Chapter 4
Anthropology in the Anthropocene: Sustainable Development, Climate Change and Interdisciplinary Research

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Abstract Recent world summits on sustainable development or climate change have been considered as failures, with greenhouse emissions rising and sustainable development much talked about yet hardly seen. In this chapter, I argue that global environmental change programmes and their understanding of interdisciplinary research are part and parcel of this problem, having turned science into an "anti-politics machine" (Ferguson 1994). I illustrate this argument with sketches from two ethnographic case studies in Portugal and northern Germany, comparing them to the globalising approach of international research programmes. Rather than the 'science is settled' approach, I argue that the open dialogue about knowledge production and collaboration based on ethnographic research leads to a shift in perspective and helps to bring issues such as climate change into the world and science back into democracy.

4.1   Introduction

Recent world summits on climate change such as *Conference of the Parties* (*COP*) *15* in Copenhagen or *Rio+20*[1] on sustainable development have not kept their promise. Greenhouse gas emissions are on the rise, while sustainable development is rarely seen. According to so-called Earthsystem scientists, the impact of human activities on planetary ecosystems is comparable to geological forces, with humanity having entered a new geological era, termed the Anthropocene (Crutzen 2002). Concerned scientists argue that more research is needed, which also has to become more interdisciplinary:

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[1]The *United Nations Conference on Sustainable Development* (*UNCSD*) was held in Rio de Janeiro in June 2012, twenty years after the first summit in Rio, 1992.

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> The challenges facing a planet under pressure demand a new approach to research that is more integrative, international and solution-oriented. We need to link high-quality focused scientific research to new policy-relevant interdisciplinary efforts for global sustainability (Brito and Stafford Smith 2012).

This call is the latest step in an already long history of scientific research programmes that have been formative for both the organisation of science and the way in which environmental problems are presented to the public and politics. In this article, I will discuss various stages of this global research agenda from the perspective of an anthropologist who conducted research on global change problems and participated in various interdisciplinary settings between the landmark summits in Rio de Janeiro 1992[2] and *Rio+20* in 2012. I will present ethnographic vignettes from my fieldwork on the (failed) implementation of sustainable development in Portugal in the early 1990s, from my participation in an interdisciplinary project on local resistance against a national park at the German North Sea coast, as well as from the performance and sometimes frustrating experiences of anthropologists in the world of global research programmes. In the final part, I present the example of a collaboration with a climate scientist; together we suggested to deal with the challenge of climate change in a way that empowers politics and people.

While there is no doubt that more and better research is needed to understand global change problems, the question remains of why there is such a discrepancy between almost routinely expressed alarmist calls from concerned scientists on the one hand and a lack of effective political management of planetary problems on the other. The current dilemma or even gridlock of climate and sustainability policies cannot only be blamed on "vested interests and fossil fuel lobbies (…), media barons hijacking public opinion or cowardly political 'leaders,'" as the palaeontologist Andrew Glikson (2013) stated in a recent article. Rather, it is also time to discuss both the agenda of scientific global change programmes and the practices and prospects of interdisciplinary research.

In this article, I will argue that science and politics have established a dangerous relationship, with science setting the political agenda in the form of thresholds, tipping points or recently planetary boundaries, thus de-politicising the political agenda. In short, science-based programmes turn into what James Ferguson (1994) calls an "anti-politics machine"; they create their own structures of knowledge and de-politicise deeply political problems such as climate change or sustainable development. Thus, scientific practice and research agendas have to become part and parcel of the field, with disciplines such as anthropology that have newly emerged on the global research panel bringing in a reflexive and self-critical approach.

Global change research has long been the domain of natural sciences, applied social sciences and economists, while disciplines from the humanities have until recently been reluctant to participate in the global research agenda. However, this volume and many other research reviews show that this is changing in an impressive manner, with anthropology, for example, increasingly contributing to research on climate change (Barnes et al. 2013; Crate 2012). With *anthropos* as

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[2] *United Nations Conference on Environment and Development* (*UNCED*).

the common denominator, anthropology is an obvious candidate for interdisciplinary research in the Anthropocene. However, for anthropologists and other social scientists, the Anthropocene is more than a scientific (and contested) definition of a new geological era; it is, like the image of planet Earth, also a global icon with political, ecological and cultural dimensions (Jasanoff 2001). Even more so, it is also a common and organisational symbol for interdisciplinary research, with its origin from geology hinting to the dominance of natural sciences in defining the problems at stake, as well as the hierarchy among the disciplines. Nonetheless, the Anthropocene also poses new ontological and epistemological questions in challenging familiar distinctions between nature and culture, as well as between the local and the global. The effects of global changes are local, as are the measures taken for mitigation and adaptation. In short, interdisciplinary research including anthropology means more than simply adding more disciplines to an already existing agenda; instead, the research agenda, its own cultural fabric and the inherent hierarchies have come into focus.

