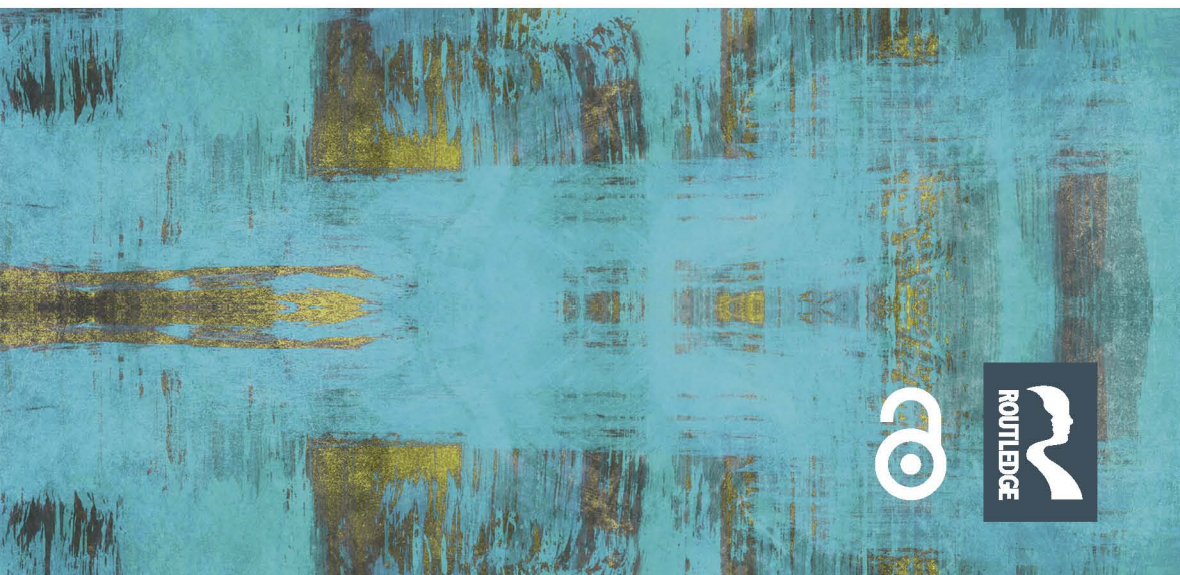
Routledge Advances in Climate Change Research

A CRITICAL APPROACH TO CLIMATE CHANGE ADAPTATION

DISCOURSES, POLICIES, AND PRACTICES

Edited by
Silja Klepp and Libertad Chavez-Rodriguez



'Climate change adaptation is political. This is the core message of this timely and potent text. At a world-historical moment in which crises of capitalism, political cynicism, and ecology converge, it reminds us that adapting to these crises is not a technocratic exercise but a deeply political undertaking which demands heightened sensitivity to uneven arrangements of power the world over. A vital contribution to the nascent field of critical adaptation studies, this theoretically informed, empirically rich text offers a much needed analytical arsenal for confronting the relations of power that subtend current conditions of crisis.'

Andrew Baldwin, Department of Geography, Durham University, UK

'This excellent book successfully highlights and critiques the often neutral and apolitical manner in which climate change adaptation is discussed. Through a series of rich empirical case studies from different parts of the world, this book brings politics back in, revealing how actors on global, regional and local levels negotiate different adaptation futures, and what injustices and vulnerabilities emerge around these power dynamics. A must-read for all those – scholars and policymakers – working on climate adaptation.'

Ingrid Boas, Assistant Professor, Wageningen University, The Netherlands

'The lived experience of climate change is not just about transforming landscapes and livelihoods; it is also about navigating and adapting to climate policies that may serve to exacerbate and re-entrench existing inequalities. This new collection of empirically informed research exposes these inequalities and will become an essential part of the climate change literature. Contributions to the collection range from remote villages to the boardroom, and have much to teach students, scholars, and policymakers about the implications not only of a changing climate, but also of the policies designed to address it.'

Heather Lazrus, National Center for Atmospheric Research, Boulder, USA

'In this compelling volume, global experts innovatively confront and respond to a critical concern of contemporary climate change adaptation: the apolitical nature that seems to pervade discourse, governance efforts and scholarship. The first of its kind, the book offers powerful insights into potential ways to account for the multiple evolving social dynamics that are critical within the framework of climate change adaptation in various spaces. It is destined to become a key reference for those interested in interrogating the political implications behind climate change adaptation.'

Louis J. Kotzé, Research Professor of Law, North-West University, South Africa, and Marie Curie Research Fellow, University of Lincoln, UK

'This diverse and enriching peer-reviewed volume exposes climate change adaptation to an overtly critical gaze. This book provides an urgently needed and empirically grounded critique of climate adaptation's purported neutrality, and, by resisting the ideological erasure of the politics at the heart of contemporary adaptation projects, pushes back against the "naturalisation" of climate and adaptation discourses and strategies. "Denaturalising" climate adaptation could scarcely be more important for resisting patterns of climate injustice. This volume makes that case, and makes it persuasively.'

Anna Grear, Professor of Law and Theory, Cardiff University, UK

'The destructive potential of climate change is one of the most complex human issues of the present century. Taking into account different regional contexts, the works included in this volume provide an urgently needed critical perspective on power relations and on the different types of injustices that are present in the global agendas of adaptation to climate change.'

Gabriela Merlinksy, Researcher at Institute Gino Germani, University of Buenos Aires, Argentina

A Critical Approach to Climate Change Adaptation

This edited volume brings together critical research on climate change adaptation discourses, policies, and practices from a multi-disciplinary perspective. Drawing on examples from countries including Colombia, Mexico, Canada, Germany, Russia, Tanzania, Indonesia, and the Pacific Islands, the chapters describe how adaptation measures are interpreted, transformed, and implemented at grassroots level and how these measures are changing or interfering with power relations, legal pluralism, and local (ecological) knowledge. As a whole, the book challenges established perspectives of climate change adaptation by taking into account issues of cultural diversity, environmental justice, and human rights, as well as feminist or intersectional approaches. This innovative approach allows for analyses of the new configurations of knowledge and power that are evolving in the name of climate change adaptation.

This volume will be of great interest to students and scholars of climate change, environmental law and policy, and environmental sociology, and to policymakers and practitioners working in the field of climate change adaptation.

Silja Klepp is a professor of geography at Kiel University, Germany.

Libertad Chavez-Rodriguez is a researcher at the Center for Research and Advanced Studies in Social Anthropology (CIESAS) in Monterrey, Mexico.

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A Critical Approach to Climate Change Adaptation

Discourses, Policies, and Practices

Edited by Silja Klepp and Libertad Chavez-Rodriguez

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Contributors

Salvador Aquino Centeno is a professor and researcher at the Center for Research and Advanced Studies in Social Anthropology in Oaxaca, Mexico. His areas of interest include indigenous peoples and the state; neoliberalism, indigenous peoples' territorialities and global environmental politics; social memory and representations of the past; and historical and contemporary anthropology of legal and illegal processes. He has conducted collaborative research among the Zapotec indigenous communities of the Northern Sierra of Oaxaca, Mexico over the past 16 years.

Sybille Bauriedl is a geographer, working as a senior researcher at the Sustainability Research Centre at the University of Bremen, Germany. Her research combines the approaches of political ecology, feminist geography, and critical urban studies with current projects on bioeconomy in East Africa, local energy transition in Germany, and digitalised urban infrastructures. She also runs a blog on climate debates (klimadebatte.wordpress.com).

Leigh-Anne Buliruarua is the regional coordinator for the European Union Pacific Technical Vocational Education and Training on Sustainable Energy and Climate Change Adaptation Project (EU-PacTVET). She holds a postgraduate diploma in environmental science from the University of the South Pacific in Fiji, and a BSc in biology from Victoria University, Melbourne, Australia. She has over ten years' experience as a project manager on climate change/natural resource management. She is currently pursuing an MSc in climate change to evaluate the alignment of the competencies developed under the EU-PacTVET with regional and global frameworks for climate change and disaster risk reduction.

Libertad Chavez-Rodriguez is a researcher and lecturer at the Center for Research and Advanced Studies in Social Anthropology in Monterrey, Mexico, and a member of the Mexican National Researchers' System. In 2014, she was awarded a PhD in social sciences from the University of Bremen, Germany, for her thesis *Climate Change and Gender: The*

significance of gender in the social vulnerability to extreme weather events in regions under flood risk in Mexico and Germany. She holds an MSc in regional science/regional planning from the University of Karlsruhe, Germany. Her current research focuses on socio-spatial segregation and social vulnerability to hydro-meteorological hazards in urban areas, mainly using socio-anthropological methodology. Her areas of interest include social vulnerability to hazards; gender and environment; intersectionality and disasters; and socio-environmental issues from a political ecology perspective.

Susan A. Crate is a professor of anthropology in the Department of Environmental Science and Policy at George Mason University, USA. She specialises in environmental and cognitive anthropology, with a focus on anthropology and climate change. She has worked with indigenous communities in Siberia since 1988, with a research agenda that now extends to Canada, Peru, Wales, Kiribati, Mongolia, and Chesapeake Bay, Virginia, USA. She currently engages in creating community-based narratives on climate change to empower and bring about positive social change, an effort inspired in part by her role in *The Anthropologist*, a documentary taking an anthropological approach to climate change. She served on the American Anthropology Association's Task Force on Climate Change and is currently a lead author on the IPCC Special Report on Oceans and Cryosphere.

Sara de Wit is a postdoctoral research fellow at the Institute of Science Innovation and Society at the University of Oxford, UK. She is currently part of the Forecasts for Anticipatory Humanitarian Action Project. Trained in anthropology and African studies, she has a strong empirical orientation, with long-term fieldwork experience in southeast Madagascar, the Bamenda Grassfields in Cameroon, and Maasailand in northern Tanzania. She has undertaken 'ethnographies of aid' – at the intersection of science and technology studies development theories, environmental anthropology, and post-colonial studies – in which she broadly focused on how globally circulating ideas, such as climate change and notions of development, travel and what happens when they are translated by different actors along the translation chain.

Michael Flitner is a professor of geography at the University of Bremen, Germany. He holds a cooperation chair at the Sustainability Research Centre and the Leibniz Centre for Tropical Marine Ecology, both in Germany. He studied geography, biology, and education, with a specialisation in development research. His work concerns environmental issues from a social science perspective, and environmental and nature conservation policy in regional and international contexts. He focuses on conflict lines between environmental/nature conservation and public opinion to environmental justice and civic engagement, as well as on

climate change questions and the historical and cultural perspectives of political ecology.

Heiko Garrelts is a researcher on environmental governance and is currently a member of the Sustainability Research Centre at the University of Bremen, Germany. He holds diplomas in political science and landscape planning. His research addresses decision-making processes in different policy fields, especially nature protection and climate change policy.

