reduce the number of people exposed to climate risks and vulnerable to poverty by 62 to 457 million and this would also lessen the risks of poor people to experience food and water insecurity, adverse health impacts and economic losses, particularly in regions that already face development challenges (IPCC 2018). Avoided impacts between 1.5 °C and 2 °C warming would also make it easier to achieve certain Sustainable Development Goals (SDGs) including targets to reduce poverty such as those that relate to hunger, health, water and sanitation, cities and ecosystems. Even if long-term warming is limited at such levels, adaptation, which in some particular cases may entrench vulnerabilities and also have the potential to enforce inequalities, will be necessary.

IPCC reports (2014, 2018) point to the fact that many of the most vulnerable countries have contributed and contribute little to greenhouse gas emissions while climate change impacts are expected to exacerbate poverty in most of these developing countries. Intuitively, we understand that most of the risks we have briefly evoked will increase inequalities there. This is fully confirmed as climate change impacts are projected to slow down economic development, make poverty reduction more difficult, further erode food security and prolong existing poverty traps and create new ones, the latter particularly in urban areas and emerging hotspots of hunger. In addition, climate change interacts with non-climatic stressors and entrenched structural inequalities to shape vulnerabilities. However, although there is growing literature on climate change and gender as well as on indigeneity, other axes such as age, class, race, caste and (dis)ability remain underexplored.

Among the numerous examples that IPCC reports provide to illustrate how climate change will increase inequalities, one can cite two related to urban areas (IPCC 2014). First management such as the privatization of urban water supply and sanitation systems can advantage specific groups over others. Conversely, community-based solutions that also build social capital can be a component in generating urban resilience. However, even these solutions may exacerbate inequality at the city level, with only those local areas with strong levels of social capital being able to benefit most from community-led action or garner support from international and national partners. Second, population living in informal settlements will not be protected by insurance because of their low ability to pay and the high transaction costs for companies of administering many small policies. Low-income groups rely instead on local solidarity and government assistance when disaster hits. In addition, where risk levels exceed certain thresholds, insurers will abandon coverage or set premiums unaffordable to those at risk.

This anticipated increase of inequalities with the creation of new poverty pockets is not limited to the poorest countries on which the majority of research on the poverty-climate nexus remains focused. This risk also exists for developed countries and indeed very limited research examines climate change impacts on poor people and livelihoods in middle- to high-income countries. However, there is mounting evidence of observed impacts of climatic events on the poor in such countries, as documented for the European heatwave, the ten-year drought in Australia, and Hurricane Katrina in the USA. This example of Katrina clearly illustrates

the propensity of natural disasters to victimize society's poorest and most vulnerable; these poorest populations were less well prepared before Katrina and had more difficulties to leave New Orleans during this devastating hurricane and, after it, all along the reconstruction phase (Mutter 2015).

I now examine this aspect of climate change and inequalities in developed countries through the ESEC's opinion on "Climate justice" (Jouzel and Michelot 2016).

Climate Change and Inequalities: The Case of France

As a member of the Economic, Social and Environmental Council (ESEC)—the third constitutional assembly in France—since 2010, I am involved in its "section de l'environnement", chaired by Anne-Marie Ducroux. In December 2015, the notion of climate justice was included in the Paris Agreement and, at the initiative of my colleague Agnès Michelot, the idea of focusing an opinion on climate justice at the national level was proposed in early 2016 and was approved by the ESEC bureau. Our section was then tasked to draft an opinion on "Climate justice: challenge and prospects for France" and we were with Agnès Michelot appointed as rapporteurs. The full draft of this opinion has been adopted by 152 votes to 15 and 15 abstentions in September 2016. For the ESEC, which supports the fight against all forms of inequality, the key aim of this opinion was to contribute to public policies which will help to limit and, if possible, to reduce social and economic inequalities caused by global warming on a national level. Before focusing on these recommendations (see also Jouzel and Michelot 2020), it is useful to briefly review some characteristics of climate change in France and the associated risks of increasing inequalities.

Since the beginning of the twenty-first century, metropolitan France has experienced warming close to 1.3 °C higher than its global average value and in about 20 years, its climate will be characterized by an increase in average temperatures of between 0.6 and 1.3 °C, all seasons combined. Beyond 2050, much greater warming would be observed in the case of an emitting scenario with, at the end of the century, a sharp increase in average temperatures of up to 5 °C in summer (Ouzeau et al. 2014). The summer of 2003, about 3 °C warmer than the average summer of the

twentieth century, would then become the norm in the second part of this century. During heatwaves record temperatures could, in certain regions, occasionally exceed 50 °C. In addition an urban heat islands is characteristic of large cities (in 2003, temperatures were, at the end of the night, 4–7 °C warmer in Paris than in the inner suburbs). Precipitation will tend to increase in winter and decrease in summer with a deficit that could exceed 50% around the Mediterranean Sea. Thus, drought episodes would increase in a large part of southern France, which does not protect these regions from "Mediterranean" events causing flash floods, episodes which could become more frequent and potentially more intense.