In their typology of interdisciplinary research, Barry et al. (2008) already reflect upon the delicate relationship between disciplines, as well as between the research agenda and politics. The authors identify three different types of interdisciplinary research, two of which easily fit the current global interdisciplinary research agenda. There is the additive model, whereby social sciences are asked to add the social dimension of global change, to deliver data about social and cultural values or indigenous knowledge and to provide a link between the scientific model and reality. There is also the 'submissive' role attributed to social sciences, whereby they are asked to translate scientific findings to the public and sum them up for politics in an understandable way. The third type is the most interesting for the purpose of this article, and is called the "agonistic-antagonistic" model, which I translate here as a relation of tension and critical dialogue between anthropology and other disciplines. This typology also makes clear that interdisciplinary research is not a value per se; it is not sufficient to simply add up increasingly more disciplines in order to achieve more reliable and better results. The Anthropocene not only challenges the dispositions of our survival; rather, it also challenges our understanding of the role of science. The view from anthropology suggests that global environmental problems still happen locally in the Anthropocene, and that it is from here that we have to compose our research agendas and the idea of a common world to be taken care of.

4.2   Anthropology in the Anthropocene: *Rio+20*

How should anthropological fieldwork be conducted on global environmental change, and can the ethnographic particular be connected with the global? In the following two sections, I present two different approaches: one starting from the global, the other from the local. Both approaches are connected to the landmark summits of *Rio 1992* and *Rio+20* and serve to provide a critique of the global sustainable development agenda.

In a recent edition of the *Anthropology News*, David Rojas (2013) from Columbia University presented a stunning example of his multi-sited and inter-disciplinary fieldwork. He attended the *Rio+20* world summit in the footsteps of the anthropologist Paul Little, who had observed the legendary *Rio 1992* summit on environment and development. Little (1995) had described the Earth summit as a global ritual, and was already aware of the enormous tensions between developing and developed countries in the negotiation about the globalisation of environmental risks and the urge for sustainable development. Twenty years later, the United Nations (UN) secretary welcomed the delegates with the video "Welcome to the Anthropocene," showing a digital image of planet Earth in the form of lines and networks representing the spread of industrialisation from England all over the world. The video visualises a common planet that has to be managed by humanity for the sake of its own survival; however, for the critical observer, it does so with an inherent western gaze, which generalises a cultur-ally-specific vision of growth and development. In any case, in order to face the challenges of global change, it is still necessary to bridge the inequalities between developing and developed countries, between north and south, on the way to sustainable development. In his report, the anthropologist David Rojas provides an insight into the enormous political tension created through the difference between global discourse and political practice, which is played out on the sum-mit itself. Official delegates and members of environmental organisations or indigenous groups crowded this summit. In the midst of this chaos, David Rojas observed a dramatic discussion between Brazil's Minister of the Environment, Isabella Texeira, and an activist who interrupted a press conference protesting against the official statement that Brazil was successful in implementing sustain-able development. Rather than ignoring the activist or calling security, Texeira answered at length, emotionally explaining the restraints imposed on sustainable development when carbon and deforestation are negotiated in a free market. In interviews with her advisers, David Rojas learned that even the anticipation of failure has become an asset in these newly emerging markets. The conflicts between north and south are played out in the south, in developing countries, with climate treaties and sustainable development agendas creating a new reality that more often than not sharply contrasts official declarations and fosters cyni-cism and frustration on all sides. After having attended *Rio+20*, the next step in his multi-sited fieldwork brought David Rojas back to the frontier line of defor-estation in the Amazon, where he studies together with environmental sciences the local effects of global treaties. Anthropology in a world turned into a 'global village' is indeed multi-sited and interdisciplinary in order to connect the lines and dots between the local and the global. While it is impossible to grasp the full picture, it is possible to follow some lines that connect the dots and fill them with thick descriptions. The ethnographic report presents a different picture of how global rituals and global research programmes on the one side and specific envi-ronments inhabited by people on the other are connected in the Anthropocene, creating new realities.

4.2.1 Anthropology in the 'Global Village': A Case Study from Portugal

The dilemma between development and nature conservation, as exemplified by David Rojas from the *Rio+20* summit with the example of Brazil, is not a new one; rather, it was there from the beginning, and not only in the American south. During the world summit in Rio 1992, I conducted fieldwork in the southwest of Portugal to study the political ecology of this geographically and economically peripheral region of the *European Union* (*EU*). In a common effort, a coalition of non-governmental organisations (NGO), local politicians and concerned biologists managed to implement a nature park to protect its natural values and the coastal landscape from mushrooming tourism, as well as implementing sustainable development. In short, what was talked about in Rio was being put into practice, turning Portugal's southwest into an exemplary 'global village.'[3]