Jonas Hein is a postdoctoral researcher in the working group Social Dynamics in Coastal and Marine Areas at the Institute of Geography at Kiel University, Germany. He previously worked at the German Development Institute in the department for Environmental Policy and Management of Natural Resources. His areas of interest include the political ecology of conservation and development, peasant resistance, forest carbon offsets, and international forest and climate policies.

Sarah Louise Hemstock is an author and adviser to the Alofa Tuvalu Small Is Beautiful project – recognised by UNESCO as a Decade of Achievement project. She is currently leading the European Union Pacific Technical Vocational Education and Training on Sustainable Energy and Climate Change Adaptation Project (EU-PacTVET) at the South Pacific Community, is an adjunct fellow of the University of the South Pacific, Fiji, and was a visiting fellow at Nottingham Trent University, UK. Her interest in the Pacific region began as a consultant at Imperial College, University of London, UK, when she researched biomass resources in several Pacific small island development states. In 2010, she was made Government of Tuvalu Honorary Ambassador – Officer for Environmental Science.

Johannes Herbeck has studied human geography, political sciences, and sociology at the Technical University of Munich and the Ludwig-Maximilians-University of Munich, Germany. Since 2008, he has been working as a researcher at the Sustainability Research Centre at the University of Bremen, Germany. In 2014, he was awarded a PhD for his thesis *Geographies of Climate Change: Vulnerability, security, translocality*. Since then, he has been a researcher and scientific coordinator within the project *New Regional Formations: Rapid environmental change and migration in coastal regions of Ghana and Indonesia*, funded by the Volkswagen Foundation, Germany.

Helene Jacot des Combes is the senior lecturer in climate change adaptation at the University of the South Pacific, Fiji. She is currently a member of the UNISDR Scientific and Technical Advisory Group, and works on the European Union Pacific Technical Vocational Education and Training on Sustainable Energy and Climate Change Adaptation Project

(EU-PacTVET). She is a member of several Pacific regional committees: the Regional Working Group on Education, Climate Change and Disaster Risk Management; the Pacific Climate Change Roundtable; and the Technical Working Group for the Development of the Regional Integrated Strategy on Climate Change and Disaster Risk Management, called the Framework for Resilient Development in the Pacific (FRDP). She is also a member of the International Association of Emergency Managers.

Emilia Kennedy works for the Government of Alberta Climate Change Office. She is a geographer with research interests in political theory, climate and energy policy, and carbon-reduction technologies in Canada.

Silja Klepp is a professor of geography at Kiel University, Germany. She is a trained social anthropologist. In her current research on climate change migration and adaptation, she integrates post-colonial perspectives and critical theories in the study of climate change effects. She has published research on issues of climate justice and climate migration in Oceania, on boat people in the Mediterranean Sea, and on EU refugee and border politics. She has conducted field research in Kiribati, Vanuatu, New Zealand, Italy, Libya, Malta, and Zambia. One of her recent articles is 'The politics of environmental migration and climate justice in the Pacific region'.

Yvonne Kunz studied human geography and cultural anthropology at the University of Trier, Germany. In 2016, she was awarded a PhD in human geography from the Georg-August-University Gottingen in Germany, where she is part of the German Research Foundation (DFG)-funded Collaborative Research Centre on Ecological and Socioeconomic Functions of Tropical Lowland Rainforest Transformation Systems (Sumatra, Indonesia). She heads the Environment and Climate Desk of the Berlin-based non-governmental organisation *Watch Indonesia!* focusing on human rights, democracy, and the environment in Indonesia and East Timor.

Kevin Maitava holds an MSc in climate change and a BA in environmental studies. He has interests in food security, disaster risk management, and climate change-induced relocation. Originating from Fiji, he is committed to using his education and professional experience to contribute towards building a better Fiji.

Tess Martin is a researcher and senior academic working with the Pacific Centre for Environment and Sustainable Development at the University of the South Pacific, Fiji. Over the past eight years she has worked in ten Pacific Island countries. Her recent work has been instrumental in developing the first technical and vocational education and training

(TVET) regional qualifications in climate change adaptation and sustainable energy for the Pacific region. Her publications focus on education and climate change adaptation in the Pacific region.

Daniel Morchain is a global adviser in climate change adaptation and resilience with Oxfam, as well as co-investigator in the Adaptation at Scale in Semi-Arid Regions project, which aims to make research more inclusive, more participatory, and to recognise social impact as researchers' ultimate objective. He views the climate change debate as one that should be embedded in social justice, transformation, gender equality, and leadership – and believes that success will depend on how we all engage with it at an emotional level.

Detlef Müller-Mahn is a professor of development geography at the University of Bonn, Germany, and spokesperson of the collaborative research centre Future Rural Africa: Future-making and Social-Ecological Transformation, in Germany. His research addresses questions of environmental governance and risk in the context of global change, with a focus on pastoralists and peasants in Eastern Africa. He edited *The Spatial Dimension of Risk: How geography shapes the emergence of riskscapes* (2013).

Alejandra Navarro-Smith is a research professor in the Department of Sociocultural Studies at ITESO University, Guadalajara, Mexico. She is a trained social anthropologist using visual media, and has undertaken fieldwork for more than a decade (2006–17) among Cocopah fishers in the Colorado River Delta. Her current work focuses on the production of vulnerability threatening the well-being of Cocopah fisher households. Climate change, rising sea temperature, and a lack of public policies on these issues in the Mexican seas are some of the factors generating high risks for Cocopah fishers. One of her recent articles is *Dilemmas of sustainability in Cocopah territory: an exercise of applied visual anthropology in the Colorado River Delta* (2016).

Ignacio Rubio C. is a professor at the School of Social and Political Sciences of the National University of Mexico. His research focuses on disasters, risks, and environmental conflict. He coordinates a research project on the sociology of risk and uncertainty. He is part of the Mexican National Researchers' System and a board member of the International Sociological Association's thematic group 04.

Celia Ruiz de Oña Plaza is an associate researcher at the Multidisciplinary Research Centre of Chiapas and the South Border of Mexico, of the National Autonomous University of Mexico. Her current research focuses on topics related to mitigation and adaptation policies in the field of political ecology and science technology studies in the coffee sector of Chiapas and in the conservation sphere. For the past ten years she has

been involved in various rural development projects in Chiapas dealing with sustainable productive systems.

Ruth Senikula is the gender and vulnerable groups inclusion consultant for the European Union Pacific Technical Vocational Education and Training on Sustainable Energy and Climate Change Adaptation Project (EU-PacTVET) based at the Pacific Community in Nabua, Fiji. She completed a joint degree in applied psychology and education from the University of the South Pacific, Fiji. She is now pursuing postgraduate studies at the same university in the area of climate change.

Roy Smith is course leader for an MA in international development at Nottingham Trent University, UK, and vice chairman of the Pacific Islands Society of the UK and Ireland. He has conducted fieldwork in Micronesia, Melanesia, and Polynesia. His current research concerns food security and marine conservation, with a focus on coral reefs.

Astrid Ulloa is an anthropologist and professor in the Department of Geography at the Universidad Nacional de Colombia. Her main research interests include indigenous movements, indigenous autonomy, gender, climate change, territoriality, extractivisms, and anthropology of the environment. She is author of *The Ecological Native: Indigenous peoples' movements and eco-governmentality in Colombia* (2013). Recent articles include *Perspectives of environmental justice from indigenous peoples of Latin America: a relational indigenous environmental justice* (2017), *Geopolitics of carbonized nature and the zero carbon citizen* (2017) and *Environment and development: reflections from Latin America* (2015). She is currently writing about gender and mining and territorial feminisms in Latin America.

Luz María Vázquez is a research coordinator and lecturer at York University, Canada, where she was also awarded a PhD in the Department of Sociology. She worked for over ten years in a research centre at the National Autonomous University of Mexico, where she acquired strong research skills based on extensive ethnographic and qualitative work. Her research interests include environmental sociology, local governance, resource management, conservation, and climate change.

Sophie Webber is a lecturer in geography in the School of Geosciences at the University of Sydney, Australia. She is an economic and environmental geographer. She studies climate change adaptation and resilience in South East Asia and the Pacific region and the development agencies and institutions that work there.

Chapter summaries

Chapter 1 Governing climate change: the power of adaptation discourses, policies, and practices

Silja Klepp and Libertad Chavez-Rodriguez

This book presents the outcome of a workshop on climate change adaptation discourses, policies, and practices held in Oaxaca, Mexico, in 2016. Participants were mostly from and/or undertaking research in the Global South. Two main themes arose: that cultural, social, and political diversity is largely absent from climate change adaptation and that the overwhelming social inequalities under which adaptation to climate change is taking place are not only ignored, but are often naturalised or even strengthened. The various chapters of this book explore a number of questions: Which social dynamics can evolve within the framework of climate change adaptation in various spaces? Which assumptions and rationalities are inherent in mainstream climate change adaptation discourses, policies, and practices? Which patterns of use and misuse can we observe regarding climate change adaptation? Which social processes are initiated or hindered through climate change adaptation?

Chapter 2 A clash of adaptations: how adaptation to climate change is translated in northern Tanzania

Sara de Wit

This chapter explores how the nascent idea of Adaptation to Climate Change is translated in northern Tanzania. By interrogating how non-governmental organisations and other actors in northern Tanzania adapt to the idea of adaptation itself we gain insight into the ways in which a new development paradigm comes into being. Based on 14 months of multi-sited ethnographic fieldwork this chapter reveals the politics of adaptation that emerge in the encounter between global ideas of adaptation and what it means for different stakeholders on the ground.

Chapter 3 Rethinking the framing of climate change adaptation: knowledge, power, and politics

Daniel Morchain

This chapter explores the existing institutional arrangement driving the thinking and action behind climate change adaptation, as well as development more broadly. It argues that it is an unfair arrangement, where Northern academic and political institutions exert disproportionate influence over the sector. It also finds that there is a bias towards understanding climate change as an overly biophysical challenge – not as a social issue. Climate change adaptation and development should, instead, be founded on inclusive, representative and consultative principles that enable the amalgamation of various sources of knowledge and that support otherwise marginalised groups to become increasingly influential and the owners of their own development pathways.

Chapter 4 Climate change economies: denaturalising adaptation and hydrocarbon economisation

Sophie Webber and Emilia Kennedy

A vibrant literature investigates marketised attempts to limit climate change impacts. This literature has exposed the failures of market-based policies, but has also overlooked equally important components of climate governance. This chapter speaks to this gap by examining adaptation economies in the Pacific Islands, and hydrocarbon economies in Alberta, Canada. Drawing connections between climate change knowledge services to inform adaptations and attempts to create carbon capture and storage programmes, we extend existing understanding of how actors are attempting to manage climate change, and we demonstrate the contours and connections of a more broadly conceived category of climate change economies.

