www.rigeo.org ISSN: 2146-0353
RIGE
Review of International Geographical Education Online
Review of International Geographical Education Online ©RIGEO 2017, **7** (1), Spring 2017

Research Article

To cite this article: Kowasch, M. (2017). Resource Exploitation and Consumption in the Frame of Education for Sustainable Development in German Geography Textbooks, *RIGEO*, 7 (1), 48-79. Retrieved from http://www.rigeo.org/vol7no1/Number1Spring/RIGEO-V7-N1-3.pdf

Submitted: March 15, 2016 Revised: April 15, 2017 Accepted: April 23, 2017

Resource Exploitation and Consumption in the Frame of Education for Sustainable Development in German Geography Textbooks

Matthias KOWASCH[1]
University of Graz, Graz, AUSTRIA

Abstract

This paper discusses the representation of resource exploitation and consumption in German geography textbooks. The aim of the paper is to contribute to a critical and reflective understanding of the representation of resource-related issues in textbooks by analyzing two scientific debates (resource curse and actor analysis). The paper shows that all studied geography textbooks contribute to a certain degree to awareness raising in Education for Sustainable Development (ESD), but references to the everyday life of students are rare. There are only few action-orientated tasks in the frame of resource exploitation and consumption in the studied textbooks. As real-world examples help develop students' critical thinking skills and shape their ideas of sustainable development, these aspects reflect a pedagogical shortcoming.

Keywords

Geography Textbooks; Education For Sustainable Development (ESD); Resource Exploitation And Consumption; Action Competence; Resource Curse; Actor Analysis

The concept of sustainable development has found its way into formal education since the 1990s. The United Nation's Decade for Education for Sustainable Development (DESD), which was announced for the time period 2005-2014, "[…] has specifically stressed the significance of all forms of education in teaching and learning for a more sustainable future" (Bagoly-Simó, 2013b, p. 57). The Global Action Programme (GAP) on Education for Sustainable Development (ESD)–the official follow-up UN introduced for the post-DESD phase–seeks to generate and scale up further actions regarding ESD.

[1]Corresponding author: Matthias Kowasch, Senior Lecturer, University of Graz, Department of Geography and Regional Science, Heinrichstr. 36, 8010 Graz, Austria, matthias.kowasch[at]uni-graz.at

ESD has a cross-curricular dimension, even if there are strong ties between geography and the concept of sustainable development expressed by statements like "geography could claim ESD [as its own]" (McKeown & Hopkins, 2007, p. 18). According to Bagoly-Simó (2013b), in 2007, experts in geography education from around the globe agreed on the subject's contribution to ESD when they ratified the Lucerne Declaration on Geographical Education for Sustainable Development (Haubrich, Reinfried, & Schleicher, 2007). The document stresses the importance of human-environment interaction and addresses both topics and methods fostering ESD by means of geography education. Along these lines, resource scarcity plays an important role, as it grasps both the essence of geography and it concurringly contributes to shaping behavior.

The interconnectedness between geography and ESD is particularly prominent in Germany (cf. Bagoly-Simó & Hemmer, 2017). Over the course of the last decade, educational standards enjoyed increasing attention in all German federal states as their implementation into curricula progressed. One of the six competences areas, Action, dedicates special attention to the ways geography education should facilitate ESD and Global Learning. When addressing aspects connected to sustainable development, German school geographies often tend to analyze conflicts and work on possible solutions. For example, according to the German educational standards, students have to "[…] explain and systematize the consequences of the use and shaping of spaces using selected examples (e.g. desertification, migration, resource conflicts, ocean pollution)" (DGfG, 2014, p. 15). Teaching about conflicts over scarce resources such as oil, gold or rare earth elements requires a critical approach to understand the different, sometimes conflicting interests and strategies of the stakeholders involved. Thereby, the specific regional structures and processes of a selected case study, such as a region, country, continent etc. have to be considered. Schrüfer (2013) notes that political, historical, economic, and cultural conditions require consideration when it comes to the analysis of resource conflicts. Students are expected to express a critical opinion about the causes and consequences of resource conflicts and gain a basic understanding of the interactions between physical and human geographical variables. They should also be able to realize that resource exploitation in other countries is directly linked to their everyday life. For example, when purchasing a specific product, they (will) have the choice to influence manufacturing conditions in the exporting countries the product originates from. For this reason, students should be willing to "[…] work on an everyday basis for better environmental quality, sustainable development, intercultural understanding and peaceful co-existence in One World" (DGfG, 2014, p. 26).

When it comes to analyzing the implementation of ESD into formal education and its interconnectedness with subject-specific (in this case geographical) knowledge (Bagoly-Simó, 2013a), there are several options available, such as focusing on institutional transfer, the process of teaching and learning, competence assessment, or educational media. An empirical study by Hemmer & Hemmer (2010) demonstrated that textbooks are the most widely used educational media in Bavarian geography classrooms. In addition, Schmithüsen (2002) stresses the role of the geography textbook in joining underlying educational principles with the curriculum and the stakeholders of the teaching-learning process (teachers and students). Moreover, textbooks are unique

because they are politically motivated and tend to be socially negotiated interpretations, thought patterns and moral concepts that are passed on to generations of young people (Georg Eckert Institute for International Textbook Research, 2007). Bagoly-Simó (2014, p. 111) calls textbooks the "secret curriculum" and a control instrument of educational content, not only in geography.

Thus, the aims of this paper are to discuss which subject-specific knowledge concerning resource exploitation and consumption is transmitted through geography textbooks and how this knowledge is action-oriented in terms of ESD.

Theoretical Background

In 2010, Lambert & Morgan (2010, p. xi) argued that school teachers should not "[…] be forced slavishly to follow the whims of the academic discipline, but it is to suggest that school geography is aware of contemporary thought in the discipline". Thus, current debates in geography, such as the ethical turn, political ecology or more than human geographies, should be mentioned and discussed in school geography.

The following chapter presents two geographical concepts (development and sustainability) and two scientific debates (resource curse and actor analysis) that both can nourish geography lessons and the relationship teachers create with young people. Before the introduction of concepts and theories, a short introduction on key concepts and educational standards in geography shall be given. The key concept 'sustainability' will be described in the frame of ESD, because this paper seeks to explore the role of resource and consumption geographies in promoting ESD.

Key Concepts vs. Educational Standards

The UK GA 12 National Curriculum puts a lot of emphasis on developing young people's capacity to 'think geographically' and provides a certain number of key concepts to shape and define what 'geography' means.

According to the Geographical Association (2012, p. 2), the three main organising concepts of geography are frequently said to be place, space, and environment. There are further candidates for this overarching framework, such as scale or change, but place, space, and environment form "[…] an enduring structure which arguably encompasses these others" (Geographical Association, 2012, p. 2). By studying place, students should understand that places are socially constructed. They explore people's aesthetic, emotional, and cultural connections with places and use the uniqueness of places to explain why the outcomes of universal environmental and socio-economic processes may vary (Geographical Association, 2012, p. 3). Concerning the notion of 'space', students should investigate, for example, the ways that space is structured and managed by people for different purposes and goals. They can learn "[…] how to evaluate the environmental, economic, social, and political consequences of particular spatial distributions" (Geographical Association, 2012, p. 3). The term 'environment' includes non-living and living spaces. When dealing with this concept, students should comprehend the environment as an ecosystem, with environmental benefits, such as the nutrient cycle. Other geographical key concepts comprise time, change, scale,

landscape, risk, interdependence and development, cultural understanding and diversity, globalisation, and sustainability.

The German educational system does not deal explicitly with key concepts. The Educational Standards for the Intermediate School Certificate (DGfG, 2014) are a common nationwide foundation for the curriculum, however, in contrast to the key concepts in the UK, the standards "[…] position geography in terms of the politics of the discipline" (DGfG, 2014, p. 1). Thus, the Standards stand rather for a political manifesto for the discipline than a content-related definition of geography.

According to the Standards, geography views the Earth as a "[…] human-environment or human-Earth system from a spatial perspective" (DGfG, 2014, p. 10). The main goals of geography lessons are "[…] to provide insights into the connections between natural conditions and social activities in different parts of the world, and to teach an associated spatially-oriented competence that can be applied" (DGfG, 2014, p. 6). A total of six areas of competence, namely Subject-specific Knowledge, Spatial Orientation, Acquisition of Knowledge/Methodology, Communication, Evaluation, and Action, serve to achieve these objectives. The competence area Action encompasses four commpetences (DGfG, 2014, p. 27-28):

a) Knowledge of information and strategies relevant to action.

b) Motivation and interest in geographical/geoscientific fields of action.

c) Willingness to take specific action in geographically/geoscientifically relevant situations (informative action, political action, everyday action).

d) Ability to reflect upon actions with regard to their effects on natural and social spaces.

Action-orientated learning represents an important factor in ESD, a practice of learning that is related toquestions of resource and consumption.

Sustainability and ESD

Based on the Brundtland report of the WCED (World Commission on Environment and Development) published in 1987, the concept of sustainability refers to development that meets the needs of the present without compromising the ability of future generations to meet their own needs (e.g. Elliott, 2006).

The main objective of ESD is to promote sustainable development within society. Wals (2011) distinguishes between two different ways to achieve this goal: an instrumental approach and an emancipatory approach. Vare & Scott (2007, p. 193) provide a summary of these two approaches (see also Rieckmann, 2016), as summarized in Table 1.

While Vare and Scott (2007) see the two approaches as complementary, from a pedagogical perspective they favor the emancipatory approach (ESD 2). Similarly, de Haan et al. (2008) and Wals (2011) also advocate for the emancipatory approach because it gives individuals the capability to act in a sustainable way if they have the intention and the goal to do so. Thus, ESD 2 tries to "show possibilities" (de Haan et al., 2008, p. 123) rather than to teach a specific sustainable behavior.

Table 1
Instrumental and emancipatory approach of Education for Sustainable Development

ESD type	Characteristics
ESD 1	• Promoting/facilitating changes in what we do • Promoting (informed, skilled) behaviours and ways of thinking, where the need for this is clearly identified and agreed • Learning for sustainable development
ESD 2	• Building capacity to think critically about [and beyond] what experts say and to test sustainable development ideas • Exploring the contradictions inherent in sustainable living • Learning as sustainable development

A recurring question shaping ESD discourse addresses key competences students should acquire to shape their own life and environment in a more sustainable way. On an international level, there is a lively debate around competence promotion through ESD. Concepts like "Sustainability Literacy" (Stibbe, 2009), "Sustainability Skills" (McKeown, 2002), "Action Competence" (Mogensen & Schnack, 2010), "Competences for Sustainable Development" (Martens et al., 2010), "Key Competencies in Sustainability" (Wiek et al., 2016) and "Sustainability Capabilities" (Thomas et al., 2013) are deliberated. Despite the multitude of perspectives, a Delphi study carried out with 70 experts from Europe and Latin America in the time period 2008-09 revealed that joined-up thinking, dealing with complexity, future-oriented and critical thinking were defined as the most important key competences ESD needs to reinforce (Rieckmann, 2012, 2016).