The prize for singling out the coastal landscape and implementing a sustainable and green agenda was the de-politicisation of the political landscape. After the revolution of 1974, landless workers occupied the *herdades* (estates) of the landowners, working the underused land. In 1986, the post-revolutionary era ended with Portugal's entry into the *European Union*. While the former landowners successfully reclaimed the occupied land and turned it into profitable eucalyptus monocultures, environmentalism was on the rise among Portugal's academic elites, as in the rest of Europe. The *International Union for Conservation of Nature* (*IUCN*), international conservation treaties and scientific *UN* programmes served as the main resources for environmentalists to overcome political polarisation, which was a heritage from the revolution. Non-governmental environmental organisations replaced the revolutionary leftist tradition and started their fight from within the system, as they called it. They heavily relied on the *European Union*, which itself had a strong regional and environmentally friendly impetus to bring development to its peripheral areas. The *European Union* and global environmentalism were seen as a means to end national nepotism and notorious bureaucratic corruption, with science-based management representing the key to a sustainable future.

While this was the theory, in practice, development was not in sight, whether sustainable or otherwise. Instead, during my fieldwork I followed ongoing stories about corruption, scandals and the misuse of European subsidies in plain protected area. While coastal inhabitants' agricultural activities were strictly subject to the laws of the recently implemented nature park, international investors in horticulture easily surpassed the law with protection from 'above' in Lisbon and with subsidies from Brussels. Rather than ending corruption, the nature park proved to be a powerless administration, serving as a fig leaf for the straight transition from pre-revolutionary feudalism to neoliberal capitalism; nature conservation and the promise of sustainable development helped to paint spatial planning and economic

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[3] The following paragraphs about sustainable development and nature conservation in Portugal are based on Krauss (2001) and Krauss and Dracklé (2012).

development green. The nature park's main achievement was the identification of endangered species listed on red lists. A handful of engaged biologists thus managed to single out small islands of nature conversation, turning them into symbols for a hopefully emerging eco-tourism, both in permanent danger of being overruled by 'higher interest.' Willingly or not, they helped to de-politicise the coastal landscape; science-based environmentalism and the promise of sustainable development served as an 'anti-politics machine.'

In the 1990s, Portuguese social scientists initiated an interdisciplinary, *EU* funded long-term research programme in order to observe the environment, society and public opinion. As a participant in one of its projects, I was able to closely observe the double nature of these programmes: on the one hand, I helped with my individual expertise in the field of ethnography to fill white spots on the map of knowledge concerning Portugal's and Europe's peripheral regions; on the other hand, I thus contributed to the establishment of a new form of governance. The programme was also educational, reaching out to schools and mass media, creating an 'environmental citizen,' while successfully linking Portuguese (social) sciences to the global research community such as the *International Geosphere-Biosphere Programme* (*IGBP*) and other *UN* programmes.

The dilemma of nature conservation and sustainable development has been the topic of several case studies in environmental anthropology, such as *Misreading the African Landscape* (Fairhead and Leach 1996), *Conservation is our Governance now* (West 2006), *Ecology, Alterity and Resistance in Sardinia* (Heatherington 2001) and, more recently, *Transforming the Frontier. Peace Parks and the Politics of Neoliberal Conservation in Southern Africa* (Büscher 2013). These are telling titles of monographs, all of which present with great scrutiny case studies similar to the Portuguese. There is abundant literature on the dynamics of sustainable development strategies; the more they fail, the more research programmes are requested to finally successfully implement ecological governance and better educate the citizens. Anna Tsing's *Friction. An ethnography of global connection* (2005) provided perhaps the most detailed look into the messy world of the Anthropocene, as seen through the lens of local populations. However, the difference between discourse and its practice, as revealed in these ethnographic studies, evidently does not disturb the continuous and uncritical praise of sustainable development, whether in the world summits in Rio 1992 or *Rio+20*, research programmes or project applications.

Twenty years after my Portuguese field experience and while the global community again met at *Rio+20*, nothing has changed. Quite the contrary, the European financial crisis has hit Portugal and the coastal landscape. As one of the results of the austerity politics imposed by the 'Troika,' the nature park's administrative staff was cut down as in many other cases in southern Europe. To overcome the crisis, economic growth is seen as the only solution, whether sustainable or not. People migrate to the European north to find employment, while international investors and tourists enjoy the landscape at the margins of Europe. Sustainable development was much spoken about in the global village between *Rio 1992* and *Rio+20*, yet was hardly seen in Portugal or elsewhere (Krauss and Dracklé 2012).

4.2.2   Interdisciplinary Perspectives from the Humanities: The Politics of Nature

Of course, there are many consensual examples of interdisciplinary research concerning global change, at least at first sight. For example, the Swiss historian Christian Pfister recently reconstructed significant changes in past temperatures from proxy data such as wheat prices, thus providing data to correct or calibrate climate models (Wetter and Pfister 2013). In doing so, abstract climate statistics from climate science have regained a social life. This method of careful translation is also relevant concerning the study of natural or ecosystem processes (see Kueffer, Chap. 2, this volume). However, even these widely accepted studies have a political flipside: politics of nature are often based on the scientific identification of endangered natural facts or ecosystems, which in turn are used to legitimate politics by suggesting that there are no alternatives. Nonetheless, this is not necessarily the end of the story. My next example shows how interdisciplinary research can help to change the global environmental anti-politics agenda through a shift of perspective on local resistance (see also Greschke, Chap.7, this volume).