Chapter 5 Tourism, environmental damage, and climate policy at the coast of Oaxaca, Mexico

Ignacio Rubio C.

Tourism is a human activity sensitive to climate. This chapter provides a brief description of some of the problems that underlie tourism development in one particular town – Zipolite – a small town on the coast of Oaxaca, Mexico. Discussion focuses on how climate change adaptation policies portray and evaluate the environmental risks that jeopardise tourism development and create environmental fragility and damage. The

chapter provides insight into these critical issues and shows that the expansion of political economies based on massive investment in infrastructure can involve marginalisation of local communities from development.

Chapter 6 Vulnerability factors among Cocopah fishers: climate change, fishery policies, and the politics of water in the delta of the Colorado River

Alejandra Navarro-Smith

This chapter examines the consequences of climate change on the daily lives of the fishing Cocopah families in Baja California, with a focus on public policy regarding climate change adaptation in northwestern Mexico and the southwestern USA. Climate change, as well as the politics of water management, and rigorous fisheries and environmental protection policies, are some of the factors endangering the quality of life for Cocopah fisher households in Baja California and may also be exacerbating their existing social vulnerability. The chapter includes a range of personal reflections from Cocopah elders.

Chapter 7 Ruling nature and indigenous communities: renewed senses of community and contending politics of mitigation of climate change in the northern Sierra of Oaxaca, Mexico

Salvador Aquino Centeno

Accepting the international agenda of climate change mitigation policy, the Mexican government has created a top–down institutional framework of environmental laws and discourses of justification for climate change prevention. This chapter examines how indigenous communities of the northern Sierra of Oaxaca have become involved in the politics of climate change mitigation, through lessons learned from several years of environmental impact due to forest extraction. The chapter focuses on how these communities have incorporated this climate policy while contesting the institutional and official policies of climate change. Based on their own experiences of sustainable management, the indigenous communities have advanced very effective practices of climate change mitigation.

Chapter 8 Adapting in a carbon pool? Politicising climate change at Sumatra's oil palm frontier

Jonas Hein and Yvonne Kunz

We investigate climate policy and its impacts on Sumatra's peasant communities using two case studies for Jambi province: one on the expansion of oil palm cultivation and one on the challenges for peasant agriculture posed by the development of a conservation forest. The associated conflicts centre on often-neglected aspects of climate politics. They illustrate trade-offs between different objectives of the UNFCCC, namely between mitigation and adaptation. We argue that marginalised actors face triple exposure. They are not only negatively affected by climate change and neoliberal globalisation but are also increasingly by attempts to reduce greenhouse gas emissions.

Chapter 9 Adapting in the borderlands: the legacy of neoliberal conservation on the Mexican–Guatemalan border

Celia Ruiz de Oña Plaza

In the Global South, incipient adaptation projects in territories that have for several years experienced mitigation strategies based on environmental payments, encounter significant inertia towards maintaining a monetised approach to combat climate change. This chapter reflects on the implications of this in the Tacaná Volcano Biosphere Reserve, in the borderland between Mexico and Guatemala. By reviewing historical and current trends for a landscape where coffee plantations and conservation strategies are the target of climate change mitigation and agro-ecological adaptation strategies, this chapter argues that it is necessary to reach a close understanding of the uniqueness of the regions where they are to be implemented.

Chapter 10 Climate change adaptation narratives in the Gulf of Mexico

Luz María Vázquez

This chapter uses a case study on fishing communities in the Gulf of Mexico to analyse the potential challenges the that Mexican government may face when implementing climate change adaptation initiatives in the region. A narrative analysis approach shows how actors understand and frame problems. Discussion of two adaptation measures – community relocation and the establishment of protected areas – demonstrates how government climate change initiatives are not designed to address the structural factors that are determining people's vulnerabilities to climate change, such as

poverty or lack of environmental planning. By ignoring such issues and focusing only on how to face impacts, government adaptation initiatives could exacerbate existing conflicts and reinforce inequalities.

Chapter 11 Leaving the comfort zone: regional governance in a German climate adaptation project

Heiko Garrelts, Johannes Herbeck, and Michael Flitner

This chapter reflects on a climate change adaptation project in northwest Germany – nordwest2050 – against the backdrop of debate around new forms of regional governance. These are bound up with hopes for improved effectiveness, wider participation and new integration and innovation processes. The broad-based participatory processes of nordwest2050 enabled the collaboration of actors whose voices are seldom heard in conventional policy processes. The project also showed that adaptation to climate change is a contested, political process. Nevertheless, the differences and conflicts revealed in the course of the project could play a productive role in the future, as a catalyst for further discussions and transformation processes.

Chapter 12 Reconfiguring climate change adaptation policy: indigenous peoples' strategies and policies for managing environmental transformations in Colombia

Astrid Ulloa

This chapter analyses conceptual discussions about 'adaptation' as a strategy for responding to climate change. The analysis indicates a wide range of interpretations on its meaning and scope. It highlights the political dimension of adaptation strategies, due to the inequalities that are generated, both in access and in their implementation in diverse cultural contexts. It starts from the idea that the culturally given causes and answers respond to conceptions about the non-human. The analysis is based on the results of work carried out in indigenous contexts in Colombia.

Chapter 13 Atlases of community change: community collaborative–interactive projects in Russia and Canada

Susan A. Crate

This chapter describes a community–collaborative partnership to develop intranet (within-community) atlases of community change, to empower local communities to monitor change in all its forms (including unprecedented local change due to climate perturbations), develop plans of action and move forward with appropriate responses. Pilot studies took place in two arctic

contexts: a post-Soviet community in northeastern Russia and a coastal community in Labrador, Canada. The chapter explores whether this approach for community self-monitoring of change will improve local adaptation to climate change. The chapter concludes that the prototypes developed drove enough community interest to warrant further development.

Chapter 14 Professionalising the 'resilience' sector in the Pacific Islands region: formal education for capacity-building

Sarah Louise Hemstock, Helene Jacot Des Combes, Leigh-Anne Buliruarua, Kevin Maitava, Ruth Senikula, Roy Smith, and Tess Martin

Practitioners and policymakers are recognising the importance of integrating climate change adaptation and disaster risk management. This approach has been adopted in the European Union Pacific Technical Vocational Education and Training on Sustainable Energy and Climate Change Adaptation Project (EU PacTVET). A key barrier to improving national resilience to climate change impacts and disaster risk has been identified as a lack of capacity and expertise due to the absence of sustainable accredited and quality-assured training programmes that guarantee access to people. TVET modules and tools developed under the EU PacTVET project will establish a community of practitioners supporting community resilience in Oceania.

Chapter 15 Conclusion: the politics in critical adaptation research

Sybille Bauriedl and Detlef Müller-Mahn

This concluding chapter focuses on the political aspects of critical adaptation research by discussing the key arguments of the various case studies presented in this book. In particular, the chapter asks why we need critical adaptation research, since is not adaption always an act of criticism on the unsustainable use of nature? The chapter argues that adaptation is not a neutral driver of action but an outcome of a contested political process. Yet, adaptation is mostly told as a single story, disregarding multifaceted knowledge systems and global environmental justice. To make adaptation research truly critical, it must be more socially and politically reflective.

Part I
Introduction

1 Governing climate change

The power of adaptation discourses, policies, and practices[1]

Silja Klepp and Libertad Chavez-Rodriguez

Introduction

Climate change adaptation is an influential discourse and a powerful political concept linked to many material practices. It has the power[2] to set political agendas and policies and to reframe development programmes on different scales – from global to local. 'Adaptation' – and linked to this the concepts of 'vulnerability' and 'resilience' – is currently the main notion mediating ideas on anthropogenic climate change and society. Nevertheless, it is often difficult to understand what various scholars have observed: that despite its significant political effects, most of the discussions concerning 'adaptation' are effectively framed in an apolitical manner (Cameron 2012; Gesing *et al.* 2014; Eriksen *et al.* 2015; Taylor 2015). This means that the political implications behind climate change adaptation are not explicitly addressed, and so remain invisible. Why is this so? And what do we learn if we focus our analysis on the political aspects, on changing power relations, growing vulnerabilities, and different kinds of injustices linked to climate change adaptation rather than the apolitical aspects of the process? This book aims to contribute to a better understanding of how climate change adaptation politics is evolving, to provide a more accurate account of what is happening on the ground, and to discuss what is needed to set free potentials for change in climate change adaptation to make it a more just and fair tool of governance.

This may be illustrated using the example of Kiribati (Oceania), where adaptation narratives are especially powerful. These Pacific islands – 33 low-lying atolls and reef islands extending just a few feet above sea level and with a permanent population of just over 110,000 – have been identified by climate scientists as highly vulnerable to climate change because of sea-level rise, more intense storms, and drought.

National budgets and aid programmes are being reframed and adaptation projects and policies are today crucial for national and regional household budgets and aid programmes in Oceania and elsewhere. In Kiribati, adaptation thinking informs political decision-making on all scales. In contexts from national to local, the people of Kiribati (the *I-Kiribati*) receive,

appropriate, and transform adaptation measures. Here, climate change adaptation has emerged as a powerful assemblage (Deleuze and Guattari 1987; Head 2009) where different interests, worldviews, and futures are negotiated. One such example is the Kiribati Adaptation Project (KAP) (Storey and Hunter 2010; Webber 2013; Donner and Webber 2014). This exemplifies those features of large adaptation projects that are most criticised: it is financed by the World Bank, it has been running since 2002, and it was established because Kiribati was seen as the 'vulnerable of the vulnerable'. To date, the project has cost around US$10 million and has recently (2015) entered phase III. Numerous consultants have been contracted since 2002, many knowing little about the country and staying in Kiribati for a couple of days only. Even World Bank managers agree that a lot of money has been wasted and that the needs of the population were not sufficiently considered (Klepp 2014). Meanwhile, Kiribati has changed socio-economically on various levels. Arguably, this change is mainly due to aid programmes having been reframed as climate change adaptation programmes, which in turn has often resulted in a shift in responsibility from the Kiribati Government to a more abstract and ever-changing assemblage associated with climate change effects. This process is referred to by some as the 'garbage can effect', metaphorically being used to contain and pose diverse and often previously existing social and socio-ecological problems. Other programmes, such as those concerning domestic violence, may no longer be financed. One researcher has coined the phrase 'performative vulnerability' (Webber 2013), which must be enacted to receive funding from major donors. The former president of Kiribati, Anote Tong, has been especially masterful at enacting performative vulnerability in international fora, drawing on images of vulnerable sinking islands partly linked to colonial legacies of perceived weak, isolated, small islands in the Pacific (Farbotko 2010). However, Kiribati's international standing has also increased (Klepp 2014) and this has resulted in adaptation funds for many positive things, such as sanitation infrastructure, health programmes, and education. Kiribati is clearly undergoing profound change – owing to both the direct effects of the changing climate (environmental effects) and the so-called second-order effects of the changing climate (social effects) that are often also bound to discursive formations (UFZ 2008: 18). Although climate change adaptation, as realised by international donors seems to be the only viable option for survival (de Wit 2014: 57), what is missing in Kiribati are discussions about what this means for the development of the country as a whole. For example, which adaptation concepts and goals would be most appropriate and how should the growing funds for climate change adaptation be spent. These political implications, although fundamental to the future of the country, are not yet openly debated in any public fora.

