Exploring regional sustainable development issues. Using the case study approach in higher education.

by

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Exploring regional sustainable development issues. Using the case study approach in higher education.

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Foreword

This book brings together a total of seven regional sustainable development case studies that have been used as teaching materials for e-learning courses at the Charles University Environment Center in Prague, Czech Republic, and which form a part of its open education resources. These case studies are accompanied in the opening pages of the book by two chapters describing the methods and approaches that we applied when teaching our e-learning courses and international summer schools held in the mountains of North Bohemia in partnerships with the Leuphana University of Lueneburg. The first chapter describes in detail the methods used in studying regional sustainable development issues from a case study perspective. The second chapter focuses on the Actor Analysis method, which was originally introduced to us by our colleagues from Leuphana University, and the third provides an example of how this method is used in a specific case in the Czech Republic. The other case studies presented here were mostly used in the context of Globalization courses accredited at Charles University and offered on an interdisciplinary basis to other universities in the
Czech Republic and abroad (through the Virtual Campus for Sustainable Europe and other networks). One case study is a product of the European Virtual Seminar, which is an e-learning programme overseen by the Open University of the Netherlands but with tutors provided by a number of European universities, including Charles University, and one other is the result of an undergraduate diploma thesis. Together, the chapters aim to provide a theoretical basis for case study oriented teaching concerned with the social dimension of sustainable development (the role of actors on the global and regional level), shows the possibilities of a common development of open education resources (teachers in collaboration with students for the next generation of students), and outlines options for independent, problem oriented learning where research skills are practiced. In this context of transformative educational practices, it provides insight into qualitative methods of exploration based on direct or indirect experience, and examples of products of such work (case studies).
I would like to convey our many thanks and gratitude to our international partners who inspired us in sustainable development oriented research methods and teaching approaches through network collaboration - especially Dr. Simon Burandt, who introduced the theme of Actor analysis to the Czech academic community and helped us write the first chapter. One other colleague deserves mention in particular, and that is Dr. Joop de Kraker from the Open University of the Netherlands who administers the European Virtual Seminar (EVS). Students from the EVS developed the final case study on sustainable tourism in Iceland included here. I would also like to express my appreciation to the students who have participated in our online study programmes and helped us develop our teaching methods and who I hope have benefited from the approach we have applied to examining and exploring sustainability issues at the regional level. I trust the materials contained herein will provide inspiration to higher education staff and students alike to study sustainable development in their own regions.

In addition, I would like to thank all our authors for their involvement, and especially our reviewer
Dr. Roman Kroufek for his very useful comments and critical insight into our work. Last but not least, we are happy to have been able to exploit the possibilities of truly interdisciplinary work which was possible thanks to the continuous engagement of the Charles University Environment Centre with innovative approaches in sustainable development teaching and the incorporation of these transformative efforts within the Czech higher education system.

This book is the result of three Education for Sustainable Development projects run by the Charles University Environment Centre (CUEC) in Prague, Czech Republic. The first is Mezioborová síť udržitelného rozvoje (MOSUR, or in English the Interdisciplinary Sustainable Development Network) funded via the Czech Ministry of Education, Youth and Sport, which helped to develop a teaching programme concerned with global and regional sustainable development issues for students of several Czech universities. The other two projects are financed through the Omega funding stream of the Technology Agency of the Czech Republic: “Analysis and support for participatory decision-making processes aimed at regional sustainable development strategies through the use of actor analysis methodology” which provides foundations for analysis of specific cases of environmental issues, sustainable development, and management of natural resources in the Czech Republic from a decision-making point of view and the development of actor analysis
methodology; and “Use of regional sustainable development case studies in higher education and for the creation of Open Educational Resources”, under which the case studies were developed and used as resources both as materials for regionally oriented education and in issue-oriented education at the HE level; the case study method was consequently outlined in the introductory chapter.

Jana Dlouhá, December 21, 2014
Introduction

This book has been written to encourage a different way of exploring sustainable development issues at the regional level and to advance the cause of education for sustainable development. The opening chapter outlines the theoretical foundations for inquiry into regional sustainability issues using case study methodology. Qualitative methods of inquiry into mainly the social aspects of regional development are briefly explained, and a model of learning is introduced which is based on experience in a real-life context. Case studies are a specific genre within academia which can also be used as a starting point for research. This particular chapter therefore describes the basic principles of case study development, as it does the possibilities for its analysis and interpretation; it also demonstrates options for its use in teaching students qualitative research methods. In chapters 4 - 9, case studies are presented which can be further used for the analysis of social actors in regional development processes, and in a practical sense can serve to envisage and plan future development strategies.
The next chapter describes an actor analysis method that primarily explores one aspect of political debate in the case of regional sustainable development: its social dimension. This method is a powerful tool for analysing relationships among social actors involved in a particular issue, their different interests, and provides an initial insight into the related social capital within networks of cooperation/competition. This understanding of social processes can help facilitate negotiation and governance processes, especially when conflict between different viewpoints, approaches or practical concerns is expected, and consequently development strategies can be proposed in a participatory way. This method also has pedagogical relevance where attention is focused on local circumstances. The case study approach described in the preceding chapter provides an opportunity for such contextualized teaching, depicting local specifics, and within them, an understanding of social aspects can be supported by an analysis of the involved actors. This chapter describes the main principles of the actor analysis method, and demonstrates its function in theory and its practical relevance.

The use of the actor analysis method for teaching purposes is illustrated in a practical way in the following chapter in the case of brown coal mining in North-West Bohemia. The focus on this particular case evolved through the Charles University Environment Center’s (CUEC) organisation of annual international summer
schools in the Ore Mountains (Krušné hory/Erzgebirge) where students were given the opportunity to study at first hand a particularly thorny issue of sustainable development that has plagued the region for many decades. The issue is one the staff of CUEC know intimately and thus represents the one case study here where theory and educational practice are combined. Given the original international nature of the summer schools, the CUEC developed an extensive array of English language materials to help non-Czech speaking students follow and understand developments for both its own wiki-based knowledge base\(^1\) and Wikipedia\(^2\). This chapter describes how a tertiary education course was developed around this regional sustainable development issue and which was also examined and described with use of the case study method. It demonstrates the context of teaching and basic educational goals; it also describes the issue in brief and the conflict which was the focus of research attention as it uncovers the relationships between the actors and their roles. It also presents the “teaching notes” developed for this particular teaching programme in more detail and what was required of students. Finally, it presents the results of students’ work and thus also opens up new perspectives


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concerning the issue under consideration — the
development of social capital in the industrialized
region of North-West Bohemia.

The individual case studies that follow the theoretical
chapters in this book represent the teaching and
learning output from online courses operated by the
CUEC. The first four of the case studies were modified
from those used over the years 2010-2014 to teach
students enrolled in globalisation and/or regional
sustainable development courses via the CUEC’s
e-learning platform. The other two case studies were
provided by students themselves: Tomas Chabada, a
student studying at Masaryk University in Brno and a
graduate of one of the CUEC’s e-learning courses,
provided a study of environmental injustice among the
Roma living in the Slovak town of Rudňany; an
international group of students provided the final
case study on sustainable tourism in Iceland that
they wrote as part of another e-learning course
on sustainable development that the CUEC is also
associated with - the European Virtual Seminar (EVS)
run by the Open University of the Netherlands. The EVS
is one of the regular offerings provided to European
students interested in sustainable development topics
through the Virtual Campus for a Sustainable Europe
(www.vcse.eu).

All six cases included here were written and designed
as teaching studies and were often used as Open
Education Resources (OER) for this purpose. They were
not intended as research case studies. Their main purpose is to briefly introduce students to specific examples of sustainable development challenges in different regions of the world as a trigger for them to conduct deeper research into particular aspects of the cases that interest them most.

All the case studies are highly conducive to the application of the Actor Analysis methodology described in detail in Chapter 2 and most of them are accompanied by an extensive, albeit selected and introductory list of resources for students who wish to learn more about them. The cases are also sourced from a mix of developed and developing countries to show that sustainable development challenges are not issues that impact the developing world only. The first study – the proposed mining of the conservation estate in New Zealand – was studied in “real time” in 2010 when the issue was being hotly debated by seemingly the entire country. For that reason, the case relies heavily on media commentary, press releases, radio interviews and television news clips rather than research articles, although modification of the cases for the purposes of publication allowed us to update the New Zealand case with more “dispassionate” analysis after the final decision on mining had been made.

The next three case studies have all been studied extensively by others and there is ample scientific literature available on each of them, although they
have been written in a style that combines academic and non-academic sources in order to keep them at a level that is relatively easy to follow for undergraduate students from a diverse range of non-native English speaking backgrounds. The reading lists for these cases could have filled several pages, so we have limited ourselves to a relative handful only.

The second case of water scarcity in Jordan focuses on what is one of the most pressing development issues in the world today, since water is such an alimentary requirement for human life. This was possibly the most accessible of the case studies used for CUEC’s e-learning courses since the scientific papers and popular articles on the subject are so numerous that it was impossible to include even a fraction of them on our recommended reading list for students. It is without doubt the most pressing of all the sustainable development issues on offer in this collection since the inadequate supply of water available to Jordan presents it with a clear and present existential threat. This is a case where virtually every individual and organisation in the country and in the bordering states is an important actor, so there is a wealth of research options available for students interested in actor analysis. The issues involved in water scarcity in Jordan are also highly pertinent to today’s continuously evolving and mutating political environment in the Middle East, not least of which is the chaos enveloping the neighbouring countries of Syria and Iraq and the
resulting human flood of refugees pouring into Jordan and placing further enormous strain on its very limited supplies of potable water. The breakdown in authority across those borders could potentially have catastrophic ramifications for regional water management, leading to over-extraction of highly finite resources, the collapse of filtration and purification systems, the intentional demolition of reservoirs and dams and pipelines as a weapon of asymmetric warfare, and military intervention by external forces, e.g. Israel or western states.

The highly negative impacts of a disintegration in authority is a theme also evoked in the third case study on deforestation in Ethiopia where at least two collapses in political regimes – the fall of Emperor Haile Selassie in 1975 and the eventual overthrow of the Marxist government that replaced it in 1992 – precipitated an immediate expansion in the rate of forest clearance resulting from the pent-up frustrations of the most important actor involved in deforestation, i.e. the rural farming community. This case study focuses a lot on the 20th century history of conflict in the country as it is important background information if one wants to obtain at least a basic understanding of poverty and deforestation issues – the two go very much hand in hand. Forests and their associated resources and products are vitally important to the livelihoods of rural dwellers in Ethiopia, and so deforestation is classic example of regional challenges from the
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doing perspective of all three pillars of sustainable development – environmental, economic and particularly social.

The fourth case study featuring the mining of gold in Ghana is, like the New Zealand mining study, related to the global imperative to pursue economic growth at almost any cost, although in Ghana’s case it also has huge social ramifications given the direct impact on rural communities, traditional land tenure, subsistence livelihoods, and rural unemployment. Perhaps more than in the New Zealand and Ethiopian cases, there is a very disparate range of actors involved in the issue, making the need for dialogue and joint participative decision-making in reaching a solution that much more complicated.

The fifth case study on environmental (in)justice in Eastern Slovakia provides a brief introductory overview on a sustainable development issue that often goes unreported on the circuitous and bumpy transition from socialist command economies to liberal capitalist markets in the former communist states of Eastern Europe. For the Roma population throughout the region the transition had been the hardest as it struggled to cope with the aftermath of the Nazi genocide, followed swiftly by the over-zealous efforts of communist authorities to collectivize, assimilate and finally wittingly or unwittingly ghettoize most Roma, and then had to face the possibly even more brutal approach of a capitalist system whose requirement for
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less than full employment to ensure the labour market remains pliant and flexible left Roma at the very bottom of the social heap. The case study here provides a snapshot of their status today and the legacy of the environmental burden inherited from the former regime. It is evident from this case that the pursuit of sustainable development and environmental justice is highly problematic even in what today can be considered a modern ‘western’ European state.

The sixth and final case study on sustainable tourism in Iceland, as noted above, was written by a group of students as part of an e-learning assignment and so the first-time authors never meet face-to-face during the drafting stage. It is included here as an pure example of how students are able to work together from variety of backgrounds and cultures to gain insights into regional sustainable development. This particular case study deals once again with a modern European state, but for vastly different reasons. Rather than what might be perceived as a problem of under-development, the issue in question in Iceland is one of over-development, i.e. a tourism market that has experienced such explosive growth over the past two decades that it has had or threatens to have a huge impact on the economic, environmental and cultural status of the country. To ensure that impact is not detrimental will require Iceland to think long and hard about how the vast numbers of tourists flying into the country can be managed sustainably. The economic benefits to a
country that was recently reeling from an economic and financial crisis are reasonably clear-cut, but what price the environment, national identity and social cohesion? The concept of sustainable tourism is still being debated among academics and practitioners alike, so once again there are rich pickings here for students interested in pursuing further research into the issue.

It is the editors’ hope that the theoretical chapters and case studies contained in this book, despite their introductory nature, will provide inspiration to teachers at the early tertiary level to apply the methods and examples described here in either a physical classroom or e-learning setting. For students, the hope is that they find the analysis of actors engaged a regional sustainable development issue and the writing of a case study describing that analysis to be an interesting and stimulating means of embarking on a research path that draws them into a deeper understanding of sustainability and sustainable development. Although they do not explicitly enumerate individual actors, their relationships and their influence on the cases they describe, the studies presented here nevertheless provide instructive sustainable development ‘stories’ that are designed to be explored from an actor analysis perspective.

Andrew Barton, December 5, 2014
Chapter One

Sustainable development case studies and their use as a teaching method in regionally focused higher education programs

Jana Dlouhá

Setting the scene

The introductory chapter will outline the theoretical foundations for inquiry into regional sustainability issues using case study methodology. Qualitative methods of inquiry into, primarily, social aspects of regional development are briefly explained, and a model of learning is introduced which is based on experience in a real-life context. The applicability of this model in (higher) education has been discussed in the context of problem-based learning, social learning or place-based learning and other active learning approaches. Case studies are dealt with as a specific genre which can also be used as a starting point for research. With this in mind, the basic principles of case study development are described, as are possibilities...
for its analysis and interpretation. In other chapters of this book, case studies are presented which can be further used for the analysis of social actors in regional development processes, and in a practical sense can serve to envisage and plan future development strategies. To serve this purpose, this chapter aims to help the reader understand the necessary specifics of case study method; it outlines the basic principles of the development of regionally oriented educational materials based on case studies and demonstrates its use in higher education.

**Use of case studies as an innovative approach in higher education**

Because of their intellectual capacity and hence their role in the “knowledge” society, universities are considered to be key actors in achieving a sustainable future on a global as well as a regional level – they often act as prime movers or leaders in many respects, they have the social capital to start up transformative processes, they are powerful enough to initiate or guide certain actions, create strategy and tactics, and they may also be able to allocate necessary financial and human resources (Zilahy & Huisingh, 2009). In this regard, deep and qualitative transformations are expected within the processes of education and research; here the need is stressed for pedagogy to include active and participatory learning. To address this need, this chapter deals with problem-oriented teaching/learning
methods, specifically working with case studies. This method is highly relevant for the theme of sustainable development in global, regional and local contexts: working with case studies allows us to collect experiences from different regions while opening them up for discussion about sustainability practices under specific cultural, environmental and other circumstances – to uncover common principles and differences within local cases, and foster the application of knowledge to real-life situations. Case study investigations undertaken by students within the learning process rely on the students’ involvement in the issue, and possibly also cooperation as part of a team with the subsequent necessary definition of responsibilities (cf. Fry, Ketteridge, & Marshall, 1999). Here, we will discuss this educational method while concentrating on the process of investigation of a sustainability problem through case studies which also potentially facilitates the engagement of different stakeholders in a real dialogue about the problems under consideration. Reflections on the benefits of this teaching/learning approach are included and enrich the overall picture to show how the method can be applied to create a shared experience as part of a real world situation, which in this case concerns sustainability. We hope that the analysis of the method and its educational potential presented in this chapter will facilitate a generalised and extended usability of case studies across diverse contexts of higher education where other
regional institutions are also involved in the teaching/learning process.

**The character of environmental and sustainability issues**

Problems of sustainable development are typically complex, uncertain, and without clearly identified causality; on the other hand they require timely solutions. In order to address these problems at different levels and areas of policy, the development and implementation of effective strategies and engagement of diverse stakeholders in these strategies is crucially needed. These stakeholders include (not only) research institutions and higher education institutes that could engage with future decision-makers and opinion-creators, but also regional partners from the business and private sectors, NGOs and other social organisations already engaged in current sustainability processes in their respective regions. Sustainability oriented leadership where higher education institutions play a crucial role (through their sustainability oriented HE programs and courses that are concerned with practical impact) is required to develop synergies between higher education institutions and communities. Then thematic networks of diverse partners are often built at different levels to cooperate on practical issues that require particular expertise and/or have a learning dimension. The ability to communicate and collaborate across the boundaries of region,
culture and discipline is therefore one of the basic competences required for the efficient engagement in sustainable development issues.

**Global vs. local and regional environmental and sustainability issues**

Environmental problems usually arise as a response to environmental pressures (exploitation of natural resources or pollution). At global level these are often large scale problems, the result of general trends and principles, and they are so complex that their solutions require a global process of negotiation in which numerous global actors are involved. On the other hand, regional or local sustainability issues are unique, and can be described only within their actual context. Solutions applied within a sustainability framework at regional or local level contribute to the overall global success. In both scales successful management of the problem is contingent upon democratic decision-making and the involvement of diverse stakeholders. However, there is a difference between the global and regional dimension: even if regional problems usually have a global component (generated especially in the global economic environment) they are greatly influenced by local economic, social or natural circumstances – so they are often context-specific. While on the global level the actors are rather amorphous (such as the United Nations) and some of them are only created to address specific environmental issue (such
as Intergovernmental Panel on Climate Change), the actors in regional decision-making are more concrete and tangible – and there are clearer democratic procedures in which organizations and even individuals can intervene. Decisions taken at regional level also usually involve civil society organisations; on the other hand there are only a few NGOs operating internationally. However, the areas of interest of such large-scale NGOs are typically legal and human rights issues, as well as environmental, and their work often focuses on lobbying and/or commenting on directives and international mechanisms. Regional SD processes provide more opportunities for local NGOs to get involved, and they can also more efficiently enter decision-making processes.

There are numerous methods which can facilitate deliberative and negotiation processes at the regional level in practice; to achieve this, some theoretical insight is needed, and experience with existing cases (either successful or demonstrating a failure in communication) is necessary. This book demonstrates good and bad practices in regional development (cf. Chapters 3-9 in this book), and principles of participative decision-making (cf. Chapter 2 herein); it offers teaching methods that permit us to understand them from the point of view of social capital and communication between actors (cf. Chapter 3 in this book). The case study method introduced in this chapter can be used as a tool for developing analytical
insight into the issue of interest (and hence serves as a research method) which can also be exploited in education. The following paragraphs will introduce this method briefly in both (but with the emphasis on educational) contexts.

**What is a case study?**

A case study is associated with a method of qualitative inquiry and the term relates to the research design as well as its output (a case study). It is supposed to be a “holistic inquiry that investigates a contemporary phenomenon within its natural setting” (Harling, 2002). Due to this holistic nature and hence the complexity of the case, it is important to set its boundaries as the case is “the unit of analysis, not the topic of investigation” (Yin, 2014).

As a detailed examination of a single particular issue, a case study represents a *practical* contribution to the theme based on experience beyond reading around the subject. If we conceptualise the case study as a *form of research*, we can appreciate the particular knowledge it brings, or its function in assisting the preliminary stage of a broader quantitative investigation; when used *for education purposes* it is associated with a specific approach (problem-based learning) as well as teaching material (see below). A case study is also defined as:

“...a complex example which provides insight into the context of a problem as well as illustrating the main point.” (Fry et al., 1999).
“...it is based on topics that demonstrate theoretical concepts in an applied setting.” (Davis & Wilcock, 2003).

...investigation of a case study is driven by an interest in individual cases, as it “...focuses on a single actor, single enterprise, etc., usually under natural conditions so as to understand ... a bounded system in its natural habitat”. Methods of inquiry are therefore adjusted to the research interests, not vice versa (Dillon & Reid, 2004).

Case studies also allow an investigation into what works and what does not (Corcoran, Walker & Wals, 2004),

In short, the method gathers evidence ready for subsequent critical assessment.

Types of case studies

From a research point of view, case studies can be used (as with other research methods in social science) for descriptive, explanatory or exploratory purposes (Yin, 2014: 8) – in this hierarchical order these methods are applied in order to fill knowledge gaps and facilitate an analytical investigation of the problem. Both explanatory and exploratory case studies contribute to theory building that reveal theoretical argument and unfold key ideas that are supported by practical evidence. Explanatory case studies examine causal arguments and show their different facets; exploratory cases are more concerned with posing new hypotheses and debating further research options. Descriptive case
studies do not have such high ambitions; their main purpose is to define, map and describe the phenomena in its complexity, but are not necessarily expected to offer substantial causal conclusions around which the case study is built (Yin, 2014, p. 188-190).

Case studies are also categorized by other authors as:

• *Intrinsic* – this is a case study undertaken by a researcher who wants to better understand a particular case. The case does not represent other cases and research is driven by interest and a desire to know more about its specifics and uniqueness rather than the desire to build a theory or make generalisations across cases. Research is often exploratory in nature and allows us to put forward new hypotheses (Grandy, 2010).

• An *instrumental* case study on the other hand does not seek insight into a specific issue nor is the research driven by interest in the particular case, to derive generalizations or build theory from this experience – it serves as a tool for understanding something else (Grandy, 2010).

• A *collective* case study involves the exploration of a number of (instrumental) cases studied jointly to inquire into an issue. It assists the process of theorizing about a larger collection of cases and is thus the basis for naturalistic generalization (Dillon & Reid, 2004)
Case studies in research and educational contexts

According to Harling (2002), case studies developed for research and for educational purposes do not differ significantly (the product is more or less the same and differs mainly in presentation). While a research case is fully relevant to its scientific genre (its purpose being to contribute to existing knowledge in a rational way), a teaching case is developed in a similar way but does not disclose some of the analysis and interpretation of data, as this is done by students while the teacher is expected to guide them within the research process to complete the case study. A teaching case is thus complemented by a teaching note which is available only to teachers. On the other hand Yin (2014) distinguishes between the two genres – he argues that the purpose of the teaching case is usually to establish a framework for student discussions and hence they are not necessarily so rigorous with regard to data and evidence of actual events. Moreover, he points out that cases developed for (educational) practice also differ from those for undertaking case study research.

But we can find general principles of the case study approach relevant to all these contexts (Yin, 2014):

- A case study is an empirical inquiry which is performed from a holistic perspective
- It is an attempt to understand complex social phenomena and gain real world experience
• Its focus is a contemporary issue which is explored in depth
• It asks “how” and “why” a social phenomenon works
• The researcher has no control over the events
• The context is almost inseparable from the issue and the boundaries are not clear
• There are usually many variables of interest, multiplesourcesofevidence,andthegeneralisability of the interpretation is limited (it is also not the focus of the research)

However, there are also some specifics of research and educational case studies which are outlined below.

**Specifics of the research context**

Within the sustainability debate, technical solutions to environmental problems are often discussed. On the other hand, sustainability problems are related to a future which has to be negotiated by numerous actors (the sustainable development concept has brought with it future visioning which is expressed in numerous documents ensuing from global conferences, e.g. The Future We Want (cf. UN, 2012)). The idea is that people actively shape their future, construct it through their understanding of reality, interpret it and decide what actions they should subsequently take, e.g. participating in decision making processes. In this context qualitative methods
of social research provide better insight than surveys into the unique perspectives of involved actors. In contrast to the positivist or quantitative approach which looks for measurable phenomena and a single meaning, qualitative approaches are concerned with “multiple constructions and interpretations of reality that are in flux and change over time”. Researchers then accept an interpretive qualitative approach (if they are interested in experience and its meaning for the individual), a critical qualitative approach (when they are concerned with the influence of larger policies and social contexts on individual constructs of reality) or a postmodern/poststructuralistic approach (working with a radically plural meaning) (Merriam, 2002: 3–4).

Qualitative research methods are exploratory in nature, and they enable us to hone and formulate questions for subsequent more precise inquiry. The use of qualitative methods is related to active construction. While quantitative methods explain (concentrate on cause and effect relationships, and aim at reasoning), qualitative methods search for understanding (“how” or “why” questions take priority). In the course of inquiry, analysis and synthesis of the data are balanced, and the meaning emerges – thus knowledge is created rather than discovered. The quality of the qualitative method is related to its reproducibility, which poses a significant challenge for the researcher (Writing@CSU, 2014; Harling, 2002).
Specifics of the educational context

Education tends to develop abstract concepts that are applied in practice. However, there are numerous attempts to transform this approach—most importantly, Schön’s (1983) concept of learning in action whereby knowledge is created (developed) in a process of continuous reflection, action, and new reflection. This results in an overall understanding of the situation and consequently the ability to intervene in it. Another concept of education closely related to experience with local context is place-based education, which uncovers the potential of local initiatives for sustainable solutions and also attempts to combat inequalities arising from globalisation forces (Smith & Sobel, 2014). The specific aims of place-based education at university level are formulated as follows:

• to learn qualitative methods of inquiry, formulate research questions for a more fundamental approach (beyond work in class);
• to contribute to sustainable solutions by being actively engaged;
• to work with local knowledge and stakeholders, explore different views and clarify one’s values;
• to achieve future-oriented thinking: learning is thus associated with the development of visions and scenarios;
• to practice social learning within real or simulated interactions.
In the teaching context, the case study serves as an opportunity to gain “real-life” experience, and provide facts and data for further qualitative analysis and discussions in the class which helps to develop a critical perspective together with an active understanding of the situation. Case studies thus represent a method of problem-based learning – students are inside the problem they are solving, they are in an active learning mode with the role of problem solvers (Lane, 2007).

The case study method (alongside other qualitative research approaches such as observation, interviews, analysis of narratives and documents), if appropriately used, may thus cover specific methodological demands both in research and education, especially where active exploration of a theme by students is desirable (at higher education level).

**How case studies can be used**

The use of case studies is relevant to the categories listed above; cases can thus be used e.g. in an *instrumental way* (which “leads to prescriptive guidelines, criteria and or standards”), or in an *emancipatory way* – thus they “provide ideas, suggestions and imagery that might sensitise outsiders to issues that they may have overlooked or not considered” (Corcoran et al., 2004). In a practical sense, a case study should explore a current problem (in contrast to historical methods which are applied to past issues) and thus it can be continuously updated
with new information (in a continuous writing process). However, the collected material and data should be precise enough to serve for a debate with the actual actors, or start the process of analysis and research. The desirable result of case study use in teaching practice is the emergence of a “community of interest” around the issue in question and the development of certain skills which are necessary for efficient problem solving, including communication of potential solutions with involved actors.

**Advantages of using Case Studies**

In general, the flexibility of the research process, the complexity of the information obtained through it, and emphasis on context are considered to be the main benefits of the case study method. As here exploration, rather than a prescription or prediction, is emphasised, researchers being free to pose additional questions and/or narrow down their interests progressively in their research. Attention paid to the context makes research less abstract and allows us to build a “story” around the case; a holistic picture of reality can thus be developed. While quantitative methods might be realized routinely, case study research is often undertaken in unpredictable situations and so it deals with uncertainty, creativity and innovation (Writing@CSU, 2014). These characteristics can be identified as benefits also within the teaching/learning process, to open spaces for creativity and independent thinking.
Criticism of the case study method

Case studies are usually characterized by uncertainty and controversy in the definition and delimitation of the problem under consideration. These complexities and ambiguities represent a factor without which the case study method might “lose its meaning” for practitioners as well as theorists. There is no “neatly packaged relationship between the problem, an innovation and the solution” in the world of complexities which characterize real-world problems (Dillon & Reid, 2004).

Besides this, the subjective character of many findings is often criticised, which has ramifications for interpreting the obtained data (testing validity), applying the results in other contexts (generalisability), and using the results for prescriptions (cognitive extrapolation from a few subjects might stress random circumstances). Thus the effort to study a single case might be considered ineffective (Writing@CSU, 2014).

According to Flyvbjerg (2006), the case study method in research is a target for criticism, (as is qualitative research as such), with regards to theory building, and reliability and validity of the method; in other words, the core principles of scientific approach. This critique is based on what he describes as five misunderstandings which he considers to be mostly a consequence of positivist thinking:
1. General, theoretical (context-independent) knowledge is more valuable than concrete, practical (context-dependent) knowledge.

2. One cannot generalize on the basis of an individual case; therefore, the case study cannot contribute to scientific development.

3. The case study is most useful for generating hypotheses; that is, in the first stage of a research process, whereas other methods are more suitable for testing hypotheses and building theory.

4. The case study contains a bias toward verification, that is, a tendency to confirm the researcher’s preconceived notions.

5. It is often difficult to summarize and develop general propositions and theories on the basis of specific case studies.

Flyvbjerg argues that the case study cannot in principle address all these points and yet it still has many advantages thanks to its specifics – especially the value added by the description of the case study context. The case study can be also applied in a mixed design with quantitative methods to balance the weak points of both. It may serve problem definition and description as a preliminary stage for surveying or exploring conditions within one of the subjects of quantitative research in order to increase its validity (a case study within a survey). The case study can also utilise broader quantitative data to explore a particular case or include
a survey within research of the case (a survey within a case study) (Yin, 2014: 66).

**Criticism of the transformative potential of case studies**

Case studies are often considered to be a *practical tool* balancing on the boundary of theory and practice. For example, they are associated with “reflective practice” which engages practitioners in research, the consequence of which might be *double-loop learning* leading to modification of this practice (Schön, 1983). Some case studies apply problem-based methodology (PBM) in a particular situation with the aim of reflecting on and modifying a certain action (Robinson, 1993).

Case studies often present special activities or unique endeavours focused on innovation which cannot be subsumed under an existing conceptual framework. From this point of view, some researchers criticize some case studies’ lack of theoretical insight and express concerns that this method is sometimes “descriptive but not transformative” (Corcoran et al., 2002). Others argue that research itself “does not have to be transformative” but that the way research evidence is used might lead to transformation (Dillon & Reid, 2004). In this context case studies are also suspected of being a corrupting agent, providing non-reproducible data or information that might demonstrate non-existent qualities.
Overcoming ambiguity in the case study method

Above we have described the objections to the case study method from those who criticise it for a lack of standard research quality criteria: validity and reliability (or difficulty in proving these qualities). On the other hand, proponents of qualitative research methods “suggest that qualitative research should be judged as credible and confirmable as opposed to valid and reliable” (Merriam, 1985) and that the fundamental function of the case study method lies in its deep exploration of particular phenomena in a real context. Despite these interesting controversies between qualitative and quantitative researchers, both approaches can be beneficially combined in research design when a case study can help formulate a hypothesis for quantitative methods. Furthermore, the effort to respect validity and reliability in the context of qualitative research can help reduce the risk of a biased interpretation of the explored phenomena. Addressing the following principles and guidelines increases the credibility of qualitative case studies:

*Time spent conducting field research* is primary. A qualitative researcher should invest a reasonably long time in the field gathering data. The validity and reliability of data obtained through quantitative methods such as surveys is then substituted by the depth of the information gained in various ways in a prolonged period of field research. It is important to recognise the fact that the data in quantitative research
gathered through questionnaires concerned with behaviour and attitudes can also be biased: responses might not be objective if respondents know what responses are expected and they want to present themselves in a good light, or simply have an unrealistic concept of self. On the other hand, direct observation in a real context within qualitative research can reveal genuine manifestations of behaviour.

Consequently, the principle of *triangulation* should be employed during the whole research process: in problem definition, collection of information, its structuring and eventual coding, and also in the interpretation of findings. The researcher should use several sources of data and combine them. For example, during the case study exploration of Brown Coal Mining in the Ore Mountains (cf. Chapter 3 herein), representatives of the Czech Coal mining company repeatedly stated in the media that the closure of a particular mine would result in the direct loss of 5000 jobs. However, alternative sources of information (web documents and interviews) showed that the number of people in directly connected professions was 700, while breaching the current mining limits, necessitating the destruction of the town of Horní Jiřetín to extract lignite deposits that lie beneath it would result in the loss of more than 800 non-mining related jobs and expulsion of 2000 people from their homes.

Triangulation is also required when we decide to structure the information according to selected or
developed (emergent) criteria (e.g. in an actor analysis which results in criticism of the actors). Ideally, three researchers combine their assessment and resolve discrepancies in a common discussion. For this purpose an additional search for data can be conducted, or feedback from those who provided the information requested. Peer consultation is also desirable in an evaluation of the whole research process and interpretation of the results, in which the researchers should consult with representatives of social actors under study; a researcher thus “talks to his/her subjects” (cf. Merriam, 1985). Other validity procedures such as disconfirming evidence, researcher reflexivity or the audit trail are described by John W. Creswell and Dana L. Miller (2000).

Of course qualitative case study findings cannot be generalised, but this is simply not the goal of this approach. Generalization can be done to a certain degree by their meta-analysis by e.g. a variable-oriented cross case analysis (according to Huberman and Miles, 1994 in Babbie, 2013, p. 390) or an even more detailed case survey method (Newig, Fritsch, 2009). Triangulation of the analysis is then even more important.

**Use of the case studies in this book**

As described above, case studies can be put to diverse uses but in this volume we follow two paths in particular: the exploration of regional sustainability issues from a
social perspective, and within the teaching/learning process where the educational goal is to develop this understanding among students. In general, case studies should be designed to answer a question. The common question in both paths demonstrated in this book is to reveal the roles of actors in (sustainable) development processes at regional level and assess what is or might potentially be their contribution in a public debate. We also ask how the actor analysis method might help to uncover these roles.