In Germany, the Standing Conference of the Ministers of Education and Cultural Affairs of the Länder in the Federal Republic of Germany (Kultusministerkonferenz, KMK) developed key competences for the teaching area "Global Development" in the frame of ESD in terms of recognition, assessment, and action (cf. Table 2). Swyngedow (2007, p. 20) shows the impossibility of sustainability as an idea in the post-colonial situation that exists today by noting:

> "I have not been able to find a single source that is against 'sustainability'. Greenpeace is in favor, George Bush Jr. and Sr. are, the World Bank and its chairman are, the Pope is, my son Arno is, the rubber tappers in the Brazilian Amazon are, Bill Gates is (…). All are presumably concerned about long-term socioenvironmental survival of (parts of) humanity; most keep doing business as usual."

This is the reason why questions of sustainability must be fully contextualized and linked to content-knowledge. In a comparative study of ESD implementation into curricula, Bagoly-Simó (2013b) argues that successful ESD has to be connected to subject-specific topics. Geography, in contrast to other subjects, addresses the majority of the contemporary global challenges. Resources are one of them, and questions of development are related to resource exploitation and consumption. Mineral resources, such as nickel, copper or lithium as well as energy resources are the main engine of global manufacturing growth. Economic growth depends on the supply of resources, and some of them already became scarce. By measuring "[…] the ecological assets that

a given population requires to produce the natural resources it consumes" (Global Footprint Network, 2003), the ecological footprint visualizes resource consumption in everyday life contexts. It is believed that the ecological footprint has a strong contribution to sesitizing students for a more sustainable way of living.

Table 2
Key competencies for the teaching area Global Development in the frame of ESD (Source: KMK/BMZ 2015)

Recognition	Assessment	Action
• Information procurement and processing • Recognise diversity • Analyse of global change • Distinguish action levels	• Change of perspective and empathy • Critical thinking and statement • Evaluate development measures	• Solidarity and shared responsibility • Agreement and conflict resolution • Ability to act in the frame of global change • Participation and active contribution

Bagoly-Simó (2013b, p. 74) observes that "[…] the Northern normativity of globally illegitimate growth in the South but legitimate growth in the North […] requires a more critical reflection". Thus, bearing in mind that development is a core concept to highlight resource-related issues and to promote ESD, we first need to address the very specific ways geography deals with ESD and ESD-topics and then proceed to the theories connected to resources.

Development Concept and Resource Curse Thesis

Many teachers experienced the concept of development in geography through the frame of humanitarian events, such as droughts and famines in Africa, often described as the "darkest continent" (Lambert & Morgan, 2010, p. 107). Students easily feel genuine concern for the 'victims' of those catastrophes, shaped by the media, particularly television.

A starting point for the definition of the development concept is a distinction between development as either immanent or intentional (Cowan & Shenton, 1996). Immanent development refers to the changing nature of capitalism, while intentional development is a particular set of projects and policies aimed at improving the lives of people in the Global South, particularly since the 1940s. Willis (2014, p. 365) explains that "[…] development usually has more specific meanings, referring to either national-level processes of economic, political and social change, or the positive change resulting from intentional actions to improve the living conditions of poor or marginal populations." But development can also be defined "[…] as a state of being, usually applied to a country or a region and implying high levels of urbanization, complex economic activity and standards of living" (Willis, 2014, p. 365).

There are several ways in which 'development' was used as a concept within geography: modernization (e.g. Friedmann, 1966; Rostow, 1960), dependency theory (e.g. Cannon, 1975), neoliberalism (e.g. Lal, 1983; Balassa, 1971), grassroots development (e.g. Edwards & Hulme, 1995; Drabek, 1987), post-colonialism, post-

structuralism, and post-development (e.g. Ferguson, 1994; Sachs, 1992). The resource curse thesis (Bebbington et al., 2008; Auty, 1993), first mentioned by Auty at the beginning of the 1990s by drawing on the historical experience of mineral economies in Zambia, Bolivia, and Papua New Guinea, is directly linked to development concepts. In contrast to the bulk of benefits flowing from the mining sector, mineral-rich countries perform less well than economies that are resource poor. Despite the wealth generated through mining, local populations remain poor and marginalized. Bridge (2004; see also Power, 1996) gives five indicators for this extraordinary irony of 'poverty in the midst of plenty':

a) Mineral booms tend to concentrate revenues on the government, which uses them to mask or postpone the need for economic reform;
b) Resource-rich countries develop states that are factional or predatory rather than those that have sufficient autonomy to pursue economic policies raising social welfare;
c) Mineral development siphons financial and human resources away from other sectors;
d) Mineral windfalls are often absorbed too quickly, leading to inflation and appreciation of the exchange rate, and
e) Mineral booms negatively affect the performance of other export sectors.

Freudenburg & Wilson (2002, p. 229; in Bridge, 2004) summarize the resource curse thesis and note that "[…] extractive activity is not only not the source of economic vitality; it is often a source of economic instability and depression".

The question arises as to how mineral wealth might not lead to a resource curse scenario, but to sustainable development. Mikesell (1994) argues that sustainability can be achieved by saving and reinvesting yearly an amount equal to the present value of the annual net revenue from the sale of mineral products. Nevertheless, the question remains as to how mining can contribute to the Sustainable Development Goals (SDGs).

As mentioned previously, the UN-DESD was followed by a Global Action Programme (GAP) on ESD, a five-year programme (2015-2019) (UNESCO, 2016). The program makes a major contribution to the Agenda 2030 adopted by the United Nations in September 2015, which includes 17 SDGs. Mining companies have the potential to become partners in achieving the SDGs that are a shared global development framework for the coming generation. For example, mining companies can "[…] leverage their energy demand to extend power to undersupplied areas through partnerships that enable shared use energy infrastructure, helping to achieve SDG 7" (Energy Access and Sustainability) (UNDP, 2017). In 2014, the UN General Assembly on SDGs (OWG) included ESD in the proposed targets for the post-2015 agenda. Content knowledge about the exploitation and trade of natural resources can make a significant contribution to understanding the scarcity of resources and to developing ideas towards more sustainable resource consumption.

Actor Analysis

When discussing resource conflicts, the stories, actions, and behavior of different actors involved in economic projects are at the center of research. Reuber (2005) explains that in addition to the interests of local people, regional and national actors involved, the influence of multinational actors' networks for several decades has significantly increased. The Acteur-Network Theory (ANT) arose in the early to mid-1980s in France. Central figures were, among others, Michel Callon and Bruno Latour. According to Lave (2015, p. 213), "[n]etworks are built and extended via processes of *translation*, through which an individual *enrolls* other actants in his network by convincing them that they will achieve their goals more easily by supporting his work, or even that they should adopt his goals as their own." Actants can be human or non-human. The political ecology distinguishes between "place-based actors" (e.g. smallholders, animal owners, etc.) and "non-place-based actors" at the national and international level (economic and financial world, international politics, national policymakers, etc.) (Krings & Müller, 2001, p. 96).

According to the 'social arena' concept (Kowasch et al., 2015; Olivier de Sardan, 2005), it should be taken into consideration that different actors are not objectively informed because their perception of the conflict is subjective and selective. Moreover, people act in their self-interest; they choose the path that promises the most benefits (Esser, 1991). At the same time, their integration into the community influences their room for manoeuvre and represents an essential corrective against self-orientated acting (Reuber, 2005).

Stakeholders involved in the exploitation of mineral and energy resources fall primarily into three categories: states, private companies, and civil society (Bridge & Le Billon, 2013). With the exception of resources outside the EEZ (Exclusive Economic Zone), energy and mineral resources are located within the territorial 'border' of states. This means that states and their governments make decisions concerning resource exploitation. The consumption of energy resources and mineral is closely linked to government policies, because the export and import control of raw materials represents a vital source of state revenue. States play an important regulatory role in security and environmental issues affecting the mining industry. Though states possess the majority of raw materials, private companies explore, mine, process, and market them. The majority of international corporations have their headquarters in the United States or Europe (e.g. Exxon or Shell in the oil sector). They compete with state-owned companies of commodity-exporting countries (e.g. Saudi Aramco or Petrobas) for the access to, and sale of, resources (Bridge & Le Billon, 2013). However, the role of civil society and NGOs experienced an increase in importance in recent years and decades. NGOs like Global Witness or Oil Watch direct the public interest towards injustices, corruption, and persistent poverty in areas affected by mining or oil-production. They not only identify and publish news/articles/information on environmental destruction and corruption, but also question exploitation.

Summing up, actor analysis and resource curse both deal with complex situations and multi-layered information. The complexity of human-environment interaction can be discussed by taking examples from resource exploitation and consumption and by

enabling the global dimension of those interactions. Allen & Massey (1996, p. 1) point out that

> "Geography has not slipped unnoticed into our lives. Nowadays you do not have to go far to experience the rest of the world. […] We only understand the changes taking place in our own backyard when we begin to understand how changes taking place elsewhere affect our world."

Actor analyses are connected to the concept of interdependence: the concept gives new purchase to the themes of development and global dimension, which have been prominent for the last three decades (Lambert & Morgan, 2010, p. 108).

The interdependence of actors involved in the production chain should be pointed out. A pair of jeans for example illustrates the global dimension of manufacturing industries: cotton grown in Benin, zip teeth made in Japan, jeans stone-washed using pumice from Turkey, synthetic indigo dye made in Germany, brass rivets and buttons made from Namibian copper and Australian zinc, jeans cut and dyed in Italy (see Garlake, 2007, p. 125). The production and consumption of jeans provides a good example for interdependent activities across the globe. Other examples such as mobile phones or laptops can also be used to illustrate the complexity and interdependence of production and consumption steps. School geography can contribute to shaping students' critical thinking concerning such interdependent and complex human-environment issues.

Hence, the present paper first aims to explore which resources are represented in geography textbooks. Secondly, it questions how current (or contemporary) scientific debates have found their way into geography textbooks to show the complexity of interests and conflicts and to provide ideas for conflict resolution. Thereby, the geographic key concept of development aling with theories (resource curse and actor analysis) will serve as example to analyze representations in selected textbooks. Thirdly, the paper will explore to which extent textbooks promote action-orientated competences in the frame of the specific topic "resource exploitation and industries". Do the tasks encourage students to reflect on their own consumption habits and develop patterns for (more) sustainable behavior?

Methods and Sample

To answer the aforementioned questions, 13 geography textbooks published by four different publishing houses (Cornelsen, Klett, Westermann/Diercke, and Schroedel) were analyzed in three steps. The publisher Schroedel is part of the Westermann Group, so there are only three competing publishing houses. Ten textbooks were for upper, three for lower secondary schools (Table 3).

All textbooks that are part of the sample of this study were published for and used in Lower Saxony. There are two reasons for this sample choice: First, the curriculum in Lower Saxony closely follows the German Educational Standards. Secondly, in contrast to other "Bundesländer" like Bremen or North Rhine-Westphalia, where geography is taught together with subjects like history and/or political science, geography in Lower

Saxony is still an independent school subject in secondary schools with two hours of teaching per week.