Motivated by this situation and by what is happening elsewhere in the world regarding politics of climate change adaptation (Chavez-Rodriguez

Figure 1.1 Kiribati Adaptation Project's placard, Kiribati.
Source: photo: Silja Klepp.

2014; Klepp 2014; Klepp and Herbeck 2016; Klepp 2017), around 20 scholars – the majority from and/or undertaking research in the Global South – met in Oaxaca, Mexico, in September 2016 for intensive discussions on climate change adaptation discourses, policies, and practices. Two main themes arose: that cultural, social, and political diversity is more or less absent from climate change adaptation (Bravo 2009; Cameron 2012; Eriksen *et al.* 2015; Taylor 2015) and that the overwhelming social inequalities under which adaptation to climate change is taking place are not only ignored, but are often naturalised (Gesing *et al.* 2014: 5) or even strengthened (Bravo 2009; Dietz and Brunnengräber 2016). In this book we discuss how social science approaches can be used to move away from the prevailing viewpoints and so capture under-represented perspectives. We also discuss how to use these findings to imagine different possible futures.

To show how the politics of climate change adaptation can be addressed rather than ignored, an academic 're-politicising' of climate change adaptation could create a more holistic perspective: referred to by von Benda-Beckmann *et al.* (2009: 9) as a 'multi-sited arena of negotiation'. This includes the structural aspects, namely the networks of interactions

connecting various actors and different kinds of actants (Latour 1996; Ingold 2008) and the power relations and rationalities that organise these interactions and are reproduced or changed by them (von Benda-Beckmann *et al.* 2009). Our approach implies a process-oriented analysis and more attention to the socio-political context (Eriksen *et al.* 2015; Moloney *et al.* 2018). It promotes climate change adaptation as a 'travelling idea' that is interpreted, localised, and modified in different settings (Weisser *et al.* 2014) or as 'mobile policy' locally translated through practice (Cochrane and Ward 2012: 7). We also recognise the idea that climate change is a neutral, apolitical, and universal imaginary projected by climate science, and detached from local responses to climate (Jasanoff 2010: 235) and a global imaginative resource (Hastrup and Fog Olwig 2012: 2). The various chapters of this book will explore a number of questions: which social dynamics can evolve within the framework of climate change adaptation in various spaces? Which assumptions and rationalities are inherent in mainstream climate change adaptation discourses, policies, and practices? Which patterns of use and misuse can we observe regarding climate change adaptation? Which social processes are initiated or hindered through climate change adaptation?

The rest of this introductory chapter summarises the different strands of discussion regarding a political analysis of climate change adaptation. These ideas are examined in greater detail in Chapters 2 to 15. We start by providing a short history of the term 'adaptation', in order to better understand its dramatic revival (Taylor 2015: 6) in the context of climate change, especially under the United Nations Framework Convention on Climate Change (UNFCCC) and the Intergovernmental Panel on Climate Change (IPCC) (Head 2009; Bassett and Fogelman 2013; Watts 2015). We then examine those perspectives and lines of research that seem fruitful in scrutinising given terminologies and assumptions in climate change adaptation projects and policies and that are effective in politicising climate change adaptation. This will help us to establish how and why climate change adaptation can become such a powerful tool in the hands of the elites and, to a lesser extent, of the subaltern.

Reinventing and de-politicising adaptation through climate change

Academic understanding of socio-economic and political processes for transforming the environment first emerged in the mid-twentieth century in the context of American geography and anthropology: the Berkeley School of Cultural Geography was developing particular interest in empirical, often ethnographic, research on the interlinkage between culture, land, and environment (Watts 2015: 23). Borrowed from evolutionary biology, where it meant constant adjustment by organisms to newly arising challenges from their external environment (Taylor 2015: 3), the

term adaptation or 'adaptational strategies' was first used in cultural ecology and then found its way into the social sciences as a whole in the 1960s (Watts 2015: 28). Cultural aspects, ecological principles, and ecosystem analysis approaches were combined in writings about adaptation, for example those concerning Native Americans and their environmental history in the southwest USA (Steward 1955), the practices of ethnic groups managing their resources on the prairie of Alberta, Canada (Bennett 1969), or the padi rice systems that organise society in Bali, Indonesia (Geertz 1963). Again, shaped largely by American anthropology and geography, natural hazards literature and its notions of vulnerability (which focused on how natural hazards created social vulnerabilities) and adaptation began to appear in the 1970s and was soon criticised by a developing political ecology in ways that still sound familiar today (Bassett and Fogelman 2013).

Debate about hazards, risks, and vulnerabilities and an emphasis on social root causes such as poverty and lack of rights in colonial contexts, or on the so-called natural sources of disaster, shaped a discussion that led to fundamentally different views on adaptation (Bassett and Fogelman 2013: 44). These varying conceptualisations are an integral part of the different understandings of vulnerability that exist within international fora, in the field of development aid, and in academia. The natural-hazard approach dates back to the 1960s and is based on a long tradition of disaster research. It was particularly influenced by the early work of Gilbert F. White (a prominent American geographer), who began to analyse natural hazards and human responses (Kasperson *et al.* 2005: 259). By integrating knowledge of natural sciences, engineering, and social sciences, an attempt was made to explain the connections between physical system elements, such as exposure, probability, and impact of hazards (Adger 2006: 271). Nevertheless, the natural hazards literature of the 1970s and 1980s was still relatively apolitical, seeing the vulnerability of a system as the result of the intensity, frequency, and nature of external events (Dietz 2006: 14), that is, primarily implying biophysical vulnerability (Füssel 2005). The 'environment as hazard' work of Burton *et al.* (1978) brought together the most important elements of the natural-hazard approach. With regard to vulnerability, it established that almost all types of hazard have different effects on different social groups (Burton *et al.* 1978). Nevertheless, the approach was dominated by problem analysis and solutions from engineering science. As a consequence, an explanation for the differences in vulnerability shown by different groups of people, and within social groups at any one geographic location, the focus of later human-ecological research, was not addressed for some years (Adger 2006: 271; Dietz 2006: 15).

In the 1970s, critiques coming mainly from a political-economy background and following social-constructivism approaches considered that nature and society should not be analysed as separate entities. They analysed

context-dependent aspects such as social structures and power relations and underlined that adaptation cannot be based on too simplistic *homo economicus* considerations of human behaviour (Dietz 2006: 14; Bassett and Fogelman 2013: 44). In the 1980s and 1990s, political ecology and researchers such as Blaikie *et al.* (1994), Dow and Downing (1995), Hewitt (1997) and Watts and Bohle (1993) began to address social vulnerability, thereby focusing on causal structures. They suggested that the vulnerability of individuals or communities to environmental change is mainly based on their position in social and political contexts (Watts and Bohle 1993; Clark *et al.* 2005).

Even if new conceptual approaches to vulnerability analysis are committed to combine social and biophysical vulnerability in an effort to overcome the separation between natural/biophysical sciences and social science analysis[3] (see for example Peluso and Watts 2001), this 'great divide' (Bassett and Fogelman 2013: 44) in the conceptualisation of vulnerability was taken up again after the re-introduction of 'adaptation' to climate change after the Rio Summit in 1992 (Pelling 2011). It still persists today and leads to different understandings of legitimate adaptation strategies.

Multiple de-politicising factors in climate change adaptation

Many factors make it difficult to consider political dynamics in mainstream adaptation approaches. In this section, we address those that appear most important. Later, we discuss analytical perspectives and tools to deconstruct these factors and shed light on the politics of climate change adaptation.

What adaptation means is still open to debate. It is used in a highly contested way (Arnall *et al.* 2013; Taylor 2015) and how it is interpreted, for example in development projects, is often unclear. Following its re-introduction to the social sciences and policy debate after the Rio Summit in 1992 (Pelling 2011), Bassett and Fogelman (2013) identified three different concepts in the climate change literature: *adjustment*, *reformist*, and *transformative* approaches to adaptation. Each of the three approaches implies different strategies for reducing vulnerability.

The *adjustment* approach mostly implies top–down solutions (see Schipper 2007: 6; Hillmann *et al.* 2015: 6). The socio-political root causes of vulnerability and anthropogenic climate change are not addressed under this approach because they are hidden behind the measurable, quantifiable, and predictable global effects of climate change (Dietz and Brunnengräber 2016). Adaptation strategies comprise technological innovation and infrastructure, a growing body of knowledge, and optimising the governance and management of society (Dietz and Brunnengräber 2016). In contrast, there are approaches that define vulnerability as being far more dependent on context, and regard more radical system change, sustainable development

(Watts and Bohle 1993; Fankhauser 1998), and societal transformation as the most viable way to reduce vulnerability and strengthen adaptation capacity (Schipper 2007). Bassett and Fogelman (2013) refer to these as *reformist* or *transformative* approaches. The latter includes the idea of resolving the internal contradiction caused by an economic system that promotes growth that is energy-intensive and accelerates climate change, and that has adverse consequences for growth and human well-being now and in the future (Harvey 2010). In their analysis of IPCC reports and adaptation-focused articles in leading global change journals, Bassett and Fogelman (2013) found that the so-called adjustment approach is by far the most influential, and is used by 70 per cent of authors.

Pelling (2011) saw the debate as being driven by four main questions: what to adapt to? Who or what adapts? How does adaptation occur? What are the limits to adaptation? All of these questions have political implications linked to questions of power and resources, social inequality, and access to decision-making and information that are not easy to answer. Although the critique of the 1970s and 1980s had found its way into aspects of development aid and disaster risk reduction (such as through grassroots or empowerment approaches), it seems that many of the criticised aspects returned via the 'back door', that is, via climate change discourses and adaptation aid projects (Bassett and Fogelman 2013; Taylor 2015; Watts 2015). The rationalities that characterise current adaptation concepts are criticised as being primarily shaped by the natural sciences (Cannon and Müller-Mahn 2010; Hastrup and Fog Olwig 2012) and as ignoring aspects of climate justice as well as social, cultural, political, and economic conditions on the ground (de Wit 2014; Gesing *et al.* 2014; Eriksen *et al.* 2015; Klepp and Herbeck 2016). What seems new in the climate change adaptation literature, compared with the critique of the natural hazards literature of the 1970s and 1980s, is the focus on the agency and empowerment of vulnerable groups and a pro-poor development planning (Bassett and Fogelman 2013: 51). This is probably due to a trend to the mentioned foci that we can see in social science and development aid generally and can be seen as a politicising factor.