**Case studies on regional sustainability issues**

As environmental problems and sustainable solutions are highly complex, communication between different actors is identified as a core principle of success in practice. Within this communication, the diversity of environmental values should be respected – they should be expressed in the debate, and, after negotiation of these views, they should be translated into real strategies. Decision making processes are an interplay of various factors and related different viewpoints (which represent the opinions of involved social groups), and all of them are supposed to contribute to sustainable solutions. These solutions, if they are to have a real impact and be “sustainable” over time, must ultimately be supported by the affected actors (Mochizuki & Fadeeva 2008).

To address this demand for respect of diversity, regional sustainability case studies might be designed
as a “boundary object” for communication where each of the actors contributes with his/her/its point of view. The case study provides a theme over which these actors meet in discussion with the aim of identifying potential synergies or conflicts between them and possible jointly acceptable solutions. When the situation is analysed by the researcher, he/she starts with multiple subjective descriptions of the case followed by observations on how shared (“objectively” valid or acceptable) perspectives and solutions are (or might be) developed.

Social learning perspective

A clash of stakeholder views thus requires a negotiation processes – it has been assumed that when different viewpoints are confronted, those involved in the dialogue necessarily try to understand each other, critically reflect on each other’s opinions and learn from each other. This exchange increases the knowledge related to the specific situation and new, emergent solutions might appear that are more acceptable for a majority of stakeholders. This process of social learning is thus transformative in its nature – the original incentives of the partners in the dialogue are modified or replaced by those which fit the situation better. To expect positive results from sustainability negotiations, mutual trust and commitment are needed in consequence of which the original concept or strategy might be reframed (Sol, Beers & Wals,
If, on the other hand, actors in the dialogue do not learn from each other and no transformation or original viewpoints takes place, communication is obviously blocked and yields no results. The social learning process is thus crucial for the practical implementation of sustainable development – in practice it is associated with reflexive governance that takes into account wide-ranging feedback from different players and requires polycentric policy making (Bagheri & Hjorth, 2007; Chapter 2 herein). Policy concepts that rely on democratic deliberation consider social learning to be one of its key elements; this notion has been also incorporated especially where the role of interest groups and other (political) parties outside the state is stressed (Hall, 1993, p. 276).

Processes of social learning are also something that could be identified, reflected upon and analysed within very diverse communication processes. And, in the context of this book, social learning is associated with certain competences which should be developed through (higher) education. In problem-based learning often specific forms of collaboration within the learning process are established – discussions and mutual engagement in ideas helps students to hone their ideas and take responsibility for learning. Through collaborative work on case studies, students receive first-hand experience with a real-world situation; they have to understand its context, develop their own point of views, and learn through interactions by mutually
exchanging knowledge. To provide an opportunity for learning of this kind, teaching case studies have to be carefully designed.

**Writing the case**

The writing process is similar to any other academic discourse – the structure of the case study includes an introduction where the purpose of the case is outlined; description of the context; the main body where the “story” around the case is illustrated and possibly also the data for further analysis provided (organized in a way so that their significance is revealed); discussion (it might be important to raise critical points here); and conclusion. When designing a teaching case, the teacher should not disclose his/her analytical work with the data as development of this research skill is one of the educational goals and students should be involved in the analysis and interpretation. There is space for creativity: the teacher can for example attribute the opinion-based arguments to certain actors (while those unattributed could be considered to be facts), thereby stimulating discussion. Also writing techniques could be proposed which allow production of a “story” with dramatic plot (e.g. using characters and dialogues, and other stylistic features to add a human dimension). However, the case should not be “overwritten” in any of its parts as it is important to keep the attention of the reader throughout (cf. Harling, 1998).
In case study writing where regional actors should be described with regard to their communication practices the following principles should be observed (modified according to Corcoran et al., 2004):

- a local issue should be selected that could answer some of the research questions, in this case concerning the role of actors in regional sustainability cases
- the “nature” of the case should be expressed, e.g. the principles of cooperation or conflict
- a thorough description of the context is important (cultural, historical, legal, economic, political, aesthetic, as appropriate)
- attention should be focused on those phenomena which are suitable for comparison with similar cases around the world.

Instructions for writing should also emphasize these points:

- there should be a clear purpose to the case study and the study should address it – case study writing is not simply a description of the situation
- it is important that all of the actors that represent all potentially diverging interests are involved in the case study and their role is described
- it should be explained how the case study could be useful for situations outside its context (some attempt at generalisation should be made)
Examples of case studies beyond the scope of this book used for teaching in higher education programs, as well as some methodological input for their development, can be found at the interactive student space VCSEwiki (VCSEwiki, online) which is used for collaborative work in case study oriented courses (cf. Dlouhá et al., 2013).

**Teaching note**

To provide sufficient guidance for students to independently explore the issue, a teaching note should be developed together with a case study. The teaching note is a document that should complement the case, is available only to teachers and includes information necessary for teaching the case (which can, however, be creatively adjusted to the specific needs of the class). Producing a teaching note ensures that the case can be taught successfully by anyone with data that are provided. Harling (1998) suggests that the teaching note should include the following eight sections which outline the context and methods of use of the case in class: 1. Where and when to use the case (an outline of courses where it is suitable to use the case and its possible modifications), 2. Lessons supported by the case (examples of those which can be developed from the case), 3. Introductory comments (demonstration of its importance), 4. Synopsis of the case (summary of the case which serves as a preamble), 5. Study questions
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(help to analyse the question and should be adjusted to the students’ experiences and capabilities), 6. Teaching strategies (instructions for analysing the case), 7. Additional material (other resources that illustrate the case), 8. Follow-up to the case (what really happened when the case was finished – this helps in discussing the students’ findings). The teaching note can be developed prior to writing the case (with the advantage that the structure of the case then fits the teaching purposes), after writing the case (the reality of the case is then well reflected in teaching) or in an iterative process concurrently with writing the case, which is most recommended (Harling, 1998).

Case study assessment

Case studies are written with particular (specific) goals: to demonstrate a feature of a concrete example and to make the experience transferable to different contexts. A good case study fulfils the goals for which it has been written. There are many ways to write a case study and thus it is relatively difficult to assess the result. Assessment by teachers should include general criteria which are preferably outlined transparently (and hence are available for students in advance); e.g. the rubric for assessment of the case study can be used. If the quality criteria are explained, it is also possible (and desirable) to involve students in assessment by a mutual peer review process (cf. Dlouhá & Burandt, 2014).
Conclusion

To understand sustainability oriented transformation processes at regional level from a social point of view, we focus in this book on the processes of deliberation, communication and social learning of diverse actors under different contexts. This field of interest is covered here by the presentation of global and regional sustainable development case studies and a demonstration of how to use the case study method to depict conflicts, failures or successes in regional sustainable development. An analytical tool – actor analysis – is employed in some of the cases to reveal the character, roles and relations of the actors involved in order to show their communication patterns and demonstrate how positive attitudes and/or a possible clash of approaches and resulting conflicts might contribute to a greater or lesser degree of success in finding sustainable solutions. The case study method is not used as a research tool here, instead we draw on cases which have been developed for educational purposes, we describe their teaching methodology, and the ways in which they can be interpreted and discussed, leading to the construction of new knowledge through this shared experience.

To achieve sustainability transformation, social learning has to be supported in regional development processes. We observe the transformative effect of social learning processes here under different circumstances, and in various policy and regional contexts. In
this book we argue that real negotiation and deliberation processes have a learning dimension. This learning is then an inseparable part of sustainable development practice, and this conclusion should be reflected in the field of education, at least at tertiary level. The learning process should be designed with regard to its impact in practice and hence its role in society (influencing individuals, institutions and communities) and explored more specifically with regard to its transformative potential within real sustainability oriented projects. Higher education institutions can play a role in this respect – with their help, a situation might be analysed and a dialogue between the involved actors moderated.

Social learning processes are associated with certain competences and in general they continue to receive attention in the education for sustainable (ESD) discourse. Learning of this kind is claimed to be one of the pillars of sustainable development. One of the aims of this book was to help higher education institutions to play a role in regional development practice, as well as in the associated overall change of teaching methods and approaches.

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Chapter Two

Actor analysis as a tool for exploring the decision-making processes in environmental governance

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Introduction

In this chapter we describe an actor analysis method that primarily explores one aspect of political debate in the case (with regards to the content of this book) of regional sustainable development: its social dimension. This method is a practical tool for analysing relationships among involved social actors, their different interests (that play a role in their debate and deliberations), and related social capital within the overall networks of cooperation/competition. It is therefore important to understand social processes wherever it is desirable to influence them. This understanding can help facilitate negotiation and governance processes, especially when conflict between different viewpoints, approaches or practical concerns is expected, and the proposed development strategy should be
designed in a participatory way. However, this method also has pedagogical relevance, especially when not only general principles of (sustainable) development are being taught, but where attention is also focused on local circumstances (raising this attention thus becomes one of the pedagogical goals). The case study approach provides an opportunity for such contextuallized teaching, depicting local specifics, and within them, an understanding of social aspects; this can be supported by an analysis of the involved actors. The use of the actor analysis method for teaching purposes has been illustrated in the case of North Bohemian brown coal mining (Chapter 3), while this chapter describes the main principles of the method, and demonstrates its function in analytical practice, as well as potential conclusions that can be derived with its help. At a practical level, it can serve to support environmental governance at local or regional level.

The character of environmental governance

Environmental, or in a broader perspective, sustainability issues are often expected to be well managed by the means of appropriate governance tools. At the regional level we understand environmental governance as a multi-level decision-making process which involves interactions among different social actors (stakeholders), who share an interest in a given environmental issue. Environmental governance is then considered to be “… the means by which society
determines and acts on goals and priorities related to the management of natural resources” (IUCN, 2010); it is often seen as an approach which has the capacity to resolve persistent problems (Hogl et al., 2012, p. 2) “... which are not well managed, are in a bad or worsening state, and which require urgent attention” (OECD, 2008, p. 24). In this sense environmental governance is also perceived by UNEP (2014) as a crucial principle for sustainable development at all levels: “Environmental governance at national, regional and global levels is critical for the achievement of environmental sustainability and ultimately sustainable development”.

Environmental issues are never unambiguous (they are perceived differently from diverse perspectives, e.g. economic, social, nature conservation etc.), and often require widely acceptable solutions; the decision-making processes are therefore expected to be open, transparent and participative. There is a difference between traditional nature conservation where there are supposed to be clear priorities (set by experts within a restricted geographical scope) and management tools to achieve them, and on the other hand sustainability issues that are related to future oriented development processes involving diverse perspectives and social actors. In this sustainability framework it is thus desirable that different stakeholders with various motivations and goals (and the means to achieve them) meet and negotiate a shared vision of sustainable development tailored to a particular regional context.
To develop these strategic and practical solutions, decision-making processes with intense communication among the actors are needed. In general, factors that contribute to success in communication are often based on trust and commitment (as well as other relationships between actors, (cf. Sol, 2013)), and hence the social capital of society. According to Habermas’s concept of deliberative democracy (Habermas, 1997), participative environmental governance emancipates the actors. It is also expected to increase the efficiency of decision-making processes (Dryzek, 1997).

**Participation**

Participation is regarded as a basic human right (Pettit & Wheeler in Vigilance et al., 2011) and has been recognized as a legal right through international agreements such as the Aarhus Convention (UNECE Convention on Access to Information, Public Participation in

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3 Social capital (SC) is usually defined as a network of social connections and a social structure that emerges “among” people and institutions and within their social environment. Like other forms of capital, SC is productive: it enables the achievement of otherwise unattainable goals. “For example, a group within which there is extensive trustworthiness and extensive trust is able to accomplish much more than a comparable group without that trustworthiness and trust” (Coleman, 1988, p. 101). Once it has emerged, social capital has a positive effect on the processes under consideration. These processes have different dimensions (political, economic, environmental) and consequently the definition of SC also differs according to context.
Decision-making and Access to Justice in Environmental Matters, UNECE, 2014). In environmental issues, specific (considered to be the most influential) forms of governance are characterized by decentralization, cooperation and multi-level decision-making where non-state actors are involved; this experience is also reflected in legal frameworks, e.g. in EU directives on water management and public participation (cf. Newig & Fritsch, 2009a). For effective participation, numerous methods have been developed over the past decades: Vigilance et al. (2011, p. 37) characterize them in the following categories: (a) participatory learning and appraisal; (b) actor (stakeholder) analysis; and (c) participatory planning and conflict management. Within participatory learning, actors are involved in building an information base which enables them to address pre-defined problems (analysis is part of the solution). The actor analysis method is considered a necessary tool in participatory processes as it helps to identify the actors involved, their interests and “stakes” (it answers the questions who, how, and to what extent they are involved). It can be used on a practical basis within different stages of participatory processes, and may also be conducted as a research task due to its analytical dimension; this method and its application (especially in the field of education) is the focus of interest in this book. Participatory planning and conflict management consequently bring these actors together to plan and negotiate practical issues under consideration. Recently, new
methods of actor involvement have been developed that are referred to as Deliberate and Inclusive Processes (DIPs) – multi-criteria analysis, visioning exercises, citizen panels, etc. These methods ensure that a diversity of actors have a substantive role in determining policy needs and visions (Vigilance et al., 2011). The involvement of actors is vital especially where policymaking is controversial, affects different groups disproportionately, or is supposed to deliver major changes (Orr, 2013).

**What for?**

Participatory governance is desirable in the sustainable development field where innovation, transformation and change are foreseen. Environmental protection is concerned with preservation of traditional values: one of its principles is “resilience”, which means maintaining a certain balance to avoid system meltdown. Sustainable development policies on the other hand are future oriented and focused on innovation and change regardless of the level and complexity of the issue.

**Why?**

Omitting principles of participatory governance could promote strategic sustainable development planning based on top-down interventions (which is in fact contradictory to sustainable development principles). It is important to emphasize the transformative
aspect of the participative decision making process. This transformation cannot be “planned” and then directed to the “target group”. Alternatively, transformation is supposed to emerge through the active involvement of social actors. In decision making which supports bottom-up initiatives, scenarios have an emergent nature: they are not clearly defined from the beginning, but are rather formulated during negotiations on the basis of inputs and information that appears during discussions. The interplay of various actors is a desirable environment where general ideas are specified and adjusted to the local needs and context.

**When?**

Participation in decision making is related to policy implementation and the realization of new projects and innovations. This means enabling citizens to participate in an organic democracy, to empower civil society groups and strengthen disadvantaged groups (through networking and the exchange of knowledge, but also via access to services, etc.) (Zimmermann & Maennling, 2007). Participation should be enshrined in the legal environment and should extend the domain of state institutions to broader relationships among government, civil society organisations and the private sector. At regional level, participative decision-making should take place especially when the topic encompasses contradictory attitudes and interests.
Who?

The change of perspective related to the application of participatory methods can be expressed by replacement of the term “target group” with the term “actor” (stakeholder). It is no longer the “recipient” of the intervention or innovation who needs to be trained. The task is more to observe and reflect the dynamics of development processes. “Processes of change do not unfold in a linear fashion, but rather involve constant negotiation concerning the interests, opinions and ideas of all those affected by the change process”. This requires constant negotiation between the different views, goals and expectations of all stakeholders. Moreover, “stakeholder landscape is by no means a stable one. It constantly changes according to interests, changes in external conditions and the different phases of the process. Supporting processes of change, then, involves the crucial task of assessing this diverse stakeholder constellation with their various interests, cultures, functions and roles” (Zimmermann & Maennling, 2007, p. 9). Non-state actors including NGOs (besides their traditional roles) take part in the process of knowledge generation and distribution so that they achieve a greater impact on policies (Start & Hovland, 2004; Čada & Ptáčková, 2013).

What processes occur in participation?

The participation concept is closely related to social learning. Social learning is needed wherever actors
depend on each other (and cannot reach their goals alone), and they are not in agreement about the issue at stake but need to decide in concert with each other (HarmoniCOP, 2005). It occurs within a debate or collaboration when the interests of diverse actors in environmental or sustainability issues differ, and negotiation between their viewpoints is required; this process may gradually result in the development of a common view while the initial viewpoints of those involved are being modified (this change is an inherent part of the social learning process). Social learning has often been used as an alternative policy concept: where the interaction of societal actors and the deliberation of ideas is expressed through policy, policy itself is considered to be a kind of social learning. The social learning concept in this context reflects the character of the learning process (“individuals assimilate new information, including that based on past experience, and apply it to their subsequent actions”) and policy context (“social learning is a deliberate attempt to adjust the goals and techniques of policy in response to past policy and new information”). An indicator of social learning is then political change itself (Hall, 1993, p. 277-278). In general, within any negotiation featuring communication among actors, social learning helps to build trust, resolve conflicts and find joint solutions that can be implemented in practice (Wals, 2007, 2009; Dlouha et al., 2013). From a practical point of view social learning processes represent a
facilitation goal – they are based on interest in a practical issue shared by actors and eventually result in the emergence of ‘communities of practice’ around this issue (cf. Wenger, 2000).

**How?**

There are two pre-requisites to develop a participation strategy with efficient communication among actors (where social learning takes place): to identify relevant social actors, and to define the problem in its specific context. Both aspects are interdependent – the problem is identified differently by each of the actors, and the selection of actors is then related to the problem definition. The context also plays an important role as it is necessary for an understanding of the specifics of the case; in general, it is subject to a context analysis which concerns the broader social, cultural, political, institutional and legal conditions of the particular case (HarmoniCOP, 2005). In this book, the context has been outlined specifically in every case study – its description is a necessary starting point for further analysis.

The actor analysis (AA) method is widely used for identifying the first aspect – the actors involved – and promoting fair participation. The AA method monitors trust between actors, the exclusion of some of them, or their mutual support; it also helps to analyse preconditions for the application of changes (distribution of forces for or against).
The actor analysis method

There are numerous methods which focus on understanding the role of actors in policy making. The common characteristic of these methods is that they all have their roots in operations research and applied systems analysis (Hermans & Thissen, 2009). Analytical instruments are primarily used to resolve practical problems, and are often applied to support policy makers in their decisions. The actor analysis method is one of those tools which can be applied to identify the actors in participative decision-making and consequently support social learning processes among them. As described in a step-by-step manual published by the German Federal Ministry for Economic Cooperation and Development, it can be used within “change intervention from inception to its final evaluation” (Zimmermann & Maennling, 2007, p. 10). The method is mainly focused on analysis of relationships between actors, an understanding of which can help to improve their communication and promote negotiation through which new, emerging solutions for sustainability issues can be found. For areas where the method could be employed in this practical sense see Figure 1.

In relation to these practical goals, AA has been developed as a practical research tool for in-depth exploration of the broad conditions for decision-making processes in environmental governance. This research
is conducted mainly as qualitative case studies (Newig & Fritsch, 2009b) and AA can be used in case study design when the research is being planned. AA can also be used for meta-analysis of existing case studies, and to provide a framework for multiple case study analysis.
when the goal is to explore the validity of theoretical assumptions about participation and environmental governance.

As a practical managerial tool, or as a part of research, the AA method is usually applied when the aim is to describe individual and collective actors, understand their relationships, and map interactions which may result in social actions. The level of its formalization may vary, but certain steps are common and can be summarized as follows – see Figure 2.

Finally, as already mentioned, actor analysis can play a role as a pedagogical tool in problem oriented teaching/learning processes that use case studies as material for exploration by students that is done independently and in cooperation with each other or as part of a dialogue with the teacher. In this respect, the case studies in this book have been used in online courses organized by the Prague Charles University Environment Center (CUEC). Other case studies focusing on regional Czech coal mining were developed cooperatively during summer schools held with the Leuphana University of Lüneburg, and there are additional cases created by students working in multidisciplinary and international teams in courses led by CUEC as part of the e-learning program European Virtual Seminar coordinated by the Open University in the Netherlands. From this experience we can see that besides its potential to create the prerequisites for social learning which takes place within regional
Figure 2. Steps of actor analysis (adopted from Grimble & Wellard, 1997; Reed et al., 2009).
environmental negotiations among actors (and which is a core principle of participatory governance), AA can be used in higher education where it helps to simulate an environment for social learning as well. Teaching through case studies combines the application of sustainability knowledge in particular regional cases, and fosters the development of competences for practical problem solving (including the ability to use the AA method for developing a deeper understanding of actors in relation to sustainable development issues) alongside the communication skills which are necessary to apply them in practice (cf. Chapter 1).

**A step-by-step outline of the method**

Among the methods focusing on the analysis of actors Hermans & Thissen (2009) review 18 approaches differentiated by the emphasis placed on particular aspects of their interactions (actors’ perceptions, resources, networks and values). It is not possible to deal with the research potential of the whole range of AA methods in their breadth here. In this book we would like to demonstrate and exploit its potential mainly for teaching purposes in the approach proposed by Zimmermann & Maennling (2007), where elements of Stakeholder Analysis and Social Network Analysis (according to Herman’s typology) are combined. AA then collects and structures information about actors which have an influence or interest in an issue being
explored, describes their roles, goals, sources of power, the relations between them, their influence and involvement in development activities, resulting in a graphical representation of their characteristics and network which helps to identify the potential for practical collaboration. Key informants, documents, interviews with stakeholders and sometimes group discussions among actors may serve as the main sources of empirical data.

A step-by-step description of the AA method is provided in the following paragraphs; each principle and step is then illustrated with experience gained from some of the analysed cases.

**Field of research and guiding questions**

To provide sufficient material for the study of regional development processes CUEC compiled a database of case studies which is published online (Enviwiki, 2014). The research interest concentrates on the patterns and means of communication between diverse actors within sustainability oriented processes at regional level. An additional set of Czech and international case studies was collected in a semi predefined structure (according to a guide for authors describing the process of case study development with respect to AA methodology) (Envigogika, 2015, in press). All case studies served as research material where preliminary experiences with the AA method were gained. In addition, more in-depth but less structured cases were developed as teaching material – students contributed
to their analysis. These teaching cases are presented in this book.

In following paragraphs the use of the actor analysis method for the exploration of regional (sustainable) development cases from a social point of view is described. A brief outline of a comparative meta-analysis undertaken on collected cases (Enviwiki, 2014; Envigogika, 2015, in press) shows the main principles and possibilities of the AA method as a research tool. The key actors in decision making processes are analysed with respect to their characteristics, aims, resources, means and modes of communication, and also the similarities of these features across the cases. As the aim was to demonstrate the specifics of SD related communication in regional sustainable issues within a Czech context, the analysis consequently concentrated on the similarities and common characteristics of the cases.

**Research questions:**

What are the conditions for successful regional development with regard to the processes of communication between actors? How are solutions negotiated and when (under which circumstances) is this a success in terms of social capital and environment? What are the relationships between actors in the specific cases provided and under the particular conditions of the Czech Republic? What could be generalised in these cases and described as social learning processes? How could these learning processes be facilitated and which could also be conceptualised for educational
settings? What are the causes of these social conflicts, their dynamics, how should they be approached and how can “dead-locked” situations, when the actors do not see any positive solutions, be prevented? How can the communication between these actors be analysed and subsequently managed so that the sustainable development potential of the region is maximised?

Problem definition
When identifying the actors, demarcation of the issue in question is very important – it is closely related to the question who is involved and how. The issue under consideration is never neutral, the (sustainable development) values are an inherent part of it and this normative “orientation” also helps to distinguish between actors (holders of pro-sustainable and anti-sustainable visions). Explication of these values should be part of the case description even if no “positive” values could be determined in the actual case. This is because some of the cases relate to a conflicting situation where a “clash” of value systems might presage a paradigm shift (e.g. in the concepts of nature protection) and there is no arbiter to resolve the situation. In practice, however, some shared values could continuously emerge from a dialogue between actors if they openly consider and overcome their conflicting values (cf. Webler et al., 1995).

As each actor defines the same issue differently depending on his/her interests and values, this stage
might be more difficult and lengthy than anticipated. In practice, to achieve a really inclusive negotiation process it is important not to define the problem too early or too narrowly (as then some points of view might not be taken into account) (HarmoniCOP, 2005). Final problem definition is thus sometimes possible only after the actor analysis is concluded.

**Formulation of hypotheses and theoretical assumptions**

This step is important not only at the beginning but also throughout the overall research process. The underlying theory and hypotheses in connection with the research question influence the actor selection (e.g. as a guiding hypothesis/theory for the case study demarcation). During the process of case study analysis it helps to formulate actor characteristics (strengths/weaknesses) and relationships, and at the end of the research it is useful for discussion (interpretation) and evaluation/drafting of conclusions. In none of these stages can strict causal relationships be expected; qualitative inquiry involves the continuous (re)interpretation of acquired information and results, and its reflection in the light of available theories. This approach is relevant for experience-based methods such as case study analysis.
Comparative meta-analysis of the set of Czech cases works with theories of environmental governance and participative decision-making at the regional level, making it possible to formulate more general and reliable conclusions. Hypotheses about participation found in the literature often deal with very positive expectations such as: “Participation of non-state actors leads to improved compliance with decisions and thus better outcomes and impacts in ecological terms than top-down modes of governance can be expected”. However, research findings can be formulated: “Citizens living in close spatial proximity to a natural resource tend to favour its economic exploitation, whereas those living farther away tend to favour its conservation” (Newig & Fritsch, 2009b, p. 206). Relationships among the actors are expected to play a crucial role. Social capital (network relationships based on trust and commitment) contributes to success in regional sustainable development and governance (Wals, 2007, 2009; Dlouhá et al., 2013; Mader, 2013).

Identifying relevant actors

The goal of this step is to create a list of actors who have an interest in a given issue. We understand actors as a group of people who act together to achieve a certain goal and have common interests and/or strategies. An actor can be a big, medium or small organization as well as a semi-organized group of people who operate actively (this is the main difference from the “target group” concept). Usually (and definitely in this collection of case studies), the relationship of the actor to the sustainable vision is used as a leading principle for their identification; this is helpful for the meta-analysis.
which examines whether they operate in relation to the issue, and if so, whether they act as promoters or opponents of environmental or sustainable innovation. To capture the diversity of interests actors have within an issue a variety of methods can be used, e.g. STEEP-formula which includes consideration of the Social, Technological, Environmental, Economic and Political spheres “that are relevant to the SD dimension of the case. If outlined, actor identification can be structured along these dimensions and subsequently elaborated upon in more detail for specific purposes (e.g. within administration, science, civil society spheres, etc.)” (Lynch 2012 in Burandt et al., 2015, p. 5, in press).

Information resources which help to identify the actors can include the following: a) documents (research papers as well as public media articles or other formats like TV clips, recordings, documentary films); and b) interviews with key informants. Various methods can be used to help identify the actors. Certain questions (within the document review or posed to informants) can help to identify relevant actors. These questions concern the following actor characteristics: possession of cardinal information and knowledge, access to important resources related to the given issue; power structures and rules the actor is in control of, as well as involvement in relationships to other actors involved with the given issue, etc. Actors can be also distinguished according to their attitude towards the issue as
“dividers”, i.e. those who potentially could reinforce the conflict, and “connectors”, i.e. those whose role is rather to mediate the tensions (Zimmermann & Maennling, 2007, p. 12).

**Identification of key actors**

The description of actors starts with identification of “key actors”. From the range of actors identified in each analysed case, several are supposed to have a crucial (positive or negative) impact on the issue under consideration. The method used for determining these “key actors” is multi-criteria assessment, an example of which is provided in Table 1 where the previously assembled information about the actors can be clustered under outlined criteria – roles and legitimacy; resources and responsibility; relationships – which are similar to those used for actor identification and

<table>
<thead>
<tr>
<th>Potential key actor in relation to the issue</th>
<th>Position of the actor within the relevant position</th>
<th>Discussion about the actor’s involvement</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ROLES AND LEGITIMACY</td>
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<td>RESOURCES AND RESPONSIBILITY</td>
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<td>RELATIONSHIPS</td>
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<td>Actor 1</td>
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<td>Actor 3</td>
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</table>

**Table 1.** Procedure for identifying key actors (multi-criteria assessment) (Zimmermann & Maennling, 2007, p. 13)
relevant to the research question (cf. Crosby, 1991; Zimmermann & Maennling, 2007).

Key actors are supposed to have a strong position in at least two of those criteria (Figure 3)

For example, a meta-analysis of the set of Czech cases identified these actors (more or less common in all analysed cases): NGOs, large business enterprises and developers, state authorities, experts and scientists, local municipalities and other groups of local citizens, local business. Some of them played a key role in a given case: usually those with access to important resources or power structures, sometimes also those with innovation potential or access to relevant up-to date information.
Actor characteristics

A description of the actors is the most important stage in the actor analysis. As mentioned above, theoretical input at this stage is needed and literature offers many options/methods in this respect. Often, the assessment of actors against different theories (and derived indicators/categories) is used. For example, from political or social science theories, different forms of power can be outlined, as well as the exploration of actor roles, or aspects of their strength and influence (Burandt et al., 2015, in press).

Categories and variables describing actor characteristics are usually designed in ordinal scales. Methods of the empirical research offer many variants. For example, in Table 2 actor characteristics are presented by indicators in 4-point scales proposed by Zimmerman & Maennling (2007), although the scope of scale may be applied in various breadths. The results of “Brown Coal Mining in the Ore Mountains in the Czech Republic” case analysis undertaken by students during an international summer school, where they personally met the actors, conducted interviews, explored the region and shared discussions with invited experts served to compare the actors’ profiles and create a more complex picture of their characteristics (cf. Burandt et al., 2015, in press; Chapter 3 herein).
Table 2. Actor profiles (cf. Burandt et al., 2015, in press; Zimmerman & Maennling, 2007, p. 17)

<table>
<thead>
<tr>
<th>Indicator / Categories</th>
<th>Assessment on a selected ordinal scale</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td># 1 Development vision: Active construction of the sustainable development vision is assessed here. Criteria such as respect for democracy, balancing of interests, transformative actions and attitudes, broad vision and interest in long-term solution, use of the relevant information are considered.</td>
<td></td>
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<tr>
<td># 2 Flexibility and innovation: openness to new ideas and ability to adapt activities accordingly. Assessed criteria: tolerance, critical attitudes, impartiality and empathy (understanding other key players); willingness to learn and to change.</td>
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</tr>
<tr>
<td># 3 Relationships: Involvement in networks, building contacts, creating communication spaces; respect for partners’ views.</td>
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<td></td>
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<tr>
<td># 4 Communication: Consistent standpoint and ability to communicate it to the other actors. Willingness to keep others informed, open and participatory exchange of information, prompt reactions.</td>
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</table>
## Exploring Regional Sustainable Development Issues

<table>
<thead>
<tr>
<th>Indicator / Categories</th>
<th>Assessment on a selected ordinal scale</th>
<th>Description</th>
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<tr>
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<tr>
<td><strong># 5 Transparency:</strong> Possession of transparent guidelines and strategies, clear roles and responsibilities.</td>
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<tr>
<td><strong># 6 Trust:</strong> Proactive and transparent flow of information, sharing of plans and strategies, understanding of other interests. Reliability and timekeeping.</td>
<td></td>
<td></td>
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<tr>
<td><strong># 7 Operational effectiveness:</strong> Goal-oriented and results-driven activities, reflection of the processes and results.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong># 8 Conflicts:</strong> Ability to flag tensions and conflicts, constructive management of them which is done openly and quickly.</td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong># 9 Resources:</strong> Financial independence and relationships to other actors based on this.</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Indicators are based on qualitative assessment of the categories selected by researchers (described in this column). Degree of agreement with the statement is shown on a selected scale, e.g. --/++

Description – remarks by researchers which could help them in further stages.
The reality represented by qualitative data usually provides space for various interpretations and coding of characteristics depending on the research question and on the researcher’s personal point of view. It is very important to combine an assessment of the characteristics of ideally three evaluators to increase the reliability of the findings and to avoid the risk of a biased description (triangulation).

In a meta-analysis, not only the actors but also the cases are characterized and sorted according to chosen criteria regarding the research question and hypothesis. A whole set of indicators/variables can be used to describe the cases. For example, the team of Prof. Newig at Lüneburg University conducted an elaborate case survey meta-analysis of 47 cases (an ongoing process currently with more case studies) using more than 340 variables to standardize the findings and test theoretical hypotheses. In regard to actor characteristics, they coded e.g. levels of representation of selected actors: in the overall decision making and by their attitude to or influence on the exploitation or conservation of natural resources (Newig et al., 2013).

In the CUEC meta-analysis of Czech case studies, the role of actors (e.g. experts and scientists) was described. NGOs, state authorities, local municipalities and scientists or other groups of local citizens were identified as sustainable vision holders. Among the main opponents were local municipalities and citizens, state authorities, business enterprises and
developers. An interesting finding was the fact that among the actors who were identified as the main sustainable vision proponents and opponents, there were several who held both roles, depending on the case. The variable (actors’ stance towards sustainability) was coded for each actor on a simple 3-point scale: pro-sustainable vision actor, ambivalent or anti-sustainable vision actor. From the pro-vision group the actor who was most active in promoting the idea of sustainable development was identified (vision holder).

Other characteristics were for example communication (3 variables: a) takes place/does not take place; b) constructive/mixed nature/conflict; c) face to face/mediated), role and representation of experts and scientists (active involvement in decision making/limited involvement as providers of information, consultants/without representation in decision making at all), outcome ((a) case resolved/not resolved, still in process; b) positive/ambivalent/negative impact on environment; c) positive/ambivalent/negative impact on local community and social capital, whether the conflict was resolved/prevails/has deteriorated or an additional one has arisen). Further critical and important factors were outlined which influenced the current state (not coded but summarised in comparison).

Actor network characteristics

When actors are analysed, it might be useful for the case study research question to look deeper into the actors’ relationships and how an actor network is organized (e.g. who communicates with whom). Networks are basically analysed on two levels, the actor level and the network level, where a network is a distinct set of knots and edges. The simplest option for analysing the actor networks is to analyse who is
connected with whom (e.g. who communicates with whom). Therefore, it is necessary to rate the existence of a simple relationship between individual partners (row and column in the table → yes/no: 1/0) and eventually its quality dependent on the research focus. This rating can be done by using a sociometric method, called the sociomatrix (a tabular representation of collected data), which can be graphically represented by a sociogram. This network level analysis shows the “connected” or “disconnected” networks: in connected networks all actors are connected to at least one other actor.