Lower Saxony's geography curriculum has the special feature to provide regional foci for the last two years of upper secondary school. The eleven regional modules are (Niedersächsisches Kultusministerium, 2010, p. 11): Germany in Europe; North Africa and the Middle East; Sub-Saharan Africa; Latin America; Anglo-America; Russia and the Commonwealth of Independent States; South Asia; East Asia; Southeast Asia; Australia/Oceania; Oceans as a future space. Hence, publishing houses edit slim volumes with a regional focus, e.g. Latin America or Germany.

The present study focuses on the volumes dedicated to the regional modules as they are more often used to teach the last two years of upper secondary geography than general textbooks are. They give in-depth information on the different topics and prepare for high school graduation finals (*Abitur*). It is the Ministry of Education and the Arts of Lower Saxony who determines which three regional modules (one per semester) will be taught during upper secondary grades. The fourth semester does not deal with a module, because of the graduation exams. While "Germany in Europe" is mandatory, the two other modules change every year.

Table 3
Textbook sample (Source: Author's representation)

Lower secondary geography textbooks (grades 7/8; students aged 11-12)			
Publishing house	**Title**	**Year**	**Pages**
Westermann/Diercke	Erdkunde 7/8	2009	224
Klett	Terra Erdkunde 1	2015	191
Cornelsen	Unsere Erde 7/8	2012	240
Upper secondary geography textbooks (grades 11-13; students aged 17-19)			
Klett	Weltmeere als Zukunftsraum	2013	95
Klett	Europa	2010	189
Klett	Deutschland	2009	193
Klett	Afrika südlich der Sahara	2014	95
Klett	Russland und asiatische Nachfolgestaaten der Sowjetunion	2015	95
Westermann/Diercke	Australien/Ozeanien	2012	96
Westermann/Diercke	Südostasien	2010	96
Westermann/Diercke	Lateinamerika	2012	116
Westermann/Diercke	Nordafrika/Vorderasien	2016	96
Schroedel	Angloamerika	2011	104

The present study is not representative because not all textbooks used in Lower Saxony were analyzed. The case study with 13 textbooks represents a range of geography textbooks that are currently in use; 10 of them are slim volumes with a regional focus (Anglo-America, Australia/Oceania, Europe, Germany, Latin America, North Africa and the middle East, Russia and the Commonwealth of Independent

States, Southeast Asia, Sub-Saharan Africa, Oceans as a future space). The choice of 10 volumes with a regional focus corresponds to the 11 regional modules of the curriculum of Lower Saxony. Every continent is represented by at least two textbooks. The study does not include textbooks about East and South Asia, because there are already two volumes with a focus on Asia. The volumes allow for comparison of the content-oriented knowledge and action competence in the frame of resource exploitation and consumption by considering the regional foci. Grades 5 and 6 (students aged 9 and 10) were not considered due to the fact that complex development issues and resource conflicts are not addressed in their respective curricula.

One of the aims of this paper is to conduct a qualitative study of scientific debates in geography textbooks by applying/using the resource curse thesis and actor analyses. Both debates contribute to developing critical thinking skills and competences in conflict resolution. It is likely that upper secondary textbooks will promote critical thinking and deal with complex scientific debates to a greater extent than textbooks for lower secondary school. Thus, the focus of the present study is on textbooks from upper secondary schools. To compare the results, three textbooks for lower secondary education, namely for seventh and eighth grade (students aged 11 and 12) were also considered.

In a first step, this paper investigates which renewable and non-renewable resources are mentioned in textbooks and which ones are discussed. Mayring's (2015) technique of structuration served to analyze the sample. Structuration is an inductive establishment of categories. The following 18 categories of renewable and non-renewable resources were established: water and hydrogen; wind; solar radiation; biomass and biofuel; geothermal energy; uranium/nuclear energy; oil; natural gas; coal; ferrous metals; non-ferrous metals; gemstone; other non-metallic minerals (e.g. sand); wood/forest; land (grabbing); salt; fish; resources in general.

Land was included into the analysis because land grabbing and land usage are increasingly relevant, not only in developing countries. Ferrous metals comprise iron (ores) and steel; non-ferrous metals are, for example, copper, gold, lithium, nickel or silver. The category "resources in general" means that no specific resources were mentioned or discussed, but resource exploitation or consumption in general was mentioned.

After the consolidation of categories, a keyword-based analysis of all textbooks followed. For example, diamonds were listed in the category "gemstone", nickel in the category of "non-ferrous metal". The unit of analysis was a textbook spread, the structural unit of German textbooks. In total, 209 spreads (146 spreads in upper secondary and 63 spreads in lower secondary textbooks) dealt with the content of resource exploitation and consumption. Moreover, the analysis distinguished between two different ways of dealing with content: the resource can be "mentioned" or "discussed". The condition for the category "mentioned" was that the resource is named in the continuous or discontinuous text (e.g. diagram or map). The condition for the category "discussed" was that a book chapter or paragraph, a map, a diagram or at least several sentences dealt with at least one specific resource. A spread can include several resources so that the number of resources (mentioned and discussed) overtakes the total

number of spreads (209). The analysis enabled the identification of those resources geography textbooks priorotized. Prioirty might impact the eventual scientific debates in textbooks about development, resource curse, and actor analyses.

The second step consisted of qualitative analysis of subject-specific, scientific debates in geography textbooks. The paper will discuss examples where in-depth information about development aspects, resource curse and/or involved actors is given. The majority of examples come from upper secondary school textbooks, in particular about Latin America and Sub-Saharan Africa, where scientific debates take place.

In a third step, all tasks included in the spreads with emphasis on resource exploitation and consumption was analyzed. For this purpose, key competences for ESD developed by the KMK/BMZ (2015) served as grounds (cf. Table 4). Specific action, interest, and everyday life play an important role in developing skill acquisition in the competence area Action. Students should, for example "[…] understand geographically based decision-making processes in planning policy and […] participate in these", "[…] be interested in the variety of nature and culture in their home area and in other regions" and "[…] provide other people with geographical information about relevant fields of action (e.g. sustainable agriculture)" (DGfG, 2014, p. 27). Clothes and electronic devices that young people buy will affect a producer in another country (see Garlake, 2007). The independence of actions and behavior can help students to understand the global dimension of development issues. By referring to their daily life, textbooks can contribute to the show this interdependence. Based on the above, three categories (Figure 1) aiming for a succinct overview of action-oriented teaching were developed. The categories served as grounds to answer the question whether geography textbooks promoted action-orientated competences and if the tasks encouraged students to develop ideas and measures in terms of sustainable development.

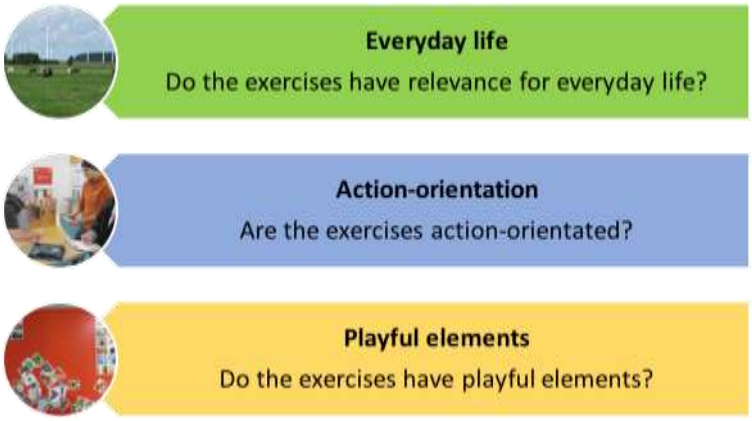

Figure 1. Categories for task analysis (Source: authors' representation)

Table 4
Individual action competencies in geography in the frame of ESD (Source: KMK/BMZ 2015)

Competence	Students should be able to…
1. Solidarity and shared responsibility	• Recognize a shared responsibility for the conservation of common goods like climate, water and biological diversity. • Perform possibilities of solidarity with humans who are affected by natural disasters, wars, and poverty. • Question their own lifestyle in terms of sustainability.
2. Agreement and conflict resolution	• Analyze spatial conflicts of interest and develop ideas for conflict resolution.
3. Ability to act in the face of global change	• Apply models for the reduction of complexity and evaluate their significance. • Represent the inconsistency of analyses, development strategies, and forecasts by using examples from their own lived environment and develop appropriate behaviour patterns.
4. Participation and active contribution	• Develop an individual model of sustainability and orient their own action towards the model. • Justify why they stand up for specific actions and projects which align with sustainability.

Concerning the category "Everyday life", the main question was whether the tasks linked the motives and elements of the students' daily life. The linkage to the everyday life is an important factor for motivation. The emphasis of the second category ("Action-orientation") was on featured elements providing alternative working methods, such as learning circles, teamwork, role play, web search, experimentation, etc. Tasks giving students the opportunity to prepare oral presentations was disconsidered. In the third category "Playful elements", the focus was on whether tasks included puzzles, enigmas, quizzes or memory games. All three categories (Everyday life, Action-orientation and Playful elements) contribute to shape the competence area Action. They are motivating, considering that students are keen to do experiments, to work with the computer or with films, as these are the methods students are most interested in (Hemmer & Hemmer, 2010, p. 93). The third step only considered those tasks that dealt with resource exploitation and consumption. Tasks located on spreads that did mention one or more resources, but never covered them in tasks, remained disconsidered.

Findings

Representation of Resources

Content analysis identified renewable and/or non-renewable resources in every textbook of the sample (cf. Figure 2). The number of spreads dealing with resources amounted 11.4 per cent of the corpus (915 spreads). The main emphasis of all textbooks was on (non-)renewable energy. In addition, some textbooks emphasized the importance of water both as drinking water and as source of energy (wave and tidal power).

