Anna Schwachula

SUSTAINABLE DEVELOPMENT IN SCIENCE POLICY-MAKING

The German Federal Ministry of Education and Research's Policies for International Cooperation in Sustainability Research

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Anna Schwachula

Sustainable Development in Science Policy-Making

The German Federal Ministry of Education and Research's Policies for International Cooperation in Sustainability Research

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New knowledge, created in international cooperation, is essential for global sustainability. Set against this background, this study focuses on German science policy for research cooperation with developing countries and emerging economies in sustainability research. Based on interviews with policy makers and researchers, the book scrutinizes the actors, processes and contents of science policy in Germany. The author argues that science policy mainly aims at German economic benefits and technology development. This, however, negatively influences global sustainability. To counter existing path dependencies, the author provides recommendations for sustainability-oriented scientific practice and science policy.

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1 Introduction

This book deals with the role of science policy for global sustainable development. Cooperation between researchers in the so-called developing as well as the so-called developed world has a great potential to foster sustainable development on a global scale. However, science policies are decisive in setting a supportive frame for research cooperation. Against this background, this book explores German science policy for cooperation with developing countries and emerging economies[1] for sustainable development and seeks to understand why under the surface, sustainability is *not* the core objective.

At a first glance, sustainable development is increasingly shifting into the focus of German policies. In its Sustainability Strategy, the Federal Government acknowledges the importance of sustainability for its policies in view of its responsibilities on the national as well as on the global level (Bundesregierung 2016). Funds for research cooperation between Germany and developing countries or emerging economies have been continuously growing in the last decade. The German Government has corroborated education and research as a priority area of cooperation with developing countries and emerging economies in consecutive governmental periods (Bundesregierung 2009a; 2013; 2018a).

The Federal Ministry of Education and Research (BMBF) and its policies play an important role in international cooperation on sustainability issues. The BMBF is the largest provider of public funds for research cooperation between German researchers and those in developing countries and emerging economies.[2] Decisively

1 Throughout this book, I use the terms *developing country* and *emerging economy* to depict the countries, located mainly in the global South, that are enlisted as recipients of Official Development Assistance (ODA) by the Organisation of Economic Co-operation and Development (OECD). The classification draws on the World Bank's numbers on Gross National Income (GNI) (OECD 2018). In most developing countries and emerging economies, social and ecological problems persist. Compared to developing countries, emerging economies have a higher GNI and have presented higher levels of economic growth in the recent past (OECD 2010a). On the concept of development as such, see chapter 2.

2 Although no total numbers are available for expenditures on cooperation with all developing countries and emerging economies, the dimensions are illustrated by the numbers published on African Countries and BRICS: the BMBF allocated app. EUR 47 million on cooperation with BRICS

setting the course of cooperation, policies for research cooperation with developing countries or emerging economies are a field of science policy, and *not* of development policy in the German context. As a consequence, global development targets such as the former Millennium Development Goals (MDGs) or the current Sustainable Development Goals (SDGs) are of subordinate importance for international science policy.

In contrast to the Federal Ministry of Economic Cooperation and Development (BMZ), responsible for German development policy, the BMBF is not bound to fulfilling international agreements on development cooperation in funding science cooperation. Therefore, development-oriented agreements such as the Paris Declaration on Aid Effectiveness, or the Accra Agenda for Action and their follow up documents (OECD 2008) agreed upon in the Organisation of Economic Co-operation and Development (OECD) are no relevant policy frames of science cooperation. At the same time, science cooperation is not a central issue in economy-related international fora, either. As such, resolutions of the G20 – even in their non- binding legal function – rarely address the role of science cooperation (see Bundesregierung 2018b).

Given this absence of compulsory norms for international science policy, it is a question of empirical research to analyze on which basis the BMBF develops its specific policies and funds cooperation with developing countries and emerging economies. Throughout this book, I demonstrate that science policy always has a normative dimension and may potentially contribute to all possible scientific objectives – as well as to objectives beyond the boundaries of science, such as fostering economic development, solving societal or environmental problems or making better political decisions (Bucar 2010; STEPS Centre 2010). The discursive[3] direction chosen in science policy hence displays the choices and values underlying it.