Other than a graphical presentation by means of a sociogram, various characteristics can be derived for

![Diagram](image_url)

**Figure 4.** Example of a sociogram applied to evaluation of cooperation among actors in a project focused on policy development for sustainable development
interpretation of a network nature such as network density, centrality, segmentation, structural holes and bridges, a description of actors’ interconnectedness, etc. The connections in Figure 4 represent the cooperation of the actors in the project where many activities (seminars, conferences, courses, field and study visits, publications, etc.) were held and many of the actors often participated in the activities of the others. The density of the network tells us about the proportion of real connections from their total possible number, which was 30% in this case, but after reducing the total number to actual possible connections (some actors did not engage in their own activity at all or only engaged in activity with no possibility of involving others) the density rose to 56%, so it is apparent that the network was connected. Similarly, for each actor or cluster of actors we can count the interconnections with others. The quality of relationships can be also coded and included in the results (here it was coded in a 3-point scale: passive, active, or close cooperation). A smaller group of actively interconnected actors (coordinator, A, L and K) was identified via such description with a density of 92% and a density of active relations of 75% (this finding was validated by their responses to a questionnaire with a high rating of importance assigned to the partners for their work).

An integrated and simplified graphical presentation to demonstrate the most important relationships among the actors in the Ore Mountains who have an
impact on the region’s development is shown in Figure 3 (Chapter 3, herein).

**Interpretation of actor relations in a given context**

As an important step in AA, all the results have to be related to the research question and interpreted. It would be a mistake to conclude the analysis with a description of the gathered data and results. Like in any research the results should be used to answer the hypotheses, eventually formulate new research questions and also offer insights into practical solutions. The results have to be interpreted in the context of problem being examined. For this purpose they should be integrated and structured, optimally in a graphical representation or in tables (e.g. table Actor profiles in Burandt et al., 2015, in press). For an example of interpretation of a network of actors see Figure 2 and mapping of actors’ relationships in Chapter 3.

In a case study in practice, the AA should be also designed according to the case study question, and underlying hypothesis or theory will become central in order to design the working process with the chosen indicators and methods. The interpretation of the results should be embedded in the overall context of the case study.
E.g. the meta-analysis of Czech cases revealed two conceptual frameworks of actor networks which included vision development, a decision making process and communication among actors. The first framework was top-down oriented and non-participative usually resulting in conflict; the second one was a participative bottom-up approach with face-to-face communication. In regard to governance theory, the second one was documented as more successful. This conclusion was not necessary as other factors may affect the result: powerful economic interests competing with a sustainable vision, locals threatened by loss of well-being, the non-transparent position of politicians who often seek political profit and shape their attitudes accordingly, etc.

The active participation of local actors (citizens, municipalities, etc.) in the decision making process, and in the development of a sustainability vision appeared to be very important success factor. Communication, transparency and information flow play a fundamental role in the cooperation of innovators with local actors. It is important that the locals understand and share the vision. Then they can contribute to social learning, take on the role of vision co-creators and proponents, or at least not act actively against it.

In successful cases the decision making processes were initiated bottom-up by NGOs, and the number of key actors was usually not high, their networks were focused on similar topics, and the levels of the decision making processes were predominantly local. The leading motive behind the regional development vision usually was not environmental conservation, but e.g. the prosperity of the local economy or support for local tourism; these local needs, however, were not in conflict with environmental concerns. On the other hand, conflicts arose when a widely accepted vision of development was not agreed upon and the actors were forced to choose between two controversial solutions.
When environmental conservation is a dominant topic, two basic scenarios are predominantly found that correspond to international experience. Either there is a conflict between a strong economic interest (e.g. an industrial polluter or developer) and the protection of local environment when locals acts together with environmental NGOs and scientists. The second scenario is the reverse situation when high ecological standards promoted by NGOs, the state or environmentally oriented scientists (but not locals) are perceived by local citizens as a threat to their well-being. The hypothesis tested in the international meta-analysis is then valid: “Citizens living in close spatial proximity to a natural resource tend to favour its economic exploitation, whereas those living farther away tend to favour its conservation” (Newig & Fritsch, 2009a, p. 206; Dlouhá, Zahradník, 2015, in press).

In all of the Czech cases, communication was an important factor. When attempts to build a constructive communication framework failed, conflicts and mistrust emerged between different social groups with a damaging effect on the relationships among the actors; under such circumstances there is usually only a limited opportunity to find shared solutions within the foreseeable future.

Evaluation of the results and practical conclusions

This final step has two main purposes. First, the validity and reliability of all research and results is once again evaluated. In all previous steps attention is paid to an appropriate demarcation of the problem, identification of actors, their characteristics and description of their relationships. Led by research questions, the problem in question is specified, relevant
and key actors are identified (a complete but not overly broad list of them), coding of actors’ characteristics and their relationships is brought together by comparing the results of several coders within discussions, and an audit of the data is undertaken once again. In qualitative research the interpretation of results by the researcher may especially be easily biased. So in this final step it is appropriate to discuss it once again with the entire research team together with the involved actors, or at least to try to gain feedback from them. Part of the evaluation should also consider the limits and limitations of the method. Questions like: “Did the case study consider the real or practicable limits of the network? Did the actor analysis include all relevant characteristics for drawing conclusions (e.g. emotions of actors)?” (cf. Burandt et al., 2015, in press). Did the chosen variables adequately express explored phenomena (e.g. power, communication) and how do we know this?

Secondly, as the AA method is originally a managerial tool, it is primarily oriented to achieving practical change or transformation. A proposal for a strategy to obtain sustainable regional development may be one of its outcomes. Such proposals can serve as inputs for collaborative scenario building, shared agreements and social learning, especially when AA is used as a tool in negotiation and facilitation of communication among actors (similarly to the Yukon wolf management team in Todd, 2002).
Example of interpretation of results and proposal of practical conclusions:

Initial guiding questions for actor analysis (selection from the previous section)

What are the conditions for successful regional development with regard to the processes of communication between actors? What are the relationships between actors in the provided specific cases under the particular conditions of the Czech Republic? What are the causes of these social conflicts and their dynamics, how they could be approached and how are “dead-locked” situations to be prevented when the actors do not see any positive outcomes? How could the communication between these actors be analysed and subsequently managed so that the development potential of the region is maximised?

Interpretation

• Relevant actors are those with a relationship to the issue and intervention (nature conservation or sustainable development project); pro-intervention and anti-intervention actors can usually be distinguished
• Some of these actors might have access to important resources (e.g. power – support from the state)
• The other actors are sometimes victims of the situation, especially those without access to these resources (political influence, connections within a network of cooperation and mutual support, etc.).
• Communication practices could usually be improved in a majority of the analysed cases).
**Practical conclusions:**

A strategy to support sustainable regional development through improved communication could include:

- The identified “victims” can be supported through help with formulation of their goals and by involvement in networks of communication or cooperation (possibly on a broader e.g. national level).
- The identified “winners” should be involved in this communication to ensure that they hear the voices of the victims. They should also have an opportunity to express their arguments and positions.
- There might be additional actors that possess important resources which were not involved in the negotiation process yet. Also, the analysis could uncover some relationships which were not taken into account and have an impact on the situation. It is usually helpful to show hidden interests and influence explicitly, and negotiate desirable processes of communication together.
- Some of the opportunities for improvement resulting from the analysis are case specific – it is important to work with the AA method and its results carefully and flexibly so that relevant solutions are offered.

(cf. Burandt et al., 2015, in press)

**Discussion**

Non-effective participation is often the result of inadequate attention paid to building the capacity of actors to be involved effectively, while there is a tendency to consider (sustainable) development to be a project of the lead actors (not a process). However, building trust and establishing frameworks for participation is
a time and energy consuming task. There are numerous challenges that must be overcome: powerful and marginalized groups have to be confronted, there is the possibility of conflict (its absence is even considered to be suspicious), and there is a need to pay attention to the local cultural and political context (Vigilance et al., 2011). Participative processes thus must be carefully planned and supervised, and even then it sometimes brings incoherence to decision making, and permits well-organized groups to enforce their interests over broad national interests (Orr, 2013).

Actor analysis as a research tool provides valuable insight into sustainability processes, reveals important relationships and social capital and hence also the driving forces of future development. It is important to reflect upon these pre-requisites for participative decision making as SD is never driven by regulations and restrictions – and consequently they can obtain political support. For example, the results of the Czech meta-analysis and international case survey both provide evidence of the positive impacts of face-to face communication. Both also reveal the fact that “collaborative agreements often represent a compromise between competing interests rather than a collective search for eco optimal solutions” (Newig & Fritsch, 2009a, p. 205). To reach such a negotiated agreement, it is crucial to carefully nurture transparent relationships based on trust among the actors from the beginning. Ideally, the result of negotiation is not only
compromise, which in fact means that all actors remain in their original positions, following the same goals and viewpoints but just willing to make some concessions. Instead the desirable result of participative governance is social learning with a transformative effect on the involved actors when they learn one from another and together develop a shared vision (as, for example in the Cider house project in Hostětín by Labohý et al., 2015, in press). Some authors document that when a framework for communication has been developed and discussions facilitated, success could be achieved in terms of setting a shared strategy for regional SD and consequent actor involvement, e.g. building a consensus by the Yukon wolf management team (Todd, 2002). This finding is in accordance with most of the theoretical assumptions in the literature on participation.

Participatory environmental governance is expected to be an effective way of resolving sustainability issues, but empirical evidence from various studies is still insufficient, provides only sporadic information and is ambivalent in its conclusions (Newig, 2012). This is usually true but there are also cases which show the opposite (Newig & Fritsch, 2009a). Issuing invitations to non-state actors is a time demanding process and when conflicts are not well managed it can prolong or even block a decision. On the other hand, even with time consuming negotiation, when a shared vision or at least a compromise is formulated, the positive
effects outweigh the effort invested in the process. The decision is then legitimate, approved by a majority of the involved actors and is indisputable. So there is a good opportunity for the application of actor analysis in research and practical field. It can be applied in specific case studies as well as offering a perspective for a broader meta-analysis of numerous cases.

Conclusion

Actor analysis represents a tool that can be used to explore environmental governance in various ways. Its original mission lay in its practical application in policy development and decision-making. It is often future-oriented, aimed at developing strategies (e.g. for creating participative decision-making process with all relevant actors, for interventions, etc.). It reveals weak points and opportunities for cooperation, supports deliberative democracy and participative decision-making processes. Thanks to its practical orientation, AA represents an opening for problem oriented learning and science as well. It can serve to provide education for a sustainable development in a real world context, and its aim to explore the social dimension can open up new perspectives (and hence also solutions) within a specific development issue. AA provides the chance to enhance scientific understanding of the social process in environmental governance, and moreover, it can create practical support for policy development and can be applied as a tool for action research. Elements
of an actor analysis should be part of any case study which is undertaken in real world contexts and human systems, as e.g. processes of sustainable regional development. AA can also provide a framework for variable-oriented cross case analysis to support empirical evidence and the verification of theoretical assumptions about environmental governance.

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Environmental Policy and Governance, 19(3), 197–214. doi: 10.1002/eet.509


Chapter Three

Students’ exploration of a Brown Coal Mining case study in higher education

Jana Dlouhá, Andrew Barton

Introduction

This chapter describes how a higher education course was built around a regional sustainable development issue which was explored with use of the case study method. It has three parts – the introductory part shows the context of teaching and basic educational goals; it also briefly describes the issue and the conflict which was the focus of research attention as it uncovers the relationships between the actors and their roles. The second part presents “teaching notes” developed for this particular teaching program in more detail and what was required of students. The last subchapter presents the results of students’ work and hence also opens up new perspectives concerning the issue under consideration – development of social capital in the industrialized region of North-West Bohemia.
Learning context

The teaching program described here was built around the idea of testing and applying an innovative teaching method using case studies for active and problem-oriented learning at the higher education level. The purpose of teaching (and hence its main educational goal) was to facilitate learning about sustainable development issues within a regional context, to explore various sources of information about an interesting case, and to practice case study methods for a description of the problems so that a more specific analytical tool could be applied – the cases were consequently investigated using the actor analysis method. The learning was organized within the framework of the international Interdisciplinary Study Program on Sustainability (ISPoS) in several e-learning courses, followed by a summer school (cf. Dlouhá et al., 2013; Dlouhá & Burandt, 2014). Within this program, students concentrated on the local problems of a specific region in North-West Bohemia where the huge impacts of supra-regional industries are visible. In its final stage (two summer schools) the program capitalized on the opportunities to see and experience the situation in the Ore Mountains: a Czech – German border region which suffers from (unregulated) mining industry, air pollution from lignite power plants and chemical factories, and above all bears the history of the Sudetenland with all its attendant stigmas relating
to the forced migration of its inhabitants pre- and post-World War Two. For teaching purposes, the case study of the Most region with a specific focus on the area of the town of Hora Svaté Kateřiny was developed and then modified by students; special attention was paid to the problems of the open cast brown coal mining industry associated with the “Czechoslovak Army Mine”. The students explored and described the current situation, reflected upon it (in their small case studies), met experts and actors who are involved in the local issues, interviewed them and held discussions with them, and consequently tried to analyze the situation with the help of the actor analysis method that was applied to the local circumstances. In the first year of the program, students undertook a role play task in which they represented regional stakeholders; the results of their work were presented to local inhabitants in a public hearing. An additional outcome was a SWOT analysis of the region from the point of view of these groups. From a learning perspective, the process of investigation was especially important when a relatively long-lasting and painful negotiation process was undertaken to agree on common priorities, identifying shared views and issues of conflict. The results of the students’ work were presented to the local inhabitants and debated in a public hearing in both years.

The e-learning courses introduced the actor analysis method and prepared students for the field work that preceded the summer school. However, there were
certain limitations in these courses for application of the actor analysis (AA) method – it was not possible for students to meet all the actual actors and conduct interviews with them, and they used only the resources provided by the teachers or which were available online; their research thus had a desk-top character. Consequently, specific procedures to address the need to explore the various perspectives of diverse actors (an understanding of which is then a pre-requisite for social learning and one of the practical goals of AA) had to be designed. This was dealt with by assigning role-play tasks in the e-learning setting: students were encouraged to accept and develop the points of view of individual actors. Then they could argue these outlooks with each other and thus be involved in fruitful discussions. The summer schools overcame the restrictions of desk-top research only, and the role play approach was also used there because of its perceived efficiency in the teaching process.

Case study: Brown coal mining in the Usti region

The natural and cultural potential of the region – context

The landscape of North-West Bohemia, including the Ore Mountains, the Sokolov and North Bohemian coal basins, the Central Bohemian Uplands and Egerland, is the result of millions of years of orogenetic processes. Human settlements have been located there
continuously since the 6th millennium BCE and mining has been associated with the region from the very beginning: the site of the oldest abandoned mines in Central Europe, including a system of prehistoric flintstone mine shafts and tunnels dating from the early 3rd millennium BCE have been found there. With the passing of the centuries, the natural beauty of the region developed its own rich cultural heritage – a built landscape of towns and villages, castles and chateaux, monasteries, churches, parks and arboreta – and as a consequence both the size and quality of the settlements and the economic development of the region increased. When lingering manifestations of volcanic activity evinced through the discovery of numerous thermal and mineralized springs and geysers, new types of settlements emerged: curative spas. They further enhanced the character of the landscape as well as exploitation of its natural resources. This development was accompanied by specific architectural and building types: spa houses, buildings for temporary guest accommodation, colonnades and promenades, casinos, open-air theatres, enclosed theatres and concert halls, riding schools, park gazebos, well-maintained walking paths with lookouts and rest facilities, and landscaped surroundings (Říha & Pakosta, 2005). Thanks to the spas, frequented by some of the most prominent cultural and political personalities of Europe, Russia and other continents, the population enjoyed a rich social and cultural life. The end of the 19th century
and the early 20th century were the region’s heyday in this respect.

The discovery of brown coal reserves and their energy potential in both the basins below the Ore Mountains was a key milestone in the region’s history. The initially tiny and primitive “cottage industry” mining methods progressively developed into demanding underground extraction techniques to meet the growing demand sparked by the Industrial Revolution in the early to mid-19th century e.g. increasingly large-scale manufacturers, modernising industries and railway transport. Surface mining continued to develop where the coal seam was found to be not too deep under the surface or even lay exposed on the ground (“in the day” as the early miners used to say). Due to its high calorific capacity, coal soon replaced firewood and charcoal, common in both production and household heating until then, and permitted the unprecedented growth of industry once the steam engine was invented and widely available. It also brought about a radical change in transportation as the railways expanded. The built landscape also changed dramatically as factories were built adjacent to waterways in order to the harness the water supplies required for production processes and the hydraulic power potential of watercourses.

The growing exploitation of the coal reserves

In the final years of the Austro-Hungarian Empire, Bohemia became the industrial workshop and one of
the most technologically advanced societies of the imperial regime. This produced a growing appetite for fuel to drive industry forward and so coal extraction in regions like North-West Bohemia steadily expanded, as did the methods used to expose it. During the years of the first Czechoslovak Republic from 1919-1938, the country developed into one of the most economically advanced in the world and its consumption of fossil fuel expanded accordingly. Yet mining left a relatively light footprint on the environment right up until the collapse of the First Republic thanks to the reasonably modest scale of extraction. Open cast mining with bucket excavators had been developed by then, but the area under excavated only a few dozen square kilometres and not the tens or hundreds of square kilometres of lunarscape that marked modern mining techniques in the decades to come. The Ervěnice coal-fired power plant, built in 1926, was the largest and newest power plant in the North Bohemian Basin. It had a capacity of 70 MW, which is only a fraction of that produced by modern-day power plants in the Basin, yet it was enough to supply Prague and an extensive consumer industry, as well as the first tram operations in the Basin towns like Ústí nad Labem and Most (Říha & Pakosta, 2005). The landscape vistas remained relatively unspoiled and there was no disruption to the spa economy.

All that changed with the Nazi annexation of the Sudetenland in 1938 and the takeover of rump Bohemia.
the following year. The Czech economy was diverted to help drive the Nazi war machine, and because of its fragile supply lines to reliable sources of oil the coal reserves of North-West Bohemia were used to manufacture synthetic fuel. In an effort to expand production, Hermann Goering consolidated a number of mines into the huge Sudetenlaendsische Bergbau (SUBAG) in 1939 in Záluží near the city of Most. This was followed a short time later by the creation of another large company to convert the local coal into oil and gas. The plant became operational in 1942 with a workforce of 30,000 and at its peak in 1944 it produced 40,000 tons of synthetic fuel a month (Glassheim, 2007). Given the desperation of the Nazi authorities to keep its war machine in the field in the final years of the war, production in the mines and the manufacturing plant was pushed to the limit with little consideration given to plant maintenance, the environment or social and cultural co-operation (Říha & Pakosta, 2005).

By the war’s end, the landscape and environment of North-West Bohemia was devastated, but worse was still to come. The returning Czechoslovak government picked up where the Nazis had left off, “actually accelerating the political centralisation, economic consolidation and ethnic reorganisation of the north Bohemian borderlands” (Glassheim, 2007, p.452). The tit-for-tat expulsion of the German population began immediately, which in combination with the earlier expulsion of the Czech population, denuded the region
of virtually all its original inhabitants. German houses and businesses were confiscated (or destroyed by a vengeful Czech population) and Most’s mines and gasification plant were nationalised. A new concern called North Bohemian Brown Coal Mines (SHD) was created from SUBAG and merged with a handful of other formerly German mining operations. Even before the Communist takeover in 1948, the authorities were fixated with the removal of all “troublesome minorities”, nationalising key industries and rationalising the economy with a focus on heavy industry and securing the means to drive it forward (Glassheim, 2007, p.453). But once the communists were safely in power, the drive to place heavy industry at the heart of post-war Czechoslovak economic renewal took on added impetus.

By cynically exploiting Czechoslovaks’ bitterness toward to the Allies for their failure to adequately confront Hitler over the Sudetenland by repositioning the country within the Soviet camp, and by manipulating the new population’s hostility to the region’s German history and its lack of connectedness to the landscape, the Ore Mountains and the basin below them were promoted as a giant utilitarian source of hugely cheap of uranium, coal and power for both socialist Czechoslovakia and the Soviet Union (Říha & Pakosta, 2005). In direct and deliberate contrast to the Sudetenland German emphasis on romantic pastoralism to define its relationship to the land, the new
regime depicted North-West Bohemia as “a productive landscape, a repository of natural fuel for economic growth” where miners were “heroic labourers who were the keys to Czechoslovakia’s economic recovery” (Glassheim, 2007, p.455).

Coal output more than doubled in the years 1950 to 1964 to nearly 50 tons a year in North-West Bohemia, of which 78% was extracted by open surface methods by 1965. And as mining operations expanded numerous villages and towns fell victim to the excavators. By the early 1960s mining officials decided that the former royal city of Most should also be razed to the ground to extract the estimated 86 million tons of coal that lay beneath. Thus from the early 1970s to the mid-1980s the city was gradually demolished and the residents housed in a reconstructed Most meant to represent the ideal environment for the new Socialist Man and reflecting the modern planning principals of efficiency, flow and separation of functions (Glassheim, 2007, p.465). The destruction of what had been one of the architectural gems of Bohemia was possible thanks to the complete erasure of the formerly dominant German culture in the city (it had been 64% German prior to the war), and the new population’s identification with the productivist and materialist goals of the communist regime. Despite the chronic environmental and health problems associated with the city and the locality – the atmospheric pollution was so bad that the state regularly bussed school children into the mountains
for clean air and paid a financial supplement to local residents ironically referred to as “pohřebné”, or burial bonus (Glassheim, 2006, p.65) – 80% of people who responded to a study conducted in 1966 said the economic importance of the mines and industry outweighed the negative environmental impact. Less than one percent preferred to live in Old Most, with the vast majority wanting to live in newer apartments with central heating, modern plumbing and the conveniences of modern living (Glassheim, 2007, p.462).

The emergence of safety risks

Not that the mining authorities were never bothered by opposition. While popular movements protesting the catastrophic state of the environment in North-West Bohemia arose in the late 1980s and large street protests pre-dated the more famous student protests in Prague in November 1989, it was a handful of courageous figures in the scientific community that first drew attention to serious safety concerns arising from the mining methods used. Prominent geologist Jan Marek highlighted the safety risks to the outcrops of coal seams under the southern slopes of the Ore Mountains in articles published in professional journals in 1977 under the titles “Engineering-Geological Problems Caused by the Expansion of Large Coal Mines in the Foothills of the Ore Mountains” and “Protection of Jezeří Chateau in the Ore Mountains as an Engineering Problem” (Koukal, 2010). As the title of
the latter article indicates, the centre of attention focused on a prominent historical monument, Jezeří Chateau, that overlooks the largest mine in the area – the Czechoslovak Army Mine. Marek and his colleagues undertook detailed research throughout the 1970s and 1980s on the stability of the chateau foundations that demonstrated how they were being seriously undermined by the nearby coal excavations. The chateau looked to have been literally written off by the mining authorities and slated for demolition on more than one occasion but was saved at the eleventh hour by a combination of Marek’s scientific work that demonstrated the potential danger of a catastrophic landslide in the Ore Mountains triggered by mining operations (see Marek, 2005), and popular support for Jezeří itself. Somehow the chateau survived, but over 100 towns and settlements did not.

The scientific data gathered by Marek was to prove exceptionally important after the democratic change of regimes in Czechoslovakia in 1989 when one of the first steps of the new democratic government in relation to the environment was to define its environmental priorities and “improvement programmes”. One for the North Bohemian Basin was passed in 1990. In November 1991, the Government passed Resolution no. 444/1991, defining “territorial ecological limits to lignite mining” including “binding delineation for mining and spoil bank restriction” which saved numerous settlements including Horní Jiřetín, originally
earmarked for destruction by the previous regime to accommodate further extraction. The limits were specifically designed to provide a sense of closure and security to the inhabitants of Horní Jiřetín and other nearby settlements that they could finally begin to rebuild and restore their communities and utility networks after decades of uncertainty over their future.

The ecological limits protected the nature and landscape of the mountainside, its base and the island of hitherto preserved landscape below it, including the settlements of Černice and Horní Jiřetín. The limits to opencast mining are based on scientifically rigorous research on the actual state of geology of the area (which is being developed with new experience of the instability of the hillsides, the adjacent mountain base and the actual slips that have occurred to date).

In 2005, the state energy policy created in 1991 was due for review date. Under pressure from the Ministry of Environment, the regional and municipal authorities and the public, the State Energy Policy (SEP) approved in 2004 did not contain any provision that the limits should be lifted. Conversely, however, it failed to affirm their permanent or even continued validity. Quite the contrary: the limits are constantly called into question and recommended for review, and so the debate about environmental versus economic concerns continues to this very day. Thus rather than adopting a strategic “future proofing” approach that might secure positive outcomes for both itself and its workforce, for
example, by providing requalification courses for the mining workforce, setting aside a larger proportion of profit for reclamation work, offering alternative economic visions for the region, or reorienting its business and investing in alternative mining models and energy strategies, the mining lobby has pinned its hopes on eventually having the limits repealed.

**Mining poses further threat to nearby settlements and wider environment**

Mining activity at the Czechoslovak Army Mine is fast approaching the territorial ecological mining limits where it comes up against the southern slopes of the Ore Mountains near Jezeří Chateau and the adjacent settlements of Černice and Horní Jiřetín (it would reach them by 2020 should the limits be lifted). The mining lobby openly advocates the razing of Černice and the demolition of significant parts of Horní Jiřetín in order to extract the coal reserves that lie beneath them. In spite of the struggles to save Jezeří Chateau under the former regime, the battle to preserve its buildings has had to be fought anew. The advance of the mine has a destructive effect on the access to the villages at the top of the Ore Mountains such as Hora Svaté Kateřiny, Nová Ves v Horách, and Brandov. It is feared that should mining encroach further beyond the limits, access would become so limited that those mountain settlements would virtually cease to exist. The Mayor of Hora Svaté Kateřiny has even suggested
that the town should secede from the Czech Republic and join itself to Germany (Biben, 2015, in press). Another significant negative impact of such designs is that they would substantially degrade the environment in the western part of the city of Litvínov (the suburbs of Janov and Hamr) where mining operations would come as close as 500 metres. That would further exacerbate the situation in the Janov housing estate which is already deeply troubled by issues of high unemployment, social exclusion and conflict between the white and Romany populations. There would be major adverse impacts on the important biocentre and accompanying biocorridors in the beech forests on the southern hillsides of the Ore Mountains between Jezeří and Litvínov-Janov. Continued mining would have destructive effects on the hydraulic conditions in the area between the arboretum below Jezeří Chateau via the remnants of Dolní Jiřetín, razed to the ground during an earlier phase of expanded mining, and the remains of Komořany because the area would be left barren of water flowing down from the Ore Mountains that would normally feed the Jiřetín brook and the groundwater horizons around it.

The roles of actors

It is evident that the major players in the mining and power generation industries continue to rely on the government repealing the mining limits and thus align their business and political plans accordingly. Since
about 2005, the mining companies in the affected areas have led a campaign aimed at convincing the populations of Horní Jiřetín and Černice of the advantage of abandoning their homes. The offers they have received from mining interests (in this particular case, Severní energetická) are much more generous than those made earlier because the amounts based on official assessments and substitute flats in a prefabricated housing estate in a faraway town can no longer be seriously offered. The mining company was provided with further incentive to offer better deals to residents when parliament overturned a presidential veto twice in 2012 to remove the compulsory expropriation clause from the Mining Act (Lidové noviny, 2012). At the same time, however, Severní energetická is doing all it can to win hearts and minds and votes in Horní Jiřetín by fair means or allegedly foul to smooth what it hopes will be a relatively seamless extension to its mining activities. For example, it embarked on a wide-ranging (and much derided) marketing campaign in 2013 that played upon fears within the local population of higher unemployment should mining operations become severely curtailed by its inability to mine beyond the limits. The theme of the campaign was “security for the region” and featured images of local residents in a variety of occupations, such as baker, electrician, miner, etc., whose livelihoods, according to the mining company, would be threatened by any slow-down in mining. The images were
accompanied in each case with the caption “I also have a job thanks to coal!”.

More sinister, given that Horní Jiřetín is a hotbed of opposition to expanded mining and is the key battleground in the fight to either retain or dismantle the limits, were the allegations made during the 2010 municipal elections in that town that the mining company had used a proxy to purchase buildings in the town and then immediately populate them with occupants registered as new permanent town residents in order to influence the election outcome (Černý & Janoušek, 2010).

In opposition to these machinations, a civic movement has been gradually developing among some inhabitants of the region (although it has to be said that if a region-wide referendum were held over whether to repeal the mining limits or not, a majority would almost certainly vote in favour of dismantling them). The symbol of this nascent opposition movement is Jezeří Chateau which sits on the edge of the open pit and which has been repeatedly threatened with destruction since the 1970s. The chateau today has the potential to become a cultural and even economic centre of the region, but as a reminder of the region’s glory days as it is only being reconstructed piecemeal, while the open cast mine below it would encroach on the hillside even further should the limits be breached. In the idealistic years after 1990 it attracted the attention of the international community (including Queen
Beatrix of the Netherlands and Prince Charles) and seemed poised to undergo and major renaissance, but recently political priorities have become much more pragmatic.

**Prospects for the future**

The territorial ecological mining limits have thus become the first milestone on the path towards sustainable development that has been momentarily abandoned. As it has turned out, however, saving the areas beyond the limits has not been enough. Recent landslides near the Czechoslovak Army Mine⁴ have shown that the miners are not adhering to their own guarantees that the safety of spoil banks and slopes, which will still be active decades from now, will be adequately safeguarded. That is why opponents say that, at a minimum, the eastward progress of the mine should be stopped and the mountain base loaded with extra weight by making an internal spoil bank instead of continuing the mining, even at the cost of writing off the reserves beyond the edge of the current opencast mine. Even opponents within the scientific company say that that does not rule out more considerate mining methods in future using underground extraction, gasification, or another means more appropriate to the

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⁴ The 3 million cubic meter landslide below Jezeří Castle and its arboretum which now threatens the stability of the soil under the Jezeří arboretum, the less recent landslides below Jizerka, Hněvín, in Čepirohy, and elsewhere.
exploring regional sustainable development issues (říha & pakosta, 2005).

continuation of mining the coal seam poses clear and present danger to the stability of the protective pillars of the arboretum and the castle lake, černice, horní jiřetín and janov. a passive defence of the established mining limits is not enough, says the anti-mining lobby. it is now essential to immediately cease devastating surface mining methods, to ensure the stability of the arboretum slopes and lakes, and to review ways of using the deposits obtained to date (říha & pakosta, 2005). the energy industry and the way in which decisions are made about how power is provided have become a political issue; all developed countries regard power generation as a strategic area of interest, and hence attempt to control it. the energy infrastructure of north-west bohemia should be interpreted as part of both the czech republic’s energy system and the entire european union (eu). securing the czech republic’s energy future is unthinkable without european integration, co-operation with the national governments of other eu states and other energy-rich countries of the world, and with power utility companies. as the issue stands at the moment, both emotions and logic have become clouded by often irrational arguments over the number of jobs that would be either created or destroyed by maintenance of the current limits, and the amount of coal needed to maintain present electricity and
heating requirements in the Czech Republic. The country is heavily dependent on coal for 56% of its energy needs, but it also produces an oversupply of electricity and hence exports 20% of production to Germany.

In summary, the imperfect technical solution employed to cover the energy demands of the Czech Republic has huge consequences for the quality of life from a global/regional development perspective as a result of the landscape degradation that has devastated human settlements. This has resulted in a large scale regional conflict between different local actors – a struggle over the mining limits which has had almost no solution over the decades and which exposes the local population to continuous uncertainty.

**Framework for exploration**

This instructional case study of a global and regional perspective concerning natural resource utilization, and the consequent conflict resulting from different attitudes towards this exploitation, was used as a teaching case. The goal was to get students involved in problem-based learning, provide them with a theme for exploration, and encourage them in the use of qualitative methods of inquiry.

**Problem and hypothesis**

With regard to the preliminary experience with the region (preparation of the theoretical background in
the e-learning course) we posed a hypothesis that the source of the pressing regional problems (including the social, economic and environmental spheres) are the distorted relationships of those living in the area – a dysfunctional social structure that provides fertile ground for exploitation rather than for living. We have evidence from history – the expulsion of the German population and the invasion of opportunist “gold diggers” after WWII caused enormous degradation of whole areas. Consequently, after the post-war period during the communist regime there appeared to be no ground for the re-establishment of civic structures, and the regime’s ideologically based regional strategy aimed at developing a heavy industry base for the whole of the communist bloc at almost any price faced no opposition. The tradition of unscrupulous exploitation is still relevant today as the area lacks common denominators for the development of new, place-based relationships within the community – history and its artefacts have virtually disappeared into the mining pits, and the artificially “reconstructed” and reclaimed natural landscape does not provide any emotional incentives that would form the basis for the redevelopment of relationships with the local culture. Attachment and rootedness to the cultural, social and built landscape will take generations to reconstruct. (However, if we look at the region more closely, its beauty can still be easily discerned.)
Exploring Regional Sustainable Development Issues

**Research question**

Sustainable development regional strategies in general aim to capitalize on regional resources (natural and cultural) and manage them in a sustainable way to develop their potential, and simultaneously preserve them for future generations. But when the economy of the region is fully geared towards “big projects” based on the exploitation of “enormous natural resource abundance”, and regional strategies do not support small scale innovations and initiatives (which make hostages of the local inhabitants), something has to change. Obviously, the local people should be empowered to avoid economic dependence on big companies, but they also need to develop a new relationship to the region and to feel responsibility for its future. For researchers, this situation provides an opportunity to analyse which actors might be the sources of inequity or conflict, and which create vital bonds or networks with other social groups and also are connected to the regional heritage (history, tradition, natural landscape etc.).