However, an inherent de-politicising factor of climate change adaptation and the reason why such projects are mostly linked to concepts of adjustment and not to a deeper understanding of societal change is closely linked to development aid functioning as an 'anti-politics machine' (Ferguson 1990). In order to be accepted as supposedly 'neutral' agents that have a humanitarian mission, development agencies 'disguise what are, in fact, highly partial and interested interventions as universal, disinterested and inherently benevolent' (Ferguson 1994: 181). This characterises the entire development aid apparatus (Ferguson 1994: 178) and replaces discussions and interventions on social and political inequalities and power relations with crisis narratives that describe 'development' in terms of the well-being of entire regions being threatened by a phenomenon such as famine or

climate change (Bravo 2009: 262). This reframes political questions of resource distribution and access as technical problems that must be addressed by technical 'development' interventions (Ferguson 1994: 180). Furthermore, these crisis narratives legitimise elites and decision-makers on the ground as main receivers of development aid that is often used in their own political interests (Bravo 2009). In the case of the Arctic, Bravo argued that an expert elite that comes as an 'army of consultant climate modellers, ecologists and anthropologists' (Bravo 2009: 269) together with local elites is sustaining the climate change crisis narrative. They legitimise the belief that local people must be guided by techno-managers and gain growing access to the resources that are at the core of the crisis narrative (Bravo 2009: 269). As the chapters of this book will show, the contested assets in adaptation settings are mostly land (Chapters 2, 7, 8, 9, and 11) and water (Chapters 6 and 10).

Nevertheless, we want to stress that we are not denying the risks that anthropogenic climate change poses for people, or claim that climate change exists only on a discursive level. On the contrary, we believe that all of these factors contribute to a bundle of de-politicising factors in climate change adaptation that shape our societal responses to climate change. This can make people on the ground much weaker and vulnerable to its effects, as answers and adaptive strategies must be complex and multidimensional, including our socially, politically, and culturally diverse realities. Moreover, climate change adaptation strategies should face the deeper roots of global inequalities, as Dietz (2009) reminded us.

If we speak about multiple de-politicising factors that are inherent to climate change adaptation on different scales, we must consider the 'multi-dimensional inequalities' (Dietz 2009) in the context of global climate change that are adversely affecting developing countries. With very low per capita emissions, these countries bear little responsibility for anthropogenic climate change and yet they remain heavily impacted by actual and expected environmental change. One important aspect that constitutes the multidimensional inequalities that Dietz is observing in the context of climate change is the violent, disempowering, and impoverishing heritage of colonialism. Nonetheless, as reported by Cameron (2012: 110), serious consideration of the colonialised context in which climate change adaptation is evolving is currently non-existent in the literature on the human dimensions of climate change. Although several authors have written about the importance of employing a colonial perspective, in Cameron's opinion they fail to account for the colonial dimensions of societal problems (Cameron 2012: 110) or to include these dimensions in climate change adaptation:

> If the very factors cited as undermining Inuit capacities to adapt to climatic change are themselves a legacy of colonial interventions, then reframing Inuit vulnerability as a matter of enhancing 'local capacities',

> rather than attending to the structural and systemic processes by which those capacities are continually undermined, must be challenged.
>
> (Cameron 2012: 110)

This is even more the case when it comes to aspects of knowledge and power, as we can see in various chapters of this book (Chapters 2, 3, and 12). The dominant role of Western (natural) science in climate change adaptation often seems to sweep away local knowledge structures. As Logan Cochrane put it in his recent blog entry on Linda Tihuiwai Smith's book *Decolonizing Methodologies: Research and indigenous peoples*, 'even when exploitation is not explicit, there is […] "a cultural orientation, a set of values, a different conceptualization of such things as time, space and subjectivity, different and competing theories of knowledge, highly specialized forms of language, and structures of power" (Smith 1999: 42), which act to reinforce the dominance of one way of knowing over another' (de Sousa Santos 2010; Mignolo 2012; Cochrane 2017). In Chapter 3, Daniel Morchain states that in the case of climate change adaptation, rather than climate science taking the lead, a multitude of knowledge, inside and outside academia, must be foundational. Currently, the imbalance of knowledge 'is used by powerful actors worldwide to maintain control and ownership over the development agenda' (Morchain 2017).

Moreover, in the context of knowledge and climate change adaptation, there is another pitfall: 'good' adaptation must take local contexts, values, and interpretations of 'good living' into consideration in order to make adaptation meaningful and successful in terms of assisting the most vulnerable. The inclusion of the populations affected by changes in adaptation planning and the relativisation of the dominant role of climate change sciences in favour of local (environmental) knowledge and climate change interpretations is urged by many authors (Crate and Nuttall 2009; Lazrus 2009; Kelman 2010; Crate 2011; Rudiak-Gould 2012). However, the focus on 'local' and on indigenous people and their knowledge is often accompanied by assumptions concerning 'intellectual and spatial confinement' (Appadurai 1988, quoted in Cameron 2012: 105) of this very knowledge that we must challenge in our thinking on climate change adaptation. Issues of scale that must be problematised as well as handled with care and sensitivity can remind us that our understandings of the local and the global in climate change adaptation are themselves relational productions (see Cameron 2012).

One last crucial factor in de-politicising climate change adaptation that needs to be raised here, and which is closely related to a restricted understanding of knowledge and vulnerability, is how our climate is understood as existing separately from human beings living in the world. As Taylor wrote, 'the Cartesian foundations of adaptation that dichotomise climate and society as separate yet mutually influencing systems or domains' (Taylor 2015: xiii) are responsible for a widespread understanding of

climate change as an external shock to an otherwise well-functioning society. As Hulme (2010), Taylor (2015) and others described in the 'socio-technical apparatus' that underlies the concept of climate of the IPCC and the UNFCCC and other mainstream understandings, climate seems to be an exclusively physical process that can be measured in local places that create indications for regional or global-scale climatic conditions (Bravo 2009; Taylor 2015: 27). Historically experienced and represented as an entanglement of physical conditions and human knowledge and practices, today an abstract and de-politicised understanding of climate forms the condition in which narratives of climate change adaptation are evolving, as Astrid Ulloa shows in Chapter 12. She examines why it seems so difficult to inscribe questions of power, inequalities, and politics into climate change adaptation. One answer comes from political ecology: because contrary to binary understandings of human/environment relations, concepts of how we act in the world in relationship with the environment, the climate, and its changes are inherently political.

Climate change adaptation politics on a global level

The IPCC and the UNFCCC, themselves informed by science, have always greatly influenced research and implementation of climate change adaptation projects and policies at various levels (Pelling 2011: 17). The IPCC was founded in 1988 and its assessment reports are based on a procedure of scientific consensus. It was mainly created for consolidating knowledge for decision-makers. Since its first assessment report in 1990, adaptation has played an ever-growing role and IPCC definitions have formed the adaptation agenda of the UNFCCC. Since the second IPCC assessment report in 1995, the idea that the severity of the threats posed by climate change to people and ecosystems is dependent on their 'vulnerability' has grown in importance (Liverman 2009: 284). In the course of this development:

> the locus of western moral concern moved (and not for the first time) from temperate to tropical and polar geographies, and the threatened worlds of other species of plant and animal as a sign for life on earth as whole.
>
> (Cosgove 2008, as quoted in Daniels and Endfield 2009: 216)

Here we find another aspect that made and makes climate change adaptation an 'urgent' matter, where in a type of modernist backlash technical solutions are transferred from the Global North to countries of the Global South without much negotiation.

Although mentioned in UNFCCC documents since the Rio Summit in 1992, it is following the 2001 UNFCCC Conference of the Parties that adaptation to climate change, particularly in the Global South, has become

a fundamental principle of global climate policy (Bassett and Fogelman 2013: 42). The UNFCCC established a governance and management structure to support low- and middle-income countries in adapting to climate change. Bilateral and multilateral institutions, such as the development banks and other UN agencies, are included in this structure. In 2001, the Adaptation Fund was established to finance adaptation projects and programmes in countries of the Global South that are parties to the Kyoto Protocol. The Adaptation Fund is financed through a share of proceeds from the Clean Development Mechanism project activities and other sources of funding. The Global Environment Facility is one of the main financial mechanisms that serves as a delivery body for adaptation projects under the UNFCCC, including small-scale projects and programmes. Another milestone is the Cancun Adaptation Framework that was adopted at the 2010 Climate Change Conference in Cancun, Mexico (COP16/CMP6). In the agreements, member countries affirmed that adaptation must be addressed with the same level of priority as mitigation. The national adaptation plan (NAP) process was established to support member countries in formulating and implementing national adaptation plans (NAPs) and to identify adaptation needs. National adaptation programmes of action (NAPAs) provide a process for least developed countries to recognise priority activities to adapt to climate change. All such programmes and institutions have great political influence on different levels. For example, Dietz (2009) described how NAPAs can set and reset political agendas of national elites in the name of climate change adaptation (de Wit, Chapter 2). A general criticism is that the emerging management and infrastructure for supporting climate change adaptation at the UNFCCC level is organised around existing power structures and favours banking interests and technical-fix solutions. Instead of being a driver for change or transformative action, these mechanisms are supporting the status quo (Pelling 2011).

Particularly since the shift from mitigation to adaptation in the climate change discourse of the early 2000s (Smith 2013: 28), ideas of adaptation have been regarded as supposedly neutral drivers of action and appear to be the only possibility for ensuring the continuation of the human species on earth (de Wit 2014: 57). The refashioning from stopping climate change towards adapting to it is itself profoundly political (Cameron 2012: 107). Even if that does not mean that mitigation is completely abandoned, the focus on adaptation has changed thinking about the human dimensions of climate change from a problem of environmental politics and justice on the global scale to something that should be tackled at a more local level, for example in 'community-based focus groups' (Cameron 2012: 109). In this case, actions would be concentrated in the local, as if adaptation capacities were only a matter of enhancing local resilience, targeted through technical intervention and expertise by Western consultants, ignoring structural and systemic processes (frequently linked to legacies of colonial intervention)

of climate change and vulnerability (Cameron 2012: 110). It has also made the social effects of climate change accessible and 'governable' for international politics and development aid (Cameron 2012: 110).