Scrutinizing different science policies worldwide, scholars have shown that economic rationales are a commonly-accepted legitimation of science policy, while a rationale for non-economy related societal benefits seems to be less common (Nowotny et al. 2001; Sarewitz et al. 2004; Leach et al. 2010; 2012). German science policy, as I argue throughout this book, is not an exception to this general observation. Rather than contributing to global development targets, the BMBF's main objective is to secure German prosperity, as stated in a self-description of the ministry:

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in 2012 (BMBF 2014a: 410) and EUR 50.8 million on cooperation with African partner countries in 2013 (BMBF 2014b: 2), see chapter 5.

3 The term *discursive* generally signifies language-based, in contrast to *non-discursive*, not language-based. I do not examine symbolic or other non-language-based practices here, and the distinction above therefore is not required. In lack of a corresponding adjective, I use the term *discursive* in a meaning of *related to discourse*.

> "Education and research are the foundations for our future. The promotion of education, science and research by the Federal Ministry of Education and Research represents an important contribution to securing our country's prosperity." (BMBF 2015a)

The BMBF's main policy goal is thus *not* to foster sustainable development in Germany or abroad, even though *sustainable development* is referenced as a policy frame in the national Sustainability Strategy as well as in specific research programmes, i.e. the BMBF's successive framework programmes on Research for Sustainable Development, FONA (BMBF 2005a; 2009a, 2015e). Hence, science policy could hypothetically envisage all types of effects on society, including global sustainable development. Empirical research shows, however, that it displays different directions. This book traces why this is so.

1.1 Shedding light on German science policy for cooperation with developing countries and emerging economies

This book describes the empirically grounded research conducted in the frame of a PhD thesis. As such, it is linked to fulfilling a specific research objective: Shedding light on German science policy for international cooperation. Specifically, I examine science policy and funding by the Federal Ministry of Education and Research (BMBF) in the field of sustainability research aimed at supporting research cooperation between Germany and emerging economies or developing countries. The focus of analysis within this study is first, on the *processes and actors* involved in policy discourse, *second*, on the underlying *ideas and objectives* of BMBF policies and programmes for cooperation with developing countries and emerging economies, and *third*, on the *effects* of the specific policy conceptualisations on project implementation.

Being interested in the *what* and *why* and *who* of German science policy on a social science background, I chose the *Sociology of Knowledge Approach to Discourse* (SKAD), developed by R. Keller (Keller 2005; 2011a; 2011b; 2011c; 2012; 2013) as analytical approach to research. A constructivist perspective thus forms the fundament of this research project.

Empirically, research is based on a qualitative approach – semi-structured interviews, participant observation and analysis of policy documents – among policymakers, employees of project funding agencies and project participants involved in designing policies, administrating funding and implementing research within the Integrated Water Resources Management (IWRM) funding initiative (BMBF 2004a) and the Megacities funding initiative (BMBF 2004b). In order to obtain deeper insights into the funding initiatives in practice, I carried out participant observation

in two research projects, LiWa, located in Lima, Peru, a German-Peruvian project funded in the Megacities initiative; and IWAS Agua-DF, carried out in Brasília, Brazil, a German-Brazilian research project funded in the IWRM scope.

The Sustainability Subdepartment's funding priority on Social-Ecological Research (*Sozial-ökologische Forschung*, SÖF), is often highlighted as an example of the BMBF's encompassing and inclusive orientation of sustainability research funding. However, I argue that SÖF funding, while crucial for transdisciplinary sustainability-oriented research in Germany, remains a niche and does not reflect the BMBF's core discourse (ch. 8). In view of its participatory agenda processes, its transdisciplinary approach and encompassing social-ecological focus, it is an outlier.[4] Furthermore, SÖF as a funding priority is not aimed at international research cooperation as such. While in some SÖF-related funding initiatives, such as the junior research groups, international cooperation is possible, it is not a crucial element of SÖF. The main funding for international cooperation in FONA takes place in the subareas of *Global Change* and *Resources and Sustainability* (BMBF 2009a). In consequence, I selected the Megacities and the IWRM funding initiatives *purposefully* to illustrate the process of transmitting the policy discourse into concrete objectives. The two initiatives are comparable in scope, but nevertheless are characterized by differences that promised interesting contrasts. As a common trait, both funding initiatives aimed at cooperation with developing countries and emerging economies. As unilateral initiatives, they were issued by the BMBF in 2004 and designed based on German interests. The projects funded within both initiatives took place outside of the frame of any bilateral agreements on science and technology between Germany and partner countries. I therefore expected comparable insights on modes of agenda setting, programme design and involvement of partner countries' governments. However, the funding initiatives demonstrated different orientations of research objectives, which seemed interesting points of differentiation: Although both funding initiatives aimed to fund inter- and transdisciplinary research, the IWRM initiative was rather oriented towards technological approaches, while the Megacities initiative targeted systemic research and initially did not prescribe a specific solution pathway.