Based on these considerations, we have identified the main research question: How is social capital formed? Who contributes to it and how? Then we also explored how this social capital might (or already is) contributing to the sustainable development of the region, what are the main processes, and who plays a role in them.
Broader questions included the following:

What are conditions for successful regional development with regard to the processes of communication between actors? How are solutions negotiated, and when (under which circumstances) is this a success? What are the relationships between actors in specific cases and under the particular conditions of the Czech Republic? What could be generalized and described in these cases as social learning processes? How could these learning processes be facilitated and what could also be conceptualized for educational settings?

What are the causes of these social conflicts and their dynamics, how could they be managed and how can “dead-locked” situations be prevented when actors do not see any positive solutions? How can SD be perceived from the point of view of communication and the cooperation of different social actors (stakeholders) which only create an environment for the creation of (commonly acceptable) strategies and the application of technical solutions? How can communication between these actors be analyzed and consequently managed so that the development potential of the region is exploited to its maximum? In general, we searched for methods or ways to describe and analyse the situation, and consequently identify principles of action which might transform existing practices, at least in the particular context of the Czech Republic.
Related case study

One of the aims was to develop a case study focused on relationships of different interest groups (or actors) that play a role in the brown coal mining conflict. As teachers, we made a basis for that – we described the situation “objectively” – using resources outlining the history, culture, environment, etc. Our aim was to let the students play the roles of the local actors to contribute to it – provide input from their subjective point of view that also included their values, views and interests (simulated by students) with regard to the mining issue. On this basis, an analysis of the regional situation and its sustainable development opportunities from the perspective of social capital, and in the historical and contemporary context, was carried out.

Teaching note

Instructions for writing a case study followed the principles outlined by Corcoran et al. (2004). Students were first asked to identify a clear purpose to the case study and address it: demarcate the boundaries of the case, explain its nature, describe its history and context, and explain the roles of actors. In this process, they should reflect upon the theoretical background but also be aware of the practical aspects of their study (cf. Chapter 2 herein).
Methodological materials for students

Aside from the readings provided about the theme (the regional case), there were also some additional materials developed by teachers to support the students’ work: a case study writing outline, an interview outline and instructions how to conduct an interview, a stakeholder mapping workshop outline, and stakeholder profiles - definition and criteria for analysis etc. Basic concepts of sustainability were also briefly described: environmental capital, social capital, and capital in the economy.

Steps undertaken as part of the work:

I. **Context**: introduction to the regional situation with its history and current problems.

II. **Framing**: identification of *guiding concepts* in a regional context (social capital, relations to place, EU and global driving forces).

The concept of **social capital (SC)** was introduced:

1. Definition
   • What does it mean in the local context?
2. Define environmental and economic capital & interrelationships.
   • What do these concepts mean in the local context?
   • How have they manifested themselves in history and now?
• Do you see any relationship between economic, environmental and social capital?

*Place based* principles demonstrated in a given regional context:
3. Definition of these principles and description of their role in relationship to social capital.

*Networks* and relationships
4. Definition or description
   • Explore the importance of different cooperation networks and reflect relations to social etc. capital.

III. **Demarcation of the case study** of the regional situation (with a hidden role for social capital) as an object for further exploration.
5. Case study writing principles introduced from a research point of view.

IV. **Hypothesis**: this step is undertaken together with demarcation as both steps are interdependent).
   Example of a hypothesis: sustainable development concept and regional strategies include three pillars and interrelationships: economic, environmental, and social. The role of social capital (SC) is underestimated. It is one of the driving forces of development and attention should be paid to it accordingly. This should be shown in our case.
Method of work: Social capital has played a role in the region’s history and recently is related to huge environmental and economic problems – this helps to examine the role of SC under different historical circumstances. We attempt to specify this research perspective – the social capital point of view – within the region and its development strategies.

**Research question:** How is SC manifested in the case under consideration? Is SC supported within development strategies?

V. **Analytical methods** available for exploration of the outlined questions (methodological introduction):

1. Case study writing (input by actors exploited, and how to supplement the existing knowledge) & analysis (how the case study works as a research tool, and what different viewpoints are revealed).

2. Interviews – goal: obtain objective information on the situation and critically assess information from involved actors; reflect the roles of the actors within the context of cooperation, public debate and regional situation as such.

3. SWOT (the strengths, weaknesses, opportunities and threats analysis) – from the perspectives of different actors.
4. Comparative study: comparison of two countries (Czech Republic and Germany), analysis of influence of different actors on regional development options.

5. Actor analysis (cf. Chapter 2 herein)

6. “Mind mapping” – maps of actors with relations between them (graphical expression of their interests and relationships).

7. Interaction analysis – analysis of relationships and interactions in the mind map.

8. System analysis of social relations (including ‘place’ as one of the elements of the system)

9. Reframing workshop: 3 perspectives (economic, environmental, and social) applied to the case study and mind maps. Relevant projects and scenarios outlined.

10. Scenario analysis – introductory steps to analyse possible future situations.

VI. **Steps of students’ work** (some of them are optional):

1. Collaborative work I (all students involved):
   - Identify actors in the network, think about the system of relations (experiences from previous stages - e-learning - could be used).
   - Identify important characteristics of the network from the point of view of SC (trust between actors, their power relations etc.).
2. **Group work I – stakeholder mapping workshop:**
   Actor groups are formed, role-playing exercise (each group plays the role of one of the actors + creates a “knowledge base” on behalf of the actor). Students’ task is to:
   - Draw a map of actors, analyse and identify uncertainties to be further explored.
   - Identify relations of the group (one of the actors) to other actors.
   - Describe interrelations of other actors

3. **Group work II – case study writing.** Students should:
   - Interview real actors.
   - Write a short case study on behalf of an actor, with input of the interviews with real actors.

4. **Collaborative work II – actor analysis** of the stakeholder map produced: Results made by “actors” = students’ groups are gathered together:
   - Presentation of stakeholder maps produced by students in groups, and combining stakeholder maps in one.
   - Analysis of actors’ relationships.
   - Find common interests and conflicts in scenarios made by different actors (from SWOT analyses).
5. Collaborative work III – *comparative study* of relationships on the Czech/German border
   - Actor analysis focused on important aspects from the SC perspective (trust, place based relationships, etc.).
   - Comparison of Czech and German situations.

6. Group work III – *reframing workshop*:
   - Sustainable development from the perspectives of different actors; the role of social capital highlighted.
   - Identification of potential regional projects.

VII. **Expected outcomes:**
1. **Case study** (as a boundary object for communication): viewpoints by individual actors included.
2. **Analytical work**: actor analysis & mind maps of social relations.
3. **Analytical results** should correspond to the research questions: what is the role of social capital in the sustainable development of the region, how is SC included in regional development strategies, what should the regional development strategy look like if SC was one of the leading principles in it?
4. **Reframing**: the region is now perceived as a system of social relations – processes of communication are the focus of attention.
5. **Potential regional projects** for future regional development identified and discussed with regional stakeholders.

6. **Public presentation and discussion** – feedback on the work by actual actors received.

This is of course the ideal comprehensive plan covering all aspects of the case study method applied to local circumstances. In reality, only some of the outlined steps were taken and goals fulfilled.

**Actor analysis in the coal mining Usti region (students’ findings)**

In the following paragraphs, we describe the analysis of actors involved or affected in some way by lignite mining in the northern Ore Mountains in the vicinity of the Czechoslovak Army and Vršany opencast coal mines operated by the Czech Coal (Severní energetická) company which have an influence on the economic, social and environmental life of the region. The analysis is the result of work undertaken by students who attended the international Interdisciplinary Study Programme on Sustainability (ISPoS) summer school in the first week of September 2012. The case study methodology used is described in Chapter 1 actor analysis methodology used was based upon the stakeholder analysis tools contained in Zimmermann and Maennling (2007) and is described in Chapter 2.
A map of regional actors was produced by identifying those most relevant, interviewing them during site visits and excursions (methodological instructions used), and analysing their relationships to one another and then depicting these in diagrammatic form. In addition to representing the key actors, the stakeholders who interact with them or who have an influence on them (primary and secondary stakeholders) were also described. All these stakeholders were depicted in concentric circles placing the issue under consideration (brown coal mining) and its three SD pillars in the centre; this circle is followed by the core actors and then the primary and secondary actors, as seen in Fig. 1.

**Regional Actors**

After several days of visits to various localities of importance to the issue of lignite mining in the northern Ore Mountains and several face-to-face meetings with significant local actors, the students constructed a list of the following stakeholders, dividing them up into core actors (the most important), primary actors (less important) and secondary actors (with marginal impact on issues at stake only):

**Core actors**

- National government
- Regional government
- Mining companies (Czech Coal)
• Local businesses
• Environmental NGOS
• The communities of Horní Jiřetín and Černice (as they lie directly in the path of proposed new mining operations)

Primary actors
• Municipal government
• Wider community citizens
• Schools
• Heavy industry
• Property owners
• Cultural NGOs
• Health care services
• European Union

Secondary actors
• Media
• Academic and lay experts

The diagram in Fig. 1. provided a general overview of all stakeholders and allowed students to make some initial observations and hypotheses about the various kinds of influence the stakeholders have on the issue of lignite mining and the potential for proposing some type of reform intervention, as well as about the relationships and mutual dependencies. Students were able to draw conclusions regarding alliances,
problematic relationships among stakeholders and their power relations.

Generally speaking, although the students did not have sufficient time to make a detailed study of the regional stakeholders and their relationships, the students nevertheless also uncovered gaps in information and areas of insufficient participation among actors. It showed which stakeholders and relationships students knew little about and about whom they required more
information, and which actors should definitely be included in any proposed intervention.

**Mapping of stakeholder relationships and interactions**

The next step was to analyse the various interactions and highlighting the different relationships between all the stakeholders. This creates what at first glance seems like a somewhat complicated map (see Fig. 2), even without every single interaction depicted, yet a closer reading revealed an elegant simplicity to the map which was able to be simplified further to demonstrate (see Fig. 3) the most critical relationships with the greatest impact on the region’s development.

An integrated and simplified graphical presentation to demonstrate the most important relationships among the actors with the greatest impact on the region’s development, and the nature of these relationships is shown in Figure 1. National government, regional government, mining companies, local businesses, environmental NGOs and local communities (which live directly in the path of proposed new mining operations) are presented as key/core actors.

The first stage of the map involved mapping the obvious relationships and networking among specific stakeholders and briefly listing what their particular interest might be in that relationship. Examples (by no means exhaustive) were as follows:
• The **national government** interacts with the **European Union**, the **regional government** and **Czech Coal** in respect to formulating strategic national and regional resource plans, analysing and negotiating energy security needs, setting a democratic framework for communicating and decision-making, defining the legal framework for resource exploitation.

• **Czech Coal** interacts with **heavy industries and local businesses** to ensure on-going supplies of coal as a source of energy for manufacturing processes or as purchasers of each other’s goods and services; **Czech Coal** also has problematic or broken relationships with the communities of **Horní Jiřetín** and **Černice** and some **property owners** because of continuing uncertainty over the future of those townships and surrounding land with the prospect of further mining operations hanging over them; there is a similar broken relationship with some **environmental and cultural NGOs** because of diametrically opposed views on future use of the landscape and preservation of the built environment.

• **Local businesses** have a symbiotic relationship with the **regional citizens**, as the former act as sources of employment for the latter, while citizens are purchasers of business services and goods; **Czech Coal** also interacts with citizens as another important source of employment and as sponsors
and funders of local community projects, e.g. cultural and sporting events.

- **Environmental NGOS** interact with Horní Jiřetín and Černice in support of the efforts of those communities to protect their existing natural and built environment and cultural monuments, and to inform other **regional citizens**, while they also seek to influence the opinions of politicians at the **local, regional and national government level**; **environmental and cultural NGOs** further interact with **academic experts** as partners or funders of independent research on local environmental impacts.

- **Municipal government** naturally has a relationship with its **local citizens** as a provider of basic and public services, and with schools as the official employers of the teaching staff, while **schools** in turn interact with the **national government** in terms of curriculum setting, and with experts in the form of pedagogues researching and testing teaching methodology.

- **Health care services** interact with the **national and regional governments** as recipients of funding for their services, and with **experts** as primary sources of research into the general health of the local population, including the impact of particulates in the atmosphere resulting from opencast mineral extraction; they naturally also have a strong
relationship toward the **local citizens** as providers of primary health care.

- The **European Union** has a relationship toward the **national and regional governments** in terms of creating an overarching European framework for environmental protection, maintaining a common market for the mineral and energy projects produced by the region, guidelines for mineral extraction and provision of funding for infrastructural projects.

- The **media** interact with the **local citizens** as conduits, filters or even interpreters of information about regional sustainability impacts, while also interacting with all other stakeholders to source their information.

Figure 2 demonstrates collective work process of description of actors’ network in Ore Mountains based on collected data from discussions with key informants, field visits and the study of documents. See also Fig. 1 for the initial draft of the map.

**How were the relationships characterised?**

Apart from visualising the actors relevant to the issue at stake and important for any proposed intervention, a further aim of the mapping exercise was to establish how the relationships and networks were characterised, i.e. were they genuine coalitions of like-minded
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Figure 2. Development of actors’ network description in Lignite Mining in the Ore Mountains

actors working towards a shared goal, or were the relationships and networks of a different nature?

The students determined that practically all of the relevant relationships were to some extent unequal and sometimes defined more by pecuniary interest which had the potential to act as a barrier to finding a common solution to the economic, social and environmental sustainability of the region. As noted above, several broken relationships between regional actors were also defined (as depicted in the map by the black lines with crosses through them). Of primary
important here is that students found **there is no common or joint search by two or more actors for solutions** to the region’s sustainability problems.

The wealth of Czech Coal, in the opinion of the students, for example, tended to have a distorting effect on some relationships. For example, it is able to fund and publish its own free newspaper, ostensibly for Czech Coal employees, but in reality available to all. It is able to fund or subsidise cultural and sporting events, such as attendance at the city of Most horse racing track, built on reclaimed land, and which might otherwise be beyond the financial means of the majority of local inhabitants. Czech Coal also dispenses its largesse to local educational institutions, the University of Finance and Administration based in Most, and is a significant contributor to primary education in the city of Litvinov through its sponsorship programme, Spolužití pro Litvínov (Co-existence for Litvinov) – Litvinov being a crucial stakeholder in the plans to mine lignite right up to its border. A further example is Czech Coal’s ability to finance and commission independent scientific research from its own research institute, Výzkumný ústav pro hnědé uhlí a.s. (Research Institute for Brown Coal).

As passions over the future of the region and whether to expand mining operations or not can become heated, relationships between the opposing camps have sometimes broken down altogether, e.g. Czech Coal and representatives of the town of Horní
Jiřetín regularly clash over interpretation of statistics and research results, and accuse each other of intrigue and underhand tricks to win their arguments. Czech Coal representatives also refuse to deal with unnamed NGOs because of what they allege to be aggressive and dangerous anti-mining tactics. On the other hand, Czech Coal PR representatives told students that the company’s relationship with the state government was fraught with difficulty which left it unable to influence national policy on mining in the region.

Given the complexity and diversity of the relationships involved in the issue of lignite mining in the region, the students then simplified their stakeholder, as depicted in Fig. 3. Interpretation of the diagram does not mean simple description of the relationships, but rather their relevance to the given issue of expansion of mining in the region. In this case it was emphasized that some of the relevant relationships were defined more by pecuniary interest that produced unequal relationship between two or more actors and which therefore had the potential to act as a barrier to finding a common solution to the economic, social and environmental sustainability of the region. Several broken relationships between regional actors were also found (as depicted in the map by the black lines with crosses through them).

Thus a map of relationships was produced based only on core interests and the needs of actors that was simple and revealed that there were not particularly
good interconnections between the environmental, economic and social sectors. In actual fact, when they sorted the actors and their relationships, the situation looked like Fig. 4, where there was a strict divider particularly between the environmental and economic spheres. But what they really needed was something that looked like Fig. 5, where sustainable development projects could be generated in the overlaps.
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Figure 4. Dimensions of sustainable development in the studies case

Figure 5. Dimension of sustainable development – ideal state.
Developing new relationships and potential interventions

In order to find new ties between the different spheres, the students tried to establish new options for cooperation. To do this, they generated ideas relating to more idealistic forms of cooperation (aimed at mutual support) based on joint vision potentially shared by different actors. In a very productive brainstorming session, they drafted new possible interactions and identified potential project proposals (different ideas surrounded each of the actors who potentially should be involved in the project under consideration).

The final step in the analysis was grouping and generalising many of the ideas generated during the brainstorm session so that eventually eight possible new project interventions were identified that could help the region to develop on the basis of a new and democratic methodology. Wider strategic options were also produced and elaborated in more detail (and in addition, relevant stakeholders for cooperating on and implementing the projects were suggested). In brief, these eight proposed projects were:

1. **European democratic mechanisms**: communicate with all relevant local actors to provide its view and opinion of regional sustainability; hiring of independent outside experts to research issues; raise local management capability and capacity;
search for funding of specific regional sustainability projects.

2. **Declaration of a large scale protected area** in the *Chráněná krajinná oblast* (Protected Landscape) category by the national government and support for tourism infrastructure.

3. **Regional identity**: bring together local cultural NGOs and schools with German cultural NGOs under the auspices of the EU to create a “relationship with place” based on its specifics: mining history and the German Sudeten heritage, etc.

4. **Regional handcraft and food product branding**: establish an alliance of local businesses, citizens, cultural NGOs and national government to support and promote a branded image of the region based on local products that characterize the region: fruit gardens, wine industry. Locally manufactured quality products would thus be promoted.

5. **Recultivation**: ally experts with environmental NGOs, local citizens and the city of Most to discuss how the region should be recultivated based on bottom-up participative processes rather than top-down prestige projects. New innovative ideas could be raised in the contexts of sustainable “landscape design” which should be more integrated into societal demands.

6. **Microregional networks**: empower smaller groups of communities within the region by facilitating greater communication among them to
develop common objectives and activities for regional sustainability – form new networks of cooperation, thematically oriented e.g. on handicraft, tourism etc.

7. **Transform ‘business as usual’ approach**: promote innovative thinking about the region’s potential by commissioning economic impact reports in alliance with government and business on alternative scenarios for the region if mining was not continued. Different actors such as environmental NGOs, mining companies, foundations etc. should be involved in the process – a specific role would be played by technical universities which could be considered as incubators.

8. **Enhance management capacities**: education and training among regional and local government officials and NGO workers to increase funding application and project management skills. Local universities should be involved in the process.

**Conclusions – case studies in education**

Case studies in the education process could be used for different purposes:

As cases are designed to demonstrate a real situation and/or (sustainability) processes, they might later possess other roles in practice – e.g. they could be used to cultivate knowledge and competences for cross-boundary dialogue in the educational field, or provide basic understanding of and insight into negotiation
processes, develop capacities needed for facilitation, and thus serve **for policy-making purposes.**

**For description** – to explore the situation without losing its specific context, and illuminate specific factors that play a role within specific regional circumstances and possibly modify or extend the research questions which were posed with regard to relevant theories.

In our specific case, they were used as a basis **for reflection and analysis** – even if the cases were not primarily collected as studies for further research, exploration of the actual situation was part of the students’ work with experience of personal contact and discussions with representatives of some of the actors and experts, observation of reality “on the ground” in threatened towns and other sites, and the open mine pit itself. There was also an analytical dimension embedded in the writing instructions from the very beginning. The case study authors were asked to observe a compulsory structure and focus on stakeholder dialogue.

Good cases incorporate different viewpoints, they provide narrative structure where diversity is possible and these different viewpoints are highlighted in a critical perspective. In a real life context they could serve as a “boundary” object and provide the basis for discussion between different actors. In general, case studies thus might contribute to a real negotiation process, e.g. serve as a boundary theme or **object of communication.**
In these practical fields case studies might become a **tool for transformation**. For example, if used in education, they introduce innovative practices – providing practical examples, facilitating learning from experience and offering space for sharing knowledge. Issues described in this specific genre and format are less abstract and more understandable; involvement of an individual is possible; this approach opens up possibilities to undertake activities which have a practical impact. As all transformative processes are very context-specific, case studies represent an appropriate knowledge base for building capacities in this field.

The main purpose of our particular effort was to accomplish some preliminary research in the region and apply an analytical tool (AA) described by Simon Burandt et al. (2015, in press) within a teaching program at the higher education level. The case study introduced served as a basic environment for the analysis, and the process of its exploration by students was described.

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Chapter Four

Mineral extraction or maintenance of the conservation estate in New Zealand: Which takes precedence?
Andrew Barton, Jana Dlouhá

Introduction

In 2008, New Zealanders voted out of office its three-term centre-left Labour Party-led government in favour of a centre-right coalition government overwhelmingly dominated by the conservative National Party. The result was partly due to voter fatigue with nine years of government increasingly portrayed in the media and perceived by the electorate in general as instigating a so-called “nanny state” fixated with regulating the minutiae of New Zealand households, such as the energy efficiency of shower heads and the types of light bulbs that New Zealanders should install in their homes. The electoral misfortunes of the Labour Party were also partly the result of the global financial and economic shock of 2008 that the incoming National-led government had promised to shield New Zealand from.
In contrast to the Labour Government’s sometime environment-friendly achievements of ratifying the Kyoto Protocol, legislating for a carbon emissions trading scheme (ETS) and declaring its intention to make New Zealand carbon neutral over the long term, some of the National Government’s first acts in power were to abolish the Govt3 programme to encourage government departments to adopt sustainable practices and achieve carbon neutrality, and to initiate a review of the ETS with a view to significantly amending it.

In an effort to refocus attention on New Zealand economic performance, the National Government floated a proposal in August 2009 to open up protected land to mining interests to revive economic growth. Minister of Energy and Resources, Gerry Brownlee, attempted to rationalise a number of mooted changes to the Crown Minerals Act protecting national parks and conservation reserves from mining operations. “The National-led Government is absolutely determined to raise our living standards. That is going to require a big improvement to our economic growth and productivity rates. We see our natural resources as playing a big role in contributing to those goals...I am committed to unlocking New Zealand’s mineral potential for the benefit of all New Zealanders, both present and future” (Brownlee, 2009).

What exactly the government had in mind was unveiled in March 2010, when it began actively
canvassing the idea of removing land from Schedule Four of the Crown Minerals Act, which prohibits mining on high conservation status land, in order to carry out prospecting for mineral deposits. When releasing a discussion paper\(^5\) proposing a number of measures to develop New Zealand’s mineral potential, Brownlee and the Minister of Conservation, Kate Wilkinson, indicated that a preliminary stocktake of Schedule Four land demonstrated (Brownlee & Wilkinson, 2010a):

- New Zealand is mineral rich and extraction could be undertaken in an environmentally friendly way
- the mineral wealth is often highly concentrated in high conservation areas
- Schedule Four lands could be mined with little direct impact
- there was inadequate information on the potential mineral deposits and the Government wanted to improve knowledge of the “mineral estate”.

The reaction to the Government’s proposal was swift and vociferous. Environmental and local community groups, celebrities and opposition political parties immediately lined up against the Government, the mining industry and big business interest groups to condemn any suggestion of encroaching upon land

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with the highest protected conservation status in the country.

**Schedule Four – origins**

Schedule Four stems from a series of reforms made to New Zealand planning and environmental laws in the late 1980s in the wake of a number of highly questionable resource-based projects implemented by the 1975-84 National Government. These resulted in a new Conservation Act in 1987 and the Resource Management Act in 1991. The former Act brought large areas of Crown land under the supervision of the newly-created Department of Conservation for primarily conservation purposes. More than 80,000 square kilometres or around 32% of the country is now public conservation land administered by the Department. Recreation and (appropriate) tourism were to be promoted by the Department, while all commercial activities had to obtain a “concession” from the Minister of Conservation if they were to be performed on conservation land. The Minister was to make a decision whether to grant permission for such activities by “weigh[ing] up a number of potentially competing values, amongst which conservation values were to predominate” (Bertram, 2011).

Mining, however, was treated differently because egress to Crown lands for mining purposes had for

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6 The Encyclopaedia of New Zealand, Protected Areas: http://www.teara.govt.nz/en/protected-areas/page-1
some time already been granted by a different minister under the former Mining Act. Mining was exempted from the Conservation Act and, instead, special “access” was arranged as part of the new Crown Minerals Act, which superseded the Mining Act in 1991. The Crown Minerals Act “sets the broad legislative policy for prospecting, exploration and mining of Crown-owned minerals in New Zealand” (Crown Minerals, 2010). Lands under the protection of the Department of Conservation were hence less protected from mining than from other commercial activities.

In 1997, the Crown Minerals Act was amended to create an absolute mining prohibition on protected land. The amendment included a Section 61 preventing the Minister of Conservation from approving access arrangements for any Crown-owned land in Schedule Four (also newly created by the amendment). The amendment was successfully guided through parliament by a National-led government with wide cross-party support. Approximately 750,000 hectares was added to Schedule Four in 2008 and was criticised by the mining industry for lacking consultation and bypassing any comprehensive analysis of the conservation values of the land or its mineral potential (Solid Energy, 2012).

**Arguments in favour of opening up Schedule Four land for prospecting**

The main parties in favour of prospecting for minerals on Schedule Four land included the Government, the
mining industry represented by Solid Energy and the Mining Industry Association, and Business New Zealand representing business interests in general. Their arguments were essentially economic and sought to play down any potentially adverse environmental impacts by referring to the limited scale of mining and the technology that could be used.

Speaking at the same conference in 2009 where Brownlee made his first public statement on the possibility of opening up conservation land for mining, Murray Stevens, the chair of the New Zealand branch of the Australasian Institute of Mining and Metallurgy, lauded Brownlee’s intention to open up conservation for prospecting: “This will be a renaissance for the industry. New Zealand has finally got a government which wants to see development of the mineral sector in a sustainable fashion.” Stevens also started a refrain that was to be repeated by mining proponents over the following months and meant to allay the fears of environmentalists: “The New Zealand mining sector has got an environmental record second to none in the world, which speaks for itself” (Hartley, 2009). Had audience members known about conditions at the Pike River coal mine on the West Coast of New Zealand’s South Island where 29 miners were killed the following year, they might have been forgiven for conflating with the country’s environmental record with its safety record and concluding that such a self-congratulatory tone was perhaps somewhat misplaced.
In supporting the idea of mining on Schedule Four land, Energy Minister Brownlee talked about “the potential for utilising more of the country’s valuable natural resources for the greater good” (Brownlee & Wilkinson, 2010). Brownlee proposed removing a total of 7,058 hectares of land from Schedule Four of the Crown Minerals Act, including some areas in the Coromandel Peninsula and the Inangahua sector of Paparoa National Park, and which represented 0.2% of all Schedule Four land (4.6m hectares in total). Of this, he suggested only 500 hectares might eventually be mined. “In fact, 500 hectares is smaller than what the Ministry of Agriculture and Forestry describes as an average New Zealand sheep and beef farm (550 ha),” Brownlee stated.

As a trade-off for removing 7,058 hectares from Schedule Four, the Government said it planned to add 12,400 hectares to the protected category, providing a net gain in protected land of 5,342 hectares.

While noting that mining in New Zealand was already a NZ$2 billion industry which contributed to export receipts and government revenue, Brownlee emphasised the high productivity of the industry which created “an average of $360,000 of GDP per worker, nearly six times the national average”.

Citing earlier stocktakes undertaken for the Ministry of Economic Development (since renamed the Ministry of Business, Innovation and Employment), the Government estimated total mineral wealth throughout New
Zealand to be worth NZ$194 billion (Ministry of Economic Development, 2010a). Of this, NZ$80 billion or 40% was estimated to be in Schedule Four land.

Phil O’Reilly, Chief Executive of Business New Zealand, went even further than government estimates and referred to “thousands of billions of dollars” in in-ground natural resources whose development “could create a step change in New Zealanders’ prosperity. “In taking stock of resources below the conservation estate the Government is acting judiciously on behalf of all New Zealanders,” O’Reilly added (TVNZ, 2010).

Reiterating the estimate of thousands of billions of dollars in natural resources, Don Elder, the Chief Executive of Solid Energy, which is a major New Zealand resource company, stated that New Zealanders wanted “...good jobs and a high standard of living. Smart well-managed use of our natural resources, combined with a conservation fund to create long-term environmental gain will allow us to have both” (Solid Energy, 2010).

Tony Kokshoorn, the Grey District mayor on the West Coast of the South Island where coal mining has been a traditional mainstay of the local economy, viewed mining as a “win-win” situation for the country because of the environmentally friendly technology that was available and the income that would accrue to the government coffers. Referring to current mining operations, Kokshoorn said “you don’t see any mining
if you drive the length of the West Coast...there’s such a vast area of rain forest that you wouldn’t notice if mining was happening...New Zealand is in the cart financially; if we want to have good health systems, if we want to have good education, we’ve got to tap into our mineral wealth as well” (Radio New Zealand, 2010a).

Professor Dave Craw, a geologist and environmental scientist from the University of Otago who researched the environmental effects of mining, stated in a Radio New Zealand interview that there will always be environmental effects related to mining, although he did not think they posed any great environmental threat in the long-term. Professor Craw referred to the gold mine in Reefton on the West Coast where technology provided for the arsenic-bearing ore to be transported elsewhere in New Zealand for processing to mitigate any serious impact on the Reefton environment. “I think you can minimise environmental impact using modern technology and using the science” (Radio New Zealand, 2010b).

Commenting after the final decision was made about mining on Schedule Four land, Chris Baker (2011), the chief executive of Straterra, the industry lobby group representing the mining and resource sector in New Zealand, took up the refrain first used by Murray Stevens that the mining today is green and could actually enhance the country’s clean and green image: “Done properly, the net environmental or conservation
effect of mining can be and should be positive.” Warming to this theme, Baker argued that the real threats facing Schedule Four land are pests and weeds, the eradication of which mining can contribute to. “Done properly, a by-product of mining could be much more conservation than can be afforded by government. It’s already happening. Seen this way, mining is more likely to enhance the New Zealand brand than detract from it.” The real problems on Schedule Four land inferred that New Zealanders were somehow confused over its true value; Baker stated that New Zealand did not know the “intrinsic” value of such land, although it appears from his comments that he was using the term in its financial rather than ethical or philosophical definition. A rigorous test of the economics involved in mining would demonstrate the benefit of opening up more protected areas for mineral extraction (Baker, 2011).

**Arguments against mining on Schedule Four land**

Lining up against the proposal were an array of politicians (both government and opposition), environmental NGOs, political commentators and bloggers, and independent scientists. Their arguments concentrated on the potential damage to the environment and New Zealand’s reputation and image in the rest of the world, the alleged distorted and poorly conceived economic argument used by the
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government, and its clumsy political management of the issue.

*Damage to the environment and New Zealand’s image*

“New Zealand is blessed with magnificent landscapes, rich forests, and a unique biodiversity. We have a proud history of protecting these precious places and the species that rely on them for survival. Over many generations, New Zealanders have fought hard to protect our National Parks and other conservation areas... It is these wild and natural places, protected from development, that underpin our valuable ‘clean green’ image and our tourism industry’s ‘100 % Pure’ brand. To put this at risk is folly in the extreme.” This is what the Green Party of Aotearoa New Zealand website stated about New Zealand’s unique nature in opposition to the proposal to mine on Schedule Four land (Green Party, 2010).

Referring to historical efforts to protect the environment, Green Party co-leader and Member of Parliament, Metiria Turei, told a crowd demonstrating against the Government’s proposal outside parliament buildings that “it was the people who created Schedule Four and protected those places, and it will be the people who save Schedule Four and those treasured places, and that’s you” (YouTube, 2010a). Another speaker at the same event stated that the mining proposal “touches our identity as a country. This is not
a country that mines its most treasured places, it is not a country that mines its national parks. It’s who we are, it’s what we believe in, it’s why we’re proud to be clean and green....The economy is not based on mining, it is based on looking after the land” (YouTube, 2010b).

The specific long-lasting environmental hazards of mining were focused on by Dennis Teag of the Coromandel Watchdog Group NGO. He said the mining industry liked to talk about the benefits of mining but rarely alluded to the drawbacks, including the very real environmental issue of tailings dams where millions of tons of toxic waste have to be stored in a containment facility forever (Radio New Zealand, 2010a). The cost of cleaning up if they go wrong was incredibly large, such as the $17.5m required to remediate the damage incurred at the Tui copper, lead and zinc mine on the western slopes of Mount Te Aroha in the Kaimai Range of the North Island and considered to be the most contaminated site in the country. It was abandoned in the 1970s, but Teag claimed the remedial work would probably not be effective anyway.

Auckland Central MP Nikki Kaye, representing the ruling National Party in an electorate that traditionally votes Labour, spoke out against her own party’s plan to remove Schedule Four protected status from part of Great Barrier Island, which is part of her electorate, and open it to mining. “My personal view is that when environmental and economic factors are taken into account, and given the island’s status in the Hauraki
Gulf Marine Park, mining on Great Barrier Island doesn’t stack up,” she said (TV3, 2010).

Auckland mayor and former National Party MP and cabinet minister, John Banks, agreed with Kaye. He said Great Barrier Island was “the untouched jewel in the crown of the Hauraki Maritime Park” and that mining the island would be a “serious blow to the established economy that depends on the area’s un tarnished image” (Radio New Zealand, 2010a). Banks stated that there were more jobs in ecotourism than in open cast mining and that the infrastructure required to mine Great Barrier Island would be devastating to the local environment.

The potential damage to New Zealand’s “clean, green” reputation was highlighted by The Economist. “In many ways, the dilemma New Zealand faces is no different to that of other rich countries—how to balance economic growth with the need to address environmental degradation. But it is particularly acute in a country so dependent on the export of commodities and landscape-driven tourism. The difference between New Zealand and other places is that New Zealand has actively sold itself as “100% Pure”. Now that New Zealanders themselves are acknowledging the gap between the claim and reality, and the risk to their reputation this poses, it is time for the country to find itself a more sustainable brand, and soon” (Economist, 2010).