One of the advantages of anthropology is the long-term observation of complex processes. In the global research agenda, nature or ecosystems are mostly portrayed as timeless entities without social history, whereas anthropology and related disciplines focus instead on how people shape, administer and inhabit their environments. According to Bruno Latour (2005), people assemble around things or matters of concern and create "parliaments of things" where questions of belonging, ownership or practices are negotiated. In the following example, I will show that conflict and resistance by local populations are not necessarily to be understood as a lack of environmental education, but rather as a driving force in bringing the politics of nature back into democracy.

At the beginning of the new millennium, I participated in an interdisciplinary project called *Nature in Conflict*, researching the conflicts surrounding a national park along the northern German coastline, the so-called Wadden Sea. It was declared a national park in 1986, and a *UNESCO* (*United Nations Educational, Scientific and Cultural Organization*) world heritage site in 2008. The history of this national park was one of embittered protests by the local population against restricted traditional access to the tidal flat area and its declaration as 'nature.' Science played a crucial role in this process: it defined the tidal flat area as a 'unique ecosystem' and thus legitimised the existence of the national park. Locals doubted whether the tidal flat area was natural at all, claiming it part of the cultural heritage in this area, where land reclamation and storm floods permanently challenge the boundaries between land and sea, nature and culture.[4]

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[4] See Krauss (2006a) about the conflicts surrounding the national park and the natural and cultural heritage. For more information about this project and interdisciplinary research in general, see Krauss (2006b).

One of the protest slogans directly addressed science, claiming that "the Wadden Sea is not a playground for scientists, but a livelihood for fishermen." This is where our project came in, which was a joint cooperation between a coastal research institute and disciplines from the humanities—history, literary and media studies and anthropology. Our common starting point was to identify different perceptions and 'images' of the coast and to critically question normative terms such as 'nature' or 'ecosystem.' In doing so, we opened up a complex conflict constellation. It was no longer good environmentalists versus backward and greedy modernist locals; instead, we interpreted the conflicts in the context of the political ecology of this landscape.

The case study of the conflicts surrounding the national park at the North Sea coastline and how they were closed serves as a good example. The focus of research was not on how to create 'environmental citizens' who willingly accept the national park; instead, we followed the conflicts, the symbols, the scandals and their plots in time and space. We deconstructed the underlying normative concepts such as nature versus culture, questioned taken-for-granted terminology such as 'ecosystem' or 'local tradition,' and instead followed the networks between people and things, humans and non-humans. This is where interdisciplinary research proves to be productive: not in presenting the tidal flat area as a timeless scientific fact, but rather in relating its elements to coastal protection, fishery or common law. It is necessary to follow migratory birds as well as migratory scientists to understand the conflicts between environmentalism and local farmers (Krauss 2011a). In doing so, it clearly turns out that even geographically and economically peripheral areas are indeed 'global villages'; for example, there are links connecting farmers to the *European Union*, to the *IUCN* or global research programmes from the *IGBP* via subsidies or regional environmental administrations. Each one of these connections warrants its own attention and has to be followed with great scrutiny; each link has to be based on perfect translations from one step to the other, while each sphere has a right of its own to exist. This is true for tourist resorts as much as for scientific communities, as well as fishermen, hunters or farmers.

The ongoing protests eventually forced the national park administration to take the initiative and stage hundreds of public hearings and meetings. Moreover, working groups were set up to manage in consensus areas of traditional use, ensuring that coastal protection has priority over nature conservation and that zones of risk were taken care of, while traditional access to the tidal flat area was acknowledged and the national park area was divided into zones with differing protection status. Common law was at least partly reconciled with the laws of the national park, and finally the conflicts were closed and the national park became part of the political landscape.

Science no longer needs to play the role of an advocate for a global environmental agenda; rather, it can serve as a source of knowledge, as a facilitator and adviser on the road towards sustainable development. In the beginning, the national park was seen as a one-way street, and resistance was interpreted as a lack of education or as backwardness. The protest against nature conservation and science as its advocate opened up a long process of negotiations between the administration of the

nature park and coastal institutions and organisations. With this shift of perspective, the role of interdisciplinary research is to identify pathways as well as to support and to facilitate democratic decisions.

This was one of the results of this interdisciplinary project, at least in my interpretation. However, this project was decidedly different from those executed under the umbrella of global science organisations. Of course, this is true in respect to size and funding, but although the main difference is that global environmental change programmes still tend to advocate a 'science-leads-politics' agenda.