While in my empirical analysis, I especially focused on Megacities and IWRM as exemplary funding initiatives, I also compared the findings to further funding initiatives for international cooperation in the BMBF's *Subdepartment for Sustainability, Climate, Energy* (that I abbreviate as *Sustainability Subdepartment* in the fol-

4 This is mirrored by the amount of funding for SÖF. Between the years 2000 and 2015, SÖF received a total budget of EUR 120 Mio, less than 10 Mio per year (BMBF 2015h). Even though annual funding increased from EUR 13,3 million in 2012 to a planned EUR 20 million budget for 2019 (BMF 2014; 2019), the overall budget remains only a small part of the overall budget for FONA – which amounted to almost EUR 2 billion from 2010-2014 (BMBF 2019a).

lowing chapters). A few years have gone by since I conducted empirical research (in 2012-2014). Since then, both the IWRM as well as Megacities funding initiatives have come to an end. Some funding initiatives, such as CLIENT, have issued new rounds of calls for proposals – CLIENT II, in 2015 (BMBF 2015i, 2017). As a follow up for the ending projects within the Megacities funding initiative, the BMBF initiated the Rapid Planning project within the Megacities funding initiative's frame (BMBF 2018).

The ministry itself has undergone some changes, as well. Its organisational structure has been slightly rearranged (ch. 5). At the time of research, the subdepartment in charge of international cooperation in sustainability research was the *Subdepartment for Sustainability, Climate, Energy*. In the new organisational shape, it is now the *Subdepartment Sustainability, Provision for the Future.* The subdepartment's working units have been slightly reorganized, as well. New units, such as on *Systemic Mobility, City of the Future* have been established; previous units have extended their responsibilities, such as the Unit for *Resources, Circular Economy, Geosciences* (BMBF 2019b). Additionally, the *individuals* working within the BMBF, in projects and as experts have continued their paths through life. While some of the people interviewed have changed to different working positions, others have retired, new people have entered.

On the one hand, the developments show that changes in policy are happening, even though policy seems to be characterized by high discursive stability (ch. 6, 8, 11). On the other hand and nevertheless, I argue that my findings in view of the general orientation of science policy for cooperation with developing countries and emerging economies continue to be pertinent: Recent documents on policies for international cooperation document that the main political mindset remains without essential changes (see: BMBF 2017). I therefore argue that my findings reflect insights on the policy processes and policy discourse within the Sustainability Subdepartment's funding initiatives for cooperation with developing countries and emerging economies.

1.2 Sustainable development as normative background

Based on the view that science policy is inherently normative, I argue that *global sustainable development* would be a legitimate objective for German science policy targeting cooperation with developing countries and emerging economies. In fact, sustainable development (or the BMBF's interpretation thereof) has already turned into an explicit frame of reference for BMBF funding in the area of sustainability research. I am thus specifically interested in investigating and exposing in which way the concept of sustainable development is constructed in the BMBF's policies for international cooperation.

At the same time, I resort to *sustainable development* as a normative basis. I argue that in its current interpretation of sustainability as a concept of predominantly environmental problems to be solved by economy-driven, technological solutions, the BMBF does not adequately enable the German science system to fulfil its role in preventing, mitigating and coping with global challenges such as climate change.