Kevin Hackwell, Forest and Bird Advocacy Manager, told Radio New Zealand’s Kathryn Ryan that economic
analysis showed that mining Schedule Four land could have had an impact on the 100% pure image to the extent that it would lower GDP by 1%, as the rest of the economy, such as the wine, horticulture, agriculture industries, etc., leverage off the 100% pure brand (Radio New Zealand, 2010b).

Forest and Bird had previously said that leaked information demonstrated that the Government had originally intended to remove up to half-a-million hectares from Schedule Four, but had pared this figure back to just over 7,000 hectares for fear of a massive backlash from the New Zealand public. Even the sweetener offered by the Government to add an extra 12,400 hectares to Schedule Four in compensation was denounced by Hackwell. He said the additional land had been proposed for protection back in 2008 (i.e. before the National Government came to power) and had simply been awaiting official designation. “They should not be seen as trade-offs for high-value conservation land being removed from Schedule 4 because none of the expected 12,000 hectares has significant mining potential” (Gay, 2010).

Hackwell also attacked the Government’s proposal to set up a contestable environment fund to include 50% of the royalty revenues from minerals, to be capped at NZ$10m a year, when NZ$53m had been cut from the Department of Conservation’s budget over the previous four years. “The proposal is proof that the Government fails to see the value of conservation land
– for tourism, for recreation and for the unique plants and animals it protects” (Forest & Bird, 2010).

**Questionable figures**

The numbers touted by the Government in relation to expected income from mining were subjected to intense scrutiny by independent scientists, journalists and commentators. Wanaka-based consultant geologist Stephen Leary, who had worked in New Zealand, Australia, Europe, Canada and South America, said some of the figures proffered for individual conservation areas in the Government’s geological reports were “misleading” because they were “wildly optimistic” and had not been backed by exploration (Williams, 2010). “The numbers they’re throwing around, the value of the mineral wealth in Stewart Island and Great Barrier Island – it’s basically just made up,” Leary said. “People might go, ‘Well, maybe it’s worth mining Stewart Island because $7b is a lot of money’, whereas in fact there’s basically no way there’s $7b worth [of minerals] there. What it’s doing is misleading the public” (Williams, 2010).

Prominent political commentator and blogger, Russell Brown (2010), criticised the Government for not undertaking a robust cost-benefit analysis and Minister of Energy Brownlee in particular for propagating estimates of mineral reserves with little scientific foundation. He referred to fellow blogger Keith Ng’s critique of gold prices – on the basis that gold was the
most commonly cited mineral in the Government’s discussion paper – whose value fluctuates greatly depending on prevailing economic conditions, and Brownlee’s allusion to the overall productivity of the mining sector.

Ng (2010) had written: “Here’s what Gerry [Brownlee] did. He took the total worth of the mining sector, then divided it by the number of people it employed. It does not mean that more mining = higher productivity. It just means that mining is very capital-intensive and employs relatively few people, which are fairly obvious facts”.

Brown remained realistic about the need to pay off public debt and reduce the Government’s fiscal deficits, as well as the hypocrisy of using mineral resources mined in other countries, “[b]ut if I’m to be asked to swallow a proposal whose implications stretch out for tens or hundreds of years, I expect far better than to be told by a minister that he is totting up that future on the back of a bloody envelope” (Brown, 2010).

Another prominent political commentator, Gordon Campbell (2010), was also highly critical of the indicative figures used by Brownlee, arguing that it encourages mining companies to exaggerate estimates in order to get government backing for drilling in sensitive ecological areas to find out whether the said estimates were correct or not. “Does that sound responsible – or does it sound more like the government is playing Russian roulette with the conservation estate?” asked Campbell.
He also criticised the estimated value of the tiny area of Schedule Four land (NZ$60 billion on 7,058 hectares) compared to the estimate of NZ$194 billion for New Zealand a whole. “It doesn’t make sense. Either these estimates are completely cockeyed – or else some very heavily intensive mining of these areas is being contemplated” (Campbell, 2010).

The problem as Campbell saw it was that the Government relied exclusively on the work of a single mining industry consultant who had admitted that his figures represented a ‘back of the envelope exercise’. “Even then, this figure [NZ$194 billion] is for gross worth. It bears no relation to the figure that would actually accrue to New Zealand, once foreign-owned mining companies have extracted the mineral wealth, and taken the lion’s share of the profits offshore” (Campbell, 2010).

This issue of the direct financial benefit to New Zealand was one pursued by Radio New Zealand host Kathryn Ryan. Asked what the expected government royalties would be from minerals extracted by a foreign-owned mining company, NZ Minerals Industry Association Chief Executive Doug Gordon said the direct return to the country would be a 5% accounting profit on gold and silver or a 1.5% gate profit – one or the other (Radio New Zealand, 2010a).

During a subsequent interview, Radio New Zealand business commentator, Rod Oram, said the thousands of billions of dollars talked about by Solid Energy and
Business NZ was “completely over the top” (Radio New Zealand, 2010c). Mining would be mostly undertaken by foreign companies and while export figures would be very impressive as a result, the question remained how much of that money “sticks to the ribs” of the New Zealand economy. It was hard to calculate, Oram said, how much of mining exports would accrue to New Zealand.

Oram was critical of the Government for not outlining a plan for dealing with a potentially substantial flow of money into the New Zealand economy. He noted that the United Kingdom had not been sensible enough to ring-fence income from its North Sea oil and gas deposits and use it as a fund to invest elsewhere in the economy. Norway, on the other hand, had invested its oil profits wisely.

**Government mishandling of the debate**

Whatever the relevant merits of the arguments put by the opposing camps, observers from both camps were sometimes united in their criticism of the Government’s mishandling of the issue. While there was general agreement that the state of New Zealand’s finances were dire and required innovative solutions, there was a general consensus that the Government had picked the wrong fight by advocating increased mining of mineral reserves and had communicated its intent poorly.

Left-wing commentator Andrew Campbell said the Government had failed in its communications, its
groundwork on the issue and its overall policy, which was opposed by the majority of New Zealanders (Radio New Zealand, 2010d), while right-wing commentator Matthew Hooton expressed frustration that by pushing for an increase in traditional mining production the National Party had not lived up to its election campaign promise to deliver innovative change to the economy (Radio New Zealand, 2010e).

Echoing Hooton’s comments, Keith Ng (2010) said the Government’s proposal was “a giant leap backwards.”

“We’ve spent so many years talking about the knowledge economy, moving up the value chain, selling ideas and knowhow rather than soil nutrients... and now the vision for a more productive New Zealand is digging shit up and cashing it in?

“We know exactly why we can’t rely on the primary sector in the long-term. The more you squeeze out of the land, the harder you need to squeeze to get the next dollar out. It means that growth becomes harder, and we’ve said for years that moving up the value chain – agriscience, biotech, etc. – was the way forward,” wrote Ng.

For Russell Brown (2010), the Government’s approach to process was “feckless”, reflecting its proclivity not to think issues through thoroughly before promoting a policy publicly.

While Radio New Zealand business commentator, Rod Oram, was generally in favour of mining because
New Zealand could not morally accept the benefits of other countries mining when it did not mine its own land, he expressed incredulity that the Government wished to pick a fight over land that might produce NZ$18 billion of income (as a proportion of conservation land potentially earmarked by the Government, i.e. 500 hectares out of 7,058 hectares) when it could mine other land that did not have any of the pitfalls of Schedule Four (Radio New Zealand, 2010c).

This point about why the Government would pick a fight over such a highly contentious issue was picked up subsequently by Wellington barrister and environmental law lecturer at Victoria University in Wellington, Tom Bennion, when reviewing legal access to minerals in 2011. He asked why mining industry groups did not seek to debate access to Schedule Four lands during the many months that Government was reviewing Schedule Four before Brownlee made his proposal public. “The industry’s silence may indicate that it does not appreciate the minister’s bold initiative, which brought thousands out onto the streets to protest against mining” (Bennion, 2011).

The Commissioner for the Environment delivers her opinion

Not long before New Zealanders took to the streets in force in Auckland on 1 May 2010 to protest the Government’s proposal – an estimated 40,000 people took part in the protest, which “in a country with
an estimated population of 4.4 million...was an overwhelming display of public sentiment” (Rudzitis & Bird, 2011) – the country’s politically independent Commissioner for the Environment, Jan Wright, publicly opined that the Government had failed to make a case for opening Schedule Four land to mining. Her official submission on the Government’s discussion document criticised the lack of information available about the conservation value of the land and the benefit to New Zealanders of mining it: “These areas have been set aside as some of our most precious conservation land and before we can even begin to discuss mining it in any rational manner we need a lot of good information which simply hasn’t been made available” said Wright (PCE, 2010a). “The onus ... is on the Government to prove beyond reasonable doubt that the mineral values below the land justify the risk to the conservation values above the land. The information contained in the [Ministry of Economic Development] discussion document does not meet this test.”

Wright was also highly critical the problems raised by the issue accompanying the proposal to water down the powers of the Minister of Conservation by legislating for access to conversation land to be jointly decided with the Minister of Energy. “Such a move would unfairly privilege mining and compromises the role of the Conservation Minister who holds the conservation estate in trust for the public.”
In September 2010, Wright issued a more detailed analysis of the issues stemming from the Government proposal and which made recommendations for clarity through legislative change. She labelled the public debate over Schedule Four “somewhat muddled”, but since the Government had backed down from the issue in July 2010, Wright focused her analysis solely on the Government’s stated intention to pursue other opportunities for expanded mining on public land, including the sixty percent of the conservation land managed by the Department of Conservation not listed in Schedule Four (PCE, 2010b).

Wright noted that there were legitimate arguments justifying mining (“[t]he conservation estate is a major Crown asset and the Crown is justified in seeking a return on this asset”), including the potential for a net conservation benefit derived from mineral extraction in the form of extra revenue for the Department of Conservation to improve pest control (an argument subsequently latched on to by Straterra chief executive Chris Baker – see above). However, Wright also pointed out that the campaign to remove conservation land from Schedule Four had eroded public confidence in mining on the other sixty percent of the conservation estate.

**Transparency of information and discussion process**

The Schedule Four – Discussion Paper stated that the Ministry of Economic Development and the Department
of Conservation were “now seeking input from the community before making decisions about ... policy initiatives set out in this paper. These actions aim to make the most of New Zealand’s mineral resources in an efficient and environmentally responsible way” (MED, 2010a).

All of the discussion documents were published on the Ministry of Economic Development website.

Public feedback was received over an eight week period beginning from the date of publication (March 2010) up until 26 May 2010. The consultation process initiated by the Government sought feedback from the public on a number of areas proposed for removal from and addition to Schedule Four. The Government stated:

“No decisions have yet been made. The results of the stocktake are presented in a discussion paper, on which public feedback is being sought. After receiving and considering submissions on the discussion paper, Cabinet will decide on any changes to Schedule 4 in the third quarter of 2010 ... The Government is also seeking feedback on proposals for a new contestable conservation fund, a proposal to further investigate New Zealand’s mineral potential, and changes to Crown land access arrangements.” (MED, 2010b)

The submission questions for the general public were clear, simple, and structured so that the answers could be analysed quantitatively.
Final decision

Results of the public feedback process

The final decision was based upon the outcomes of the consultation process; these reflected the views of a huge number of organizations, as well as individuals (although a large number of these were presented via pro forma submissions).

As a Government media release on 20 July 2010 stated: “The Government was undertaking a genuine consultation process and had not made up its mind on any of the matters prior to the eight week discussion period which began on March 22. … The government received 37,552 submissions … and the vast majority of submissions were focused on the proposal to remove 0.2 per cent of land from Schedule Four to allow for wider mineral prospecting on those sites.

“Most of those submissions said we should not remove any land from Schedule Four. We heard that message loud and clear” (Brownlee & Wilkinson, 2010b).

Outline of the final decision

In July 2010, the Government confirmed it no longer planned to remove any land from Schedule Four of the Crown Minerals Act for the purposes of further mineral exploration or extraction. Instead, it would focus its efforts on exploiting New Zealand’s mineral wealth in areas that fall outside conservation areas. The reason
for this decision was that the Government received more than 37,000 submissions after launching a discussion document, resulting in public protest actions, including large street demonstrations. As the opposition leader, Phil Goff, said, the Government was “forced to drop the plans because of the public outcry” as “New Zealanders did not want to see their pristine conservation estates and their national parks dug up for mines” (quoted by Watkins, 2010). New areas were to be added to Schedule Four by October 2010 as originally planned.

However, the Government still saw a silver lining to the outcome, as Energy Minister Brownlee said: “I suspect few New Zealanders knew the country had such considerable mineral potential before we undertook this process and I get a sense that New Zealanders are now much more aware of that potential and how it might contribute to economic growth” (Watkins).

Ex post facto analysis of the economic case for mining Schedule Four land

Geoff Bertram (2011), a Senior Associate with the Institute of Policy Studies at Victoria University in Wellington, looked at the economics of the Government proposal as part of a symposium on the Schedule Four debate in August 2010 following the final Government decision on the issue. He wrote up his findings for publication in 2011 in which he began with a reminder
of the “resource curse” concept, which holds that countries overly reliant on resource-based exports tend to grow more slowly than the average. Associated with the damage minerals booms do to growth is the tendency to unwittingly encourage “rent-seeking” whereby large mining companies fund large-scale lobbying to extract special favours from government, which in turn distorts policy regimes to the detriment of the rest of the economy. Although mining in New Zealand has not been large enough to make the resource curse a destabilising factor in macroeconomic issues, there are nevertheless issues of “diffuse negative spillovers from mining...such as damage to the national branding of pastoral and tourism exports, loss of the existence and option values of natural landscapes and ecosystems, and the potential for regulatory capture by large mining interests” (p. 14).

New Zealand had faced such distortions under the 1975-1984 National Government when it embarked on a series of large resource-based projects under its much derided “Think Big” programme, e.g. exploitation of the huge Maui gas field in the Tasman sea off the coast of Taranaki as a way of countering the oil shocks of the 1970s. Later governments sought to remedy the negative impact Think Big had on the regulatory system by recalibrating planning and environmental law via a new Conservation Act in 1987 and the Resource Management Act in 1991 (see above). The anomaly represented by mining activities, which the Minister of
Conservation had no power over, was remedied by amendment of the Crown Minerals Act 1997 with the creation of Schedule Four “as a device to reduce regulatory uncertainty” by “removing the highest-value categories of [conservation] land from consideration for mining” (Bertram 2011, p. 15). The credibility of such protection, however, is seriously undermined when industry lobby groups, or those who believe they would be doing these groups a service, pinpoint an opportunity to circumvent or nullify these types of rules. This was indeed the case with Schedule Four because it gives the ministers responsible the option of removing protected areas from the schedule by means of a simple Order in Council “following a consultation process that might easily be reduced to tokenism” (p. 15). According to Bertram, the furore triggered over the status of conservation land protected by Schedule Four in 2010 showed that removal from such protection should be decided by a parliamentary vote and the Crown Minerals Act should accordingly be amended.

Turning to the actual value of Schedule Four minerals, Bertram used as a starting point the only dollar figure the Government provided in its discussion document: NZ$194 billion. However, this was merely an estimate of the gross revenue from the extraction of all “on-shore minerals, excluding hydro-carbons”. Using 2002 and 2003 Statistics New Zealand estimates of the rental value of the country’s mineral estate, i.e. after
subtracting all relevant costs (exploration, development, transportation, etc) to establish the net income that total mineral resources could yield, Bertram found that the lump-sum valuation of the entire mineral estate was less than NZ$2 billion, or less than 1% of the Government’s gross sales revenue figure. As the Government’s 2010 stocktake included only 10% of New Zealand’s total mineral reserves, they would equate to less than $200 million or not even $70 for each of New Zealand’s 2.8 million voters. Even if all Schedule Four land were opened up for mining, which would be roughly equal to 40% of the mineral estate, the country could expect to make only $400 million, or $143 per voter.

Coming to the issue of specific spillovers or externalities stemming from mining protected land, Bertram referred to two earlier studies which showed that a major negative shock to New Zealand’s “brand” as a ‘clean and green’ and ‘100% pure’ nation in terms of real or perceived environmental damage could have a big economic impact by substantially reducing overseas tourism. The potential negative impact on GDP from a loss of image could be as much as 1-2%.

Prospects for expanded mining in future

Despite the Government’s climb down over its mining plans, it had not lost its appetite for expanded mineral
exploration. According to Brownlee, the advantage of the discussion process was that it identified where the mining industry could and could not go. “As many people have pointed out, around 85 percent of the country is not protected by Schedule Four and a great deal of that land has mineral potential” (quoted by Watkins, 2010).

“New Zealanders have given the miners sector [sic] a clear mandate to go and explore that land and, where appropriate, within the constraints of the resource consent process, utilise its mineral resources for everyone’s benefit,” Brownlee said.

The Government would conduct a significant aeromagnetic survey of non-Schedule Four land in Northland and on the West Coast of the South Island to learn more about which areas have the highest concentrations of valuable minerals.

Issues from a global perspective

This New Zealand case study provides an example of issues that are writ large on a global scale: how to sustainably benefit economically from the exploitation of non-renewable natural resources?, at what cost to the natural environment should mineral extraction take place?, how should civil society and all relevant stakeholders be engaged in a discussion over the efficacy of mining?, and what is the best and most effective regulatory framework that avoids the potential danger of the “resource curse”?
What were “success” factors that led to the rejection of the purely economically justified political strategy under specific New Zealand conditions? These factors included the following:

- Accountability: the importance of a rigorous assessment of the country’s economic potential (from a mineral resource point of view), called a ‘stocktake’ on the one hand – or in this particular case the recognition that such assessment was lacking in rigour – and a thorough examination of public views on the other. Ultimately, Government representatives proved accountable to the general public and conceded that its argument had been weak and therefore had not convinced the voters to back it.

- Transparency: the importance of a democratic consultation process – “hard data” from the stocktake (mostly relating to the economic value of minerals) were supplemented by “soft data” on the intrinsic value of culture and the environment (conservation), and contribution to the New Zealand economy of its ‘100% pure’ brand image with the benefits that accrue from tourism and recreation, and which finally appeared from the point of view of local communities to be more beneficial.

- Openness: the importance of having a dialogue with a wide range of industry groups, individuals,
civic associations and NGOs in the country, which resulted in a diversity of viewpoints on the issue. The communication process is of particular interest in this case study and could be analysed further from the perspective of applying it to less or newly democratic societies.

- **Intrinsic value:** Even though New Zealanders overwhelmingly voted into power a conservative government in 2008 which promised to focus on the country’s economic needs, the anti-mining debate was nevertheless driven by a strong sense of the intrinsic value of the country’s conservation estate and an inherent understanding that whatever financial benefit could be literally extracted from protected land could not possibly outweigh the benefit of leaving that land intact.

**Was the final result based on radical ideology?**  
**What were the general benefits of the consultation process?**

- Although the pro-mining lobby accused the anti-mining camp of being overly emotional over the issue, it was clear that a wide spectrum of the New Zealand public was against the Government’s proposal, including NGOs, both government and opposition politicians, professional commentators, and academics etc. These groups were simply following a long New Zealand tradition that placed higher value on an unspoiled natural environment
than short-term financial gain. As Bertram noted, “the existence values of landscapes and ecosystems...are no less real than commercial values, and it is not helpful to dismiss them as ‘emotion’, since human welfare is ultimately experienced as happiness by individuals and it is this that economics seeks to maximise” (Bertram, 2011, p. 2).

• Although protests of the size and scale of the anti-mining demonstrations are relatively rare in New Zealand, the opposition provoked by the Government mining proposal fits in with a wider global reaction against the perceived interests of the wealthy “elite”. According to O’Brien (2012), the protest, especially among the grassroots, “may represent a reaction to the prioritization of economic development over environmental protection undertaken by the right of centre National led government” (p.649). The protests should not be construed as “radical”, however, as past support for environmental issues among the general public in New Zealand has been tempered by the understanding that economic performance should be maintained. This is true of the mining issue in New Zealand where the public is generally comfortable with coal mining and quarrying for aggregates for the construction and roading industries (Bertram, 2011).

• In this case, rather than generating an insoluble conflict, a better understanding of the country’s
mineral estate and its potential worth to the New Zealand economy was created: including the value of environmental “services” (sometimes subjectively perceived).

• Gaps in knowledge and information were highlighted, sometimes to the embarrassment of the Government, which were quickly filled by a range of expert commentators.

• Light was cast upon the way government decision-making procedures work, with the result that proposals for greater legislative clarity were put forward that would provide more regulatory certainty and transparency in future.

• Considerations regarding the improvement of technical mining procedures were started.

**Was the philosophical debate over the efficacy of mining for minerals in general resolved?**

• Mining the conservation estate in New Zealand was emphatically rejected on both environmental and economic grounds, i.e. the damage to New Zealand’s image would have serious ramifications for one of its main income earners – tourism

• The economic argument for mining more non-scheduled areas became more readily accepted

• There was growing awareness of the moral gap between rejection of mining in New Zealand and acceptance of products derived from mining in other countries
• The stirrings of a debate over how to best use future potential income from mineral resource exploitation began, e.g. establishment of a special purpose Conservation Fund.

Positive outcomes to be learned from

Although the way the debate was conducted clearly exasperated parties on both sides, the whole process might be considered as positive:

• it triggered a deluge of analytical commentary on the pros and cons of mining the conservation estate and contribution of the mining industry to the New Zealand economy
• both sides probably felt they had been given ample opportunity to voice their arguments, even though the Government may have regretted the way it handled its communication campaign (which may have been the result of relative inexperience after having only recently won an election for the first time in nine years)
• although shortcomings in the regulatory process were highlighted, a comparatively large number of New Zealanders felt confident enough about influencing the outcome to participate in the public consultation process. Democratic dialogue was respected
• the debate promoted a thorough and thoughtful discussion of conservation values, and went some
way toward demarcating the distance to which New Zealanders are prepared to go to encourage economic growth at the expense of the environment

Conclusion

The heated debate in New Zealand over the benefits of mining for minerals on the conservation estate was a symptom of wider global economic forces that place an especial emphasis on economic growth at almost any cost. While there is a very legitimate debate to be had over the intrinsic and economic value New Zealanders place on their landscape and environmental heritage and what role mineral extraction should or could play in that, the arguments used by the government to justify the potential exploitation of conservation land were clearly not seen as credible by most New Zealanders. The government may not have abandoned ideas of revisiting the issue in the future, but regardless of the action it takes and the strategies it adopts, the whole debate has triggered a wider ranging philosophical and political discussion over the way the environment is perceived and whether decision-making processes relating to environmental protection reflect the high ideals and democratic traditions that New Zealanders aspire to.

Questions and proposed methods for further research

The communication process could be investigated in more detail: what are the links between the most
important factors involved in economic development ("economic development" should not be considered "mining" itself, but rather "technological progress" in the mining industry, the process of collation and utilisation of geological data, an appropriate breakdown of mining data at the aggregate level, and the interlinking of the mining industry with other sectors, e.g. recreation, tourism, agriculture, viniculture), and the number, diversity, and value orientation of the responses in the Summary of Submissions (MED, 2010b)?

- What are the subjective values of the environment? How could they be used as a counter-weight to economic values?
- What are the economic counter-factuals to the primary economic argument for mining? What is the opportunity cost?
- Institutional procedures and official decision-making processes (going on in the ministries and other institutions concerned) versus the democratic process (on the part of civic society) – what were the differences? Were there any correlations?
- Does New Zealand have an advantage or disadvantage in comparison to other democratic societies in these types of public participatory consultation processes because of its small size? Is New Zealand unique in its desire to protect its
landscape at the cost of potentially enhanced economic benefit from exploitation of such natural resources?

- Did the proposed removal of Schedule Four status from some lands represent “a significant challenge to the prevailing conservation paradigm” in the face of wider global challenges to protected areas from increasing “global commodity demands and local land pressures”? Is this the thin end of the wedge in terms of moving away from protected conservation status (Mascia & Pailller, 2010)?

References


YouTube. (2010b). A montage of a mining protest that was held outside Wellington parliament on 30 March
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Additional Resources

Video clips/Documentaries

TV3 News: Mining in the Denniston Plateau Likely 22 November 2011 9m35s http://www.youtube.com/watch?v=j84OKs4K2r4

Useful web sites

Coromandel Watchdog: http://watchdog.org.nz/info/fact-sheet-resources/
Forest and Bird: http://www.forestandbird.org.nz/
Straterra. The industry group representing the New Zealand minerals sector: http://www.straterra.co.nz/
Too Precious To Mine: http://www.2precious2mine.org.nz/
Chapter Five

Water scarcity in Jordan

Andrew Barton

Introduction

Why is water so important to us? Firstly, it is one of the fundamental requirements for human physical survival along with oxygen, food, shelter and sleep. It is one of the basic human rights guaranteed by the United Nations. According to the UN Human Rights Council, “the human right to safe drinking water and sanitation is derived from the right to an adequate standard of living and inextricably related to the right to the highest attainable standard of physical and mental health, as well as the right to life and human dignity” (OHCHR, n.d.).

For basic physical survival, a human requires something between 2 and 5 litres of water per day. If we add the water needed for cooking and washing, then a Bedouin tribe from the Middle East can make do on roughly 20-30 litres of water per day, while sedentary populations require an absolute minimum of 100 litres per person a day for safe hygiene and an adequate
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standard of living (Mohsen, 2007). Domestic households in developed countries typically require about 250-350 litres a person in Europe and over 500 litres in North America.

But it is not only a basic factor in the maintenance of human lives and the life of every organic life form on the planet, it is also essential to every other aspect of human life from cooking and cleaning, to transport and energy, to climate and food production, to carbon sequestration (the oceans act as a vital carbon sink and hence are becoming more and more acidified), to our religious rituals (think of the Catholic Church’s use of holy water or the ablutions required of Islam before prayer), to our physical landscape (our coastlines, lakes, rivers, glacial valleys, etc) and to our mental landscape (our art, poetry and literature is full of water images, e.g. Strauss’s The Blue Danube, Smetana’s The Moldau, etc).

The human body itself is composed mainly of water: about 75 to 80% of babies, to between 50 and 65% of adults, while our brains are composed of up to 85% water (Chemcraft, n.d.). The planet’s surface is made up of 71% water, but only 0.03% of this is available to us as fresh water. Of the 1,386m km3 of water on the Earth’s surface, 96.5% is made up of the oceans, another 1% is saline ground water, and only 2.5% is fresh water. Of that 2.5%, 68.7% is locked up in the polar ice caps, 30.1% is found in groundwater, and 1.2% is surface water (Chemistryviews, n.d.).
Globalisation aspects of access to water

In every corner of the modern globe, water is to a greater or lesser extent a crucial raw material for practically all economic activity. Around the planet, up to 92% of water is used for non-household purposes, mostly in the agricultural sector. Growing a sufficient amount of food for a human adult requires around 300 metric tons of water a year, i.e. nearly a ton a day (Mohsen, 2007). If this water does not arrive through natural precipitation, then it has to come via human constructed irrigation conduits – irrigated agriculture is responsible for 69% of global water consumption.

Industry also consumes enormous amounts of water for washing, diluting, cooling and production of steam. Highly industrialised economies therefore harness most of their water for such purposes where water often also provides an important source of energy via hydroelectric power generation in large-scale dams, as well as a vital means of transport. As the natural habitat for planetary piscine life all countries that are able to heavily exploit their water resources as a source of food, and for the countries with the most highly developed economies, water is a natural draw card for recreational and tourism activities.

All these activities have a great impact on the world’s water reserves and in particular on its limited resources of fresh water. As the world economy becomes more
and more globalised and integrated in order to meet the demands of an ever increasing population, water consumption increases accordingly, placing pressure on the drinking water supply. In “water poor” nations, competition increases between people and commercial activity over dwindling supplies of potable water – water is diverted toward irrigation for expanded food production, to upmarket hotels and golf courses to cater to rising numbers of wealthy tourists, and to new industries to provide the consumer products demanded by the global market. But the impact is not only on the increased volume of water used. Expanded agricultural activity not only consumes more water but also pollutes remaining water supplies with the run-off of chemical fertilisers, while large scale irrigation schemes can destroy natural water ecosystems; greater industrial consumption of water creates greater amounts of waste water that can overwhelm sewage and water purification plants; rapidly expanding populations in water stressed countries place overwhelming pressure on water delivery systems; and over-pumping of groundwater supplies can dramatically increase salinity levels and render water unfit for human consumption.

In terms of water stress levels, it is generally considered that countries with annual supplies of 1,000-2,000 m³ per person are water-stressed, with 1,000 m³ thought to be the minimum per capita requirement of a moderately developed country.
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(Mohsen, 2007). Societies with less than 500 m3 per capita are said to suffer from absolute scarcity, so this “lack of water then requires application of expensive technologies and becomes a constraint on food production, social and economic development, and protection of natural systems” (Mohsen, 2007, p. 32).

It is generally accepted that we face a global water crisis, elements of which can be summed up as follow (Medina, 2010):

- More than 2.4 billion people have no access to sanitation and more than 1.2 billion lack potable water.
- Even under the best circumstances, the sanitation deficit could be reduced to only 1.9 billion people by 2015.
- Conservation or efficient water management is not encouraged by the low price of water.
- Climate change will have a dramatic impact on water supplies in future, although there is huge uncertainty as to the effects it will have on individual regions, making it extremely difficult to plan adequately for the future.

Few regions in the world are immune to water stress and there is the fear that open conflict could break out over water access, if not between states then between sub-national groups, like farmers and urban dwellers.
Water in the Middle East

The climate in the Middle East is classified as “arid”, with low precipitation and high evapotranspiration, i.e. a large swathe of the region receives less than 200mm of rainfall per annum and potential evaporation of surface water of over 2000mm (Alqadi & Kumar, 2011).

It has very few rivers: the Euphrates and the Tigris are very important sources of water for the whole region, while the shrinking levels of the Jordan and its tributaries are of use to the west of the region only.

The relative decline of water supplies due to more frequent droughts and a burgeoning population has increased political conflict. It is expected that the population of countries in the Arabian Peninsula, for example, will double over the next 50 years to 600 million. Some of these countries are already extracting over 75% of their total renewable water resources (Medina, 2010). Israel has about 300 m3 of fresh water per person per year and Kuwait a mere 1 m3, while in the Gaza Strip in Palestine it is estimated that 90% of the local water supply is undrinkable as a result of pollution and increased salinity (Alqadi & Kumar, 2011). This problem is aggravated by the continuing historical tensions between the Arabs and the Israelis. Tensions over water even played a part in the Arab-Israeli War of 1967 due to a dispute over the diversion of the River Jordan and the sabotage of water pipelines...
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(Black, 2010); the post-war gains of Israel provided it with control over the headwaters of the Jordan and the aquifers of the West Bank and hence strengthened its overall geostrategic position in the region (Alqadi & Kumar, 2011). But despite such conflicts, water can also serve as a point of agreement; the Israeli-Palestine water commission, for example, is the only joint committee created by the Oslo Accord that still exists today, while Israel and Jordan have worked together for years on managing the Sea of Galilee located in Israel but near the Yarmuk River, which demarcates the border between the two countries (Black, 2010).

**Water in Jordan**

**Water availability**

Jordan is classified as a water scarce or water poor nation and is ranked number ten in the world in relation to its water shortage (Hadadin, Qadish, Akawwi, & Bdour, 2010). It has been facing water deficits since the 1960s. In 1996, Jordan had 175 m³/y per person, which was 20% of the world’s water poverty level (anything below 1,000 m³/y classifies a country as water-poor). If current trends continue, by 2025 the water supply per capita will fall to 91 m³ (Mohsen, 2007).

Overall, about 80% of the country receives annual rainfall of less than 100mm, 12.5% receives between 100 and 200mm, 3.8% between 200 and 300mm, 1.8% between 300 and 500mm, and only 1.3% of
Jordan receives more than 500mm per year (Hadadin et al., 2010).

Total rainfall in 2004/2005 was roughly 9,304 million m³ (MCM) of which between 85% (Mohsen, 2007) and 93.9% (Hadadin et al., 2010) evaporates, and only 3.9% of rain filters through to recharge groundwater.

**Climate**

The amount of rain that falls in Jordan in the north is mainly influenced by orography (the topographic relief of mountains), with rainfall in Galilee and Jerusalem (which are about 800m above sea level) exceeding 600mm per year, while rainfall in the Jordan Valley (in the range of -400 to 0m) is less than 200mm per year (Black, 2010) (as a measure of how little water this is, a viable level of rain-fed agriculture is 400mm per year, i.e. it’s impossible to farm below that level (Medina, 2010)). By way of contrast, the south is exceedingly dry and rainfall is not influenced by mountain topography. Ma’an, for example, is 1,069m above sea level but receives less than 100mm of rain per year (Black, 2010). This north-south contrast is the result of the differences in trajectories of depressions that bring most of the winter rainfall to the Middle East: in the north they bring moist Mediterranean air and therefore cause it to rain, while in the south the same depressions bring dry desert air from the Sinai and hence almost no rain (Black, 2010).
Climate change will probably bring a reduction in rainfall at the peak of the rainy season by the end of the century.

**Surface water resources**

Jordan has three large rivers, the Jordan, the Zarqa and the Yarmouk, but all have become highly undependable. The River Jordan is the main water source for both Jordan and Israel, but as it is saline (salty), it is not suitable for drinking or irrigation without undergoing filtration first. It is also small in comparison to other major rivers – the natural discharge of the Jordan River basin of approximately 1,500 MCM is 65 times less than the Nile’s and 400 times less than the Mississippi’s (Black, 2010). There is also huge variability in discharge year on year from the River Jordan, with reductions of up to 40% in drought periods. It has also been reduced to “nothing more than a creek” (Hadadin et al., 2010) as a result of upstream diversions and over-pumping by Syria and Israel (Mohsen, 2007). The River Zarqa meanwhile receives large amounts of municipal, industrial and agricultural effluent, making it close to unusable for domestic and irrigation purposes during the dry season, while the River Yarmouk, while less stressed, is also a receptacle for municipal wastewater (Hadadin et al., 2010).