4.3 Science Studies and Interdisciplinary Research: From the Local to the Global

When studying the conflicts at the North Sea coastline, my fieldwork became multi-sited; besides research in a coastal community and the administration of the national park, I became a participant observer in the *Institute for Coastal Research*, which had played a leading role in the ecosystem studies of this tidal flat area.[5] Participant observation among colleagues is a tricky thing, of course. Being interested in the scientific construction and perception of the coast, I attended their workshops and conferences, asking questions; I tried to understand how they collected data in the Wadden Sea and turned them into graphs and scales on their computers. I shared an office in their institute and studied the history of coastal research in northern Germany. How did coastal research deal with the political changes and the respective changing coastal politics? The North Sea coast always was political; in imperial times, it nourished fantasies about Germany as a sea power; during national socialism the tidal flat area was considered as a resource for a "people without land"; and with the rise of environmentalism, century old land reclamation ended and was replaced by nature conservation. On the other hand, coastal research claims to be objective and timeless, despite the shifting context of research. The rise of ecosystem studies coincided with the rise of environmentalism and, in this case, with the implementation of the national park. Most of the ecosystem researchers left the interpretation of their data and the political implications to the staff of the national park administration. While these studies were used to legitimate the existence of the park, scientists claimed to only be interested in the data and not their political use. Nowadays, the institute plays a leading role in climate research, with its director one of the leading climate scientists. At times deeply involved in politics, sometimes even driving the political agenda, scientists mostly claim to be apolitical and only interested in the timeless production of knowledge and truth.

In an interview, one of the directors of the institute suggested not only focusing on the regional dimension; instead, I should see the local conflicts at the North Sea coast in a global dimension. In order to get introduced, he suggested participating in

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[5] For more details, see Krauss (2007).

the *Open Science Conference on Global Change*, which was staged in Amsterdam in 2001. A new perspective opened up: indeed, the coast now stood in the context of global change, as did science.

The *Challenges of Changing Earth*: *Global Change Open Science Conference* was organised by global research programmes such as *IGBP*, *IHDP* (*International Human Dimension Programme on Global Environmental Change*), *Diversitas* and *WCRP* (*World Conference of Religions for Peace*). Here, I was first introduced to the 'Anthropocene,' which was a keyword in many keynotes. My presence as an anthropologist was timely, given the urge for an increased participation of social sciences in this already interdisciplinary world. Just notice the capital letters that connect the natural with the social sciences in the self-description of the *IGBP*:

> IGBP was launched in 1987 to coordinate international research on global-scale and regional-scale interactions between Earth's biological, chemical and physical processes and their interactions with human systems. IGBP views the Earth system as the Earth's natural physical, chemical and biological cycles and processes AND the social and economic dimensions (IGBP n.d.).

The conference in Amsterdam was staged right before decisive negotiations about the Kyoto treaty in The Hague and in Bonn, with the keynotes and panels serving to raise alarm and place pressure on politics. Global change meant identifying vulnerabilities and risks concerning land-use, climate, oceans and the atmosphere; the social and economic dimensions mostly consisted in quantifying the human costs of global change. The image of planet Earth was omnipresent in the keynote speeches, with the final "Declaration of Amsterdam" leaving no doubt that "global change is real" and political action is urgent.

Interviews with scientists who attended the conference denounced the keynote speeches as 'politics' rather than science; they considered it 'part of the business,' but also expressed concern for the reputation of science. Other scientists, especially those actively engaged in non-governmental organisations or bureaucratic or administrative institutions, welcomed the political engagement of the keynote speakers. There were special sessions for scientists from developing countries who complained about restricted access to technology and education in their countries and the dominance of Anglo-Saxon countries in the organisation of science.

As my 'admission card,' I had prepared a poster about the conflicts surrounding the national park, with a specific focus on the networks and actors involved. However, I am afraid it looked somehow strange and got lost among hundreds of other posters from natural scientists, presenting their results from remote sensing or modelling. The "social and economic dimensions" suggested by the *IGBP* were not absent, but rather presented in the specific Esperanto of global change research. My individual case study was just this: a case study that did not seem to fit in when the whole Earth has to be saved. To become a member of this global tribe, one needs strong allies in form of established research institutes, and has to comply with a hidden political agenda. At least, this is how I felt in this environment and at many other conferences and workshops related to global research programmes. The local did not yet really fit into the global, and I struggled with how anthropology might fit in global change research.

4.4 Interdisciplinary Research and Earth System Sciences: A Critical Perspective

Coming from a relatively small discipline such as anthropology, entering the world of global change research can come as a culture shock. In order to participate, one has to learn the written and unwritten rules, the common rituals and the specific iconography, as well as finding a place from where it feels safe to speak. In short, participant observation affords a kind of credibility, which to gain in turn is part of the process. The world of so-called Earth system sciences is one of symbolic power and a more-or-less open political agenda; the world is at risk, the science is settled, and it is time for political action—this is the message in a nutshell. It is a message that is accepted uniformly. However, the opening towards disciplines such as anthropology or sociology has brought different perspectives and opened up dialogue inside the scientific community. One such example is the recent debate about planetary boundaries identified by Earth system sciences; critical voices from anthropology and other disciplines interpreted these boundaries as a power grab, as millenarian prophesies and an attempt to suspend democracy in order to save the world.