Using sustainable development as a normative lens on science policy does not seem farfetched: Environmental challenges on the global level, such as climate change, as well as on the local level, such as unsustainable management of resources, become more and more pressing and affect developing countries as well as all other countries alike, and scientific concern with sustainability is ongoing. Research shows that *planetary boundaries* and a *safe operating space* – which can neither be negotiated nor extended – have to be maintained to prevent severe consequences for the planet (Rockström et al. 2009), while ensuring a socially just space for humanity (Raworth 2012). This will require substantial transformations within *all* societies (WBGU 2011). In addition, striving for global equality is presented as an *ethical* obligation of people in a world habited by a *common humanity*, while at the same time, global sustainable development – as collective benefit – is also a matter of *self-interest* on a planet with limited ecological boundaries and resources (Hulme 2016). Based on this insight, the Agenda 2030 and its Sustainable Development Goals (SDGs) have been internationally adopted as a political frame of reference by the UN states in 2015 (UN 2015). Indeed, in view of sustainable development, not developing countries, but high income-countries lag behind in view of most environmental targets, such as regarding SDG12 on responsible consumption and production, or SDG 13 on climate action (Sachs et al. 2017). Perceiving sustainable development as a *global* challenge and a *global* responsibility therefore shifts the emphasis of previous development agendas.

In parallel to the ongoing ecological concerns, global social and economic changes occur. In recent years, previous economic and social divides between *developed* and *developing* countries increasingly blur and new constellations between former donors and recipients of development cooperation emerge. This has led to discussions around the future of development cooperation in a Beyond Aid debate (Janus et al. 2015; Horner and Hulme 2017). Taking global development, as expressed in the SDGs, seriously as a new development paradigm requires substantial changes of national policies from national interests towards global sustainability and wellbeing (Hulme 2016; Horner and Hulme 2017). On this background, other forms of cooperation between developed countries and developing countries or emerging economies are worth scientific scrutiny. Research cooperation between Germany and developing countries and emerging economies presents such a case.

Two remarks seem necessary in view of taking over a critical perspective based on the normative standpoint of sustainable development. The analysis of German

science policy presented here reveals some critical issues in view of global sustainable development. Representations in research, as in this book, often compete with official, authorized representations of the informants and their organisations. On this background, it is important to point towards the power dynamics during research. The empirical research I carried out for this analysis was coined by a situation of *studying up*, thus researching among actors in higher levels of power and status. In order to the avoid risk of censorship and to maintain the interpretative authority over the contents, interview statements were anonymized instead of requesting authorized statements from interviewees (ch. 4).

At the same time, in being critical of the general BMBF discourse, I do not intend to discourage those actors within the BMBF who initiated novel approaches to encompassing sustainability research (ch. 9); project participants who used their room for agency to extend their projects' scope in order to redirect them to more sustainable pathways (ch. 10); or external experts who publicly and critically discuss the direction of current science policy (Box 7-1). The conclusive chapter provides recommendations for these actors (ch. 11).

1.3 Contributions to scientific literature

Science policy, the processes of its production as well as its aims are researched from various social science perspectives. My investigation of sustainable development as a concept of German science policy, especially as a frame for cooperation with developing countries and emerging economies, therefore potentially enriches various disciplines. For scholars in science and technology studies, for example, one of the central research subjects in science policy research is on which basis policy decisions are made (Bozeman and Sarewitz 2011). Further knowledge gaps exist in view of the relation of science, science policy and societal benefits. While economic impacts of science are researched extensively, the effects of science and science policy on other social spheres have been less investigated (Miller and Neff 2013). From a sustainability and development research perspective, the relation between policy, science and sustainable development is equally pointed out as a knowledge gap, next to the effects of research cooperation (Maselli et al. 2006; Stamm 2008; Mohan and Yanacopulos 2007).

The research presented here aims to add to the existing literature on both a conceptual as well as an applied level. In applying SKAD to a policy setting, the approach is conceptually reflected and further refined. To suit the specific setting of policy making, I combine SKAD with constructivist approaches to policy processes. I consider policies as a specific type of discourse with specific rules and practices of (re)production. The practices of creating policy discourse include different planes of policy making from designing new strategies and programmes, issuing calls for

proposals, to funding research projects. Viewing policy as discourse enables me to expose the interconnections between ideas and structures in policy. In doing so, it has been useful to scrutinize the relation of stabilizing structures and practices – the discursive *dispositive* – and the spaces for agency through which actors maintain, renew, change or contest a policy discourse in the practices of policy production from decisions on topics and cooperation countries to policy implementation in funded activities.