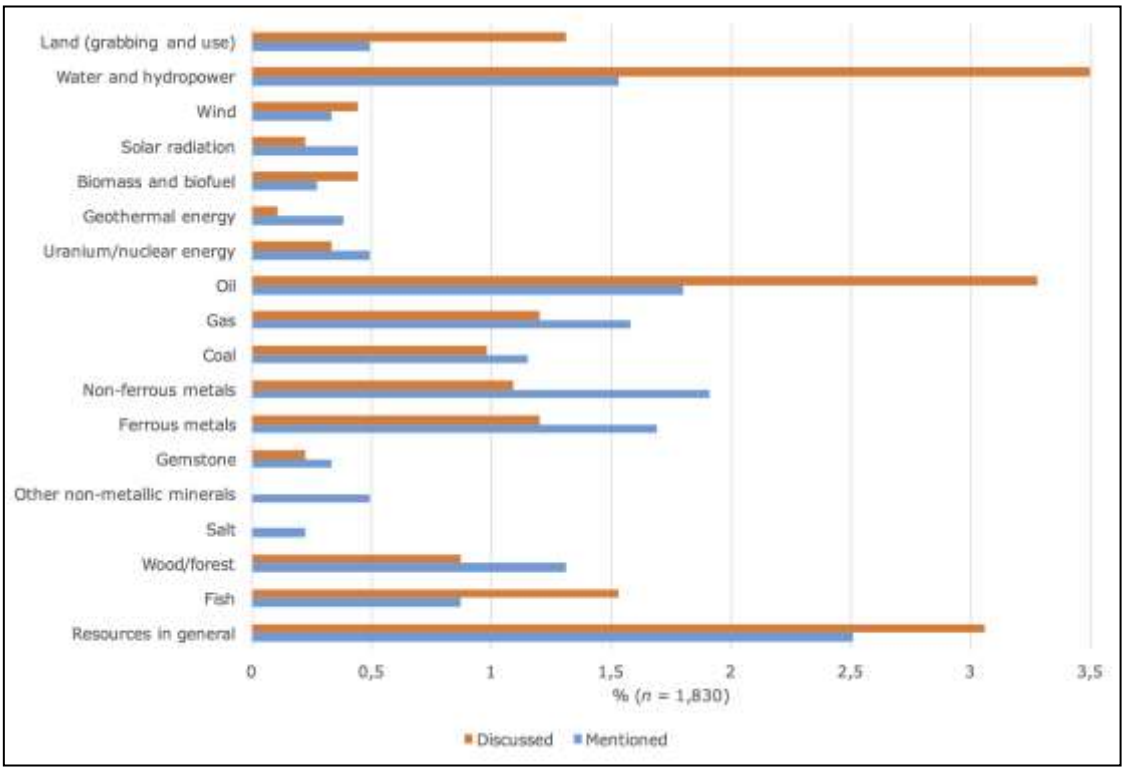

Figure 2. Representation of renewable and non-renewable resources in 13 geography textbooks of upper and lower secondary schools (Lower Saxony) (Source: authors' representation)

The broadest discussion of resources happened in general terms. "Resources in general" filled nearly 5.6 per cent of all spreads and almost half of the ones dedicated to resource exploitation and consumption. The individual textbooks further displayed specific ways of dealing with the topic resources (cf. Figure 2). The second most represented type of resource was oil. While 1.8 per cent of the spreads merely mentioned the topic, another 3.28 per cent discussed issues related to oil. Oil plays an important role in daily life, for example as constituent of cosmetics, computers or mobile phones, but in the present sample, there were few actual linkages to the daily life of students (cf. Figures 3 and 4). Despite the unique patterns of dealing with the fossil resource oil, with the exception of the edition dedicated to Southeast Asia, all textbooks mentioned the topic. Almost 45 per cent of the spreads related to resource exploitation and consumption dealt with oil in continuous or discontinuous text. Along these lines, the lower secondary textbook published by Klett as well as the volumes dedicated to Europe, Germany, and Australia/Oceania mentioned oil only within the discontinuous text. Nine of the 13 textbooks also discussed the fossil resource oil. In addition, almost half (44%) of the spreads dedicated to resource exploitation and consumption mentioned oil in continuous or discontinuous text.

Along with oil, a number of other resources used to produce energy were counted in the sample. Both continuous and discontinuous text mentioned the following energy resources: water, natural gas, and coal. Along with water, biomass, geothermal energy, solar radiation and wind were the other renewable resources mentioned in the textbooks. Surprisingly, the space dedicated to the latter two sources of renewable energy was rather modest. Solar radiation was mentioned in 0.44 per cent of the textbook spreads,

and discussed in another 1.9 per cent of the sample. Discontinuous text mentioned wind in 0.33 per cent of all spreads, while another 0.44 per cent discussed the topic in their continuous text.

In contrast to the other renewable sources of energy, water was attributed a higher significance (discontinuous texts: 1.53%; continuous texts: 3.5%) due to its role as drinking water. Consequently, all analyzed textbooks dealt with water in a way or another. While the volumes dedicated to Europe and Germany (published by Klett) merely mentioned it, the book with regional focus on Southeast Asia discussed the resource water. All other textbooks of the sample dedicated both continuous and discontinuous text to water (cf. Figure 2).

Along with oil and water, textbooks also dedicated special attention to ferrous and non-ferrous metals. A total of 1.69 per cent of all spreads mentioned ferrous metals in their discontinuous text, while other 1.2 per cent did so in the continuous text parts. In contrast, non-ferrous metals, such as lithium and gold, were mentioned in 1.91 per cent, and discussed in other 1.09 per cent of the spreads (cf. Figure 2). Interestingly, the analyzed textbooks rarely dedicated attention to salt, gemstones, geothermal energy, and other non-metallic minerals, such as sand.

In addition, some of the textbooks contained case studies or sub-chapters dedicated to specifics of resource exploitation. For example, the volume with a regional focus on Australia/Oceania (Diercke) featured sub-chapters about iron ore extraction, coal and uranium exploitation, bauxite and aluminum production, and nickel exploitation. The volume about Russia and the Commonwealth of Independent States featured a sub-chapter "Energy Resources: Cause of Conflicts", which introduced oil and gas pipelines from Russia to the European Union. The two sub-chapters of the regional volume dedicated to North Africa and the Middle East – "Oil as Development Factor" and "The Future of Oil" – covered all countries of the region. However, the case studies about Saudi-Arabia and the Iran mainly discussed economic development via oil production and export. Both states depend strongly on the oil sector that implies economic risks. Resource wealth does not inevitably lead to economic growth, but can also result in resource curse scenarios. The following chapter will discuss how geography textbooks deal with the thesis of resource curse as well as with actor analyses.

Theories

Two of the ten analyzed textbooks, namely Diercke Latin America and Klett Sub-Saharan Africa, discussed the resource curse thesis. The textbook dedicated to Latin America explained that many resource-rich countries were very careless with their natural wealth. They suffered from corruption and particular interests of organized minorities that diverted resource revenues into their pockets (rent seeking). Regarding the tasks, students were asked to explain opportunities and risks of a resource-based growth strategy.

The textbook dedicated to Sub-Saharan Africa featured sub-chapters dealing with "Raw Materials or Development?", "Darfur–A Region Does Not Come to Rest", "Poor Infrastructure Slows Down Economy" or "Suspended Continent?". The examples of oil production and diamond exploitation in Ghana served to introduce the resource curse

thesis. The associated tasks required students to explain whether and how far Ghana's fear of a resource curse is justifiable. Concerning diamond exploitation, the term "blood diamonds" highlights a very specific approach to the subject. In terms of tasks, after defining the term, students were required to explain the connection between diamond deposits and civil wars. Nevertheless, the textbook also showed development opportunities, such as the connection to the Internet.

Moreover, the resource curse thesis is defined in the textbook about Latin America. It is explained that many resource-rich countries are very careless with their natural wealth. They suffer from corruption and particular interests of organized minorities that divert resources revenues into their pockets (rent seeking). Students have to explain opportunities and risks of a resource-based growth strategy (Girndt et al., 2012, p. 73). The volume about Russia and the Asian successor states of Soviet Union does not deal directly with the resource curse thesis, but provides a task in a chapter about how to improve competences: "Resource Wealth – Curse or Boon? Take a Stand.". Similar to the volume dedicated to Russia, the textbook about Anglo-America does not mention the resource curse theory, but explains the Katanga-Syndrome that links environmental destruction to mining (Waldeck, 2011, p. 95).

In addition to the above described two volumes, the textbook dedicated to Russia and the Commonwealth of Independent States, despite not having directly dealt with the resource curse thesis, featured a task in a chapter on improving competences ("Resource Wealth – Curse or Boon? Take a Stand"). Similarly, the textbook about Anglo-America did not mention the resource curse theory, but explained the Katanga-Syndrome that links environmental destruction to mining.

Textbooks for lower secondary grades introduced the connection between development and resource exploitation without delivering an explanation of the resource curse theory. The volume published by Westermann/Diercke (Erdkunde 7/8), for example, summarized a case study about oil exploitation in Nigeria: "Raw materials are depleted without creating a basis for a long-term development by means of incomes [from the resource sector]" (Stonjek, 2009, p. 183).

The second theory explored in this paper was actor analysis/ANT. The analysis of states and mining companies was at heart of the textbook sample, while NGO statements merely found mentioning. In contrast, civil society initiatives and indigenous communities had a weaker voice and were less represented. The textbook on Sub-Saharan Africa used three source texts from "Frankfurter Allgemeine Zeitung", "Spiegel", and "Areva Group" to introduce different positions of the involved actors in uranium mining in Niger. Environmental impacts of uranium exploitation were one important aspect in the texts. In addition to mining companies and civil society, the state was a main actor in resource exploitation.

A case study entitled "Venezuela: Curse or Blessing of the Oil" in the volume about Latin America described the development of resource exploitation and analyzed the state of Venezuela as a mining actor. The authors used both continuous and discontinuous text elements to illustrate the importance and dependence on the oil sector. The policy of Hugo Chávez was explained by keywords and short statements.

The case study about oil exploitation in Venezuela also provides tasks that will be presented in the next step.

Tasks

The 13 textbooks featured tasks related to resource exploitation and consumption on 173 of the 209 spreads. The analysis of the tasks served to answer the third research question exploring to what extent tasks provided action-orientated competences and if they encouraged students to reflect on their own consumption habits and develop patterns for (more) sustainable behaviour.

The lower secondary geography textbooks contained very few playful elements. None of the spreads dedicated to resource exploitation and consumption contained more than 12.5 per cent playful elements. There was also little reference to the daily lives of the students. The tasks featured in the textbooks published by Westermann/Diercke displayed the highest number of references to daily life (9.5% of the spreads related to resource exploitation and consumption). Concerning action competence, the three textbooks displayed considerable differences. While merely 5.8 per cent of the spreads published by Klett contained tasks fostering action competence, the ones featured in books by Cornelsen covered 41.7 per cent of the spreads (Figure 3).

Only two upper secondary geography textbooks (Diercke Latin America and Klett Germany) considered students' daily life when designing their tasks. None of the textbooks contained playful elements (Figure 4). Regarding the promotion of action competence, seven upper secondary textbooks offered tasks containing role play, web search or other action-orientated possibilities. The tasks featured in the volume dedicated to Germany contained an amount of 60 per cent of action-oriented tasks, while those contained in the thematic volume Southeast Asia by Diercke counted for a third of all tasks. However, both textbooks dedicated very few spreads to resources. In contrast, the textbooks with regional emphasis on Russia (published by Klett), Sub-Saharan Africa (Klett), Anglo-America (Schroedel), and Australia/Oceania (Diercke) displayed more than 10 per cent of the tasks dedicated to resource exploitation and consumption with emphasis on action-orientation (Figure 4).