There is a long discussion in global change research about the limits and boundaries of life support systems. From the limits of growth propagated by the *Club of Rome* in the 1970s to the "Declaration of Amsterdam" in 2001 or the "Planet under Pressure" Declaration from London 2012, the scientific global change community has continuously influenced and set the frameworks for politics, such as the 2 °C goal in climate negotiations. A current example of this process is the debate about so-called 'planetary boundaries,' a concept that goes back to studies by Rockstroem et al. (2009) in cooperation with prominent Earth system scientists such as Hans-Joachim Schellnhuber, who is the scientific advisor of the German government, or the Nobel Prize laureate Paul Crutzen. They identified nine boundaries of life support systems such as climate change, biodiversity loss, land use or freshwater that are essential for human life on planet Earth. This concept differs from previous ones insofar as it goes beyond sectorial politics; planetary boundaries crosscut every aspect of human existence in the Anthropocene. According to leading Earth system scientists, planetary boundaries set the framework and agenda for politics in order to secure human existence. In a nutshell, this is an extreme example of science assuming the role of political authority in a way that raised the critical attention from their colleagues from anthropology and other social scientists.

The anthropologist Steve Rayner (2013) considers the rhetoric employed in the discourse about planetary limits and tipping points as showing the "characteristic features of traditional millenarianism," as evident in religious movements or Marxist splinter groups: catastrophe is near, the Earth is a closed system with no escape, and particularly the weak and poor will suffer. The present is established "as a unique defining moment for the future of humanity requiring urgent action on a global scale which seems slow in coming" (ibid.). The planetary boundaries are presented as scientific facts, ignoring the debate about the validity of the categories and the degree of certainty. Instead, they are considered as a threshold,

which necessarily implies a new hierarchy in the system of competing values. Sustainable development is no longer the balancing of environmental, social and economic values; from now on, environmental values come first.

Roger Pielke Jr. (2013) interprets the promotion of planetary boundaries as a "power grab," reminding him of the idea of 'trusteeship' once suggested by Hans Joachim Schellnhuber and the *German Environmental Advisory Council*, the *WBGU*. They suggested reforming democratic institutions by assigning 10 % of all seats in parliament to ombudsmen who only represent the interest of future generations. To varying degrees, science is assigned authoritative power over democratic institutions once those planetary boundaries are reached. The sociologist Nico Stehr (2013) writes about the political implications for democracy:

> Consensus on facts, it is argued, should motivate consensus on politics. The constitutive social, political and economic uncertainties are treated as minor obstacles that need to be delimited as soon as possible—of course by a top down approach (Stehr 2013).

Consequently,

> (…) the discourse of impatient scientists privileges hegemonic players such as world powers, states, transnational organizations, and multinational corporations. Participatory strategies are only rarely in evidence. Likewise, global mitigation has precedence over local adaptation (ibid.).

This interpretation is surprisingly shared by one of the leading Canadian political activists, Naomi Klein. In a recent interview (Mark 2013), she states that this kind of green agenda has done greater damage to the environmental movement than right-wing activists. She particularly focuses on the political dimension of this agenda, which favours cooperation with big industry and neglects local activities such as during hurricane Sandy in New York. As a result, all measures to reduce greenhouse emissions like the Kyoto treaty and carbon markets have failed miserably.

The anthropologist Melissa Leach, a frequent collaborator in the global change community, felt this power grab on a very personal level. She recently published in the *Huffington Post UK* her experiences as a participant in a *United Nations* meeting of experts, asking:

> When the Economist famously announced 'Welcome to the Anthropocene' a couple of years ago, was it welcoming us to a new geological epoch, or a dangerous new world of undisputed scientific authority and anti-democratic politics? (Leach 2013).

In her report, she describes in detail how her ambitions to represent the results of her fieldwork in Africa during an *UN* session failed miserably. She wanted to argue that choices between pathways are political and have to become a matter of democratic debate; that public and citizen expertise is of value and "that scientists should be bringing plural and conditional advice to decision-making [. . .] and that sustainability is political, as is the knowledge that shapes goal definition and processes" (Leach 2013). However, those statements somehow disappeared in the course of the session. She blames the need to translate her ambitions into '*UN*-speak'; she had to reduce her arguments to four slides, sparing the minimal remaining political content

for the following discussion. In the end, all was about agenda setting and about the implementation of mechanisms, while the option of political pathways had disappeared. This leads her to the question:

> Is there a contradiction between the world of the Anthropocene, and democracy? The Anthropocene, with its associated concepts of planetary boundaries and 'hard' environmental threats and limits, encourages a focus on clear single goals and solutions. It is co-constructed with ideas of scientific authority and incontrovertible evidence; with the closing down of uncertainty or at least its reduction into clear, manageable risks and consensual messages (Leach 2013).