The rise in sea level will accelerate according to the rate of greenhouse gas emissions, with the risk of reaching up to one meter by 2100 in the case of an emitting scenario. Sea level rise would then become the main cause of the aggravation of the flood hazard: the regions of Languedoc, the Rhone delta and Aquitaine are particularly concerned but the rest of the Atlantic coast, certain coasts of Hauts de France and the plain of eastern Corsica are also affected. Up to a million people in these coastal regions could be affected by at least one flood every year from 2050. In practice, all the consequences identified on a global scale must be taken into account for our country: loss of biodiversity, modifications of natural ecosystems, reduction in agricultural yields, impacts on viticulture and forests, increase risk of forest fires, acidification of the ocean with consequences on oceanic productivity and on coral reefs. And that is just as worrying on the side of the populations: in the hypothesis of a warming of 3 °C, two-thirds of Europeans could be affected by climatic disasters in the absence of appropriate adaptation measures. Each year, around 350 million Europeans could then be exposed to harmful climatic extremes, 14 times more than at the beginning of the 2000s and the number of deaths associated with these extremes would increase considerably. Compared to the turn of the century, people living in southern Europe, Italy, Greece, Spain and southern France, with 64 times more deaths, should be the hardest hit. At the origin of 99% of deaths, heat waves are expected to have the deadliest effects.

As in metropolitan France, global warming will be perceptible in the overseas territories but generally at a slightly slower rate. As for tropical cyclones, their frequency should either not be changed or be reduced, but the most intense could become even more intense in terms of maximum wind speed and intensity of precipitation, especially those that will reach

the coasts of America from North and Central America; this also applies to many islands in the Pacific.

To my knowledge, we have no quantitative estimates of the relative influence of these extreme events on low income with respect to high-income populations on a national basis, but intuitively, the former should be more affected in the majority of situations. For example, in the case of intense heatwaves in the Paris area, low-income populations have often no possibility to leave this area for a few days, or a few weeks. Populations living in flood-prone areas in departments such as Hérault, Gard and Aude subject to Mediterranean events which are likely to intensify do not have the means to leave their difficult-to-sell house and this could be also the case in certain coastal regions subject to the risk of submersion. And one can think that low-income populations were less well prepared and had more difficulty coping with devastating hurricanes like Irma, which in 2017 destroyed many homes on the islands of Saint-Martin and Saint Bartholomew (this vulnerability of low-income populations is well documented for Hurricane Harvey which devastated Houston area one week earlier—see Guivarch and Taconet 2020).

Note also that almost all sectors of our economy are concerned: health, water resources, biodiversity, natural hazards, agriculture, forestry, fishing and aquaculture, energy and industry, infrastructure and transport systems, urban planning and the built environment, tourism, financing and insurance and so on with consequences as increased unemployment rate which in many sectors affects more directly low-income population. Also, all of these sectors—some of which contribute to emissions of greenhouse gases—are more or less affected by climate change and must prepare for it by considering appropriate adaptation measures. However, some measures proposed or taken with the aim to diminish our emissions or to adapt to climate change can generate inequalities. The planned increase in the carbon tax, triggering the "yellow vests" crisis, provides an example. This increase was unfair in the sense that, in a relative way, it affects more, and was rejected, by the low-income population, in particular by people who have to take their car to get to work.

As noted by the Haut Conseil sur le Climat (2019), an increase of the climate-energy contribution at the level initially planned for 2022 coupled with the modification on the taxation of diesel would have represented an effort of almost 1% of disposable income for the poorest 10% of households against 0.3% for the top 10% richest.

In this context of increasing inequalities linked to climate change, the ESEC has built a definition of climate justice at the national level based on the objectives that climate justice must pursue in terms of the fight against inequalities, considering that the failure to take into account the impact of climate change in public policies could increase the risks of social divide. The recommendations included in this opinion (Jouzel and Michelot 2016) have the ambition to create synergies between economic, social and environmental policies.

In this perspective, the ESEC recommends that strategies for combating and adapting to climate change be integrated into the policy for combating poverty and be evaluated with regard to their benefits for the poorest 20%. The recommendations also concern the national adaptation plan (PNACC) which should account for the concept of climate justice—which has since been done—and should also be integrated into the policy of fight against poverty. The ESEC also recommends that the ecological transition is prepared and supported by the training of workers according to the sectors of activity and that the most disadvantaged populations can benefit from training and job creation linked to the implementation of the ecological transition.