While not all textbooks featured in the sample offered a great range of action-oriented tasks, some of them contributed to action competence (e.g. Klett Germany or Klett Sub-Saharan Africa). In doing so, they not only motivate students, but also support the development of key competences in ESD (cf. Table 2). Therefore, methods proposed to train action competence require further attention. The most commonly employed method (cf. Figure 5) was web search, which was prompted by eleven tasks (five in textbooks for upper, and six for lower secondary schools). Five tasks required general search, whereby "general search" merely meant that students could (and often actually do) rely on web searches. This type of method was exclusive to upper secondary textbooks, enabling students to train their abilities to consult different types of sources (i.e. books, scientific articles, newspaper articles, internet, etc.). The design of a wall newspaper represented a method only offered by lower secondary textbooks (three tasks), but it often implied an individual search for information to collect newspaper articles or other materials available online. Other action-orientated and motivating methods, such as role play, learning circles or fieldtrips were rarely represented or missing (Figure 5).

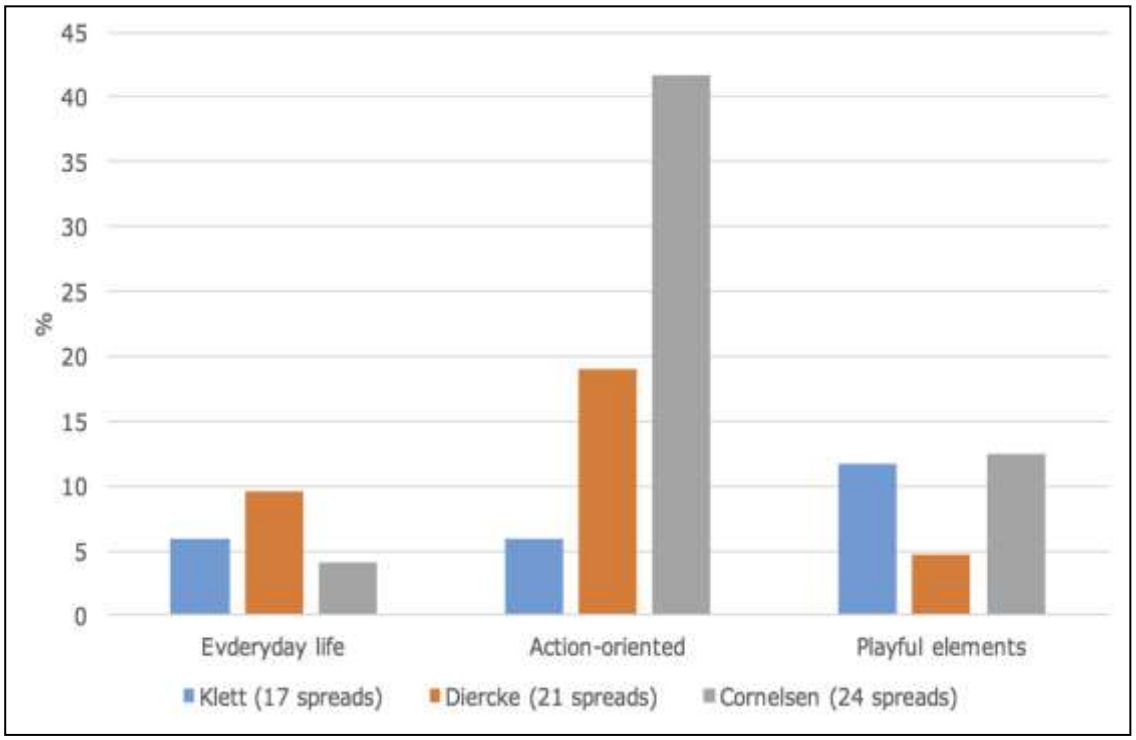

Figure 3. Didactic analysis of geography textbooks in lower secondary schools (Source: authors' representation)

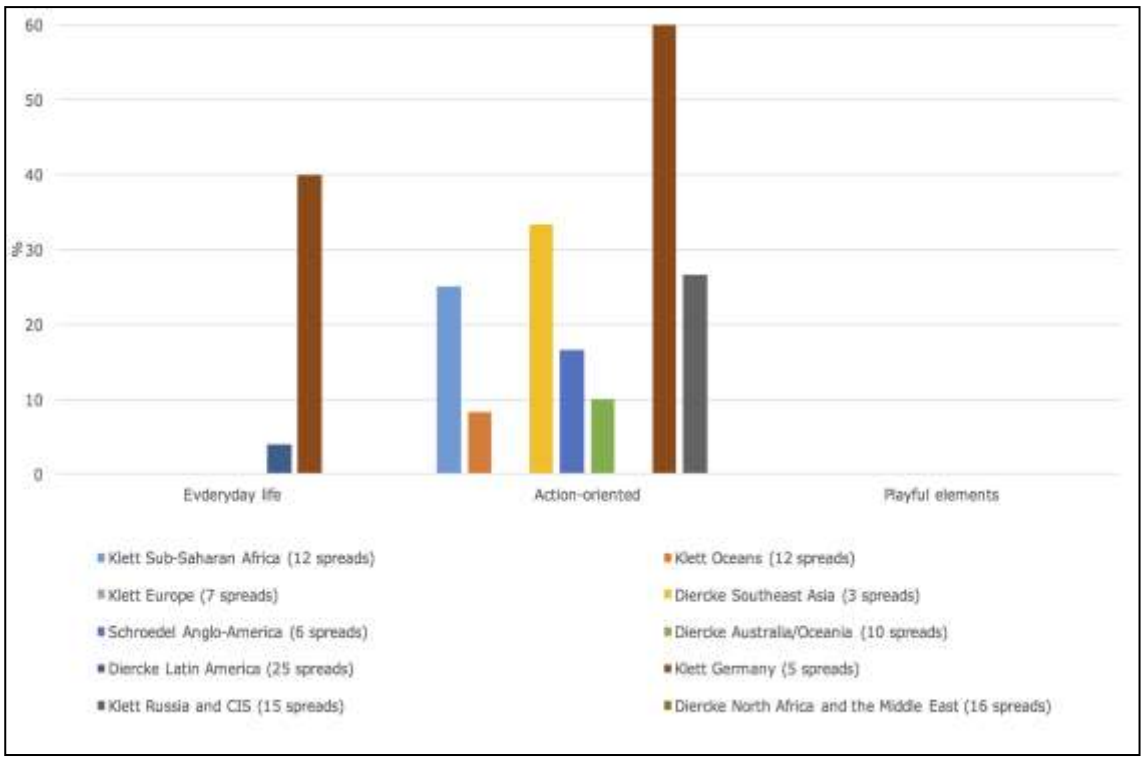

Figure 4. Didactic analysis of geography textbooks in upper secondary schools (Source: authors' representation)

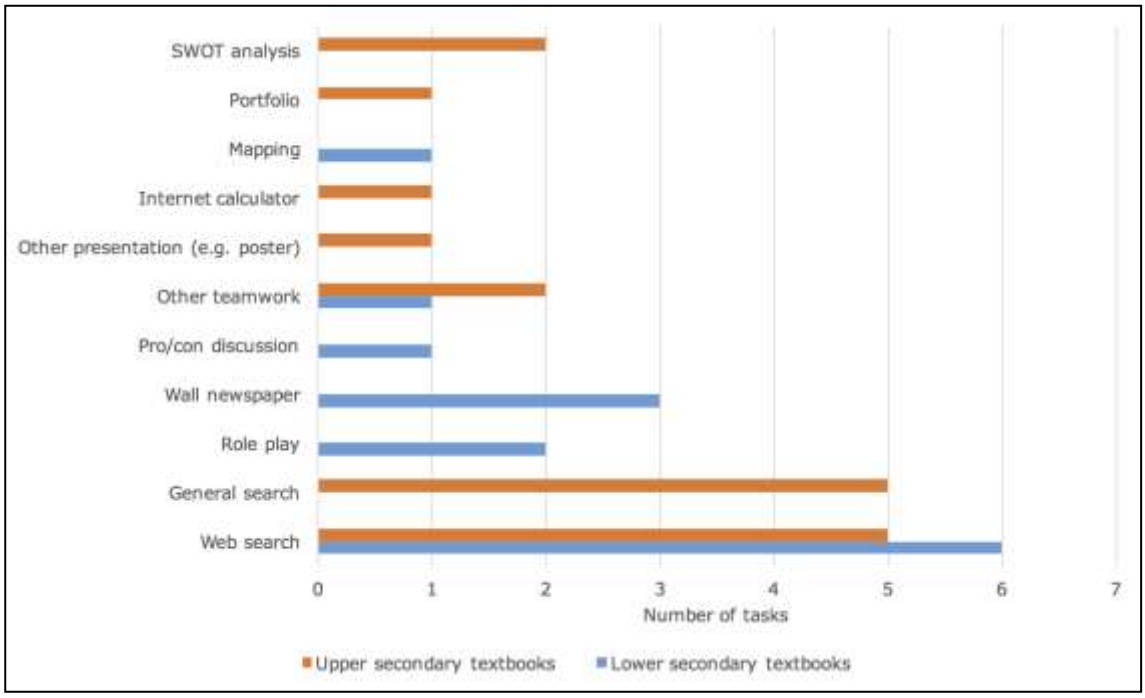

Figure 5. Action-orientated methods of exercises in selected geography textbooks (Source: authors' representation)

None of the tasks dealing with the resource curse thesis were action-orientated or promoted key competences for ESD. Students' everyday life also remained disconsidered. In the volume about Latin America (Diercke), students were asked to "[e]xplain the opportunities and risks of a resource based growth strategy" (Girndt et al., 2012, p. 73). In the same textbook, students were required to evaluate the success of the new resource policy of Venezuela. In addition, they were asked to discussion the quote by Hugo Chávez stating that oil is a boon and a curse for Venezuela (Girndt et al., 2012, p. 81). The textbook about Sub-Saharan Africa asks students to "[d]ebate if and how far Ghana's fear of the resource curse is justified." (Haberlag et al., 2014, p. 46). All the above tasks do not link resource exploitation to the daily life of students and do not encourage them to reflect their own behaviour.

Discussion

The discussion is structured according to the research questions.

Which resources are represented in geography textbooks?

The analyzed textbooks address the issue of resource exploitation and consumption. A wide range of mineral and energy resources are mentioned or discussed in both continuous and discontinuous text elements. However, in contrast to the continuous text offering the reader a deeper insight into the topic, discontinuous text only allows a superficial depiction. Along these lines, resources mentioned in maps, such as oil, ferrous or non-ferrous metals often remain limited to the representation of their spatial distribution within a specific country or region and fall into the category of mineral and/or energy resources.

Dealing with resources seems to be connected to specific regions. While the process of transition from fossil fuels to renewable energy is a central one in both Germany and Europe, textbooks with a regional focus on neither of these spaces contain a chapter about resources. In contrast, students learn about oil exploitation and trade in Saudi Arabia, the aluminum production in Australia, the gold extraction in Peru, and the uranium exploitation in Niger, but they neither learn about the chain connecting exploitation through trade with consumption, nor about the link between resource exploitation and their own consumption. For example, the textbooks fail to explain what selected resources, such as uranium (energy), aluminum (e.g. aerospace industry), nickel (e.g. stainless steel products) or oil (e.g. cosmetic products) are used for. The only exception is the textbook by Cornelsen for lower secondary education that features one spread explaining the interconnectedness between oil production and consumption: "From the Borehole to the Consumer" (Flath & Rudyk, 2012, p. 153).