In 2007, the IPCC defined adaptation as 'the adjustment in natural or human systems in response to actual or expected climatic stimuli or their effects, which moderates harm or exploits beneficial opportunities' (IPCC 2007: 27). Here the root causes of social vulnerabilities are framed in terms of exogenous environmental drivers that must be dealt with. Dietz and Brunnengräber saw this 2007 IPCC definition as the most influential reference for climate policy today (2016: 128). However, the critical literature associated with different perspectives on climate change adaptation has grown rapidly since 2000, with a clear recent trend for understanding this more and more as a complex social process (Eriksen *et al.* 2015). More differentiated and contextual understandings of vulnerability to climate change found their way into different chapters of the latest (2014) IPCC assessment report, while other chapters still understood adaptation to be 'the adoption of specific technologies, programs, policies or measures to address climate risk' (Eriksen *et al.* 2015: 525). These conceptual tensions will probably endure (ibid.: 526). They are accompanied by different understandings of climate change as an inherently political problem that calls us to change lifestyles and politics on different scales or, in contrast, as a local or regional problem to which people on the ground should adapt (see Cameron 2012; Klepp and Herbeck 2016). Generally, the historically high greenhouse gas emissions of industrialised countries and commensurate responsibilities for observable and expected changes in global climate have been subsumed under the notion of 'shared, but differentiated responsibilities'. This has not, however, resulted in far-reaching political concessions towards the so-called developing countries of the world. Rather, global power structures themselves have complicated negotiations about 'fair' goals of climate politics and about compensatory payments for adaptation measures (Parks and Roberts 2010). It remains to be seen whether newer concepts such as 'loss and damage' (McNamara *et al.* 2018) or the Paris Agreement (which establishes new instruments such as the nationally determined contributions [NDCs]) will bring fundamental change.

Operationalising climate change adaptation through vulnerability and resilience thinking

At present, the impact of climate change on society is primarily framed in terms of adaptation, vulnerability, and resilience. In terms of operationalising adaptation concepts, notions of vulnerability and resilience are particularly powerful in their practical meaning for governance on the ground. They are translated into political measures and adaptation projects, which are implemented at the local, national, regional, and transnational level

(Bravo 2009: 258). Concepts of vulnerability and resilience were used to describe the choices available to people and ecosystems in response to (and adaptation to) natural events well before discussion of climate change began (Gaillard 2007: 522). These concepts are closely associated with each other and are difficult to disentangle. In the context of climate change, both concepts are the subject of competing definitions, which are often not made transparent when they are used (Fog Olwig 2009: 314; Kelman 2010). They define the social and cultural effects of climate change using a vocabulary of ecological risks and within an ecosystemic perspective, which fails to reflect the complexity of human societies (Bravo 2009: 259). As a result, the primarily political and normative issues raised by climate change adaptation are framed in de-politicising natural science and ecosystem terms (Hastrup 2009: 26; Felli and Castree 2012; Gesing *et al.* 2014). In the context of climate change, they frame the categories within which adaptation thinking takes place. These concepts must be challenged to allow space for alternative ideas about tackling climate change or for alternative societal reactions to be developed (Dreher and Voyer 2014).

The following discussion outlines and examines the discourses relating to the concepts of vulnerability and resilience. The focus is on outlining the main points of criticism of these concepts, and on illustrating the conditions that they have created for negotiating climate change adaptation mainly in countries of the Global South. The chapter authors adopt such perspectives, and several case studies reflect the influence of the conceptualisations of vulnerability and resilience in shaping climate change adaptation.

Vulnerability and climate change

Abundant use has been made of the concept of vulnerability since the very beginnings of climate change research. In its 2007 assessment report, the IPCC defined vulnerability as:

> the degree to which a system is susceptible to, and unable to cope with, adverse effects of climate change, including climate variability and extremes. Vulnerability is a function of the character, magnitude, and rate of climate change and variation to which a system is exposed, its sensitivity, and its adaptive capacity.
>
> (IPCC 2007: 27)

In the following, we trace some of the vulnerability narratives that connect to the effects of global climate change. Why are these narratives so powerful? The historical importance of climate change discourses is seen by Liverman to lie 'in their impact on the environmental, energy and economic development of many countries, […] and the structuring of a new set of international relations around responsibility for causing and solving climate change' (Liverman 2009: 282).

Numerous authors have criticised the way in which discussion of appropriate adaptation to climate change is dominated by the supposedly objective, hard-data-based, neutral solutions offered by the natural sciences (e.g. Barnett and Campbell 2010; Tanner and Allouche 2011) and 'geographic objects' (Barnett and Campbell 2010: 2), such as coastlines, sea-level rise or precipitation data. The devastating consequences of climate change predicted by natural scientists also shape media and academic discourses on climate change, for example in Oceania and Africa. Very little attention is paid to inhabitants' own interpretations of climate change or to the potential strategies for responding which they have traditionally used or are currently using (Barnett and Campbell 2010: 21; de Wit 2014, Chapter 12 (this volume); Ulloa Chapter 12 (this volume)). Development states are pictured by Western media, academics, and international cooperation as marginalised, vulnerable and in need of development, as well as poor and not equipped for economic growth. These constructions are an expression of constellations of knowledge and power, which have been reconfigured in the context of climate change.

The vulnerability discourses linked to the effects of climate change tend to emphasise the internal deficits of countries of the Global South. The threat of climate change, it is implied, can only be averted and the problems of powerless groups solved by an active 'invulnerable expert' (Barnett and Campbell 2010: 162) who interprets what would be good for them. The behaviour of industrialised countries, whose emissions are considered to have caused climate change in the first place, is blended out by shifting the locus of the problem to the countries of the Global South (Barnett and Campbell 2010: 2). In this way, it becomes clear how concepts of vulnerability, which are implemented as part of international cooperation, produce and reproduce unequal power relationships within the knowledge–power nexus. Ideas about adaptation to climate change, which do not necessarily correlate with the needs and preferences of people on the ground, can be forced through into practice.

Resilient citizens?

In parallel form, since the beginning of the century discourses of adjustment to climate change have increasingly moved away from the concept of vulnerability to privilege the concept of resilience instead (Walker *et al.* 2002, 2006; Smith 2013: 28; Weichselgartner and Kelman 2015). In contrast to the widely criticised concept of vulnerability, resilience appears to have the potential to cope more effectively with the uncertainties inherent in climate science (Barnett 2001: 984), is better able to take account of specific local features (Bravo 2009), and allows for greater conceptual flexibility (Hastrup 2009: 28).

The concept of resilience in the context of ecological systems was first introduced by Crawford S. Holling in an article published in 1973

(Barnett 2001: 984; Bravo 2009: 260). This ecological context was subsequently important for transplanting the concept to climate change discourse. In its 2007 assessment report, the IPCC defined resilience as 'the ability of a social or ecological system to absorb disturbances while retaining the same basic structure and ways of functioning, the capacity for self-organization, and the capacity to adapt to stress and change' (IPCC 2007: 880). The 2012 IPCC Special Report on extreme weather events recognised resilience – together with coping – to be one of the essential conditions for the alleviation of the adverse impacts of disasters. Resilience is understood as:

> the ability of a system and its component parts to anticipate, absorb, accommodate, or recover from the effects of a potentially hazardous event in a timely and efficient manner, including through ensuring the preservation, restoration, or improvement of its essential basic structures and functions.
>
> (IPCC 2012: 34)

One of the advantages of resilience is that the term provides a shared vocabulary which enables policies and initiatives in various areas and at different levels to be brought together and compared (Bravo 2009: 258). The concept has been used since the 1970s as a technical term in several disciplines, such as engineering and child psychology. It has also been used in the field of disaster research (Gaillard 2010: 220). In the field of ecology, it is trendsetting mainly because of the resilience theory developed through the later theoretical and empirical work of Holling, and in collaboration with other researchers such as Lance Gunderson and Brian Walker. The resilience theory has been further developed and expanded to comprise social-ecological systems (see Gunderson and Holling 2002; Walker *et al.* 2006). This was mainly accomplished through the work of the international research network *ResilienceAlliance*, founded by Holling in 1999 (ResilienceAlliance 2015). The danger, however, is that a concept is seen to have emerged from ecology, which is rooted in a common, worldwide understanding of the framework and interpretation of climate change (Bravo 2009: 258). This implies a systemic perspective which understands ecosystems as being closed systems (Hastrup 2009: 20; see also Crate 2011: 186).

Cannon and Müller-Mahn (2010) regarded the concept as being insufficiently differentiated in relation to the effects of climate change and as inadequate for capturing people's multifaceted, dynamic livelihoods. As is the case with the concept of vulnerability,[4] the concept of resilience excludes the possibility of rethinking the relationships and processes of co-production of natural and social orders (Ingold 1996, quoted in Bravo 2009: 260) and of resolving the dichotomies between nature and humans. This fundamentally functionalist narrative framing of the effects of climate

change is criticised for taking material causes as its starting point, the rational human response to which is to take adaptive action (Bravo 2009: 260; Cannon and Müller-Mahn 2010). The concept of resilience obscures power relationships and socio-economic factors, such as the impact of colonialism, which play a major role in connection with environmental risk (Cannon and Müller-Mahn 2010).

Around the discourses on climate change and migration, the concept of resilience now seems to have taken a further neoliberal turn which emphasises the individual responsibility of 'more resilient' climate change subjects and migrants (Felli and Castree 2012; Klepp 2017). The 'resilient lives' (Felli and Castree 2012: 4) of individuals and communities are discussed in terms of their ability to be absorbed by foreign labour markets. The 'resilient subject' will be compelled to continually adapt to dangers supposedly beyond their control, in contrast to a subject that considers itself capable of changing the world, its structures and conditions (Evans and Reid 2013). This neoliberal thinking sees, for example, climate-induced migration as successful adaptation and a solution rather than, as was previously the case, a problem of securitisation within a discourse of environmental migration (Herbeck and Flitner 2010; Klepp and Herbeck 2016; Klepp 2017). The danger here is that the populations concerned may find themselves being selected into groups of the resilient and non-resilient, and may experience new forms of discrimination and control as the non-resilient 'others' (Gesing *et al.* 2014: 11), in which aspects of climate justice are excluded altogether. In the resilience discourse linked to climate change adaptation, the responsibility for successfully adapting to climate change is generally shifted to the regions, communities, and individuals that are suffering from the effects of climate change, disguising the responsibility of industrialised countries as the originators of anthropogenic climate change (see Chandler 2014; Davoudi 2016).

How does power operate in climate change adaptation? Alternative concepts, useful tools

The climate change adaptation literature today offers various alternatives to the mainstream concepts discussed above and paves multiple ways for re-politicising climate change and climate change adaptation, and puts people, their agency, and their living conditions back in the focus of analysis. They highlight the 'geographies of inequality' (Daniels and Endfield 2009: 219) in climate change adaptation in opposition to the across-the-board de-politicising of climate change and climate change adaptation, through the climate change sciences (Bravo 2009; Bettini 2013; Gesing *et al.* 2014; Methmann and Oels 2015), through international cooperation (Tanner and Allouche 2011), and to some extent as a result of disempowering concepts such as vulnerability and resilience. A standpoint that goes even further aims to supplant current vulnerability and resilience concepts

with a broader 'citizenship approach' which emphasises agency and political aspects in adaptation debates (Bravo 2009) as well as futures that show alternatives to a nation-state system that is refusing solidarity with people that are experiencing the adverse effects of climate change (Klepp and Herbeck 2016, Klepp 2017).