With relatively few surface water resources available, there are not surprisingly few dams and reservoirs in Jordan. The largest reservoir is the King Talal
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Dam, but it faces the dual problems of erratic river flows that reduce the trapped water level below the dam’s capacity of 86 MCM, while pollution from factories dumping wastewater into tributaries leading to the dam raises its salinity and chemical and metal levels (Mohsen, 2007).

**Groundwater resources**

It is groundwater stored in aquifers rather than surface water that provides Jordan with most of its domestic water supply. It is the only source of water in some areas of the country. The depth of groundwater is highly variable, ranging from 2 to 1,000m, and the main reserves are found in the south with a long-term safe yield estimate of about 90 MCM per year for 100 years (Alqadi & Kumar, 2011). The total long-term safe yield of all renewable groundwater resources in Jordan from 12 groundwater basins comprising several groundwater aquifer systems has been estimated at 275 MCM (Mohsen, 2007). However, exploitation of this water resource is not without its problems, as salt levels vary between aquifers from 170 to 3,000 parts per million as a result of surrounding geological formations (calcium, magnesium and sodium leech into the water to various degrees, making the water “brackish”) (Alqadi & Kumar, 2011). “Each source of groundwater needs to be considered independently in order to achieve effective management of the risk of salinity associated with each formation’s chemistry” (Alqadi & Kumar, 2011, p.1020).
There are also non-renewable fossil water supplies (i.e. resources that are not recharged through rainfall) that are being extracted at a rate of 77 MCM (Kubursi, Grover, Darwish, & Deutsch, 2011).

**Waste water resources**

As of 2006, there were 16 wastewater treatment plants in Jordan, which provide an additional water resource for the country’s use. Because of Jordan’s topography and the location of the vast majority of its urban population above the Jordan Valley, most treated wastewater flows downstream into the Valley, where it is used for irrigation purposes (Mohsen, 2007). Currently, around 80 MCM is used for irrigation (Kubursi et al., 2011), but the Jordanian government envisages 232 MCM of wastewater used for irrigation by 2020 (Mohsen, 2007).

**Supply and demand**

Current water use exceeds the renewable supply, so Jordan faces a constant and growing water deficit. In other words, the present rate of water extraction from all sources is unsustainable, and prospects for increased availability in the future are not good. In 2010, the total water demand was 1,383 MCM, while the total supply from all sources, was 1,054 MCM, creating a total deficit of 329 MCM. By 2040, it is estimated that due to population and economic growth demand will increase to 2,236 MCM, but supply will expand to
only 1,549 MCM, leaving a huge deficit of 689 MCM (Hadadin et al., 2010).

There are three main uses for water in Jordan: municipal, industrial and agricultural. Agriculture is the single largest user of water, both from surface and aquifer resources. Irrigation water consumes 77.5% of the total water demand, while municipal and industry requirements make up the rest (Hadadin et al., 2010). This is despite the fact that agriculture represents only 3% of Jordanian GDP (Kubursi et al., 2011).

Impact of current water use practices

Rationing and deficient water infrastructure

Domestic water rationing was introduced as early as 1987, and many households in Amman are without mains-water for six days a week. Such an obviously inadequate supply of water led to illegal tapping of water mains, resulting in 30,000 prosecutions for water violations in 2004 alone (Alqadi). Water systems in Amman are in a calamitous state with up to 54% of the 105 MCM entering the system lost or unaccounted for in 2004, while the majority of the city’s population thought the water supply polluted with chlorine, dirt, sediments and algae (Alqadi & Kumar, 2011).

Water use in the agricultural sector

An exaggerated focus by the government on regulating the domestic water supply has diverted attention from
the damage incurred to the water system through agricultural use where pollution from fertilisers and other agricultural outputs has had a large negative impact.

Between 1953 and 1986, the government promoted agriculture production that it thought would align with the soil and water available. However, farmers preferred to grow crops with greater commercial potential, and this led to depleted water resources and soil quality. There was an over-reliance on thirsty tree crops irrigated by flooding with open canals highly susceptible to evaporation in such an arid climate; most of the land was used to grow vegetables (54% of land area, 99.8% irrigated) or permanent fruit tree crops (33% of land area, 99.2% irrigated) (average numbers between 1994 and 2008) (Kubursi et al., 2011). As one would expect from these figures, much of the estimated cultivatable land in Jordan is located outside the zone of sufficient rainfall for rain-fed agriculture. Moreover, the land area that does receive sufficient rainfall for growing food crops is decreasing as climate change renders rain patterns more unreliable and urban expansion increases (Ammam, for example, covers some of the best rain-led land in the country). And as noted already, irrigation methods tend to be highly inefficient and wasteful due to the continued use of traditional flood irrigation systems rather than modern drip and sprinkler systems.
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**Over-pumping of groundwater**

It is estimated that current use of groundwater is 161% above the safe yield limit (Alqadi & Kumar, 2011), meaning that some of the non-renewable aquifers not recharged through rainwater will eventually run out altogether. Furthermore, the greater the drawdown on underwater systems, the more saline the water becomes as the concentration of natural minerals resulting from the natural rock formation of the aquifer increases, and hence requiring expensive desalination technology to remedy.

**Overloaded wastewater systems**

As noted above, treated wastewater is another source of water utilised in Jordan. However, as with urban water supply systems, wastewater treatment plants have received low priority investment and current performance is insufficient to cope with the amount of wastewater that requires purification and so ends up discharging low quality effluent. This effluent then has a negative effect on public health because of contamination of crops or the build-up of toxins in irrigated soils. “Surface and groundwater are also adversely impacted due to runoff and seepage of polluted water, limiting their use for drinking water purposes. Furthermore, septic water is not regulated and untreated water discharged into the watershed has become a health and environmental issue” (Kubursi et al., 2011, p. 6).
Water scarcity as a barrier to sustainable development

Environment and population pressure

Overdrawing on aquifers has led to the drying up of a large percentage of aquatic ecosystems in Jordan. The Azraq Oasis – a wetland of international renown – dried up in 1985 as a result of its over exploitation for domestic and agricultural purposes (Mohsen, 2007). Growth in human settlements has adversely affected natural streams and springs and often led to their extinction through overuse. To make up for the loss, wells were dug to extract renewable and non-renewable groundwater, but which has led to a reduction in the water table and increased salinity, while wastewater from human activity has resulted in contamination of groundwater resources.

At the same time we should be careful to remember, however, that it is not only Jordan’s natural birth rate that is producing high population growth, but also the state’s generosity as a host to the many refugees fleeing the numerous conflicts in the region. According to planning figures published by the UN High Commissioner for Refugees, Jordan would be host to nearly 900,000 refugees by the end of 2013 (UNCHR, 2003). This has certainly been exceeded as a result of the conflict in neighbouring Syria. In addition, nearly three million Palestinian refugees made Jordan their home after the Arab-Israeli wars of 1948 and 1967, half a million
Jordanian ex-patriates returned home after the First Gulf War of 1991, and a further half million Iraqis arrived after the Second Gulf War of 2003 (Kubursi et al., 2011). The Jordanian population currently stands at 6.3 million and is predicted to rise to 9.2 million by 2020.

**Social**

Water shortages obviously have marked effect on the living conditions of average Jordanians. Jordan has the lowest domestic water consumption in the Arab world, and moreover municipal demand has exceeded available supply since the mid-1980s. During the peak of summer, 85% of Jordanians live at the “hygienic brink” (Mohsen, 2007). The necessity to purchase potable water also deprives Jordanian households of income that could be spent otherwise on improving their social conditions.

As a developing nation, Jordan has few options to improve its overall water management infrastructure or diversify its economy, leading to a situation that has been compared to the ‘food politics’ of the United States, i.e. using shortages of a vital element in basic human survival to leverage a pro-American stance (Mohsen, 2007).

**Economic**

Industrial output is also highly reliant on large amounts of fresh water. Generally speaking, three litres of water
are required to produce a tin of vegetables, 100 L for 1 kg of paper, 4,500 L to produce one ton of cement, 50,000 L to manufacture a ton of leather, and about 280,000 L to make one ton of steel (Mohsen, 2007). Water is also needed for energy production and cooling systems.

Due to the chronic shortages of water, Jordanian industrial companies often rely on water delivered by tankers at huge cost. Others rely on their own private wells that they have to keep drilling deeper and deeper at great cost as the water table falls, in addition to having to filter extracted water that is high in salt content. As there is a widespread ban on drilling new wells, companies are frequently forced to relocate to localities where there are existing wells, but where the price of land is understandably far higher than normal.

Economic development is therefore being held back in Jordan by the high cost of industrial production requiring large amounts of quality fresh water. It would hence seem more logical from a purely economic point of view to reallocate water resources from agriculture to industry where “productivity per unit of consumed water is 40 times higher...and the employment effect is 13 times higher” (Mohsen, 2007, p. 34).

**Potential solutions**

Just as common responses to climate change-inducing carbon emissions are strategies that advocate mixtures of renewable energy sources to substitute for the world’s
current addiction to fossil fuel, so a common solution to water shortage is Integrated Water Resources Management (IWRM) that combines a variety of strategies, including water reuse, demand reduction/management, energy-water co-management, and transboundary water resource management (Scott, El-Naser, Hagan & Hijazi, 2003).

**Water reuse**

Water reuse is the biggest potential sustainable growth area for water use, particularly in regard to utilising wastewater for irrigation purposes, especially via the separation of household grey water. Urban effluent often has the added advantage of containing relatively high levels of nutrients, which should appeal to farmers struggling to cope with water scarcity. It has been estimated that the 60 to 70 MCM of treated wastewater discharged into water bodies and then used for irrigation purposes in 2003 will increase by a factor of four to 240 MCM within 20 years. If true, it could match groundwater recharge in magnitude (Scott et al., p.211). Under such circumstances, it is possible that groundwater could then be reserved solely for future urban water demands. On the other hand, there are some risks associated with reuse of urban wastewater for agricultural irrigation, including various parasites contained in the water that could pose a threat to human health and that may prove an obstacle to public acceptance of wastewater reuse. Such issues, however,
could be managed via public education campaigns propagated, for example, through mosques and churches. Another obstacle that would need to be overcome is finding the finance required to build and maintain sufficient effluent treatment plants.

**Demand reduction and management**

Savings in the current water use regime need to come primarily from agriculture in order to reduce the extraction of groundwater resources. This would include a shift to less water-intensive crops, including market incentives to move away from low value to high crops, and improvements in irrigation efficiency, including the use of sprinkler systems, drip irrigation, subsurface irrigation systems and plastic green houses, which could reduce agricultural water consumption by 20%. There is also ample room for manoeuvre within the urban sector, especially with regard to gardening and urban agriculture, while the huge amount of water lost through leakage from dilapidated and poorly maintained water infrastructure can also be ameliorated.

Economic tools are another important instrument in resolving water scarcity and reallocating resources to more water efficient sectors, although they would have to be accompanied by very sensitive consideration of the social impact. For example, moving water prices more toward market value would shift resources away from agriculture to industry, but agriculture is a big employer in Jordan “and is highly valued for reasons of
agrarian identity, an emotionally charged subject in many societies. Land ownership and farming are culturally linked and breaking this mystique will not be easy” (Scott et al., p.212). It would vital to mollify the powerful vested interests with a large economic stake in over-abstraction of groundwater and to create alternative employment options.

Gradual closure of wells would have to be considered by restricting permits for new wells and buying out existing permits and concessions, such as those agricultural wells that draw from the same aquifers that service urban populations.

Additional sources of water will also have to be found, including use of brackish and sea water from the Gulf of Aqaba through desalination. There are hundreds of millions of cubic metres of brackish water available throughout Jordan, but they are very difficult to exploit because of the country’s topography, the distance between the various sources, the requirement to treat them to remove chemicals such as manganese, sulfates and iron, and gases like hydrogen sulphide, and the disposal of brine, which can be environmentally hazardous (Hadadin et al., p.200). Another problem is the energy required for the desalination process, although small and isolated communities can use solar and/or wind generated energy to power the desalination of local brackish water sources. Large desalination plants exist in neighbouring or nearby countries like Saudi Arabia, the United Arab Emirates, and Kuwait,
but the cost of pumping this supply of fresh water to elevated locations like Amman would be prohibitive.

Some mega-projects may be viable in the long-term, such as the transportation and processing of seawater from the Mediterranean or Red Sea, or the importation of fresh water from Turkey, though “the capital investment (several billions of dollars), execution time, political complexity, and full cost per cubic meter appear to exceed that of modular desalination plants” (Hadadin et al., p.201).

Finally, increased collection and harvesting of rainwater is a highly viable and effective option. As noted above, evapotranspiration results in the loss of over 93% of Jordan’s surface water supply, and this can be reduced, for example, in rain-fed agriculture areas by storing rainfall directly in the soil for crop production using terraces, rippers, contour ridges and other types of methods (Hadadin et al., p.200). Household rainwater harvesting has also proven to be of some value not only in terms of collecting additional potable water, but also in reducing the amount of income spent on water. Assayed et al. (2013) report on a five-year project called “Community Based Initiatives for Water Demand Management in Jordan” which showed an average saving of 2-37% in potable water for each participating rural and peri-urban household per year using either pear- or square-shaped cisterns depending on the local topography and soil type. Households were able to save 50-240 Jordanian Dollars
per year that was previously used for purchasing water. “This saving has enabled many households to afford family and social activities they were not able to afford previously” (Assayed et al., 2013, p.76). Another study by Abdulla and Al-Shareef (2009) using similar methodology and collecting rainwater from roofs of residential buildings from 12 Jordanian governates showed that the equivalent of 5.6% of total annual domestic water supply could be harvested. Analysis of the harvested rainwater indicated lives of organic compounds that generally complied with World Health Organisation standards for drinking water. Geographic Information System (GIS) technology could also be used to select suitable areas for creating water harvesting ponds (Al-Adamat, Diabat & Shatnawi, 2010).

**Energy-water co-management**

Like its water resources, Jordan is also lacking in natural energy sources and is thus dependent on imports of fuel to drive its economy. Not surprisingly, this makes the cost of water abstraction, supply, treatment and reuse very expensive. It has been suggested that a quarter of Jordan’s total electrical energy requirements are in the water supply sector (Scott et al., p. 213). Plans to pump water from other parts of Jordan to Amman in the future will result in even further energy consumption. Thus managing the reduction of over-abstraction of aquifers, especially where water levels are low and falling, will have clear energy and economic
benefits not only in terms of over-stressed water resources. This has real implications in the agricultural sector where pumping represents around 10% of input costs, so restricting electrical power and maintaining high prices would encourage farmers to use more innovative practices that are less water intensive and hence reduce overall demand. Linking energy and water management hence offers another option in the catalogue of water strategies.

**Transboundary water resource management**

As we noted above, conflict in the Middle East has provided yet another obstacle in the way of alleviating water stress in Jordan. This problem is compounded by the lack of comprehensive riparian agreements. While there are some bilateral agreements, such as between Jordan and Syria to regulate and utilize the flow of the Yarmouk River, and between Israel and Jordan to allocate the water of the Jordan and Yarmouk rivers, there is no multilateral treaty to regulate the use of all the regional transboundary river systems. A Working Group on Water Resources (WGWR) was established as part of the Middle East Peace Process started in 1992 that encourages cooperation among the Israelis, Palestinians and Jordanians, although formal meetings of the group are in abeyance, but it has the potential to “play a major role with the core parties in reaching comprehensive and multilateral agreements between all the involved parties, which will pave the road for
unified management of the Jordan River Basin” (Scott et al., p.214). It could also form the basis for a region-wide treaty among all national parties suffering from competing claims over scarce water supplies.

Conclusion

The issue of water scarcity in Jordan involves a set of actors that encompasses the entire spectrum of society, so alimentary is the challenge of ensuring adequate water supplies to the nation. The problem appears close to intractable and so will require maximum resources and the full attention of policy and decision makers in the years ahead if the country is not to suffer an apocalyptic reduction in living standards. Jordan was left without sufficient water resources at its very creation and its rapidly expanding population and the catastrophic effect of climate change will only exacerbate the situation. Well-thought out strategies, a popular mandate, education campaigns and good relationships with the neighbours will all be required to find a solution that remedies and mitigates the very worst of its water scarcity.

References


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Exploring Regional Sustainable Development Issues


Exploring Regional Sustainable Development Issues


Resources

Selected academic articles

The following academic papers can be found by using academic search engines or databases like www.
Exploring Regional Sustainable Development Issues

scholar.google.com, www.scopus.com or www.sciencedirect.com, etc.


200
Exploring Regional Sustainable Development Issues


Physical and Engineering Sciences, 368(1931), 5299-5313.


Documentary Films

A World Without Water Channel Four documentary 1hr 16min  http://www.youtube.com/watch?v=egtKx24dat8
Exploring Regional Sustainable Development Issues

BBC Our World – India’s Water Crisis 22min http://www.youtube.com/watch?v=jscOuWpw_iU
Every Drop Matters. A documentary on water governance in Arab States: Stories of community-based solutions to water scarcity 16min (with subtitles) http://www.youtube.com/watch?v=62UOiK30DS4
It Runs On Water 51min http://www.youtube.com/watch?v=xHISTsiR9qc
Saving The River Jordan 16min http://www.youtube.com/watch?v=U29xdvLBUIs&list=PL822A7C14FFBF4F09
Villages On The Front Line – Jordan 3-part documentary http://www.youtube.com/watch?v=wSX5y4Ju2J8

Web sites

There are many websites dedicated to water shortage issues. Here is a small sample:
The Jewish Virtual Library http://www.jewishvirtuallibrary.org/jsource/Peace/water2.html
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Wikipedia: Water Politics in the Middle East http://en.wikipedia.org/wiki/Water_politics_in_the_Middle_East

Other resources

Chapter Six

Deforestation in Ethiopia

Andrew Barton

Introduction

The theme of least developed countries (LDCs) and developing countries is important within the globalisation debate – they are often considered to be more-or-less passive spectators to, and some might say victims of, global economic development fuelled by the predominant growth-at-all-costs and market-driven economic paradigm. Forestry and agriculture naturally continue to be the primary source of resources and income for people living in LDCs, yet are subject to huge pressure from the forces of globalisation whether in the form of planetary environmental challenges, access to international finance and markets, the emphasis on cash cropping ahead of internal food security, global conflict, and acceptance of aid and Structural Adjustment Programmes, among others. Ethiopia and the state of its forests is a case where we can see these pressures played out.
Globalisation

This is a complex phenomenon and can be viewed from different (disciplinary) perspectives. Our viewpoint is that it has a direct impact at the local level – on the quality of life in diverse parts of the world.

Economics is the driving force of globalisation processes. However, the economy looks different from the global as opposed to the local perspective: due to on-going trade liberalisation and increasing opportunities for investment across national borders, the global production and distribution network has become even more interconnected, its efficiency has (arguably) increased, and it no longer takes heed of boundaries and borders; the globalised economy maximizes its profit but also delivers cheap goods to underdeveloped regions. However, from the local perspective, globalised economic processes might hinder local initiatives as they neglect the local specific context – social, cultural and political conditions, and of course the traditional economy based on those same conditions. In the past, tariffs would have been imposed on imports to developing countries in order to nurture and incubate local industry and hence protect them from foreign competition, just as new industries had once been protected in developed societies, but the demands of the global economy and the World Trade Organization require the opening up of markets in developing nations to the full force of global
competition. Globalisation in a certain sense means universalization, and its economic imperatives can destroy local diversity, which often means neglecting local consumption needs or patterns. Something of this phenomenon can be perceived in the situation as it pertains today to the state of forest cover in Ethiopia, although other global themes are present also, not the least of which include the effect of global conflict and population growth.

**The problem of poverty and deforestation in Ethiopia**

Ethiopia is one of the poorest countries in the world, and its poverty and land and resource degradation seem to be part and parcel of the same vicious circle. The supreme irony is that Ethiopia is actually a country with a very diverse environment and rich biodiversity and unique ecosystems (the Ethiopian Highlands, for example, elevate the country, which lies close the equator, to give an unexpectedly temperate climate, so although it lies in tropical altitudes, its climate varies between cool in the highlands and warm in the lowlands). As Bishaw and Abdelkadir (2003) note, “Ethiopia relies on its diverse biological resources for its socio-economic development, and these resources are now under severe pressure”.

Thirty-nine percent of the population lives below the poverty line, only 34% of the rural population has access to an adequate water source, and the average
life expectancy is a low 59 years (although these figures have been improving in recent years thanks in part to a relatively high GDP growth rate of 7.5%). Agriculture accounts for about 46% percent of GDP, of which forestry plays a part, although some estimates put direct losses of productivity from deforestation and land degradation at roughly 3 percent of agriculture GDP (Berry, 2003). With a population estimated in 2012 at over 84 million (World Bank, 2014) (making it the 14th largest country in the world) and a growth rate of 2.1 percent, this is a critically important figure.

Deforestation and the resulting environmental degradation is a major problem in Ethiopia and a key factor challenging food security, community livelihood and sustainable development, especially since 94% of the population relies on wood-based and biomass fuel for household energy (Bishaw & Abdelkadir, 2003). For example, despite the importance of the forest economy to subsistence livelihoods through the provision of timber, fruit, honey and bush meat products, extreme poverty leads subsistence farmers (especially those displaced through war) to clear trees in search of arable land. This in turn leads loss of shade required for many agricultural products, changes to local weather patterns, and decreases in agricultural productivity resulting from decreased retention of water in the soil and decreased streamflow (Dessie & Kleman, 2007). In the late nineteenth century, approximately 30 percent (Ofcansky & Berry, 1991) to 40 percent (Assefa & Bork,
2013) of the country was covered with forest. But the clearing of land for agricultural use and the logging of trees for building materials and fuel slowly changed the look of the country’s forest cover and which sped up considerably as the 20th century progressed. By the 1950s, only 16% of land area was covered by forests, and during the 1980s about 15.4 million hectares of tropical forest disappeared each year (Getahun, K., Van Rompaey, A., Van Turnhout, P., & Poesen, J., 2013), leading to depleted forest cover of only 2.7% in the 1990s (Assefa & Bork, 2013). Between 1955 and 1979, over 77 percent of the country’s forested area disappeared and it continues to lose 8 percent or 140,000 hectares of its remaining forests annually (Winberg, 2010).

**Why are forests so important?**

Humans benefit from and are very often reliant upon forests for the ecosystem services they make available, including regulating and supporting cultural and provisional services. Humans exploit their timber products for fuel and building purposes, although non-timber resources provided by forests are also hugely important as a means of survival during times of stress and scarcity, e.g. wild fruits, bee keeping, fodder and grazing (Winberg, 2010). However, all across the globe the expanse of forest areas is declining for very many reasons, but largely as a result of logging activities and the conversion of forest habitats to croplands; for
example, agricultural expansion accounts for up to 43 percent of tropical forest losses (Green Facts, n.d.).

There is a very wide array of forested landscapes in Africa. Many of these forests are under incredible pressure from people as local populations expanded almost exponentially over the course of the last century: nearly everywhere the forested landscapes show clear signs of human impact. How they look today is a result of both environmental and human factors, but it is the latter which have had the most negative impact. Humans interact with the forested landscape through the collection of forest products, shifting cultivation, permanent or semi-permanent agriculture, and many different kinds of agroforestry systems. The issues of deforestation and accompanying land degradation is high on national and international agendas, but still poses a large challenge at the local level, as is the case in Ethiopia (Bongers & Tennigkeit, 2010).

Deforestation in Ethiopia takes place in both forests and farm woodlands and is recognized as the most severe environmental problem there. As noted above, deforestation and land degradation are impairing the capacity of forests and the land to contribute to food security and to provide other benefits such as fuel wood and fodder. The National Conservation Strategy of the Federal Democratic Republic of Ethiopia (FDRE) identifies deforestation as a major problem not only in the forest proper, but also in how it impacts upon other sectors such as crop farming, animal
husbandry, water resources, and wildlife habitat (Bishaw, & Abdelkadir, 2003).

Specific examples of the benefits forests bring to the local population in Ethiopia – 85% of which is reliant on the land for their livelihood – include a source of fuel and building materials, as well as non-timber forest products (NTFPs) such herbs and spices and traditional medicaments, and natural food products like nuts, honey, fruit and edible fungi; they also provide cover and food sources for domesticated animal populations. Forests provide the invaluable natural ecosystems that house a wide range of tree and plant species and the fauna that rely on them for their survival that otherwise would not survive in typical manmade monocultural habitats. And of course they also act as conservators and regenerators of soil and filtration systems for natural water catchments and hence protect waterways from damaging effluent run-off from chemical fertilisers and rapid evaporation from constant exposure to the sun.

Why then, if the overwhelming majority of the population is so reliant upon the benefits that forests bring, have they shrunk to a mere fraction of their past glory? The causes of Ethiopian deforestation are manifold and have been recorded through Ethiopian history in association with settlement patterns and agricultural practices. “Unprecedented deforestation, however, has spread since the beginning of the twentieth century as a result of dynamic demographic,
polical, economic and social conditions” (Assefa & Bork, 2013, p.284). Therefore, before looking at the specific reasons for the current state of affairs, it is important to understand the historical context in which Ethiopian society has developed over the modern era.

Recent History

Ethiopia has a rich and varied history, but its modern history, which arguably laid the foundations of its long and bloody conflict in the late 20th century and its current position as one of the poorest nations on the planet, began with the first overt European interference in the country’s affairs in the mid-19th century. Until 1936, Ethiopia had avoided the fate of most other African nations during the Europeans’ scramble for African colonies, although it was subject to military attacks, first by the British during an 1868 expedition to Abyssinia to rescue British nationals imprisoned by King Tewodros II, and then the Italians, who were desperate to keep up with the British, French, Belgians by carving out their own little piece of empire on the continent. Italian companies acquired land in Eritrea on the Red Sea board of Ethiopia in the 1870s and 1880s and then occupied it with Italian soldiers in 1888. Under Emperor Menelik II, the Ethiopians signed the Treaty of Wuchale with the Italians in 1889, granting them part of Northern Ethiopia in return for guns and ammunition to help fight the Egyptian Sudanese. Eritrea was effectively recognised by Ethiopia as an
Italian colony from this date (and up until Mussolini assumed power in Italy in 1922, when the new administration stressed the racial and political superiority of Italians, “[t]he local population shared in the benefits conferred under Italian colonial administration, especially through newly created medical services, agricultural improvements, and the provision of urban amenities…” (Ofcansky & Berry 1991)). However, the Italians argued this also gave them power over all Ethiopia, but Menelik demurred, saying the native Amharic language version of the treaty said no such thing. Tensions came to a head in 1896 when the two nations went to war and the Italians were completely defeated at the Battle of Adowa – the first time a European army had ever been beaten by an African military force. The Italians recognised the full independence of Ethiopia as a result, although they never forgot their humiliation and returned to militarily intervene in Ethiopia again in 1936 under Mussolini.

Menelik was followed in quick succession by his grandson Lyasu V in 1913, who was deposed by the Ethiopian Christian nobility three years later because of his Muslim ties, and then Menelik’s daughter Zauditu, while her cousin, Ras Tafari Makonnen, was made regent and heir apparent. After the death of Empress Zauditu in 1930, Ras Tafari succeeded to the throne as Emperor Haile Selassie I (Haile Selassie is worshipped as the reincarnation of Jesus by adherents of Rastafarianism).
In 1935, the Italians, who had been waiting for an opportunity to take revenge for Adowa, invaded. Haile Selassie, as the only independent black monarch in Africa, appealed to the League of Nations for aid, but the western powers failed to help and Ethiopia was formerly annexed by Italy in 1936, while Selassie went into exile. He returned in 1941 after the British defeated the Italian forces in Africa during World War Two.

In a spurt of energy after the war, Selassie promoted the modernisation of Ethiopia. He opened the first university in Addis Ababa in 1950, introduced a constitution in 1955 that expanded the powers of parliament and improved relations with other African nations by helping to establish the Organisation of African Unity. Unfortunately, Ethiopia became caught up in a war from 1961 with the province of Eritrea, which had been an Italian colony for many decades and which had then been annexed by Ethiopia in 1943. It had been self-governing under a federal system until 1961, when its parliament was shut down by Selassie and the Ethiopian language, Amharic, made compulsory at all Eritrean schools. This war lasted more than 30 years until Eritrea gained full independence in 1993.

Selassie’s advancing age, his increasing distance from the daily life of his subjects, and the growing sense among a number of Marxist-oriented Ethiopians during the climate of the Cold War that the conflict with Eritrea was imperialist in nature all helped to
undermine Selassie’s regime. Inflation, corruption and famine added to the growing unrest in the country and eventually a military coup was staged by Marxist officers in the army under Mengistu Haile Mariam in 1974. Haile Selassie, the very last emperor of Ethiopia, was murdered in 1975.

Power was assumed in 1974 by a provisional administrative council of soldiers known as the Derg, with Mengistu as head of the newly Marxist state and Derg chairman. This triggered an all-out Ethiopian Civil War that was to last until 1991, with the Derg imprisoning or exterminating many thousands of its political opponents, and continuing to prosecute the Emperor’s war against the rebel province of Eritrea, as well as the province of Tigray. Under the Derg, Ethiopia became a client state of the Soviet Union, and as a result also became the most militarised state in the region. It was thanks to military aid from the Soviet Union, Libya, East Germany and North Korea, and 17,000 professional soldiers from Cuba that Ethiopia was able to fight off an invasion by Somali forces in 1977.

At the same time, the Derg attempted to follow through on its Marxist philosophy by redistributing land to the peasants. However, mismanagement, corruption, and wholesale hostility to the Derg’s violent rule, combined with the debilitating effects of constant warfare, resulted in a precipitous fall in agricultural production, and it is during this period that deforestation in Ethiopia began to rapidly escalate.
Although Ethiopia has generally long been prone to drought, few were prepared for the scale of drought and famine that hit the country in the mid-1980s, in which up to eight million were affected and one million may have died. According to Kloos and Lindtjorn (1993, p.103), the droughts caused by the failure of the rains preceding the famine “were exacerbated by manmade environmental degradation that ... increasingly impacted on food production in [past] decades”.

Mengistu was finally overthrown in 1991 when the Ethiopian Peoples’ Revolutionary Democratic Front captured Addis Ababa and the Soviet Union under Mikhail Gorbachev failed to intervene on the Marxist government’s behalf. Under a transitional government, a new constitution was written in 1994 that established a bicameral legislature and judicial system. The first ever multi-party elections then took place in 1995 with Meles Zenawi elected Prime Minister.

Democracy was not, however, accompanied by a permanent peace. A border dispute with Eritrea in May 1998 led to a war that neither side could afford and which lasted until 2000, the same year that new elections were held that resulted in only 12 seats being won by the opposition. New elections in 2005 were greatly disputed, and those in 2010 again returned Meles Zenawi as Prime Minister. In mid-2011, after the rainy season failed two years in a row, East Africa experienced its worst drought in 60 years.
Specific causes of deforestation

Conflict and forced migration

Violent conflict generally does not directly cause loss of forest cover, but it does provide the conditions in which more specific causes can rapidly accelerate. As this very brief history of recent Ethiopian history shows, the country and its people have had to contend with the mayhem caused by almost constant conflict throughout much of the 20th century, and even into the early 21st century, thanks to its attempted colonisation by the Italians and then decades of either repression of Eritrea following its annexation or open internecine warfare triggered by the Marxist putsch of 1974. As if this was not enough, there were then border wars with the newly independent Eritrea at the close of last century. Not only have those wars killed and maimed hundreds of thousands of people, they have also led to the destruction or undermining of national infrastructure and institutions that regulated and policed natural resource use, including forests, disrupted traditional forest husbandry and commercial activities based on cultivation of forest products, reduced local populations to extreme poverty so that they are forced to exploit land and forest resources far beyond their natural capacity to regenerate themselves, and contributed to devastating droughts that seriously eroded forestry ecosystems.
It has become a popular aphorism that modern day famines tend to be manmade, and this was certainly the case in the infamous mid-1980s famine that sparked Western humanitarian efforts, such as Live Aid. While other African countries (Kenya and Botswana) had faced drought conditions and the potential for famine at the same time, a humanitarian disaster was created in Ethiopia by the social disruption triggered by the ill-conceived efforts of the revolutionary Marxist regime to promote affirmative policies, such as administration of the rural sector through military, state and party structures, collectivisation of agriculture, diversion of scarce resources to state and collective farms at the expense of small-scale farmers, and the resolution of conflict through military means, etc (Kloos & Lindtjorn, 1993). The subsequent famine prompted the survival mechanism among Ethiopian subsistence farmers to migrate from the north to Southwest Ethiopia in search of not only humanitarian aid camps, but also arable land where they could continue to maintain agricultural output. However, as all the readily accessible land in lower elevations was already occupied, the new immigrants had no choice but to settle in remote locations at higher elevations and clear the land of trees to make a living where the profits to be made from farming are much lower due to the lower soil quality and greater transportation costs (Getahun et al., 2013). Moreover, migrating subsistence farmers driven by conflict and poverty come into conflict with
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forest farmers that collect natural coffee, spices and honey from natural forests (Getahun et al., 2013).

Times of extreme violence and security vacuums resulting from regime breakdown also lead to accelerated deforestation. In their study of deforestation in the South Central Rift Valley Region of Ethiopia, Dessie and Kleman (2007) identified two periods in particular of abrupt change that correspond with the two most recent changes of governments in Ethiopia: the collapse of the old order of Haile Sellasie in 1974-75 and the crumbling of Mengistu’s Marxist regime in 1991-92. Farmers interviewed by Dessie and Kleman reported that during periods of disorder and transition between governments, more trees are felled and more forestland settled. Presumably this is the result of either greater forced migration pressures induced by the dying regimes’ final violent death throes and/or the catastrophic breakdown in authority that eliminates all physical and legal protection of forested land.