Regarding oil and fossil fuels, the analyzed textbooks is yet to address the dominant political discourse on energy transition from fossil fuels to renewable sources of energy as they hold on to oil production and consumption and hardly discuss renewable sources of energy, such as wind, solar radiation, and biomass (cf. Figure 2). To promote patterns of (more) sustainable behavior, textbooks first need to inform students about risks and opportunities of the different energy sources. In contrast, textbooks seem to be stuck in a time when oil and gas feed the world markets of different economic sectors enabling endless industrial development and growth. Some critical perspectives arise from introducing the weaknesses and strengths of economies heavily depending on oil. These

perspectives require students to analyze the risks and chances of the oil sector by example of North America and the Middle East (both Diercke).

Another shortcoming of the textbooks is the missing reference to international treaties and summits aiming at emission reduction. At the COP 21 summit in November 2015 in Paris, 197 countries signed a convention where they recognize "[…] that climate change represents an urgent and potentially irreversible threat to human societies and the planet and thus requires the widest possible cooperation by all countries" (UNFCCC, 2016a, p. 2). The countries, of whom 139 have ratified the agreement until today (UNFCC, 2016b), also recognize "[…] that deep reductions in global emissions will be required in order to achieve the ultimate objective of the Convention and emphasizing the need for urgency in addressing climate change" (UNFCCC, 2016a, p. 2). The analyzed geography textbooks fail to link the exploitation of mineral resources in general and of oil in particular, to the goals of the United Nations Climate Change conferences. They also fail to address the essential question, how countries can achieve their specified goals in the frame of promotion of renewable resources. Even if questions of this nature required students to conduct additional research on follow-up conferences of the 1992 Earth Summit (see Table 5), progress and challenges in the field may not be ignored.

Similarly, informing students about development in the field of emission reduction and transition to renewable energy in their closest proximity, namely the federal state of Lower Saxony, is an essential dimension of ESD. In Lower Saxony, 37.1 per cent of the net energy production in 2014 came from renewable energy sources (Statista, 2016). With 750 km of coast line, Lower Saxony has good prerequisites to establish both onshore and offshore wind farms. In addition, the German Federal Government actually works on the promotion of offshore wind farms. In the German North and Baltic Sea, a total of twelve wind farms were in operation by the end of 2016, 25 were authorized and in construction (Bundesministerium für Wirtschaft und Energie, 2016). The Renewable Energy Act in Germany, first established in 2000, regulates the preferential input of electricity from renewable sources into the power grid and guarantees their feed-in tariffs to the producers. The textbook dedicated to Germany does not deal with the Renewable Energy Act and the transition from non-renewable to renewable resource consumption. In doing so, it fails to provide students with relevant information to their daily life. It also oversees a great opportunity for ESD.

Summing up, the analyzed textbooks discuss different aspects of resources. In doing so, they continue to focus on non-renewable resources and fail to address both international and national initiatives targeting emission reduction. Discourse on resources also seems to remain detached from value-added chains and consumption and, thus, deeply rooted in isolated national and regional examples at the expense of the global scale. The global dimension including different actors who intervene in the production processes, for example in the production of a pair of jeans, described by Garlake (2007), or in the manufacturing of a mobile phone, is not analyzed. Regarding the ways resources are presented, discontinuous elements merely offer a brief insight and often remain unaccompanied by continuous elements embedding them into larger explanatory contexts.

In a next step, the accuracy of scientific discourse on resources will be given distinct attention.

How do current scientific debates find their way into geography textbooks?

All textbooks examined deal with development issues, but only one gives a definition of the resource curse thesis (Diercke Latin America). The definition links resource wealth, bad governance and economic stagnation. While corruption plays an important role, other indicators developed by Bridge (2004), such as the rapid consumption of mineral windfalls (leading to inflation and appreciation of the exchange rate), the siphon of financial and human resources away from other economic sectors and the negative impacts of the mineral boom on the performance of other export sectors, are missing. In sum, only two of the five indicators discussed by Bridge (2014) are taken into consideration. The resource curse, as presented in the analyzed textbooks (e.g. volumes about Latin America and Sub-Saharan Africa), primarily refers to the paradox of resource wealth and weak performance of economic development. In this frame, students should discuss if resource wealth is a boon or a bane for the country. In consequence, the complexity and the background of the situation and resulting (resource) conflicts become difficult to understand. Textbook authors could argue that they have to adjust scientific theories to student's knowledge in the frame of didactical reduction. Nevertheless, the theory should be accurately defined, and in the studied textbooks the definition of resource curse is incomplete.

The resource curse theory refers to all three pillars of the concept of sustainable development: economic prosperity, environmental quality, and social justice (Lambert & Morgan, 2010). Figure 6 shows the three pillars adapted to the case of resource curse.

As Swyngedow (2007, p. 37) argues, "[…] questions of sustainability are fundamentally political questions revolving around attempts to tease out who (or what) gains from and pays for, who benefits from and who suffers (and in what ways) from particular processes of (the workings of capitalism)". That's why questions of sustainability and resource exploitation need to be fully contextualized. However, aside from corruption, social issues are often neglected by discussing development and resource curse arguments. The textbooks examined tend to highlight economic and environmental questions, such as trade (with data about export and import development) and environmental degradation. For example, the chapter about bauxite and aluminum exploitation in Australia deals with impacts of the resource extraction: destruction of ecosystems, high energy consumption, CO_2 emissions, and problems of restoration and renaturation (Claaßen, 2012, p. 70-71). None of the impacts questions social impacts on local communities.

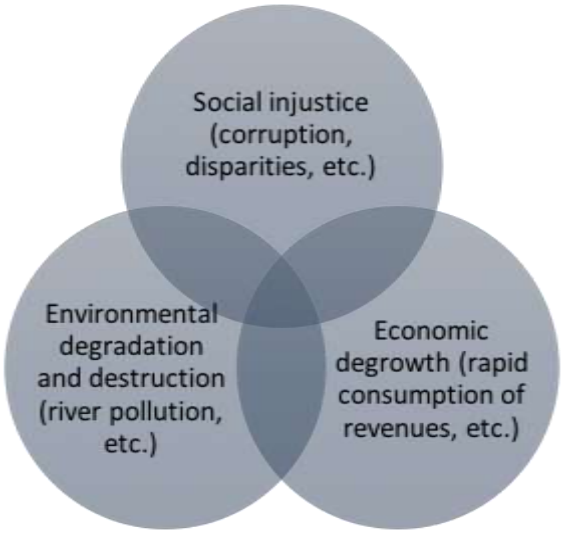

Figure 6. Simple model of resource curse (Source: authors' representation)

The paradigm of economic growth seems to still be the underlying conception of textbooks. In the textbooks examined, economic growth is represented as "good" (according to current politics), degrowth or stagnation is considered as "bad". When textbooks deal with the resource curse thesis, they refer mostly to the economic dimension by highlighting the lack of economic development.

The resource curse thesis is always embedded in a regional context and related to a certain number of resources, mostly mineral resources. The problem of this approach is that students might link the resource curse to particular states like Bolivia or Ghana. The global dimension of the interdependency concept is not discussed. Factors that influence the resource curse (e.g. commodity prices on the world market, middlemen) are neglected. Thus, stereotypes of corruption and weak states remain, even if South African and Brazilian mining companies are presented as important global players.

The analyzed textbooks introduce states and mining companies as actors of resource exploitation and consumption. Referring to the distinction between "place-based actors" and "non-place-based actors" (Reuber, 2005), textbooks seem to deal more likely with "non-place-based actors", such as mining companies or states. The interests of "place-based actors", such as fishermen or smallholders, are mostly not discussed, except for situations where they made their voice heard through media and where they represent an important actor shaping for example a conflict.

Actor analyses are not neutral. By focussing on states and private companies, the textbooks examined draw a certain image of resource conflicts that highlights their interests and activities. The third actor mentioned by Bridge & Le Billon (2013), the civil society, is often represented as a 'uniformous' actor, which neglects the multiple interests and opinions of the society.

According to Reuber (2005), the influence of multinational actors' networks has increased in the last decades, but the Actor-Network-Theory (ANT) that provides a tool to analyze such networks is not mentioned in any of the studied textbooks. The multi-

layered dimension of actors and actor-networks with diverse interests requires an in-depth analysis of the economic, political, social, and environmental situation. By neglecting ANT, the global dimension of resource exploitation and consumption cannot fully be understood. However, the dense curriculum of a school year does often not allow a complex study of involved actors with different and multi-layered interests.

Moreover, textbooks mainly link actors to a certain mineral or energy resource. The government of Venezuela, for example, is represented as an important actor in oil production. The French company Areva is described as a producer of uranium in Niger, while other activities of Areva (in other parts of the world) are blanked out. However, to understand a certain company's measures and policy, students should be aware of its other business units, which impact the company's decision-making. None of the textbooks provide a chapter about Glencore, Areva or Apple, only about states such as Venezuela, Saudi-Arabia or Australia.

In a next step, special attention will be dedicated to the tasks related to content-knowledge concerning resource exploitation and consumption.

Are the tasks related to resource exploitation and consumption action-orientated and do they encourage students to reflect on their own consumption habits and develop patterns for sustainable behaviour?

Table 5 visualizes the contribution of selected tasks to ESD and the area of competence "Action" (DGfG, 2014) by means of the topic resource exploitation and consumption.

Table 5
Selected action-orientated tasks and their impact according to ESD competences and German educational standards (Source: author's representation)

Textbook	Method	ESD competence	Standards
Task: Research the current global oil reserves with the help of a web search and record the eight countries with the largest reserves			
Diercke, 7/8, p. 189	Web search	none	a)
Task: Discuss the benefits and difficulties of resource exploitation in the Arctic. Form groups that represent the interests of mining companies, local Inuit groups, environmentalists and neighboring countries.			
Cornelsen 7/8, p. 82	Role playing	1, 2, 3	a), b), c), d)
Task: Conduct research on Chinese investment in Africa, based on the map 26.			
Klett Sub-Saharan Africa, p. 73	General search	3	a)
Task: Present the actual state of oil and gas exploration in the northern German shallows.			
Klett Oceans, p. 60	Other presentation	1, 3	a)
Task: Conduct research about the production methods of well-known clothing brands, such as H&M, Nike, GAP.			
Diercke Southeast Asia, p. 71	General search	1, 3	a)
Task: Conduct research on the actual energy and resource politics of the USA, Canada and the world.			