As previously mentioned, we suggest that re-politicising climate change adaptation should create a more holistic perspective – one of a 'multi-sited arena of negotiation' (von Benda-Beckmann *et al.* 2009: 9). This implies understanding climate change adaptation as a social process (Eriksen *et al.* 2015) that produces winners and losers. The 'processes of prioritisation and exclusion' (ibid.: 526) that are inherent in every climate change adaptation choice, 'necessarily have positive and negative effects distributed socially, spatially and through time' (ibid.: 526). Knowledge plays a crucial role in the social dynamics of prioritisation and exclusion. Western and northern scientific institutions mainly produce the knowledge that forms the basis of and validates a certain type of climate change adaptation; one that fits into international aid schemes and is often connected to or directly sells Western technical knowledge and products.

Research on a more systematic way to understand the failures of climate change adaptation projects and the rationalities of climate change adaptation more generally is about to start (see Sovacool and Linnér 2016: 2). This book contributes by collating empirical insights from a variety of settings, where climate change adaptation is studied as a powerful concept and tool in socially, culturally, and politically diverse contexts. Nonetheless, numerous approaches from critical social sciences have recently been applied in critical climate change adaptation research. Some appear to be especially popular and effective for re-politicising climate change adaptation and are addressed in this book, mainly political ecology (e.g. Taylor 2015), political economy (e.g. Sovacool and Linnér 2016), critical development studies (e.g. Cameron 2012), and science and technology studies, in relation to questions of knowledge, climate science, and technology (e.g. Jasanoff 2010).

We assume that a first step in re-politicising climate change adaptation must be to question and discuss the biopolitical implications of adaptation concepts (Cameron 2012; Taylor 2015). In our empirical research, we ask the 'classical' questions of governmentality (Foucault 1979; Walters 2012): which hidden ontologies can be found that must be carved out and historicised? What can they tell us about power relations, interests, and rationalities in adaptation settings? Which are the actors, actants, interests, and practices involved in climate change adaptation? Which worldview and mission is behind an adaptation project or policy?

At the workshop in Oaxaca we also discussed that scrutinising adaptation policies and practices and de-constructing the multiple de-politicising factors mentioned above might not be enough. In settings regarding the Global South especially, there is a need for approaches sensitive to cultural

diversity and which have post-colonial and de-colonising research perspectives. This is also linked to different ontologies regarding naturecultures and an overcoming of dichotomies between humans and their environments in our research perspectives.

Feminist approaches are also needed to explore the various and often intersectional discriminations that can be reinforced through adaptation policies and projects on the ground. Power and gender relations are often persuasive and persistent, indicating that elites frequently profit most from politics and adaptation projects implemented by international donors. From a gender perspective there are at least two important issues to consider in climate change adaptation: the representation level of women in climate change negotiations and the still widespread representation of women as victims of climate change impacts. Although women's representation does not imply gender awareness, the overwhelming lack of representation of women (such as in disaster risk management), a highly relevant policy field for climate change adaptation, reveals prevailing gender stereotypes about activities related to physical risk exposure and strength mostly assigned to men (Chavez-Rodriguez 2014: 182). Also, in international and national negotiations on climate change, particularly senior officers and decision-making posts are held by men (GenderCC 2017; see UN Women and Mary Robinson Foundation 2013). For example, at the UNFCCC COP16 in Cancun, women accounted for only 30 per cent of all delegation parties, and between 12 per cent and 15 per cent of all heads of delegations; since COP21 in Paris, the increased number of party delegates has been accompanied by a strong decrease in the share of women – to 19 per cent and 17 per cent in 2016 COP22 in Marrakesh (GenderCC 2017). This reflects the entanglement of power and gender relations, and the frequent exclusion of women from learning and working with technical issues, from socialisation to vocational guidance and professional profiles linked to climate change adaptation. Furthermore, this has consequences in terms of gender and social vulnerability to climate change; there is a danger that the over-representation of men in climate change adaptation tasks limits or prevents a consideration of experiences, views, political interests, and (alternative) perspectives of solutions of women (Röhr *et al.* 2008). It is therefore also unlikely that the diverse needs of men and women in highly vulnerable social groups (such as people in need of special health care) will be taken into account. The low representation of women can also be criticised from the human rights perspective, since it reveals the low level of realisation of 'climate and gender justice'. There is an unfair distribution of political participation possibilities between men and women in climate change adaptation, and an unfair distribution of damage and burdens due to climate change-related impacts among groups of different social vulnerability. The inclusion of women is of the utmost importance, but inclusion alone, particularly at the local level, is a double-edged sword: although it can lead

to empowerment for women, which can in turn promote overall gender equity, it can also hide the risk of feminising participation at the local level, while women's workloads increase and their participation at higher levels of decision-making beyond their community is not encouraged to the same extent (Röhr *et al.* 2008). Debates on victimisation or agency of women are also highlighted in discussions on gender and climate change adaptation (Enarson 2007; Arora-Jonsson 2011). As Seema Arora-Jonsson (2011) suggested, it is necessary to overcome dichotomous positions in which women can only be considered as defenceless victims or as agents of change, for example in situations of disaster. Women, just like other human beings, can occupy both positions at once, which means being agents of change and being immersed in situations of disadvantage that determine their greater vulnerability compared with men (Kleinman 2007; Arora-Jonsson 2011). Thus, it is not necessary to deny such disadvantages to consider them important players in climate change adaptation at all policy levels.

The notion of intersectionality from the field of gender studies allows for a differentiated analysis of the social vulnerability to natural hazards (Chavez-Rodriguez 2014: 64) and to climate change impacts, considering a differential exposure according to socio-economic variables such as income level, education, housing and transportation conditions, and access to urban services. Furthermore, intersectionality also differentiates according to attributes inherent to the individual such as gender, age, physical and mental dis/abilities, ethnicity, and migratory condition. Intersectional approaches specially acknowledge the entangled relationships among the aforementioned lines of difference and differentiation (West and Fenstermaker 1995; Walgenbach 2007; Lykke 2010) and their role in the configuration of social vulnerability. The approach of 'processes of accumulation of disadvantages' by Mercedes González de la Rocha feature the configuration of social vulnerability (González de la Rocha 2007). According to this approach, for people with high social vulnerability, the disadvantages are generally multiple, feed back onto each other, and tend to accumulate. Examples of commonly accumulating disadvantages are little or no schooling, low income, subordination and dependency in terms of gender and generation, and difficulties in maintaining social relationships (see Wolff and De-Shalit 2007). The intersectionality concept – together with the notion of accumulation of disadvantages – seems to be necessary for a deep comprehension of the social vulnerability to climate change in order to take account of social differences and its interrelations.

Finally, post-colonial perspectives and subaltern studies offer powerful thinking alternatives for the challenge of re-politicising climate change adaptation, by urging the necessity of theoretical and epistemological distance of the Global South to Western thinking, and by fundamentally challenging deep-rooted dynamics of knowledge construction and international power relations shaped by influential historical processes of colonialisation

and imperialism articulated by notions of race and racism (Quijano 2000; Dussel 2001; see de Sousa Santos 2010; Mignolo 2012). Regarding the highly diversified human experience, Boaventura de Sousa Santos suggested that the comprehension of the world is broader than the occidental comprehension of the world (de Sousa Santos 2010: 8). He claims for the establishment of 'intercultural post imperial human rights', some of which are of critical relevance for a re-politicisation of climate change adaptation such as the rights of recognition of entities that are actually unable to bear duties, specifically nature and future generations, the right of knowledge, and the right of transformation of property rights based on solidarity notions (de Sousa Santos 2010). In the pursuit of taking theoretical and epistemological distance, Arturo Escobar (2017) – together with other Latin American scholars – explored and synthesised several voices and approaches related to notions of transformation coming from the Global South (e.g. *Buen Vivir*, post-development, civilisational transitions, and transitions to post-extractivism), some of which are approached in different chapters of this book. The suggestion to 're-socialise' the climate in the politics of representation of climate change in order to question the de-politicising effects of the 'rationalist account of abstract climate' (Taylor 2015: 37) connects closely to these approaches of an ontological opening in the debates on climate change and climate change adaptation. Florian Weisser *et al.* (2014) demanded more ontological and epistemological reflections in all climate change adaptation research, as it is mostly absent.

Broadly, what this book shows is that the mechanisms of 'prioritisation and exclusion' (Eriksen *et al.* 2015: 526) that are shown by a variety of different analytical tools follow similar rationalities, in different social, cultural, and political settings all over the world. For example in Chapter 11, Heiko Garrelts and co-authors analyse a German climate change adaptation project in terms of the power relations of different status groups. Stakeholders from a regional economic interest group managed to dominate the agenda with their economic benefits connected to regional development and partly took over the participatory decision-making process. The tendency for climate change adaptation to be dominated by economic drivers and by economically strong actors can be observed in most of the chapters.

Conclusion and chapters

This book collates a variety of perspectives on climate change adaptation. Although these perspectives vary widely in terms of subject matter, they all focus on climate change adaptation as a social process where actors on different levels are negotiating knowledge, power, and different possible futures. In synthesis, it seems to us that climate change adaptation can be seen as a magnifier – a contemporary phenomenon (Sovacool and Linnér 2016) that, also in the form of a biopolitical tool, is connected closely to

the most powerful narratives of our time. It represents a new paradigm in North–South cooperation (Weisser *et al.* 2014) and a new arena in which North–South relations are negotiated and reconfigured. In the field of climate change adaptation, humanity is called to deal with the socio-ecological crisis that it has produced. To theorise climate change adaptation and climate change more generally in a better way, we need new understandings in the socio-theoretical conceptualisation of 'locality, sociality and connectivity', as is asked for by Kirsten Hastrup (in press). We need to grasp, first, the increasing complexity of decision-making processes; second, the intensified (transnational) interactions, locally and globally; and third, the increasing dynamics of technological and scientific developments in the climate change and climate change adaptation context.

However, these pathways/understandings that are explored in many chapters of this book should not only be questioned on a theoretical-analytical level, but must also be manifest on a societal level. The latest turn in climate change adaptation concepts are notions of transformation in various contexts and at different scales. Transformative adaptation can become just another buzzword in climate change adaptation, or it can become a real driver for more radical socio-ecological system change (Klepp and Herbeck 2016). All chapters of this book make it very clear that climate change cannot be left to natural science; it is a deeply political, naturecultural phenomenon, and dealing with it must always be multi-dimensional and multidisciplinary. As Daniel Morchain put it: 'Adaptation needs to be transformational, but it can't be so unless the actors driving it radically change their own ways and become more inclusive. Adaptation without transformation is dangerous' (Morchain 2016). Its manifold effects can be observed throughout this book: adaptation without transformation means business as usual in development aid and a cementation of power relations, including a worsening of social inequalities. It remains to be seen as to which direction climate change adaptation will take.