Next to reflections on the theoretical groundings of SKAD, research also offers empirically grounded insights into processes of policy making and the consequences for the discursive contents. I demonstrate that the general discourse of German science policy, centred around the idea of fostering science for German economic prosperity, influences the concept of sustainability in science policy substantially. In consequence, funding initiatives for cooperation with developing countries and emerging economies in sustainability-related research are not aimed at global sustainability. Sustainable development rather turns into a legitimizing narrative for securing German prosperity through promoting technological, economically-viable solutions. In doing so, the concept of sustainability is narrowed and depoliticized. I argue that this has consequences for the type of knowledge produced within the German science system. In most funding initiatives empirically scrutinized, the BMBF attributed a minor role to the social sciences. As part of technology-oriented projects, the social sciences were reduced to accompanying technology implementation. However, if the BMBF, as one of the main funding institutions of applied research, neglects the larger social, cultural and essentially political aspects of sustainable development, it weakens the capacities of science to critically reflect. This means that the BMBF does not enable the German science system to adequately deal with sustainability challenges in the long run.

In the case of the BMBF's science policy for sustainable development that I empirically investigated, several factors contributed to a high degree of stability of the policy discourse. Institutional structures (such as organisational shape and bureaucratic rules), redundancies in policy processes and practices of discourse actualisation as well as the BMBF's position to exclude alternative discourse made the continuation of ideas more likely than discourse change. External discourses as well as individual agency played an important role in instances of discourse actualisation leading to change. In pointing at the spaces of agency within science policy processes, I wish to contribute to the field of literature on processes of change for sustainability (Smith et al. 2010; WBGU 2011; Wiek et al. 2012; Göpel 2016).

A last contribution targets the preconditions of research for sustainable development on several levels. The empirical insights allow an abstraction in view of recommendations aimed at research projects, the BMBF as well as at interministerial cooperation. In the context of scholarly debates on new types of cooperation

(Janus et al. 2015) these might help to adjust science policy to objectives of *mutual* benefit for global sustainable development.

1.4 Analytical structure and outline of the chapters

This book is structured in the following way: After this introduction, a *literature review* (ch. 2) gives an overview about different conceptualisations of science, science policy and potential effects on society. Different conceptions of discursive elements such as *science*, *innovation, policy, sustainable development* as well as their interrelation are in the spotlight of the chapter. I show that multiple conceptions of the relation between science and society exist. Potentially, science policy could be aimed at any conceivable scientific, technological or societal goals. Its implemented form therefore displays underlying social norms, choices and values. Acknowledging the potential openness of goals opens up room for investigating why a certain view dominates current German science policy.

In chapter 3, I introduce the Sociology of Knowledge Approach to Discourse (SKAD) as the *conceptual basis* of my research. The chapter exposes different approaches to the analysis of policy processes and exhibits why a theoretical framework based on the discursive construction of knowledge is an adequate approach to the analysis of German science policy for cooperation with developing countries and emerging economies.

Chapter 4 then situates my research in the corresponding *methodological context*. In choosing the perspective of SKAD, my research is embedded in a constructivist perspective. Following, I make use of qualitative social research methods for obtaining empirical data, including semi-structured interviews, participant observation as well as the analysis of policy documents. The chapter informs about data collection as well as methods of analysis. Also, I reflect about my own positionality as a researcher as well as the people whose statements build the corpus of data.

The empirical chapters of the book answer research questions around the research subject of the BMBF's science policy for cooperation with developing countries and emerging economies, firmly based on the theoretical, conceptual and methodological considerations exposed in the previous chapters. Chapter 5 provides necessary *background information* to understand why the BMBF as such, and especially its policies and funding in the area of sustainability, are relevant research subjects in view of cooperation with developing countries and emerging economies. In the first section, I give an overview of the different public actors who are involved in funding research in general within Germany, and more specifically those who fund science cooperation between Germany and developing countries and emerging economies. This helps to situate the BMBF's policies, research programmes and funding initiatives in the German context. The second section

of chapter 5 then deals with the policies, strategies and funding initiatives of the BMBF and shows the historically grown importance of research cooperation between Germany and developing countries and emerging economies especially in the field of environmental and sustainability sciences, which is reflected in BMBF policy and funding.

Chapter 6 centres on the interlinkages of structures and agency in *internal decision-making processes in the BMBF* which lead to a specific policy discourse. I show that institutional structures, rules, norms, as well as previous discourse cast into strategies and programmes play a role in shaping the specific discourse on research cooperation with developing countries and emerging economies. These structural elements make up a dispositive, which enhances discursive stability. Nevertheless, it still leaves spaces of agency for the individual actors within the BMBF to influence policies for research cooperation with developing countries and emerging economies in the field of sustainability research.