Textbook	Method	ESD competence	Standards
Schroedel Anglo-America, p. 92	General search	3	a)
Task: Prepare a portfolio on the UNESCO world heritage sites (criteria, global distribution, etc.)			
Diercke Australia/ Oceania, p. 77	Portfolio	1	a)
Task: Assess the development potential of Azerbaijan and Uzbekistan in terms of sustainability. To do this, carry out a SWOT analysis for Azerbaijan and Uzbekistan. This best is to work in groups. Add more materials. Search also on the Internet.			
Russia and the CIS, p. 83	SWOT analysis, other teamwork and web search	1, 3	a)
Task: In the frame of a web search, find out about the follow-up conferences of the UN summit in Rio de Janeirto in 1992.			
Klett Germany, p. 141	Web search	1	a)
Task: Calculate your ecological footprint. Please use the ONLINE link below.			
Klett Germany, p. 141	Internet calculator	1, 3, 4	a), b), c), d)

ESD competences: 1. Solidarity and shared responsibility; 2. Agreement and resolution; 3. Ability to act in the face of global change; 4. Participation and active contribution (see Table 3)

Standards: a) Knowledge of information and strategies relevant to action; b) Motivation and interest in geographical/geoscientific fields of action; c) Willingness to take specific action in geographically/geoscientifically relevant situations (informative action, political action, everyday action); d) Ability to reflect upon actions with regard to their effects on natural and social spaces.

First, most of the action-orientated tasks rely on web or general search (see also Figure 5). Second, merely one task promotes the competence "Participation and active contribution". It does so in an indirect manner. Even if computing the ecological footprint does not invite students to resolve conflict situations, the task still makes them question their lifestyle and might contribute to the development of an individual model of sustainability. Referring to the Educational Standards, the task also promotes the ability to reflect upon actions with regard to their effects on natural and social spaces. The footprint calculation can also help students to represent the inconsistency of analyses and to develop appropriate behaviour patterns towards sustainability. Third, to further work on the competence "Ability to act in the face of global change", students should be able to apply models for the reduction of complexity, but the complexity of (resource) exploitation, trade, and conflicts is rarely discussed in textbooks. In consequence, the interdependence of actors and the global chain of production should be substantially discussed. Fourth, the competence "Agreement and conflict resolution" (students are expected to "analyse spatial conflicts of interest and develop ideas for conflict resolution"; see Table 4) is trained exclusively by means of role play (cf. Table 5), where students are required to assume positions based on different interests to eventually compromise and identify possible solutions. Fifth, several tasks train the competence "Solidarity and shared responsibility". For example, by discussing the benefits and challenges of resource exploitation in the Arctic via a role play, students

can become more empathic as they are assuming a role and understand the situation humans affected by e.g. mining exploitation face. In addition, they might recognize the shared responsibility for the conservation of common goods, like climate, water, and biological diversity by analyzing the resource extraction in the Arctic and by conducting research on the actual energy and resource politics of the USA, Canada, and the world (see Tables 3 and 5). Sixth, only two tasks of the selected examples shape–referring to the Educational Standards–more action competence than the knowledge of information and strategies relevant to action. Generally, most tasks rely on web search and do not encourage to take measures for a more sustainable way of living and/or to reflect behavior patterns.

According to Standish (2009, p. 41), teaching geography is careful *not* to provide a moral code of right and wrong "[…] that encourages [students] to consume less, have fewer children, take public transport rather than drive cars, be less money grabbing, support charities and so forth". The analyzed textbooks highlight that we are all responsible for environmental deterioration, we need to make sacrifices or we have to suffer from consequences–the question is if this ideological approach is helpful to train students to develop measures for sustainable way of living?

The main objective of ESD is neither moral education nor indoctrination. Teachers should not "deliver" sustainability education and question what resource curse is about, but barely provide a "culture of argument" (Myerson & Rydin, 1996). In consequence, ESD 2 seems to be the preferable way for a successful ESD, because students can explore contradictions inherent to sustainable living instead of learning for sustainable development (see Table 1). Nevertheless, it is difficult for students to question their own lifestyle in terms of sustainability when the tasks (of the studied textbooks) fail to establish connection to their everyday life. Regarding the analyzed textbooks, most tasks actually fail to do so.

Conclusions

Despite a number of particularities, all analyzed textbooks contribute to a certain extent to awareness rising for resource exploitation and consumption in terms of ESD. Still, several shortcomings need to be pointed out.

First, the textbooks dedicate very limited space to renewable resources. In the face of climate change, international agreements on energy transition, and political efforts to promote energy transition and sustainable development, it is worrisome that geography textbooks still focus mainly on oil and gas production and consumption.

Second, the increasing scarcity and limited access to natural resources can result in conflicts over their exploitation between governments, companies, and local people. Differences of opinion and interest are not always peaceful, and in several cases can lead to violent conflicts or wars (Reuber, 2005). Learning about resource conflicts can contribute to shaping key competences and skills in ESD as students come to understand the complexity of conflict and develop ideas for conflict resolution. However, all too often, textbooks provide merely simplified explanations, introduce a one-dimensional perspective and tend to moralise. The different scales of resource extraction (local–regional–national–global) and the path from exploitation to consumption are rarely explained.

Third, scientific debates, like the resource curse and actor analysis, are mentioned in a few geography textbooks, but the definitions are incomplete. These theories can support students while developing their own plans and behavior towards sustainability. However, the tasks featured in the textbooks are rarely action-orientated and hardly ake reference to students' daily lives. In addition, web search is the most frequently used method to train action competence. However, this method is not very inventive and motivational.

Fourth, the analyzed textbooks fail to explain that resources, such as nickel, lithium, copper, and gold are used to produce items that students use on a daily basis (stainless steel products, jewellery, computers, etc.). Furthermore, textbooks also dedicate very little attention to the fact that actors and networks are always place-related and to the global dimension of production chains.

Fifth, according to the ethical turn (Huckle, 2005, p. 1), if we want teachers to promote particular ways of seeing the world, "[…] we are in danger of teaching for a 'good cause' and indoctrination rather than education" (Lambert & Morgan, 2010, p. 139). The question of moralization in geography teaching is not the primary focus of this paper. However, in the light of the findings presented in this study, the debate cannot be ignored. Most textbooks show a tendency to moralize development and sustainability issues. Along these lines, promoting sustainable development represents the 'good cause' and students have to be lead to act and behave in a more sustainable way. In light of this, it seems highly likely that students experience a form of indoctrination.

In conclusion, four recommendations for textbooks authors can be formulated: First, tasks should help students to question their own lifestyle, develop new ideas, and promote a culture of argument and not a culture of response. Second, tasks should be action-orientated to strengthen the framework of ESD. Third, the global dimension of production chains should be discussed in order to link resource exploitation to consumption patterns. Fourth, scientific debates, such as the resource curse thesis and actor analysis could be utilized to show the complexity of conflicts and development questions and to understand the interdependence of actors. They can also contribute to shape ESD skills and creative approaches for sustainability. Fifth, the diversity of actors should be shown, e.g. by discussing multi-layered interests of the civil society.

References

Allen, J. & Massey, D. (eds.) (1996). *Geographical worlds*. Oxford: Oxford University Press.

Auty, R. (1993). *Sustaining development in mineral economies: The resource curse thesis*. London: Routledge.

Bagoly-Simó, P. (2013a). Dealing with growth: Demographic dynamics and (un)sustainability in geography textbooks. *RIGEO, 3*(1), 56-76.

Bagoly-Simó, P. (2013b): Tracing sustainability: An international comparison of ESD implementation into lower secondary education. *Journal of Education for Sustainable Development, 7*(1), 91-108.

Bagoly-Simó, P. (2014). Traditionen geographiedidaktischer Schulbuchforschung – eine Metaanalyse. In P. Knecht et al. (eds.), *Methodologie und Methoden der Schulbuch- und Lehrmittelforschung* (pp. 111-126). Justus Klinkhardt: Bad Heilbrunn.

Bagoly-Simó, P. & Hemmer, I. (2017). Bildung für nachhaltige Entwicklung, State of the art–Sekundarschulen. In G. de Haan (ed.), *Bildung für nachhaltige Entwicklung. Stand und Perspektiven*. Heidelberg: Springer.

Balassa, B. (1971). Trade policies in developing countries. *American Economic Review, 61*(2), 178-187.

Bebbington, A., Hinojosa, L., Humphreys Bebbington, D., Burneo, M.L. & Warnaars, X. (2008). Contention and ambiguity: Mining and the possibilities of development. *Development and Change, 39*(6), 887-914.

Bierwirth, J., Haberlag, B. & Wagener, D. (2015). *TERRA Erdkunde 2 Gymnasium*. Stuttgart/Leipzig: Ernst Klett Verlag.

Blechschmidt, K., Eck, T. & Götz, K. (2010). *Südostasien. Diercke Spezial*. Braunschweig: Westermann.

Bridge, G. (2004). Contested terrain: Mining and the environment. *Annual Review of Environment and Resources, 29*, 205-259.

Bridge, G. & Le Billon, P. (2013). *Oil*. Polity Press: Cambridge/Malden.

Bundesministerium für Wirtschaft und Energie (2016). Übersicht Offshore-Netzanbindungen. Retrieved from http://www.erneuerbare-energien.de/EE/Navigation/DE/Technologien/Windenergie-auf-See/Offshore-Projekte/Netzanbindungen/netzanbindungen.html

Cannon, T. (1975). Geography and underdevelopment. *Area, 7*(3), 212-216.

Claaßen, K. (2012). *Australien/Ozeanien – Wirtschaft und Bevölkerung. Diercke Spezial*. Braunschweig: Westermann.

Cowan, M. & Shenton, R.W. (1996). *Doctrines of development.* Routledge: London/New York.

Cowan, M.P. and Shenton, R.W. (1996). *Doctrines of development.* Routledge: London/New York.

de Haan, G., Kamp, G., Lerch, A., Martignon, L., Müller-Christ, G. & Nutzinger, H.-G. (eds.) (2008). *Nachhaltigkeit und Gerechtigkeit. Grundlagen und schulpraktische Konsequenzen*. Berlin/Heidelberg: Springer.

DGfG (Deutsche Gesellschaft für Geographie) (2014*): Bildungsstandards im Fach Geographie für den Mittleren Schulabschluss mit Aufgabenbeispielen*. Bonn: DGfG.

Drabek, A.G. (1987). *Development alternatives: The challenge of NGOs*. World Development.

Edwards, M. & Hulme, D. (eds.) (1995). *Non-governmental organisations–Performance and accountability: Beyond the magic bullet.* London: Earthscan.

Elliott, J.A. (2006). *An introduction to sustainable development.* Routledge: London.

Esser, H. (1991). *Alltagshandeln und Verstehen*. Tübingen.

Ferguson, J. (1994). *The anti-politics machine: 'Development', depoliticization and bureaucratic power in Lesotho*. University of Minnesota Press: Minneapolis, MN.

Flath, M. & Rudyk, E. (2012). *Unsere Erde. Gymnasium Niedsersachsen 7/8*. Berlin/Oldenburg/München: Cornelsen.