This book comprises five parts. A brief overview of each major section and its component chapters now follows; this includes the geographical focus. Part I contains this chapter – the introduction.

The different conceptualisations of climate change adaptation and their uses and misuses are examined in Part II by Sara de Wit and Daniel Morchain. Sara de Wit (Chapter 2) shows how non-governmental organisations in northern Tanzania are interpreting ideas of adaptation. Her work explores emerging geographies of climate change adaptation as well as sedimented practices that replicate old power structures in the context of what she calls an 'adaptation imperative'. De Wit offers insights into the politics of adaptation that are brought about in the encounter between global ideas of adaptation and what it means for people on the ground. She states that '[w]hereas the government of Tanzania sees the Maasai both as environmental destroyers as well as the most vulnerable people in the face of

climate change, the NGOs representing them argue that they are *masters* of adaptation instead' (de Wit, Chapter 2: 43). Daniel Morchain (Chapter 3) outlines an alternative framing of climate change adaptation that takes into account the interplay of knowledge, power, and politics. He examines the implications of the existing institutional set-up and power dynamics on adaptation debates, for example the strong influence of the IPCC versus the weaker representation of local and indigenous knowledge, and the effects of this on the adaptive and developmental potential of the targeted populations.

Part III addresses the many political economies of climate change adaptation and illustrates trade-offs between mitigation and adaptation on various scales. A vibrant literature investigates marketised attempts to limit climate change impacts. This literature has exposed the failings of market-based policies, but has also overlooked equally important components of climate governance. Chapter 4 by Sophie Webber and Emilia Kennedy refers to this gap by examining adaptation economies in the Pacific islands, and hydrocarbon economies in Alberta, Canada. The authors extend existing ideas of how actors are attempting to manage climate change in order to increase understanding of the new carbon economy and the economisation processes and logics involved in governing climate change. They demonstrate the contours and connections of a more broadly conceived category of climate change economies.

Three Mexican authors contribute to Part III: Chapter 5, authored by Ignacio Rubio C., discusses the problems arising through massive investment in tourism infrastructure. Taking the example of a small Mexican town on the coast of Oaxaca (Zipolite), he highlights the missing political and social understanding of environmental risks in times of global change. Climate change adaptation policies as they are applied in Zipolite are therefore condemned only to deliver few results.

In Chapter 6, Alejandra Navarro-Smith asks how climate change and public policy regarding climate change adaptation in the Baja California region of northwestern Mexico and southwest USA influences everyday life for the fishing Cocopah families. In addition to climate change, public water management and strict fisheries and environmental protection are aggravating their social vulnerability.

In Chapter 7, Salvador Aquino Centeno delineates the contestation of climate change mitigation politics by indigenous communities with solid experience in forest conservation and administration in the northern Sierra of Oaxaca, Mexico – a region historically impacted by forest extraction. He shows how a top–down institutional framework (including environmental laws, discourses of legitimation of climate change mitigation, and the enforcement of carbon sequestration strategies and forest degradation prevention measures) has been incorporated and indeed contested by indigenous communities through new forms of social organisation and a renewal of their community sense.

The final chapter of Part III, by Jonas Hein and Yvonne Kunz (Chapter 8), considers trade-offs between climate change mitigation and adaptation, and between mitigation policy objectives and violent conflicts, water scarcity, and biodiversity loss at Sumatra's oil palm frontier in Jambi province. Using two case studies, the authors show how climate policy changes geographies of resource access and control and how certain actors may become marginalised, making them more vulnerable to environmental change.

Different adaptation settings and conflicting meanings and understandings of climate change adaptation are analysed in Part IV: in Chiapas, in the Gulf of Mexico, in Germany, and in Colombia. The failures of adaptation projects are given particular attention in Part IV.

In Chapter 9, Celia Ruiz de Oña Plaza reviews historical trends in coffee plantations and conservation strategies in the Tacana Volcano Biosphere Reserve, located at the Mexican–Guatemalan border. The author argues that incipient climate change adaptation projects in territories that have for years experienced mitigation strategies (based on environmental payments) encounter significant inertia towards maintaining a monetised approach to combat climate change.

Focusing on fishing communities in the Gulf of Mexico, Luz María Vázquez (Chapter 10) analyses Mexican government climate change adaptation narratives through the study of five coastal communities located in the Mexican state of Tabasco, identifying a discrepancy between what government initiatives propose as potential strategies to promote climate change adaptation, and the views of fishers about interrelated local issues. She argues that government initiatives that are presented as neutral strategies to help communities become better equipped to face climate change impacts are contentious, and that their implementation may face challenges of which the government is unaware when they define the climate change problem.

In Chapter 11, Heiko Garrelts, Johannes Herbeck, and Michael Flitner use a case study in northwest Germany to explore the chances and challenges of regional broad-based participatory governance projects relevant to climate change adaptation. They also point to the productivity of the conflicts that emerge once stakeholders 'leave the comfort zone'. Customary practices and political narratives were questioned during the project, and the possibility raised for new approaches towards climate change and climate change adaptation.

Astrid Ulloa (Chapter 12) contributes to conceptual discussions about adaptation, questioning fixed notions of climate change adaptation and raising the importance of historical, political, and cultural dimensions. Ulloa asserts that the culturally given causes and answers to climate change respond to conceptions about the non-human. Her analysis draws on work carried out in indigenous contexts in Colombia and she argues for the need to include cultural perspectives on climate change in public policy.

The book concludes with Part V, in which Crate (Chapter 13) and Hemstock and co-authors (Chapter 14) describe concrete ideas and practices

for change in development aid and climate change adaptation research, to show how those aspects of climate change adaptation that were criticised in preceding chapters can be tackled.

Susan A. Crate (Chapter 13) describes a community collaborative partnership to develop intranet atlases of community change, to empower local communities to monitor change in all its forms, develop plans of action, and move forward with appropriate responses. She based her ideas on pilot studies undertaken in two Arctic contexts – a post-Soviet community in northeastern Russia and a coastal community in Labrador, Canada – and concluded that this approach for community self-monitoring of change drove enough community interest to warrant further development.

In Chapter 14, Sarah Hemstock and co-authors describe how a regional project financed by the European Union tackles different problems in the realm of disaster risk reduction and climate change adaptation in Oceania. Based on technical vocational training and capacity-building, a community of practitioners is trained in strategies of disaster risk reduction and climate change adaptation. In this way, local communities get formal education certificates, resources can be used for staff with local knowledge (often making foreign consultants superfluous), and the overall resilience of communities is strengthened.

In the concluding chapter to the book, Chapter 15, Sybille Bauriedl and Detlef Müller-Mahn focus on the political aspects of critical adaptation research, by discussing the key arguments of the various contributions and asking why we need a critical adaptation research. Is not adaptation always an act of criticism on unsustainable use of nature? What are the specific perspectives of critical approaches? What is the political in critical adaptation research?

Although the material presented here may be approached from the perspective of individual chapters and their focus on a particular aspect of the current debate, for a more complete understanding of the difficulties and shortcomings of climate change adaptation and the interconnections between different discourses, politics, and practices, it is better to approach the book differently – it is recommended to approach the book from a more holistic perspective viewing the chapter-specific material more as part of a whole. Nonetheless, what is most important to us at this point is an invitation to our readers to question conceptualisations of climate change adaptation in different adaptation settings, to further advance critical research approaches on climate change adaptation, and to develop solutions for our collective futures that are based on solidarity, emancipation, and fairness, and which take climate justice aspects into account.

Notes

1 This introduction has profited very much from the work of our colleagues who were so kind as to review it: Alejandro Camargo, Hartmut Fuenfgeld, Florian

Dünckmann, Robert Hassink, and Jonas Hein. Thank you for this! We are also grateful to our student assistants Cynthia Aurich, Lucas Wogawa, Sarah Hartwig, and Ana González.

2 Following Lukes (2005), Gaventa (2006), and Hein (2016), we understand power as a dynamic social relationship which operates across scales, space and time. Lukes (2005) differentiates between three dimensions of power: visible power, hidden power, and invisible power. Put simply, visible power 'may be understood primarily by looking at who prevails in bargaining over the resolution of key issues' (Gaventa 1982: 14). It refers to resources, such as financial and natural resources and social and political capital, such as being part of or the leader of a (more or less powerful) political party. Hidden power can be described as the ability to set the agenda, to influence the values, beliefs, and procedures that are thinkable and practicable. This often means the exclusion of certain actors and mechanisms of disciplining others. The third dimension of power, invisible power, refers to internalised domination, subordination, and the acceptance of social inequalities as the order of things. The third dimension refers also to the Gramscian concept of hegemony (Hein 2016). It is mostly invisible power that influences how marginalised people interpret and accept the dominant social production of nature, space, and resources (Gaventa 1982: 16–19).

3 This understanding of vulnerability is known as cross-scale integrated vulnerability. Integrative approaches take into account comprehensive definitions of vulnerability (Füssel 2005). Several new conceptual frameworks for analysing vulnerability have emerged; within the more influential ones are the model of 'double structure of vulnerability' from Hans-Georg Bohle (Bohle 2001), the approach 'environmental criticality' by Kasperson *et al.* (2005), the analytical work 'Syndromes of Global Change' of the research group led by Hans Joachim Schellnhuber (Schellnhuber *et al.* 1997), the work on the vulnerability of coupled social-ecological systems of the research network ResilienceAlliance around Crawford S. Holling (Gotts 2007; Gunderson and Holling 2002; Walker *et al.* 2002, 2006), and the hazard-of-place framework, established by Susan L. Cutter (1996).

4 According to Clark *et al.* (2005), vulnerability can be defined 'as people's differential incapacity to deal with hazards, based on the exposition of groups and individuals within both the physical and socials worlds'. It is a function of two characteristics as follows: 'Exposure (the risk of experiencing a hazardous event)' and 'Coping ability, subdivided into resistance (the ability to absorb impacts and continue functioning) and resilience (the ability to recover from losses after an impact)' (Clark *et al.* 2005: 198). Both characteristics are considered, at least partly, as socially constructed:

> exposure […] is partly socially constructed in that existing land use and daily commuting patterns, to name but two exposure variables, are social and temporal phenomena […]. Coping ability […] is influenced by a large list of variables identified by sociologists, geographers, political scientists and other investigators.
>
> (Clark *et al.* 2005: 199)

These variables include age, disability, family structure and social networks, housing and built environment, income and material resources, lifelines (including transportation and communication, building equipment and appliances, emergency response, and hospitals), employment, as well as race and ethnicity (Clark *et al.* 2005: 199, 204).

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