As policies are not created exclusively within the boundaries of the individual BMBF working unit or (sub-)department, chapter 7 considers the *roles of different external actors* in shaping the policy discourse. Next to experts of different types, the project management agencies are important contributors to policy discourse. In addition, interaction occurs with actors from other policy fields, both within and outside of the BMBF. The chapter thus examines why the BMBF admits certain actors into the discourse coalition on science policy, while the gates are kept shut for others. Hence, the chapter highlights whose knowledge is deemed as relevant and valid for policy, and whose is not. In addition, I expose through which mechanisms and in which processes external knowledge is integrated into the policy discourse or actively excluded.

I then turn to the *contents of policy discourse* for research cooperation with developing countries and emerging economies in sustainability research. In SKAD, discourse is considered as "concrete and material" (Keller 2011c: 48). In view of the analysis of policy contents in chapters 8 and 9, this means that I base the analysis on different types of manifest discursive statements in texts and speech, including statements in policy strategies, such as the High-Tech Strategy (BMBF 2006; 2010c; 2014) , Internationalisation Strategy (BMBF 2008a; 2016b), or FONA (BMBF 2005a; 2009a; 2015e) as well statements from interviews with BMBF staff and from the BMBF's website.

Chapter 8 focuses on the *heart* of the BMBF's policy – its *core discourse,* or *leitmotif* that coins and frames all further BMBF policies, and which consists in the concept of *prosperity through science*. *Sustainability* is a further concept used in BMBF discourse, which provides an additional frame to policies – as strategies, funding initiatives as well as interview statements – as instances of discursive events – document. I reveal the development of the discursive policy orientation towards economic innovation on the one hand, and sustainable development on the other, and

expose the current discursive usage in the BMBF's policy discourse. The final part of chapter 8 is then dedicated to the BMBF's specific policy discourse for cooperation with developing countries and emerging economies – and how the overarching leitmotifs of prosperity through economy-oriented innovation and sustainable development influence the specific subdiscourse. I show which concepts the BMBF employs as rationale for funding research cooperation with developing countries and emerging economies in sustainability research, which specific aims the BMBF pursues in doing so and how these are embedded in the core discourse.

Chapter 9 is dedicated to *two exemplary BMBF funding initiatives* for cooperation with developing countries and emerging economies in sustainability research: the IWRM funding initiative and the Megacities funding initiative (BMBF 2004a; 2004b). I reconstruct the concrete objectives of the specific policy discourse – as instances of transmitting more abstract policy discourse into more concrete effects. While the IWRM funding initiative serves as an example of an economy-oriented rationale congruent to the BMBF's core discourse, the Megacities Initiative illustrates how policy makers may use spaces of agency to deviate from the main story-line and pursue objectives beyond German economic benefits. The chapter also exposes capacity development, transdisciplinarity and cooperation on eyelevel as concepts of the policy discourse which are closely related to the policy expectation of creating impacts.

After focussing on actors and contents of the discourse within German science policy for cooperation with developing countries, chapter 10 as last empirical chapter analyzes the *discourse effects*. In a first part, the dispositive used to establish and maintain a specific discourse is exposed. In the case of science policy for research cooperation with developing countries and emerging economies, the dispositive aimed at discourse effects consists of those institutional structures and practices that transmit the objectives of policy to the project level. For example, splitting funding phases into short time contracts, can be seen as a way to exercise power over the policy discourse's effects by maintaining control over resources – as a means of preventing projects to adapt policy objectives (and thus to actualize or reinterpret discourse) in the process of project implementation. In a second part of the chapter, the effects of the policy discourse as such are illuminated. I analyze how the specific orientation of policy coins the projects, how they translate this orientation into their practice and how policy discourse thereby exerts influence on the local realities of the research projects. In pointing at the policy effects, I also consider the spaces of agency that projects use to re-interpret policy, thus, to modify discourse.

Last, the conclusive chapter 11 is dedicated to a summary of the factors of *discourse stability and discourse change* as well as the *dominance of the current core discourse* of science policy as result of the various influences exposed through this book. In addition, the chapter provides a concluding analysis of the BMBF funding initia-

tives on the normative backdrop of *global sustainable development* and gives corresponding *policy recommendations* for future funding initiatives aimed at research cooperation with developing countries and emerging economies.