Population pressure

As noted above, Ethiopia has a population estimated at over 84 million, making it one of the largest in Africa and the 14th largest in the world. Large population increases over the last century have put huge pressure on the land and have resulted in extensive forest clearing for agricultural use and grazing, and exploitation of existing forests for fuel wood, fodder, and construction materials. Population pressures have also added to
north-south migration and settlement, and clearance of forested land previously seen as unsuitable for farming. In their study of deforestation in the moist evergreen Afromontane forests of Southwest Ethiopia, Getahun et al. (2013) noted that the forest transitions from a phase of net deforestation to net reforestation recorded in many parts of tropical areas in Southeast Asia and Latin America have generally not been seen in Africa. One of the possible reasons Getahun et al. give for this observed delay is the ongoing exponential population growth, the large proportion of people who are employed in subsistence farming and the slow adoption of modern farming techniques. According to Ethiopian Tree Fund Foundation (n.d.), “the high population growth, low agricultural productivity, and the poor economic performance of the country so far are important push factors that have accelerated the deforestation process in the country”.

**Fuel wood**

In a low technology and poverty-stricken society like Ethiopia, the main source of fuel for cooking and heat is wood or charcoal made from wood, and this is one of the chief causes of deforestation. Wood is the primary source of household energy consumption in most rural areas and in poorer households in urban areas. It is used for cooking, heating, lighting, brewing and smithing. Even relatively modern facilities can be dependent on fuel wood. For example, Assefa and Bork
(2013) report that hotels and higher educational institutions and schools in the Chencha and Arbaminch areas in Southern Ethiopia use wood for energy, mainly for catering. In these areas wood is cheaper than electricity and is readily available in comparison with the unreliability of electricity supplies.

Population increases have also contributed to higher demand for both fuel wood and construction wood and it is surrounding natural forests that tend to be the main source of timber production. Consequently, the sale of wood is an important source of income for many people and is used to supplement income from agricultural production rural areas.

**Agricultural practices**

Forest clearance to facilitate expansion of agricultural land is driven not only by population increases, but also low agricultural production rates. In some areas the majority of farming households cultivate plots less than 0.5 ha in size, which is usually insufficient for providing nutrition all year round, and which in turn drives the clearance of even more marginal land. Low productivity combined with further declines in soil fertility from lack of forest cover, soil erosion, erratic rainfall, pests and diseases, and an inability to purchase fertilisers and improved seed because of a lack of off-farm employment further compounds the problem (Assefa & Bork, 2013). This dearth of fertile land and alternative employment to supplement farm
income is critical in continuing deforestation practices. Traditionally, subsistence or smallholder farmers farmed only the most suitable land in relatively flat areas with access to nearby roads and near settlements with complementary job opportunities. War and internal forced migration from the mid-1970s onwards, however, led to the reclamation of farmland on less suitable areas, especially in the hitherto less populated south, including steep hillside slopes and in more remote locations. As Getahun et al. (2013) note “[e]ven after three decades these immigrants were on average not able to obtain the living standards of the original farmers because the profits they can generate with their farming activities are much lower due to a lower soil quality and higher transportation costs” (p.179).

The long years of violent conflict are also responsible for a lack of investment in the infrastructure that would create jobs and support more sustainable agriculture and use of existing forest resources by local communities. For example, the lack of development means there are few roads and hence easy access to markets to sell agricultural or forest products. The result is on-going poverty in the most inaccessible regions and hence over-exploitation of forest resources or clearance for the basic needs of survival.

One of the contributing factors to the decline in soil fertility is the use of animal dung as fuel in times of scarcity and stress (caused by war or drought) when it should be used as a fertiliser on cultivated land, thus
further forcing encroachment on to forested areas. In addition, as agricultural technology was slow to develop in Africa, farming systems were perpetuated that relied on slash-and-burn cultivation.

The advent of cash cropping has also played a hand in deforestation. In some areas industrial-style agriculture was introduced to supply export markets for cash to fund modernisation projects, e.g. coffee, resulting in the clearing of large areas of forest and the introduction of intensive, often non-sustainable agricultural practices. Cash crops also reduce the amount of cultivated land available for subsistence farming and hence encourage migration into more marginal areas or the settling of evicted smallholder farmers in forest settlements which leads to further clear felling (Dessie & Kleman, 2007).

*Misdirected foreign aid and de-emphasis of indigenous knowledge*

This goes hand-in-hand with the rise of cash cropping, as well-intentioned aid foreign programmes and World Bank-imposed Structural Adjustment Programmes have laid stress on modernising the Ethiopian economy and incorporating it into the global economy through the farming of monocultural crops for world markets, such as the aforementioned coffee, and cereal crops for export. This has exacerbated forest clearance for fresh fertile land that is in many cases quickly exhausted without the liberal application of chemical
fertilisers. The same process also tends to de-emphasise customary agricultural and forestry practices through which some equilibrium between livelihood, environmental sustainability and resource exploitation was maintained in the past.

**Over-exploitation of non-timber forest products (NTFPs)**

Where forest cover still exists and is preserved by the local population there is still the acute danger of over-exploitation of forest products. Whether for subsistence or commercial purposes, intense extraction of these products can have a negative impact on the population dynamics of the plants being exploited. Such impacts may lead to changes in the forest community structure. The impact depends on the parts of plants that are harvested in NTFPs. Harvesting of some NTFPs like leaves and fruits, may have a negligible effect on the plant population being exploited, depending on the intensity of the harvest. Harvesting of bark, roots or bulbs, however, usually kills or fatally weakens the plant species used. For other products, such as palm heart, trees have to be cut to be able to harvest the product. An important group of NTFP in East Africa is gums and resins or Acaica, Boswellia and Commiphora species that produce gum Arabic, frankincense and myrrh (Bishaw & Abdelkadir, 2003).
Lack of governance and land tenure issues

Ethiopia has seen a number of changes in the regulatory frameworks governing land ownership which continue to provide uncertainty to the farmer and to rural communities. Up until the late 19th century land ownership was generally ruled by a caste system, but as Ethiopia adapted to the Western notion of the nation-state and various territories were incorporated into the country different land tenure systems began to be used. Assefa and Bork (2013) discuss the introduction of the “gabar” system in the south-west through which land was provided to central government officials, priests, civil servants and the high-ranking military officers. The sources of land were forest tracts that were then cleared and used for agriculture. Nation-building, the establishment of a standing army and the infrastructure and roads needed to facilitate the two also exerted pressure on the natural forests. During their occupation of the country from 1938 to 1943, the Italians tried to curry favour among the local people by revoking the “gabar” system and giving the land to those who had previous served the “gabars” (landowners). Those who had legal permits to extend their land did so by felling trees.

Once the Italians left, private individuals took over many of the forests in Ethiopia, which led the way to large-scale mechanized agriculture, resulting in the wholesale clearance of forests. But following the
ascendance of the Marxist regime in 1974-75, the land tenure system changed dramatically when all land became the property of the state and farmers were left with only usufruct rights. Farmers thus had no incentive to invest in long-term land development “and therefore they did not plant trees for fear that the land might be appropriated by the government and redistributed to others” (Assefa & Bork, 2013, p.289). Before 1974 about half of the forestland was privately owned or claimed, and approximately half was held by the government, though there was next to no government control of forestry operations prior to the revolution. The 1975 land reform under the Marxist government nationalised forestland and sawmills, which were concentrated in the south. The government controlled harvesting of forestland, and in some cases individuals had to obtain permits from local peasant associations to cut trees. But this measure encouraged illegal logging and expedited the destruction of Ethiopia’s forests (Ofcansky & Berry, 1991). In addition, the Derg regime’s management of land was so resented by farmers that once the government collapsed in 1991 the farming population vented their anger by clearing trees that had been planted as part of an afforestation programme promoted by the former regime. The intentions of this programme had been well-placed and had been instituted in response to the massive famine of the mid-1980s, resulting in tree planting on 400,000 ha of land. But it was a top-down initiative that lacked
genuine community participation and had largely been undertaken on land previously used for grazing purposes (Assefa & Bork, 2013). Thus it had no popular support which led to the removal of those forests and poor management of existing forests by extremely weak institutions and legal frameworks during the tumult of the 1991 regime change.

Consequences

The negative impacts of deforestation are numerous. Soil erosion and nutrient depletion from the removal of trees and over-grazing on cleared areas are the main reasons for loss of agricultural production and increased food insecurity. The loss of vegetation through over-grazing exacerbates soil erosion by water and lowers retention of nutrients in the soil. In addition, cattle tracks seal the soil which in turn prevents infiltration that causes high surface run-off during heavy rains, which again further erodes the soil (Assefa & Bork, 2013).

Biodiversity has been adversely affected. Indigenous trees have become endangered. *Cordia Africana*, for example, has become rare. Its wood is used to make coffins, roof supports, agricultural sheds and its wood provides the raw material needed in the timber industry. Bamboo is another tree species that is fast disappearing and which is used for house construction and fences. Previously, bamboo was left to grow for a long period, which allowed the construction of larger
dwellings, but now that early felling is so common, houses are consequently smaller (Assefa & Bork, 2013). In addition, thanks to the lack of bamboo and long, hard grasses, rectangular houses made of corrugated iron are taking the place of the traditional upturned-basket form of houses. This disappearance of rare tree species also leads to destruction and fragmentation of natural habitats and hence additional loss of biodiversity. For example, the mountain nyala, a mammal endemic to Ethiopia, became extinct in the South Central Rift Valley in the 1980s (Assefa & Bork, 2013).

The inability of soils cleared of trees to retain water leads to a reduction in the amount of available underground water. Decreases in surface water have also been reported. For example, Lake Cheleleka dried up between 1972 and 2000, as have a number of streams that previously fed the lake, which is most probably related to reduced streamflow resulting from deforestation and increased use of stream water for irrigation purposes (Dessie & Kleman, 2007). Deforestation has also been linked to increased sedimentation in rivers which obstruct hydropower plants considered to be of great importance to the economic development of Ethiopia (Getahun et al., 2013).

**Existing stands of forest**

Despite the many problems of deforestation in Ethiopia, there are still examples of well-managed and preserved
forests and trees in various parts of the country. The Orthodox Church, for example, has maintained forest cover on its property for a long period of time. There are also sacred forests in parts of Ethiopia mostly found on the summits of mountains and the plateaus of ridges. They are where sacrificial functions take place to ensure a good year in which the land will provide a bountiful harvest and women will give birth. Some of these sacred forests are used to a very limited extent as a source of firewood and construction materials, strictly policed by spiritual leaders, while in other sacred forests there is a taboo on cutting trees and collecting firewood (Assefa & Bork, 2013). There are also stands of old trees along lakeshores and near springs in the lowlands which play a vital role in regulating water fluxes and the movement of sediment. Furthermore, there are still woodlands along the escarpment in the rift valley that are used as a source of firewood collection. They are, however, over-exploited and are used to provide grazing for cattle from the surrounding countryside with all its attendant problems. This has led to high surface run-off and flooding that affects the lowlands during the rainy season and is the subject of conflict between highlanders who look upon the escarpment woodlands as a source of firewood, while lowland farmers look upon the woodland as something that needs to be preserved to protect lowland farmland from gullying and flooding (Assefa & Bork, 2013).
Afforestation efforts

As noted above, the Mengistu regime had attempted large-scale afforestation in the 1980s, although without proper public consultation and participatory processes most farmers had a negative view of the campaign because it reduced the amount of pasture land available to them. Moreover, the planting of exotic, mostly eucalyptus trees did not facilitate the undergrowth of herbs and grasses suitable for cattle grazing. As the planting failed to allow for community participation it was not able to address the main problems of rural and farming communities.

On the other hand, trees are planted at the individual household level, usually on degraded steep slopes with poorer soil quality that are no longer used for cropping or grazing, or along paths and roads. However, the general tendency is to plant mostly exotic varieties – eucalyptus and juniper. The former became predominant in the 1980s when they were encouraged by the government and eucalyptus seedlings were supplied for free. They also have certain advantages over indigenous types in the eyes of farmers: there is a short period between harvests (eucalyptuses are coppiced each third year), they do not require much care and they can grow in poorer soils (Assefa & Bork, 2013). There are disadvantages, however, as they require large amounts of water and grass rarely grows at their base, thus limiting grazing potential.
Conclusion

Ethiopia has suffered a catastrophic reduction in forest cover over the past century to between an estimated 2% to 3% of its original forest area as a result of farming practices, violent conflict, high population growth, and land tenure regimes. Deforestation has resulted in a precipitous fall in the quality of land used for agricultural purposes, even though the vast majority of the population relies on agriculture for subsistence needs. It also has negative impacts on eco-system provisional services, such as loss of water retention and the drying up of lakes and waterways. Decades of civil war have exacerbated forest clearance by forcing the internal migration of huge numbers of Ethiopians from the heavily populated north to the comparatively sparsely populated climes of the south which were once relatively well forested. Well-intentioned but ill-advised top-down afforestation campaigns and the breakdown in government authority during regime change placed further pressure on the remaining old stands of trees.

We can see a number of relationships at work between various actors involved in the issues that lie behind deforestation in Ethiopia. To name but a few, they include the historic relationships between the former tribal aristocracies and the lower castes, inter-tribal relations and their different conceptions of and attitudes toward the land, the creation of the Ethiopian nation-state and the dynamic that led to
the imposition of alien land tenure regimes in different parts of the country, the creation of a new upper social class alongside the new state and its monarchy and its attendant demands, the occupation by European invading forces and their efforts to suppress national customs or curry favour with specific groups, the conflict between different users of the land, e.g. farmers versus the growing urban population, religious customs versus economic and population pressures, the state and its agents versus the people, especially during the bedlam of regime change in the 1970s and the 1990s, and the external demands of foreign financial institutions (the International Monetary Fund and the World Bank) or well-meaning foreign NGOs. Just from this brief enumeration of the relationships between various actors it is clear that one set of highly unequal relationships follows another. The potential for more inclusive and participatory processes that heed the needs of all actors would therefore seem to be a logical way forward in the struggle to retain and increase forest cover in Ethiopia. Deeper research into analysing different actors, their resources and influence on other actors also logically warrants further attention.

References


**Resources**

**Documentary films**

Green: Death of the Forests http://www.youtube.com/watch?v=dvKlhxfUa24 47m

The Charcoal People. Brazilian Deforestation http://www.youtube.com/watch?v=VUy3Yducjtk 1hr 4m

How Ethiopia is Tackling Deforestation http://www.youtube.com/watch?v=GhhdC9v2KRo 5m23s

One Million Trees for Ethiopia http://www.youtube.com/watch?v=qa69MVyGNkA 3m47s

TheLastOneStanding http://thelastonestandingmovie.com/ This is not a documentary, but at the time of writing it was rather a trailer for a future documentary about Ethiopian deforestation that might or might not get made through Kickstarter funding.
**Websites**


Ethiopian Free Fund Foundation http://www.etff.org

**Academic articles**


Exploring Regional Sustainable Development Issues


Chapter Seven

Globalisation and the gold mining resurgence in Ghana

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Introduction

The theme of developing countries is important in the globalisation debate – they are often considered to be beneficiaries or victims, depending on one’s perspective, of global economic development fuelled by multinational corporations. Mineral resources are traditional sources of income in these countries that do not require a great deal of know-how to profit from its exploitation and export. In this case study, we will examine how the global imperative to seek rapid economic development measured by growth in Gross Domestic Product (GDP) via the extraction of valuable mineral resources has impacted the economy, the environment and social life in the developing West African state of Ghana.
Globalisation

Globalisation is a complex phenomenon and can be viewed from different (disciplinary) perspectives. From our perspective we wish to look at direct impact at the local level.

The economy is the driving force of globalisation processes. However, the economy looks different from both a global and local perspective as a result of: on-going trade liberalisation and increasing opportunities for investment across national borders, the global production and distribution network that have become even more interconnected, their increased efficiency, and the lesser importance of boundaries and borders; the globalised economic driver to maximize profit but also deliver cheap goods to underdeveloped regions. However, from a local perspective, globalisation of economic processes might block local initiatives as it neglects local specifics – social, cultural and political conditions, and of course the traditional economy based on those same conditions. In the past, tariffs would have been imposed on imports in developing countries in order to nurture and incubate local industry and hence protect it from foreign competition, just as new industries had once been protected in developed societies, but the demands of the global economy and the World Trade Organization require opening up markets in developing nations to the full force of global competition. Globalisation in a certain
sense means universalisation, and its economic imperatives destroy local diversity, which often means neglecting local consumption needs or patterns. Local people are perceived as part of the global “labour force” often working primarily toward the benefit of the wealthy “north” and absorbing their externalities – economic characteristics are important but traditional skills are no longer valued.

Thus an economy which is a driving force for development in terms of GDP growth is not usually accompanied by cultural development, which is a local matter, but generates educated and motivated citizens to cope with its challenges. The global economic paradigm in which multinational corporations (MNCs) operate is thus an external “engine” for development – if it is “applied” where political, social and other conditions have not been prepared then local development could be substantially distorted.

Some developing countries have experienced a so-called “Dutch Disease”, which is “the name applied to the phenomenon experienced by countries which have a rich endowment of minerals, the result of which is that the economy of the country becomes heavily reliant upon the revenues received from mineral sales, at the expense of the growth of other industries” (Cawood, Kangwa, Macfarlane & Minnitt, 2001, p.94). From the point of view of business, including mining companies, the following factors are important for the predictability of investment outcomes (and are also
indicators of countries’ economic performance): international competitiveness; efficient bureaucracy; a good tax system; good training systems; a wide pool of human resources; exchange controls; labour productivity; government spending; levels of corruption; infrastructural development; economic stability; crime; political stability (Cawood, Kangwa, Macfarlane & Minnitt, 2001).

The Dutch Disease phenomenon has often been applied by economists and researchers to many individual cases on the African continent where 69% of countries rely on the mining industry as their largest sector; the mining exports of 13 of these countries comprise between 25% and 90% of annual export earnings (Darimani, Akabzaa & Attuquayefio, 2013). Related to this phenomenon, especially in association with the energy and mining sectors of mineral-rich developing countries, is the “enclave economy” or “enclave export model” thesis. This holds that a particular sector has more external (foreign) linkages than internal (domestic) linkages and where most inputs are imported and most exports are unprocessed. In the mining sector, for example, extracted ores do not contribute to the development of the economy other than to be sent abroad to generate foreign exchange (Bloch & Owusu, 2012). It is also often used to describe post-colonial dependency relations in the developing world.

Some factors that contribute to Dutch Disease or an enclave economy are visible under the local
circumstances of this case study. Ghana is rich in natural resources but has low technological capacity to develop its mining industry. Large mining companies can bring in the technological innovation needed but their operations should ideally be supported and controlled by national institutions. If these are not fully functional in terms of administrative capability and transparent governance, then there is the risk that the environmental and other consequences of mining activities may be considered “externalities” and therefore will not be adequately addressed by foreign companies. In some cases, the local economy may not have the capacity to absorb large amounts of income from mining activities, which may in turn fuel corruption\(^7\). Moreover, if the legal framework that establishes the administrative and regulatory conditions in which foreign companies operate is weak or poorly enforced, then it creates an environment conducive not only to corruption, but also to penetration by actors involved in the “black” economy. What actually constitutes a black economy is a distinctly grey area in developing countries where survival and subsistence living obviously takes precedence over

\(^7\) I.e. inadequate strategic planning regarding long-term sustainable economic development via the creation of some sort of ‘National Fund’, such as Norway did when it discovered large oil reserves in the 1970s, can lead directly to a ‘resource curse’ – sudden huge inflows of cash without proper oversight leading to enrichment of corrupt elites.
strict adherence to government-imposed regulations, but “illegal” economic activity can have far-reaching negative impacts on the natural environment when allowed to go unchecked. We will see an example of this in the Ghanaian gold mining sector where illegal and semi-illegal activity by small-scale miners has wrought considerable damage to both the local environment and human health.

Ghana has gone through rapid economic development (based on the resurgence of its mining industry since 1989) that was based on liberalisation of the environment for private (foreign) investments. It has in particular been a beneficiary of a huge increase in the world price of gold in the last few decades. While production, for example, increased about 700% from 1980 to 2000, the gold price began surging soon after: it rose from approximately $300/oz. in early 2002 to over $1,900/oz. in September 2012 (Bloch & Owusu, 2012). In 2009, gold accounted for 43% of Ghana’s exports. Mining’s share of GDP, of which gold represents 95%, was 5.8% that same year, which is higher than Ghana’s other chief export commodities, cocoa (3.9%) and forestry (3.2%). Staying in 2009, Ghana was the world’s ninth largest producer of gold (3.8% of global production). By 2012, Ghana had climbed the production rankings to number 8, with an output of 96.8 tonnes, with total revenue from gold at over US$5.3 billion (Ghana Chamber of Mines, 2012).
On the face of it, there have been very clear fiscal benefits to Ghana from the mining of gold. However, despite the rapid growth in gold exports and a concomitant growth in GDP, there have also been considerable social costs associated with this development (growing conflicts with local mining communities), as well as huge environmental costs (Akabzaa & Darimani, 2001). But before we look more closely at what these individual costs have been, we need to understand the various stages in the development of the Ghanaian mining sector and especially how it has experienced a major resurgence in recent years.

**Ghana and mining**

Ghana’s history is very closely connected with mining – from ancient times to the colonial period up to the present day when economic transformation (and income) is largely based on the mining industry. Ghana’s official name until its independence in 1957 was the Gold Coast, reflecting the fact that gold was the most important and widespread mineral resource, with large-scale industrial mining for the mineral dating back to the last quarter of the 19th century. It is currently the second biggest producer of gold on the African continent after South Africa. Gold was displaced in importance by bauxite and manganese only in the last century. Many wars for control over its gold deposits occurred throughout its history, followed by economic
struggle in more recent times – gold remains one of the country’s most important exports.

Actually, there have been several periods in the mining history of Ghana. First, it is a part of the country’s tradition: indigenous people used gold even in pre-Christian times. As a result, Ghanaians often prefer to work in small mines rather than be employed with some big company. But from 1933 these small miners were banned because of a Mercury Law which made the use of mercury for mining illegal (mercury is used to bond with gold in order to facilitate easier extraction from gravels and crushed rock). Small scale gold mining based on this rather outdated and dangerous technology was criminalised up until 1989 (when the Small-Scale Mining Law was enacted).

In the colonial period, large scale mining activities were undertaken by foreign, especially British investors (Ghana was a British colony). The period of independence was characterised by nationalisation of resources and the creation of state enterprises (e.g. the State Gold Mining Corporation (SGMC)) – state control lasted from 1957–1986 and ensured government revenues, employability and the control of resources. However, there was little investment and exploration of new resources. Ill-considered macroeconomic policies, such as an overvalued exchange rate, reduced the amount of money available to maintain and retool the mining industry. This in turn led to undercapitalisation and low efficiency because of poor management and
less than robust mining skills. As a result, gold extraction decreased from 915,317 ounces in 1960 to an historic low of 287,124 ounces in 1986 (Akpalu & Parks, 2007, p.56).

After 1986, when mining sector reforms were initiated (as a part of the macro-economic policy reforms of the Economic Recovery Programme (ERP) sponsored by the International Monetary Fund), an emphasis was placed on shifting away from state ownership of the sector to liberalisation, deregulation and privatisation, leading to considerable technological development accompanied by exploration. The National Mineral Policy of 1986 revised several mining policies, including a reduction in state royalty taxes on extracted gold and a relatively low corporate tax of 35%. Extensive policy changes were passed to attract foreign investments that included “a conducive policy, legislative and administrative frame work more conducive to business, and a thorough privatization programme” (Akabzaa & Darimani, 2001, p.14). These policy changes caused a shift in perception of the investment environment by investors and Ghana was recognized as one of the better countries in Africa for its attractive geological and investment environment. Foreign direct investment greatly increased and gold production quickly overtook the peak production year of 1960. By 1994, gold exports produced 45% of total export earnings and overtook cocoa, which until then had been the leading export commodity.
Small-scale mining gains a new lease on life

The Ghanian gold mining industry underwent a minor revolution in 1989 with the regularisation of small-scale mining operators, which created a legal framework for the registration of small-scale gold mines (and diamond mines), mineral production and sales of mineral output. This new framework consisted of three laws: the Small-Scale Mining Law, the Mercury Law, and the Precious Minerals Marketing Corporation (PMMC) Law (Awankwah & Anim-Sackey, 2003). The Small-Scale Mining Law established the Small-Scale Mining Project within the Ghana Minerals Commission to provide technical assistance for prospective and registered small-scale miners and promote their activities. The Mercury Law legalised the purchase of mercury from authorised dealers for gold extraction purposes, while the PMMC law established a body to buy and sell gold (and diamonds). It operates gold purchasing offices in the big cities and licenses buy agents and sub-agents to buy gold on its behalf in the country’s gold mining regions. In addition, buying licenses were also granted to two privately owned companies to inject some competition into the gold purchasing sector (Awankwah & Anim-Sackey, 2003).

Since the establishment of this legal framework, two forms of small-scale gold miners (also known as Artisanal and Small-Scale Miners or ASM) have emerged – legal miners who have acquired their mining licences
from the Minerals Commission of Ghana, and illegal miners who operate without a requisite licence and often operate on concessions held by other companies. These illegal operators are known as “galamsey”, which is a corruption of “gather them (the gold) and sell” (Awankwah & Anim-Sackey, 2003). It is estimated that the ASM sector accounted for 12% of total gold production and 89% of diamond production from 2000 to 2008 (Darimani, Akabzaa & Attuquayefio, 2013).

ASM usually operate in the gold-bearing areas of Ghana where there are rich deposits, but which are too small for large companies to justify their investment in the infrastructure and equipment required. These small-scale operators are better suited to such conditions with their very low overheads and rudimentary equipment that ensure production costs are kept to a minimum, and which in turn makes them relatively impervious to fluctuations in the world price for gold (Awankwah & Anim-Sackey, 2003).

ASM are not allowed to work the concessions held by large-scale miners. However, some galamsey encroach on such concessions, which leads to conflicts between the two sides. This has sometimes been successfully resolved by large mining company management taking the step to officially recognise the activities of small-scale operators on their concessions by ceding portions of land where the reserves are too few to be economically extracted on a large scale.
The rapid shift from diamond to gold mining by small-scale miners in 2006

In the latter half of the 2000s a very rapid and dramatic change occurred in ASM as a result of two factors. First, after reaching peak diamond production of 2.5 million carats in 1972, the state-owned Ghana Consolidated Diamonds (GCD) company gradually went into permanent decline, which resulted in the conversion of many of the country’s artisanal “tributary” diamond miners who worked GCD’s ‘sub-economic’ areas to gold mining. Previously, after the government had legalised ASM activities in 1989, it was not able to entirely stamp out illegal small-scale mining, but GCD tried to contain this activity by supervising “tributor” mining, which allowed company-registered small-scale diamond miners to increase their production from the less economic areas of GCD’s concessions. Over time, however, GCD was unable to control and manage these small-scale operations as more illegal artisanal miners than it could keep track of poured into the company’s concession areas. Once large-scale diamond mining shut down when GCD ceased to operate in September 2007, ASM were left with few alternatives and used their skills to convert from diamond to gold mining instead (Nyame & Grant, 2012). Such a conversion was not difficult to achieve since gold had always been recovered as a by-product of alluvial diamond mining, hence former diamond miners were able to use their
knowledge of handling and selling gold to facilitate their shift in focus.

Second, international guilt and concerns about the sale of “conflict” or “blood” diamonds originating from the Ivory Coast, but smuggled onto world markets through Ghana, led in late-2006 to the imposition of a temporary ban on Ghanaian exports of rough diamonds. This was followed by the introduction of stricter production and export regulations through the international Kimberley Process Certification Scheme (KPCS) that had a debilitatingly negative effect by very suddenly increasing the cost of working in the diamond industry and hence creating an incentive for artisanal miners to move to gold. Other accompanying factors essentially encouraged this transition, including favourable geological terrain that contains both diamonds and gold within a limited spatial area, the growth of informal partnerships between customary land owners and illegal artisanal miners after the former re-acquired or re-occupied land previously signed over to GCD, the volatility in the price of diamonds (from US$32 per carat in 2005-2008 to US$20 per carat in 2008) and the soaring price of gold (US$445 per ounce in 2005 compared to US$1224 in 2010), the rising operational costs of diamond mining due to new regulations imposed by government, and the paucity of opportunities in other types and sectors of employment. “As a result, artisanal miners have triggered a set of self-sustaining forces that have
permanently transformed the political economy of mining in the country” (Nyame & Grant, 2012, p.164). The effect of this change of focus away from diamond mining to gold mining can be seen in the rapid shift in the ratio of workers in both industries: in mid-2008 it was approximately 55-45 in favour of gold mining, although it stabilised at 50-50 once world diamond prices recovered slightly and government restrictions were loosened, but this represents a phenomenal change from the 1990s when the ratio favoured diamond mining at 95-5, and even more recently in the mid-2000s when the ratio was still 80-20 in favour of diamonds.

The impact of the resurgence in gold mining

Loss of farmland and forest cover

Despite the undoubted fiscal benefits of increased gold mining activity since 1989, much of this has been achieved at considerable environment and social cost. The institution of the new IMF-inspired policy regime in the mining sector, for example, was not accompanied by any environmental regulations until 1994. Since that time, legislation mandating environmental assessment impacts and environment management plans has been passed, but in reality these laws are not strictly policed due to a lack of resources (Akpalu & Parks, 2007). The technology applied to the gold mining sector also changed at the same time as the more easily extractable
mineral deposits began to run out. Gold mining has gradually shifted from underground to surface mining resulting in considerable environmental damage from deforestation and the loss of farmland within mining concessions. The loss of farmland is especially relevant to this case study, as it has wide-ranging spill-over effects by forcing farmers to expand their farmland into forests and brings them into direct and often violent conflict with mining interests over land use rights. In one study of land use in mining concession areas in Western Ghana by Schueler, Kuemmerle and Schroder (2011), it was found that 45% of farmland and 58% of forest cover had been lost, respectively, as a result of surface gold mining. Interviews with farmers and other local stakeholders suggested a widespread loss of ecosystem services and environmental degradation “together pointing to rapidly eroding livelihood foundations. Since we found substantial indirect effects of surface mining (via displacement of farming), the environmental and social costs of Ghana’s gold boom may be much higher than the often acknowledged direct costs” (Schueler, Kuemmerle & Schroder, 2011, p.537).

Akpalu and Parks (2007) look at the same issue of land use from an economic perspective by analysing the resource conflict arising from the interaction of non-renewable and renewable source use, i.e. the opportunity cost of mining in Ghana’s rainforest regions. The surface mining technologies generally favoured by large mining companies to extract gold
located in rainforests have led to deforestation rates of approximately 2 million acres; over 60% of the rainforest in the Wassa West District, for example, was lost to gold mining operations by 2001 (Tockman, 2001, cited in Akpalu & Parks, 2007). Surface gold mining is thought to be mainly responsible for the reduction in the country’s rainforest coverage to only 12% of its original total coverage (Ismi, 2003, cited in Akpalu & Parks, 2007).

The non-mining benefits of Ghanaian rain forests are extensive. For example, it is thought that about 75% of protein in West Africa comes from bush meat, i.e. animals tracked and killed in forests. It has been estimated that 300,000 people in rural areas are supported by the bush meat trade, of which 270,000 are independent hunters. The annual harvest is thought to be about 385,000 tons, worth in the vicinity of $350 million (Akpalu & Parks, 2007).

Ghanaian rain forests are also sources of traditional medicines derived from about 2,000 plants used by roughly 70% of native Ghanaians for their healthcare and also exported to Europe for production of medicines there (Akpalu & Parks, 2007). In addition, a large number of forest products are as the basic material in the production of baskets, furniture, roofing materials, musical instruments, jewellery, hunting tools, and traditional drums, etc. Major waterways that provide the main source of drinking water to the country’s population are fed by rivers and streams that pass through forest reserves.
Finally, Ghanian forests are home to many rare species of flora and fauna, which are gradually being reduced in size because of the destruction caused by open cast gold mining operations. For example, ten species of timber are of concern to the International Union for Conservation of Nature and Natural Resources (Akpalu & Parks, 2007). These are not issues, however, that are taken into account when mining concessions are granted.

In Ghana, a minimum tax of 3 per cent is usually imposed on mining companies to compensate for the opportunity cost of the extracted gold resulting from the preference for open-pit or surface mining methods in rainforests. As Akpalu and Parks have pointed out, however, such a level of tax “is too low to fully represent the external cost of extraction (i.e. lost forest products)” (Akpalu & Parks, 2007, p.69), and is therefore unlikely to compensate for the damage inflicted on forests or led to greater efforts to protect renewable forest resources.

The conflict between large-scale and small-scale mining

Related to the land use issue is that of burgeoning conflict between different types of users. Large-scale mineral exploration companies remain the primary players in both the diamond and gold mining industries, but their relationship with ASM has become more fraught as the latter have a acquired a greater
taste for gold mining and have consequently begun encroaching more and more upon large-scale concession holdings. These encroachments have begun to exceed the government’s and the companies’ capacity to control them, with the potential for greater confrontation and possible violent clashes in future.

According to the Ghana Chamber of Mines (2012), illegal mining has become a major environmental, health, safety and security problem. The economic ramifications are also potentially damaging to the country, particularly when illegal mining takes place on the concessions of large companies. Without proper oversight and regulation, these small-scale illegal miners leave behind them polluted waterways, craters filled with toxic waste material (from technologically backward gold extraction methods that rely greatly on mercury), and general destruction of surrounding flora and fauna. The cost to the Ghanaian state of having to treat previously pristine water sources in order to make them potable would be considerable. And in the opinion of the Chamber of Mines, which has a clear vested interest in reducing competition, “the difference small-scale mining operations and illegal mining is not distinct” (Ghana Chamber of Mines, 2012, p.17). Moreover, they both contribute minimally to the nation’s coffers (read: they pay little in the way of tax), while producing more than a third of the country’s gold output.
The use of mercury in gold mining

There has been a large increase in the use of mercury as extraction has shifted from alluvial mining to surface mining. Previously, most ASM gold mining accompanied diamond mining as a side activity where gold could be relatively easily sifted from the diamond-bearing gravels in or near streams and in alluvial terraces. Because of the shift in focus to gold, mining has also moved away from the depleted surface layers of river beds and streams to harder to mine areas where mercury is used in large amounts to combine with the gold particles embedded in rock and soil. The mercury-gold amalgam is then heated by the miners, usually in very rudimentary conditions, to remove excess material so that only gold ingots are left over. Thus a much larger market for mercury for created from greater numbers of miners processing rock with the use of mechanised extraction equipment. The clear downside of this is the poisonous vapours released during the heating process, which often come into contact with the skin and mouth and are even inhaled by the miners themselves with long-term implications for their health. Not only that, waste mercury is usually left to run off into nearby waterways or the local soils with a highly detrimental effect on the environment.