Evidently, the increasing participation of anthropologists and scholars from other disciplines not only add another perspective or serve as translators of scientific findings to the public; instead, they enter into an 'agonistic–antagonistic' relationship. Global change research comes under scrutiny in a moment of a 'power grab' of science on the one hand and increasing frustration about global environmental policies on the other. These discussions also reflect the changes in science policies, career patterns and disciplinary identities. Indeed, the actual experiences of anthropologists in such an interdisciplinary environment are a mixed bag; on the one hand, global change research offers new research possibilities, providing political relevance and new ways of and sources for funding; on the other hand, short field trips increasingly replace extensive fieldwork, and anthropological expertise is often rigorously subordinated to strict solution oriented research agendas. In informal conversations, I often hear of experiences similar to that of Melissa Leach, namely of feeling silenced in a research environment dominated by science.

While the presence of anthropologists and other social scientists becomes increasingly normal, they often express a submissive attitude towards consensus. Many post-docs or adjunct professors hardly feel entitled to challenge the overall assumptions or frameworks such as the Anthropocene, planetary boundaries and the implicit supremacy attributed to scientific knowledge over other forms of knowledge. Seen from this perspective, global change research can indeed be understood as an anti-politics machine, producing its own reality and "depoliticizing everything it touches" (see p. xv in Ferguson 1994).

4.5 Climate Change and the Prospects of Collaborative Research

How to bring climate change into the world? How to connect the local and the global, the North Sea coast and *Rio+20*? How to bring together Earth system science with its totalising approach and anthropology, with its focus on local perspectives and multiple pathways? And how to integrate science into the democratic process rather than suspending it? These are questions for interdisciplinary research in the Anthropocene. Throughout this chapter, I have presented different variations of interdisciplinary research, and will end with a specific anthropological approach

that is based on the long tradition of the relationship between informant and researcher. Particularly in studies on elites or in science studies, informants are interlocutors who have their own social theories concerning their objects of study, their expertise and societal role. They often enter into a dialogue or conversation with the anthropologist in order to better perform their own research or practice. Once both agree upon this conversation, this collaborative effort can lead to framing or understanding current problems in a new way (see Krauss 2011b). In this last section, I wish to outline such an interdisciplinary effort by using the example of my collaboration with a climate scientist. In doing so, I will also close the circle of this article by bringing the global problem of climate change to the North Sea coast in Germany in a new and innovative way.

I started to already gain interest in climate change as an object of study during the interdisciplinary project on the national park conflicts in northern Germany. The only natural scientist in this project was Hans von Storch, one of the directors of a coastal research institute and a well-known climate scientist. Within the project, I added the ethnographic approach for the research on differing representations of nature and started to conduct research on the 'tribe of climate scientists.' I was fascinated by the existence of the 'prophets of doom,' prevalent in both the environmentalist and climate arenas, as well as their role played in the representation of anthropogenic climate change in politics and the public. Hans von Storch was involved in all stages of the current debate on anthropogenic climate change, and is also critical of this prophetic attitude. I followed his activities as a scientist, as a director of an institute and science manager, as an editor of a climate journal, and most of all as a prominent climate scientist in the public arena. For example, he was one of the main actors in the so-called hockey-stick debate, when he challenged the methodology of this iconic climate curve, which serves as a symbol for catastrophic climate change. Furthermore, he was also indirectly involved in the so-called 'Climategate' scandal, when he was mentioned in the emails stolen from the server of a climate institute.[6] In short, the stories, scandals, confrontations and conflicts that he remains a part of provided me as an anthropologist with an insight into climate science as a deeply politicised science, whereby climate scientists act in a political arena with every research result gaining political significance.

My interest in climate science as a cultural activity resulted in a multi-sited ethnography of varying intensities over a decade; here, participant observation meant participating in common projects, organising interdisciplinary workshops, writing articles together, giving lectures on climate conferences and having regular conversations about the heated debates that are so characteristic for climate science.

Coming from different scientific backgrounds, we managed to find a mode of conversation about climate science as a cultural practice. Our common grounds are the questions concerning the adequate representation of man-made climate change and the role of climate science in the public perception and politics of climate. As a working hypothesis, we agreed upon the theory of post-normal science that politics have to make decisions even though the knowledge basis is uncertain, values are in

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[6] For more detail, see Krauss (2009).

play and stakes are high (Funtowicz and Ravetz 1991). Together with two other scientists, we established a blog on the internet in order to discuss current climate affairs with climate scientists, experts and interested citizens. The blog was founded during the 'Climategate' scandal, and we especially invited so-called climate sceptics to present their critical arguments. It was a time when there were rumours about 'gatekeepers' who keep sceptical articles out of relevant journals, and the air was full of conspiracy on all sides. At least in these troubled times, some so-called sceptics helped to reintroduce scientific scepticism in a climate science that seemed to be more concerned about acting politically correcte rather than admitting uncertainties and open questions. The blogosphere mirrors the current climate debate and sometimes also drives its agenda.