Friedmann, J. (1966). *Regional development policy: A case study of Venezuela*. MIT Press: Cambridge. MA.

Garlake, T. (2007). Interdependence. In D. Hicks & C. Holden (eds.), *Teaching the global dimension: Key principles and effective practice* (pp. 114-126). Routledge: London.

Geographical Association (2012). Thinking geographically. Retrieved from http://www.geography.org.uk/download/GA_GINCConsultation12ThinkingGeographically.pdf

Georg Eckert Institute for International Textbook Research (2007). *Unternehmer und Staat in europäischen Schulbüchern – Deutschland, England und Schweden im Vergleich*. GEI: Braunschweig.

Girndt, T, Schoop, W. & Mingenbach, M. (2012). *Raummodul Lateinamerika. Diercke Spezial*. Braunschweig: Westermann.

Girndt, T. & Zimmermann, S. (2016). Nordafrika und Vorderasien. Diercke Spezial, Westermann: Braunschweig.

Global Footprint Network (2003). *The ecological footprint*. Retrieved from http://www.footprintnetwork.org/our-work/ecological-footprint/

Haberlag, B. & Wagener, D. (2013). *Weltmeere als Zukunftsraum. TERRA, Themenband Oberstufe*. Stuttgart/Leipzig: Ernst Klett Verlag.

Haberlag, B., Korby, W., Kreus, A., von der Ruhren, N & Wagener, D. (2014). *Afrika südlich der Sahara. TERRA, Themenband Oberstufe*. Stuttgart/Leipzig: Ernst Klett Verlag.

Haberlag, B., Kreus, A. & Wagener, D. (2015*). Russland und asiatische Nachfolgestaaten der Sowjetunion. Themenband Oberstufe, TERRA*. Stuttgart/Leipzig: Ernst Klett Verlag.

Haubrich, H., Reinfried, S. & Schleicher, Y. (2007). Lucerne Declaration on Geographical Education for Sustainable Development. Lucerne: IGU. In S. Reinfried, Y. Schleicher, & A. Rempfler (eds), *Geographical views on Education for Sustainable Development. Proceedings of the Lucerne-Symposium, Switzerland, July 29-31, 2007. Geographiedidaktische Forschungen 42* (pp. 243–250). Weingarten: HGD.

Hemmer, I. & Hemmer, M. (2010). *Schülerinteresse an Themen, Regionen und Arbeitsweisen des Geographieunterrichts*. Geographiedidaktische Forschungen 46. Weingarten: HGD.

Huckle, J. (2005). *Education for Sustainable Development. Briefing document prepared for the TDA*. Retrieved from http://www.ttrb.ac.uk/viewarticle2.aspx?contentId=12789

KMK/BMZ (Kultusministerkonferenz/Bundesministerium für wirtschaftliche Zusammenarbeit und Entwicklung) (2015). *Orientierungsrahmen für den Lernbereich Globale Entwicklung im Rahmen einer Bildung für nachhaltige Entwicklung*. http://www.kmk.org/fileadmin/veroeffentlichungen_beschluesse/2015/2015_06_00-Orientierungsrahmen-Globale-Entwicklung.pdf

Kowasch, M., Batterbury, S. & Neumann, M. (2015). Social arena and strategic logics–A case study in Poum, northern New Caledonia. *Settler Colonial Studies*, *5*(4), 302-316.

Kreus, A. & von der Ruhren, N. (2010). *Europa. TERRA, Themenband Oberstufe*. Stuttgart/Leipzig: Ernst Klett Verlag.

Kreus, A. and von der Ruhren, N. (2009). *Deutschland. TERRA, Themenband Oberstufe*. Stuttgart/Leipzig: Ernst Klett Verlag.

Krings, T. & Müller, B. (2001). Politische Ökologie: Theoretische Leitlinien und aktuelle Forschungsfelder. In P. Reuber & G. Wolkersdorfer (eds.), *Politische Geographie.*

Handlungsorientierte Ansätze und Critical Geopolitics. Heidelberger Geographische Arbeiten 112 (pp. 93-116). Heidelberg: Geographisches Institut.

Lal, D. (1983). *The poverty of development economics*. Institute of Economic Affairs: London.

Lambert, D. & Morgan, J. (2010). *Teaching geography, 11-18–A conceptual approach*. London/New York: Open University Press.

Lave, R. (2015). Reassembling the structural–Political ecology and actor-network theory. In T. Perreault, G. Bridge & J. McCarthy (eds.), *The Routledge handbook of political ecology* (pp. 213-223). Abington/New York: Routledge.

Martens, P., Roorda, N. & Cörvers, R. (2010). Sustainability, science and higher education: The need for new paradigms. *Sustainability: The Journal of Record, 3*(5), 294-303.

Mayring, P. (2015). *Qualitative Inhaltsanalyse: Grundlagen und Techniken*. Weinheim/Basel: Beltz.

McKeown, R. (2002). *Education for Sustainable Development Toolkit.* Retrieved at http:/ /esdtoolkit.org/esd_toolkit_v2.pdf

McKeown, R. & Hopkins, S. (2007). Moving beyond the EE and ESD disciplinary debate in formal education. *Journal of Education for Sustainable Development, 1*, 17-26.

Mikesell, R. (1994). Sustainable development and mineral resources. *Resour. Policy, 20*(2), 83-86.

Mogensen, F. & Schnack, K. (2010). The action competence approach and the 'new' discourses of Education for Sustainable Development, competence and quality criteria. *Environmental Education Research, 16*(1), 59-74.

Myerson, G. & Rydin, Y. (1996). *The language of environment: A new rhetoric*. London: UCI Press.

Niedersächsisches Kultusministerium (2010). *Kerncurriculum für das Gymnasium – gymnasiale Oberstufe die Gesamtschule – gymnasiale Oberstufe das Abendgymnasium das Kolleg*. Hannover: Niedersächsisches Kultusministerium.

Olivier de Sardan, J.-P. (2005). *Anthropologie et développement – essai en socio- anthropologie du changement social.* Marseille/Paris : Editions APAD–Karthala.

Power, T.M. (1996). *Lost landscapes and failed economies: The search for a value of place*. Washington DC: Island Press.

Reuber, P. (2005). Konflikte um Ressourcen. *Praxis Geographie, 9*, 4-9.

Rieckmann, M. (2012). The global perspective of Education for Sustainable Development: A European-Latin American study about key competencies for thinking and acting in the world society. *Environmental Education Research, 19*(2), 257-258.

Rieckmann, M. (2016). Kompetenzentwicklungsprozesse in der Bildung für nachhaltige Entwicklung erfassen: Überblick über ein heterogenes Forschungsfeld. In M. Barth & M. Rieckmann (eds.), *Empirische Forschung zur Bildung für nachhaltige Entwicklung – Themen, Methoden und Trends. Schriftenreihe Ökologie und Erziehungswissenschaft der Kommission für nachhaltige Entwicklung der DGfE* (pp. 89-109). Opladen, Berlin, Toronto: Verlag Barbara Budrich.

Rostow, W.W. (1960). The stages of economic growth: A non-communist nanifesto. Cambridge: Cambridge University Press.

Sachs, W. (ed.) (1992). *The development dictionary: A guide to knowledge as power*. Zed Books: London.

Schmithüsen, F. (2002). *Wandel des Erdkundeschulbuchs seit dem Kieler Geographentag*. Shaker Verlag: Aachen.

Schrüfer, G. (2013). Konflikte im Geographieunterricht. In M. Rolfes & A. Uhlenwinkel (eds.), *Metzler Handbuch 2.0 Geographieunterricht* (pp. 350-357). Braunschweig: Westermann.

Standish, A. (2009). *Global perspectives in the geography curriculum: Reviewing the moral case for geography*. Routledge: London.

Statista (2016). *Anteil der Energieträger an der Nettostromerzeugung in Niedersachsen im Jahr 2014*. Retrieved from https://de.statista.com/statistik/daten/studie/198935/umfrage/strommix-nach-energietraegern-in-niedersachsen/

Stibbe, A. (2009). *The handbook of sustainability literacy. Skills for a changing world*. UIT Cambridge Ltd: Totnes.

Stonjek, D. (2009). Diercke Erdkunde 7/8. Braunschweig: Westermann.

Swyngedouw, E. (2007). Impossible 'sustainability' and the postpolitical condition. In R. Krueger & D. Gibbs (eds.), *The sustainable development paradox: Urban political economy in the United States and Europe* (pp. 13-40). Guilford Press: London.

Thomas, I., Barth, M. & Day, T. (2013). Education for sustainability, graduate capabilities, professional employment: How they all connect. *Australian Journal of Environmental Education, 29*(1), 33-51.

UNDP (United Nations Development Programme) (2017) *How can mining contribute to Sustainable Development Goals?* Retrieved from http://www.un.org/africarenewal/news/how-can-mining-contribute-sustainable-development-goals

UNESCO (2016). *UNESCO Global Action Programme on Education for Sustainable Development.* Retrieved from http://unesdoc.unesco.org/images/0024/002462/246270E.pdf

UNFCC (United Nations Framework Convention on Climate Change) (2016a). *Report of the Conference of the Parties on its twenty – first session, held in Paris from 30 November to 13 December 2015*. Retrieved from http://unfccc.int/resource/docs/2015/cop21/eng/10a01.pdf#page=2

UNFCC (United Nations Framework Convention on Climate Change) (2016b). *The Paris agreement*. Retrieved from http://unfccc.int/paris_agreement/ items/9485.php

Vare, P. & Scott, W. (2007). Learning for a change: Exploring the relationship between education and sustainable development. *Journal of Education for Sustainable Development, 1*(2), 191-198.

Waldeck, W. (2011). *Angloamerika. Seydlitz Geographie, Rote Reihe*. Braunschweig: Schroedel.

Wals, A.E.J. (2011). Learning our way to sustainability. *Journal of Education for Sustainable Development, 5*(2), 177-186.

Wiek, A., Bernstein, M.J., Foley, R.W., Cohen, M., Forrest, N., Kuzdas, C., Kay, B. & Withycombe Keeler, L. (2016). Operationalising competencies in higher education for sustainable development. In M. Barth, G. Michelsen, I. Thomas & M. Rieckmann (eds),

Routledge handbook of higher education for sustainable development (pp. 241-260). Routledge: London.

Willis, K.D. (2014). Development: Critical approaches in human geography. In N.J. Clifford, S.L. Holloway, S.P. Rice & G. Valentine (eds.), *Key Concepts in Geography* (pp. 584-609). SAGE: London.

Acknowledgements

I express my sincere gratitude to Péter Bagoly-Simó, Denise Fisher and Heide Bruckner for advice, corrections and fruitful comments on this manuscript.

Biographical statement

Matthias KOWASCH is Senior Lecturer for geographical education and human geography at Department of Geography and Regional Science, University of Graz since 2016. His research focuses on Education for Sustainable Development, content knowledge and resource geographies. His research projects are located in Central Europe (Austria, Germany, France and Switzerland), Australia and Oceania.