The ESEC seeks to support better integration of social and intergenerational justice into investment programs and projects. This requires that impact studies take into account how the most disadvantaged populations are affected by climate change, and by revising the rules for socio-economic evaluation of investment projects that the State applies to its own financing. This involves supplementing the calculation of a net present value or an internal global rate of return with an analysis of the redistributive effects regarding the most disadvantaged people and by setting an adjustment rate which better takes into account the well-being of future generations.

For the ESEC, climate justice should make it possible to promote practices and investments that strengthen the quality of employment in sectors that hire people, such as construction, waste management or circular economy. From the perspective of social, financial and fiscal equalization, the ESEC recommends carbon taxation to be able to be adjusted socially through the establishment of a system of progressivity, which has not been the case for the initially planned increase of this carbon tax. Another area attracts the attention of the ESEC, that of insurance policies, because it is becoming urgent to prepare for reforming the cover of climate risks in general and of the natural disaster schemes in particular, both to maintain national solidarity and to allow the poorest people to access insurance.

The ESEC also points to the need for supporting research with a focus on the consequences of global warming at regional scales and on "Climate services" intended to facilitate the implementation of mitigation and adaptation measures, in particular the prevention of risks linked to extreme phenomena, heat waves, floods, droughts, cyclones in overseas territories. The interactions between these climatic extremes and the health of populations deserve to be better understood. Work on the evolution of jobs, on the link between poverty and climate change, and more generally on the evolution of our societies in the face of inequalities would also be very relevant. There is also a need for studies on gender vulnerability taking into consideration the realities in different territories and a more significant risk culture in overseas France.

Via their impact on public policies, in particular, these recommendations should help to limit, and if possible, to reduce social and economic inequalities caused by global warming on the French population.

Conclusion

The notion of climate justice that this chapter has tried to explore and illustrate goes beyond the global and national levels on which I have focused here.

First, this notion has been discussed at the European level—and I anticipate in many other national and international contexts—with an opinion of the European Economic and Social Committee (Lohan 2017) in which it is recognized that the most vulnerable and poorest in society often suffer the greatest impact of the effects of climate change, despite these people being the least responsible for the emissions that have driven the climate crisis.

Second, developed countries should not limit their actions in favor of climate justice to their national territory as their international investments can weigh heavily in the implementation of environmental policies abroad. The ESEC expressed in this perspective the hope that a significant part of French investments will be geared toward the most vulnerable populations and in this way engage with the "Climate justice" approach, which our country committed to during the Paris Conference. Moreover, the ESEC recommends that France supports a definition of investment within the investment treaties which incorporates the principles of "Climate justice" and policies fighting climate change.

Still, the highest priority should be given to the concrete implementation of climate justice goals at the national level. The proposals presented clearly indicate that France, like many other countries, has the means to enter into an operational dimension quickly, without waiting for any consensus on a unanimously accepted definition of the concept at the international level. The objective of carbon neutrality in 2050 was indeed adopted unilaterally by France. By the same token, the creation of a "Citizen's Convention on Climate" which involved 150 citizens drawn by lot whose mandate was "to define structuring measures to achieve, in a spirit of social justice, to reduce greenhouse gas emissions by at least 40% in 2030 compared to 1990", was a significant advance in recognizing the importance of climate justice as a solution to climate change. Climate justice is an essential goal so that young people of today and tomorrow can, in the second part of this century, adapt to climate change instead of being ruled by climate change.

References

Guivarch, C., & Taconet, M. (2020). Inégalités mondiales et changement climatique. *Revue de l'OFCE, 165*, 37–69.

Haut Conseil pour le Climat. (2019). Agir en cohérence avec les ambitions, rapport annuel.

IPCC, Climate Change. (2014). *Impacts, adaptation, and vulnerability. Global and sectoral aspects*. Contribution of Working Group II to the Fifth Assessment Report. Cambridge, UK and New York, NY: Cambridge University Press.

IPCC. (2018). Global warming of 1.5°C.

Jouzel, J., & Michelot, A. (2016). Climate justice: Challenges and prospects for France ESEC opinion.

Jouzel, J., & Michelot, A. (2020). Quelle justice climatique pour la France. *Revue de l'OFCE, 165*, 74–96.

Lohan, C. (2017). La justice climatique, Comité Economique et social européen, Avis d'initiative.

Mutter, J. (2015). *Disaster profiteers: How natural disasters make the rich richer and the poor even poorer*. St. Martin's Press, St. Martin's Publishing Group, 288 p.

Ouzeau, G., Déqué, M., Jouini, M., Planton, S., & Vautard, R. (2014). Sous la direction de Jean Jouzel. Le climat de la France, au XXIe siècle, Volume 4, Scénarios régionalisés pour la métropole et les régions d'outre-mer.