Climate change is one of the hot topics on global conferences; it is negotiated globally and the agenda is set by science, with the current 2 °C limit reflecting a prominent example of so-called 'planetary boundaries.' This has led to a dangerous relationship between science and politics, as we argue in our recent common project, an essay called "The climate trap" (von Storch and Krauss 2013). In this book, our collaborative effort comprises the double perspective from an insider and outsider. In a certain sense, we wrote an ethnographic case study based on our own experiences and observations as actors in the scene, as observers and commentators. These different yet complementary perspectives and the intention to write a cultural history of climate science is intended to open up new ways of conversation about a topic that is notoriously blocked between 'warners' and 'sceptics,' as well as between science and politics. Once the scientific production of knowledge on climate is put into context and understood as a cultural activity, it becomes evident that science cannot decide political conflicts or set the political agenda. Instead, it is politics and society that have to decide how to deal with the challenges imposed by the production of knowledge on climate change, in each and every place.

The North Sea coast serves as an example to illustrate this different understanding of the relation between science and politics; it is the anthropological case study that helps to put global problems into perspective. The effects of climate change are local, and adaptation and mitigation also need to be embedded in a local context in order to be sustainable. From an ethnographic perspective, climate change does not hit the North Sea coastline like a meteor from outer space; instead, climate change challenges a local society with a century long tradition of coastal protection, and with a social organisation based on the necessity of reclaiming and protecting land from the sea. It was in this area that the first wind turbines were erected during the 1970s, in protest against nuclear energy and an economy dependent on foreign oil; it is often forgotten that the origins of the German 'Energiewende' are to be found in local resistance.[7] Regional climate models downscaled from global climate models have to be linked to this complex history of infrastructures; the information has to find its proper addressees in the web of connections and associations that make up the local or regional sphere. Climate is just one factor

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[7] For more information about the regional history of the "Energiewende" and the social life of things such as wind turbines, see Krauss (2010).

among many others of equal importance in the coastal reality; Hans von Storch is just one, albeit an important informant for coastal protection. Climate science cannot tell local or regional administrations and political institutions what to do; rather, it can provide specific information and scenarios to support local decisions concerning a variety of pathways. In order to do so, detailed ethnographic knowledge about local dynamics and social organisation as well as complementary forms of knowledge are indispensable. The conflicts surrounding the national park, as well as the way in which they were solved, served as a template for effective climate politics. In order to bring climate change into the world, it is necessary to situate it carefully in the web of connections that make up the local assemblages. Climate affects all aspects of coastal life, from coastal protection to questions of ownership and belonging; certainly, this will not go without conflicts. All voices will be heard, different pathways have to be identified and decisions have to be taken by the responsible political entities; the task of science is to offer scenarios and provide expertise in order to find the best solutions. In doing so, science becomes a part of the democratic process, rather than trying to substitute it. While this approach does not replace global research programmes or interdisciplinary work on a global level, it is a shift in perspective, bringing those people into the foreground that actually shape, administer and inhabit their environments.

4.6   Conclusion

There is more at stake in the Anthropocene than a simple addition of natural sciences and those concerned with *anthropos*. It is also not sufficient to identify planetary boundaries, tipping points and limits of growth from a scientific perspective in order to successfully implement sustainable development or effective climate politics. We have to take into account the double challenge of global change, which affects our environment as well as our intellectual dispositions. The Anthropocene challenges the familiar distinction between nature and culture, which structured the order of knowledge and disciplines for such a long time. Taking *anthropos* as the driving force means an epistemological and ontological challenge, and Ferguson's warning not to produce an 'anti-politics machine' is to be taken seriously; indeed, recent failures in global climate policies remind the observer of previous development strategies. Science is easily misused as an authoritative measure to implement specific politics and suspend democracy; local populations in geographically and economically peripheral areas have to carry the costs of the failure of carbon markets and misguided sustainable development strategies.

   The discussions about the political role of global research programmes are reflected in their influence on the identity of small disciplines, their practices and the respective career patterns. Despite a demand for disciplines such as anthropology, it still has to find its place in global change research. Of course, there is no one-size-fits-all solution; instead, each situation and problem needs its own solution. In this chapter, I have shown the importance of carefully tracing the connections between the local and the

global, between people and things, and between science and politics. Great care and scrutiny is necessary to bring the Anthropocene into the world and science back into democracy, in each and every case. With its focus on the place of *anthropos* in the world, anthropology is well prepared to contribute to achieving this ambitious goal, even though it is sometimes difficult to find a place to speak and not too easily submit to preconceived agendas.

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