A study of the health effects of mercury use in a galamsey village found that 90% of villagers (both
galamsey and non-galamsey) reported experiencing a slight metallic taste and salivation problems. Twenty percent also experience physical tremors and 65% has sleep disorders. Analysis of mercury levels in biological samples indicated 86-91% of the population had been exposed to mercury (Rambaud et al., 1999). A second similar study in a different region of Ghana that looked at the effect of mercury use on overall river systems found that: river sediments were significantly contaminated and were carried so far downstream that some coastal areas were just as contaminated at inland areas; fish are also highly affected so that in the particular area examined the consumption of a mere 45g of fish per day was sufficient to exceed the World Health Organisation’s (WHO) weekly tolerance of 300 µg; and consumption of particular types of vegetables could exceed the weekly mercury intake set by the WHO/Food and Agricultural Organisation’s expert committee (Babut et al., 2001).

There was a push in the early 2000s to encourage the purchase of “retorts” among ASM which are used for the separation of gold and amalgam to reduce the negative effects of mercury use on miners and others within the immediate vicinity of their workings, but it appears that the education campaign was not able to maintain pace with the huge boom in mining experienced since the middle of the decade.
Alteration of the physical environment

Even without the use of mercury, the effect of alluvial extraction methods by artisanal miners can be devastating by disturbing the physical characteristics of the environment. Miners are not particularly concerned about water discharge and simply deal with flow as they require for the immediate purposes of their mining activities. They dig pits in or alongside river beds in which they need just enough water for washing the gold (and diamond) bearing gravels. Habitats for aquatic life are therefore greatly disturbed and thus food availability is limited because excavation pits destroy the vegetation cover and aquatic macrophytes, which reduces the amounts of organic matter available to invertebrates and omnivorous fish (Rambaud et al., 2003). Environmental damage has been exacerbated beyond alluvial mining areas by the expansion of ASM gold mining outside easily accessible diamond-bearing gravels in the proximity of streams. “[M]iners have now moved several kilometres outwards from the low-lying diamond-bearing areas to weathered and primary host rock gold-bearing material in comparatively higher ground” (Nyame & Grant 2012, p.168).
**How artisanal miners extract gold**

In a typical small-scale gold mining operation where hard rock is mined, the ore is excavated manually and size reduction is carried out using a combination of jaw and rocker crushers, hammer, disc and stamp mills. The stamp mills and rockers are manually operated while the others are powered by diesel or electricity. Generally, the milled material is washed in a sluice lined with corduroy, jute material, miner’s moss or astro turf to obstruct the flow of slurry and concentrate gold particles. Alluvial ores do not go through comminution [the reduction of solid materials to smaller sizes] but are scrubbed, screened and concentrated by sluicing. The concentrate in both cases is cleaned in pans and the gold is amalgamated with mercury. The amalgam is then roasted to obtain the gold, which is sold to licensed buyers.

Awankwah & Anim-Sackey, (2003), p.133

During the days GCD was the leading diamond miner in Ghana it created a 30-metre buffer zone alongside stream channels where mining was prohibited. This was a deliberate strategy to prevent environmental degradation and pollution. With the demise of GCD, artisanal miners felt free to begin mining these areas, leading to increased siltation of waterways, and to divert lengthy sections of stream channels. Such behaviour resulted in the complete diversion, for example, of the Birim River in the Akwatia area of Ghana, and in combination with deforestation and siltation also caused by small-scale miners, it has led to wholesale flooding during the annual rainy season,
including loss of life and large-scale displacement of local peoples.

**Weakening of the Kimberly Process**

The shift in mining activities has also seriously undermined the Kimberly Process. Intended to block the flow of conflict diamonds from the Ivory Coast for purposes of re-export as Ghanaian diamonds, government authorities swiftly strengthened the diamond registration regime in Ghana to include personal examination and digital photographing as a means of “foot-printing” rough diamonds (Nyame & Grant, 2012). A temporary ban was even placed on the export of all Ghanaian diamonds from November 2006 to January 2007 while the new procedures were implemented. Once the ban was lifted Ghanaian authorities made great progress in the registration of diamond mining participants, monitoring the diamond trade, and generally raising KPCS awareness among miners and traders. However, the demise of GCD and the reduction in diamond mining in general – resulting in part from the relatively new stringent registration measures – effectively made it more difficult to monitor diamond mining activities. Either artisanal miners moved to new (often illegal) mining sites, or they shifted their focus to gold mining instead. In sum, the well-intentioned KPCS process created a number of perverse incentives that both undermined the legitimate diamond mining sector and helped trigger a
sudden upswing in gold mining with all its attendant environmental hazards.

**Effect on local communities**

The temporary ban on diamond exports and its immediate aftermath also placed severe strain on local communities previously reliant on income from small-scale diamond mining. The limited economic alternatives, such as farming, were seen as far too unre-munerative and insecure, and so a shift to gold mining provided an immediate opportunity to maintain a livelihood. In contrast to the land use impact study undertaken by Schueler, Kuemmerle and Schroder (2011), Nyame and Grant identify a number of positive features to artisanal goldmining. “[L]ocal economic growth steadily picked up to such an extent that many people were of the opinion that artisanal mining offered far more direct benefits to both the people and local communities than the large-scale mining of GCD” (Nyame & Grant 2012, p.169). The perception within such local communities in the Akwatia region, for example, is that combinations of small-scale diamond and gold mining are actually of greater economic benefit than large-scale mining and create more employment opportunities. The shift to a greater concentration on gold mining is hence viewed positively by mining sector participants and their dependents.

Another possible benefit ensuing from the shift toward gold mining, according to Nyame and Grant is
that it arrested the net outflow of workers and their families from the country’s diamond mining regions. The closure of GCD triggered a serious out-flow of migrants from the regions where it operated, which negatively affected social and economic activities in those areas. But as we noted above, as one opportunity was closed off, another one opened up as from GCD miners and others used their skills from the diamond mining trade to transform themselves into artisanal diamond and gold miners and moved into the concessions vacated by GCD. The surge in small-scale operations also prompted like-minded gold mining opportunists from other parts of the country to migrate to those same areas, as well as transnational migrants from other countries like Burkina Faso, the Ivory Coast, Guinea, Angola, and Mali. This increase in inward migration “more than compensated for the emigration of persons and loss of related economic activity that followed GCD’s demise” (Nyame & Grant 2012, p.169).

Awankwah and Anim-Sackey (2003) concur that working small-scale mines has a dramatic socio-economic impact on the individuals involved, providing full- and part-time jobs and often their only source of income. It rural areas it has reduced the exodus from the countryside to the cities, encouraged local economic development and assisted in poverty reduction. Moreover, it has helped people develop basic skills and hence transformed unskilled labour into semi-skilled and skilled labour, and it has offered
chances for indigenous entrepreneurs to evolve. In 2003, it was estimated that around 100,000 people worked in the small-scale gold and diamond mining sector legally, while about the same number worked without legal status (Awankwah & Anim-Sackey, 2003).

This issue of mining sector labour skills is currently of great relevance given that the start-up of commercial oil drilling in Ghana in recent years has placed huge pressure on the country’s stocks of skilled labour as competition has increased dramatically in the extractives sector. The Ghana Chamber of Mines (2012) is particularly concerned that there is an increasing overall demand for skills in the industry in order to take advantage of the higher price for gold as previously marginal mining areas have become more “economic” to work. The Ghana Chamber of Mines also highlights the significant proportion of the mining population with the requisite skills that is at or nearing retirement age.

Is Ghana an enclave economy?

Although the influence of the mining sector on the Ghanaian economy is often cited as a classic example of a “resource curse” or “enclave economy” (e.g. Schue-ler, Kuemmerle & Schroder), Bloch and Owusu (2012) dispute this thesis. They believe that a sustained period of growth and strong investment, gold mining is more deeply linked to the Ghanaian economy than previously understood that can be further strengthened in
future. Although “forward linkages” are weak because of a lack of ore processing capability and poor local demand for gold jewellery, fiscal linkages are becoming stronger, with the gold mining sector contributing 20% to government revenue in 2009 – up from 14% the previous decade – through royalties and various taxes. Consumption linkages are also expanding as incomes from increased mining activities flow through mining communities. But it is backwards linkages that are increasing most with the emergence of “a mining inputs cluster of firms supplying and servicing both producing and exploration mining companies across the country’s various mining communities” (Bloch & Owusu, 2012, p.441).

Conclusion

The globalising influences on the Ghanaian economy in the form of increased global demand and consumption of gold and heavy investment in the mining sector to feed that demand clearly have a range of impacts on the economic, environmental and social life of the country and involve an array of stakeholders. In economic terms, the boom in gold mining in recent years has contributed greatly to overall economic health and GDP growth through increased foreign investment, greater production and higher gold prices. Whether that has assisted in diversifying the Ghanaian economy and creating a more sustainable outlook in the years ahead remains debatable. Ghana has all the
hallmarks of an enclave economy, but further research may bear out Bloch and Owusu’s thesis that the mining sector is showing real signs of developing deeper and wider linkages to the rest of the economy.

Evidence of environmental damage stemming from expanded mining activities is much clearer and the trade-offs in terms of destruction of renewable forestry and fishery resources and eco-systems do not appear worth it in the long run. Loss of forest cover and farmland has been considerable and has reduced traditional livelihood opportunities in the vicinity of mine workings. Both human health and the physical environment are negatively affected by the use of toxins in the artisanal gold extraction process, while the method of digging for gold seriously disrupts waterways and results in the loss of habitat for aquatic life. As the same time, artisanal miners, farmers, traditional landowners and large mining concerns are increasingly at loggerheads over land use rights.

On the other hand, there is some evidence that gold mining, particularly in the case of the renewed boom in small-scale mining, appears to have brought some benefits to local communities in the form of increased income flows, the establishment of mining service industries and the creation of job opportunities.

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**Selected academic papers**


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**Websites**

Community –Based Innovations to Reduce Child Labor through Education (CIRCLE) http://circle.winrock.org/ngo/gh/EPAG.cfm

Ghana Mining Portal http://www.ghana-mining.org/ghanaims/


Plight of the Child http://www.plightofthechild.org/

The Money Stone (follow Kickstarter efforts to fund a documentary about gold mining in Ghana) http://www.moneystonefilm.com/

**Video**

Illegal mining in Ghana, Aljazeera three-part documentary. First part (12m01s) http://www.youtube.com/watch?v=aK60XaJJeJM
Exploring Regional Sustainable Development Issues

The price of gold: Chinese mining in Ghana documentary, Guardian Investigations (14m 20s) https://www.youtube.com/watch?v=ohrrE1rjzLo
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Chapter Eight

Environmental (in)justice in Eastern Slovakia: the Roma community of Rudňany

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Introduction

This article employs the environmental justice framework to describe the environmental disadvantages of marginalised Roma communities in Eastern Slovakia. The first part of the article presents the history of the environmental justice framework together with definitions of the crucial concepts of environmental justice and injustice. The next section summarises the main findings of the studies of discrimination against Roma minorities in terms of environmental justice in the region of Central and Eastern Europe, as well as in the region of Eastern Slovakia. The main part of the text is devoted to the study of marginalised Roma communities in the village of Rudňany. It reports
the emergence and dynamics of an unequal distribution of environmental benefits and risks within the Rudňany population. Local Roma communities are negatively affected by the impacts of past mining activities in this region and have restricted access to the environmental benefits available to the non-Roma majority.

A brief history of the development of the environmental justice framework

The concept of environmental justice was developed by academics and activists in the USA to describe a new form of grassroots environmental movement connecting environmental issues with issues of social justice (Stephens, 1998). The notion of environmental justice emerged as part of the fight for racial equality and was first used to highlight racial and ethnic inequalities in the exposure of ethnic minorities towards environmental risks within society, as well as the exclusion of racial minorities from definitions and the implementation of US environmental policies (Laurent, 2011). The argument that some sections of the population bear greater burdens of development without adequate access to its benefits is at the core of the environmental justice movement (Stephens, 1998).

At the end of the First National People of Color Environmental Leadership Summit (1991) representatives of diverse sections of the environmental justice movement adopted 17 Principles of environmental
justice movement\textsuperscript{8}, which became the fundamental document of the environmental justice movement. Recognition of the need to address environmental injustice is still promoted mostly in the USA (Sandler & Pezzullo, 2007). The US Environmental Protection Agency employs a clear definition of environmental justice\textsuperscript{9} which the US government uses to act accordingly (Laurent, 2011).

**The definition of environmental (in)justice**

Environmental and human rights organizations in Central and Eastern Europe have developed definitions of environmental justice and environmental injustice, and generated a framework for assessing environmental justice (Steger, 2007).

**The definition of environmental injustice**

An environmental injustice exists when members of disadvantaged, ethnic, minority or other groups suffer disproportionately at the local, regional (sub-national), or national levels from environmental risks or hazards, and/or suffer disproportionately from violations of fundamental human rights as a result of environmental factors, and/or denied access to environmental investments, benefits, and/or natural resources, and/or are denied access to information;

\textsuperscript{8} http://www.ejnet.org/ej/principles.html
\textsuperscript{9} http://www.epa.gov/compliance/uj/basics/ejbackground.html
and/or participation in decision-making; and/or access to justice in environment-related matters.

**The definition of environmental justice**

A condition of environmental justice exists when environmental risks, hazards, investments and benefits are equally distributed without direct or indirect discrimination at all jurisdictional levels, and when access to environmental investments, benefits, and natural resources are equally distributed; and when access to information, participation in decision-making, and access to justice in environment-related matters are enjoyed by all.

**Environmental (in)justice in Central and Eastern Europe**

An analytical framework of environmental justice that provides a tool for studying distributional patterns of environmental risks and environmental also benefits Central and Eastern European Countries. Discrimination of Roma settlements has been documented by several studies undertaken in this region (Filčák, 2012a, 2012b; Harper, Steger & Filčák, 2009; Steger, 2007). This research supports the observation that in certain locations, members of ethnic minorities, communities of lower socioeconomic status and the least educated disproportionately (1) suffer from exposure to environmental hazards due to their proximity to hazardous waste sites, incinerators, factories,
abandoned industrial facilities and other sources of pollution, and/or (2) are denied environmental benefits such as potable water, sewage treatment facilities, sanitation and access to natural resources, and/or (3) are witnesses to the conceptualization of their living space as “beyond the pale” areas where environmentally controversial practices are concentrated (Harper, Steger & Filčák, 2009).

**Environmental (in)justice in Eastern Slovakia**

Research undertaken into 30 randomly selected rural Roma settlements in Eastern Slovakia revealed that only seven cases indicated that access to natural resources and exposure to environmental threats was comparable for both Roma and non-Roma people living there. The four patterns of unequal distribution of environmental benefits and harm identified in the research were: 1) Exposure to hazardous waste and chemicals (settlements on or near contaminated sites); 2) vulnerability to floods; 3) differentiated access to potable water; 4) discriminatory waste management practices (Filčák, 2012a).

Although different in form and scope, they possess several common features. They are the outcome of divisions in the villages, where through social processes the weaker group (Roma) is unequally exposed to adverse environmental impacts or has limited access to environmental benefits. The location of settlements, management of natural resources or
waste is largely an outcome of conflicts over space in villages, and the environment plays an important role in the struggle.

Filčák (2012a) identifies three main factors influencing the decisions of the majority towards the selection of environmentally problematic areas for Roma settlements. These are:

- economic interests (the price of the land/real estate value, commercial potential),
- ethnic discrimination and spatial distance (proximity to the main village and racial prejudices/the effort to push Roma out of the main village), and
- competition over resources (entitlements, management of the resources and access to employment).

Environmental conditions may (mainly through their impact on the value and commercial potential of the land) play a decisive role in the selection of areas for settlement. Environmental discrimination does not stop with the selection of such places. Once areas for settlements are selected and inhabited by Roma, they may become places for other environmentally unfriendly activities. Parts of villages inhabited by Roma are considered to be “lost” for any meaningful investment, and the local council is well aware of the fact that Roma, as the least powerful group at the local level, will not generate sufficient pressure to prevent this type of land use. The space is then constructed as
“beyond the pale”. This means conceptualization of Roma village sections as “beyond the pale” spaces where environmentally controversial practices are (or may be) gradually concentrated (Harper, Steger & Filčák, 2009).

**Case study: The village of Rudňany – a brief introduction**

The situation in Rudňany is a clear example of environmental injustice, where one group of citizens is much more exposed to environmental threats than the rest of the population. Insufficient access to potable water, sewage treatment and discriminatory waste practices are accompanying factors affecting local Roma settlements.

The Roma settlement of Pätoracké is located very near a former mercury and iron mine, where local conditions are highly toxic. The settlement is surrounded by a giant hill of debris of loose rock from the mine. Non-Roma Slovaks were earlier evacuated from the site as the ground began to give way and homes began to sink into the earth.

Another Roma settlement in the village is located on a derelict factory site (Zabijánec) where mining waste surrounds the community and the ground is contaminated by industrial waste. Children playing in “their backyard” are fully exposed to these toxins which have long-term effects on health, including neurological damage (Steger, 2007).
Mining and industrial activities in Rudňany

The village of Rudňany is located in the central-eastern part of Slovakia, 15 km from the provincial town of Spišská Nová Ves. The whole region has a long tradition of mining and iron ore smelting. The greatest mining development in Rudňany dates back to the period after WWII, when mercury started to be processed there. Enlargement of the industrial zone culminated with mining output of 1 million tonnes per year. A new industrial plant for complex ore processing was constructed between the years 1964-1970. During the 1970s and 1980s it was biggest deep ore plant in the former Czechoslovakia. This development created demand for unskilled labour, which enticed many inhabitants to move into this region. Some of these migrants were Roma arriving mostly from settlements around Spiš (Filčák, 2007b, 2012b).

The change of political regime in 1989 triggered the eventual termination of mining activities. Mining and metal processing were the main sources of employment in the village, and the sudden collapse of mining and the associated industry at the beginning of the 1990s reshaped the social situation and the perspectives of all the inhabitants. The collapse of the mining company, accompanied by the downsizing of almost every enterprise in the region, had a strong negative impact on the village. Many people lost their jobs, which gave rise to social instability in their families.
For the Roma who moved into Rudňany mostly because of job opportunities, the era of state socialism represented a period of relatively good times. Roma worked in the mining factories, the railway company, waste management and other employers with a demand for unskilled labour. Following the beginning of the economic transformation, the unemployment rate among Roma from the shantytowns soared to almost 100% (Filčák, 2007a).

**Environmental conditions in Rudňany**

The Rudňany area is among one of the 10 most problematic environmental “hot spots” in the Slovak Republic. The reason is the long tradition of mining and ore-processing industries that was intensified from the 1950s until the 1980s by the former socialist regime and a centrally planned economy that focused on the promotion of heavy industries and exploitation of natural resources. Investment in environmental measures began to take place only in the late 1980s as a result of a decline in central control and the opening up of the system. Nevertheless, these changes came only several years before some of the mining industries collapsed (e.g. Rudňany) (Filčák, 2007a).

Until 1993, Rudňany’s Železorudné bane company was the biggest polluter of the atmosphere and the terrestrial environment with mixtures of mercury, cuprum, cadmium, lead, antimony and other elements. The main sources of pollution were its mercury and
barite operations (Krokusová & Čech, 2010). From the 1950s until the end of the 1980s the ore-processing factory released approximately 60 tons of mercury into the air annually, what made this village one of the most problematic places in Czechoslovakia from an environmental point of view (Filčák, 2007b).

The decision to remove the settlement of Oľšo (part of the area of Markušovce) near Rudňany adopted by the district committee on 1 January 1977 illustrates the intolerable pollution of the environment in this area. Measurement of pollution revealed that the environment surrounding the settlement was excessively polluted by dust, mercury, arsenic and other harmful substances. This was reason for the office of district sanitarian to establish a sanitary protection zone around the new industrial plant in Rudňany. Seven years from the initiation of a new plant it was decided that the processing of iron ores had devastating effects on the health of the citizens10 (Šoltísová, 2012).

While atmospheric emissions from production have dramatically decreased due to the collapse of production at the beginning of 1990s, the whole territory is contaminated by toxic emissions and surrounded by abandoned factory sites (often polluted from industrial activities and operations), waste dumps and abandoned mines as an outcome of past industrial development. Nowadays these remain unresolved

problems which present a permanent danger to the local inhabitants. There are more than 40 km² of land contaminated by lead in the area surrounding the Rudňany mining factory area. The toxic mine tailings contain mercury, which can cause mental illness, birth defects, kidney failure and other diseases. Heavy metals are still present in increased levels in nearly all of parts of the environment (Filčák, 2007a, 2007b).

The measurements suggest that pollution was even higher during the 1990s than limit values, especially in the areas directly adjacent to the factory premises and in areas of past mining and metal processing activities where the two Roma settlements in question (Pätoracké & Zabijánec) are situated (Filčák, 2007a). Generally, only a slight improvement has occurred in terms of the quality of the environment in Rudňany. Pollution persists in forms of evaporation and deflation from the mining waste dumps, setting pits and from contaminated soil horizons (Michaeli & Boltižiar, 2010).

The abandoned mines are gradually collecting water from underground and surface sources, which pose the risk of a release of highly toxic effluents into the environment. The problem can be seen in the lack of financial resources needed for the proper maintenance of old mines (Krokusová & Čech, 2010).

The Roma minority in Rudňany

The Roma settlement in Rudňany is a relatively new phenomenon. Roma settlements or shantytowns were
virtually unknown in the village prior to the 1950s. Industrial development in the 1950s, the economic policies of the centrally planned economy, and relatively attractive salaries and demand for unskilled labour attracted Roma from the surrounding villages to settle in this area.

Although state-owned companies in the former socialist system provided accommodation for their workers, this did not happen in the case of the Roma workers. Non-Roma miners and industrial workers used to live in social housing built by the state factory, whereas Roma comprised the population of the shantytown of Zimná dolina (Cold Valley), located close to the centre of the village. Only a limited number of Roma workers’ families overcame the barrier between the minority and majority and escaped the shantytown by moving into public housing for employees.

The situation changed at the beginning of the 1970s, when the Roma moved out to the present locations at Zabijánec and Pätoracké. There are two suggested reasons explaining this resettlement, but it is impossible to verify them nowadays. Firstly, it has been claimed that the number of inhabitants of the former settlement grew rapidly beyond its capacity to sufficiently house the numbers required. Secondly, it has been suggested that the pressure from the majority of the town population, which refused to tolerate the presence of the Roma in the centre of the village, forced them to move out of their old houses and settle in new dwellings on the outskirts (Filčák, 2007a). This reason was also
cited by the mayor of the village during the research interview. Most likely, both reasons influenced the process of resettlement, which created two segregated Roma shantytowns.

The settlement of Pätoracké was established on the site of former administrative buildings and a residential area which non-Roma had left due to the constant risk of landslides. The second settlement of Zabijánec was formed on an abandoned factory site. The re-settlement was barely imaginable (under the former totalitarian regime) without the approval (or at least indifference) of the local authorities and the mining administration, although they must have all been aware of the social and environmental conditions in the areas the Roma moved to (Steger, 2007). Both the company management and municipal council were under direct control of the Communist Party. Whether the Roma were pushed into leaving their former settlement or if they decided to do so voluntarily is not crucial. The result is that they settled on environmentally problematic sites, unsuitable for living, with the tacit and unwritten approval of the company and local authorities. In the period of concentrated power it is unimaginable that Roma would have been allowed to settle there against the will of the party and its local executive bodies.

**Pätoracké**

Pätoracké used to be a privileged part of the village of Rudňany. In the 1950s and 1960s, the mining company
built houses and an entire infrastructure for the employees. Two blocks of flats served for the company’s mid- and high level managers. The settlement could be described as a fully functioning part of the village, with water and electricity infrastructure, schools, offices and shops. At the beginning of the 1970s, problems began to arise. The mining activities from the past started to endanger the settlement when the land in the vicinity began to subside. There are several kilometres of mine corridors directly under the settlement. The deepest underground structures are estimated to go as far as 900 metres below the surface. The first accident with the collapse of houses occurred at the beginning of the 1970s. The authorities declared the place to be an endangered zone. As an immediate response, the company decided to move all residents to newly built houses and flats in the towns of Spišská Nová Ves and Smižany. The estimates are that around 2,700 people moved out. The entire public utility network and houses were destroyed and decommissioned with the exception of two three-floor administrative buildings. This happened despite the fact that the mining and processing company received money from the state budget for the demolition of all buildings and infrastructure as part of the programme to clear the endangered zone. It is not clear why they left these two buildings behind, but the abandoned blocks soon attracted Roma from the village and from other surrounding villages and towns. Non-Roma
people were evacuated, while Roma were silently allowed to move there (Steger, 2007).

Pätoracké is located only a few hundred metres from the mining and factory sites, which made this place even more attractive for Roma because the place was close to their work. Entrance to the mine was on the left side on the top of the hill of the mining waste. The Roma settlement at Pätoracké had started to grow because to natural population growth and occasional migration from other shantytowns. Mining activities in this area were not abandoned and mining waste accumulated around the Roma community. One of the administrative buildings collapsed in 1989 and Roma used the scrap material to construct small houses and huts in the surrounding area. Later a second building also collapsed and the material was used in a similar way. The shantytown, with houses made of waste material, tin and stones, is built on the company’s land. The Roma are neither owners, nor tenants. Small houses and huts are built illegally on the land restricted for any public or commercial use. The shantytown is located approximately 1 km from the edge of the village and the only access is via an unpaved road. Snow and climatic conditions often prevent children from attending school in the winter time. Access by medical rescue teams in the case of an emergency is problematic. The local authorities and factory management did not take any steps to address the situation until 1989, when the company filed for
bankruptcy. At that time, increased press scrutiny and the new social and political system generated criticism of living conditions in the Pätoracké settlement. In 2001, part of the zone sank into the earth, and there is still a hole in the ground in the middle of the settlement. After this incident, an emergency situation was declared and the government immediately responded with new plans on how to address the situation (Filčák, 2012b).

In 2001, 31 new low-standard flats were built for 270 inhabitants of the Pätoracké shantytown. These are located just several hundred metres from the shantytown in a reconstructed building of the former mining company. Residents from those houses most endangered by the threat of subsidence were resettled, but the remaining families still await a resolution. Despite the fact that the new location is free of landslides and sinkholes, it is still surrounded by the mining waste dumps and is separated from the main part of the village where non-Roma live. In the meantime, the momentum generated to address this emergency situation has diminished and the situation is increasingly considered “normal” (Steger, 2007). About 450 still live in the zone under the threat of subsidence and landslides. In September 2009, there was an abrupt subsidence which created a crater 10 m in diameter in the Roma shantytown. This sinkhole incident was repeated again in 2011.

The Roma settlement of Pätoracké is one of the most endangered Roma settlements in the whole
region of Central and Eastern Europe. As a result of past mining activity and other industry, the entire area of the settlement is contaminated by toxic emissions, waste dumps and abandoned mine tailings. The abandoned mines are gradually collecting water from underground and surface sources, and in a few years they will start to release highly toxic effluents into the environment. The settlement is surrounded by a giant mound of loose rock from the mine. In addition to soil contamination, the threat of subsidence creates a constant health threat with immediate and drastic consequences (Antypas, 2008).

Typical of many Roma communities in Europe, the lack of sufficient sewage and waste treatment creates the context for ongoing negative health impacts associated with contagions related to poor living conditions. There is just one outdoor water tap serving the whole community of Pätoracké. There is no sewage system or sewage treatment in this settlement, and the hygiene conditions are very bad, especially in the summer months. There are no toilets with running water, no place to wash, and children collect water in plastic jars and bottles. In the absence of waste collection, the place is surrounded by rotting garbage (Steger, 2007).

Zabijánec

This settlement is located directly on a former industrial zone and is located nearly 1km from the edge of the
village. Three of blocks of apartments were built there as administrative buildings for the mining company. The area served as a place for collecting metal ore and as a transport hub. In 1965, the company moved their activities closer to the actual mining sites and the place was abandoned. A few years later, (at the beginning of the 1970s) Roma moved into the abandoned buildings and have lived there ever since (Filčák, 2012b).

Sources of pollution in Zabíjanec are twofold. The first one is in surrounding area comprised of toxic mining waste dumps. Since these dumps are on the slope above the settlement, when it rains and the winter snows melt, water with high levels of heavy metals flows down into the settlement and is deposited in the soil. Inhabitants then bring this contaminated soil into their houses on their feet or breathe it in the dust during the summer time. The second source of contamination is the area itself. Since it served as an industrial zone, there are residues of heavy metals, oils and other industrial materials in the soil. Children playing outside close to their homes are exposed to toxic substances, which have long-term effects on health, including serious neurological damage (Steger, 2007).

In the year 2007, 29 new low-standard flats were built for 240 local inhabitants. This social housing as also segregated from the village and the majority population. However, more than 500 people still live
in the original shantytown. Roma built a few huts near to the blocks of apartments. The living conditions of the local residents remain terrible. The blocks of apartments are in very poor condition and the entire area around them is waterlogged with effluent from abandoned mines. There is no water tap in the settlement, which is why the residents have to bring water from wells which are nearly 2 kilometres away. There is no sewage system or sewage treatment in the settlement and no flush toilets in the houses.

**Conclusion**

The area around the village of Rudňany in Eastern Slovakia is deeply negatively affected by the past tradition of mining and ore-processing industries. The whole territory is contaminated by toxic emissions and surrounded by abandoned factory sites, waste dumps and abandoned mines as a legacy of past industrial development.

However, environmental risks and hazards are not distributed evenly across the local population. Members of the disadvantaged local Roma communities suffer disproportionately from environmental hazards, such as the risk of landslides and the toxic pollution of their surroundings. Moreover, these people do not have adequate access to environmental benefits and resources, such as potable water, sewage treatment and waste management practices. The main causes of this unpleasant situation can be traced back to the
former socialist era, during which the resettlement of the local Roma population into problematic areas took place. With the approval of the former communist regime Roma were allowed to settle down on environmentally hazardous sites, unsuitable for living. The Pătoracké settlement was established in the former residential area, which was declared by authorities to be an endangered zone and left by non-Roma inhabitants, whereas the settlement of Zabijánec was formed on an abandoned factory site. Despite some measures adopted by the local government, living conditions in these settlements remain very poor.

The documented situation of Roma communities in Rudňany can be considered a clear example of environmental injustice. Unfortunately, similar patterns of an unequal distribution of environmental risks and benefits between Roma minorities and the non-Roma majority can be found in many countries within the Central and Eastern Europe region.

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References:


Exploring Regional Sustainable Development Issues


Chapter Nine

The influences of tourism on natural, economic, social and cultural values in Iceland with special emphasis on sustainable tourism

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Introduction

Iceland, as most readers will know, is a small island nation located in the North Atlantic and home to one of the more inhospitable climates of any of the planet’s inhabited land masses. In the late twentieth century it was probably best known as the venue of one of the late Cold War meetings between President Ronald Reagan and Soviet leader Mikhail Gorbachev, and for its exports of alternative pop music from the likes of The Sugar Cubes and Bjork. Its population was so homogenous that biomedical researchers at the forefront of the revolution in human genome research were eager to tap into its “pure genetic lode” to help unravel the mysteries of genetic disease (Marshall, 1998).
Fast forward to the first decade of the new millennium and Iceland becomes better known as one of the first victims of the 2008 global credit crash, one of the film sets of the immensely popular television series Game of Thrones, and – something that was close to unthinkable little more than 10 or 15 years earlier – an important European tourist destination.

Over the past two decades, tourism in Iceland has grown to such an extent that the economy is now considered to have successfully diversified away from its traditional mainstay of fishing, and – since the early 1990s – aluminium smelting; economic diversification is considered the Holy Grail of all small island nations in order to stave off economic shocks resulting from fluctuations in their primary export markets. In 2009, the Icelandic tourism industry accounted for 5.9% of national Gross Domestic Product (Statistics Iceland, 2011), with the industry recording growth figures on average of 11% per year (Iceland Complete, 2014). To give some idea of the explosive growth in numbers of foreign tourists arriving in Iceland, around 140,000 arrived in 1990 while 781,016 flew into Reflavik International Airport in 2013 – an astounding 458% increase (Icelandic Tourist Board, 2014). At this rate, numbers of foreign visitors may exceed 1 million in the very near future.

This massive boom in tourism is in part due to the collapse of the Icelandic krona, which has yet to recover the 47% of its value lost against the Euro following the
destruction wrought by the credit crisis of 2008 (Raw Story, 2014). Previously the preserve of well-heeled travellers looking for a respite from the rat race, Iceland suddenly became a far more affordable destination for a larger portion of the foreign vacation-seeking public. So, paradoxically, the economically calamitous storm clouds that hit Iceland came with a silver lining that has managed to help the country lead the way out of recession in Europe with forecast growth of 2.7% in 2014 and 3.2% in 2015 (OECD, 2014).

But such growth in tourism comes at a cost. Just how many tourists can such a small nation handle and what is the impact on the natural, economic, social and cultural values of Iceland? Do the economic benefits outweigh any potential harm to other aspects of the island nation’s life? Can that type of growth be balanced against maintenance of the existing environment and social order? This case study focuses on the ability of Iceland to pursue a form of tourism that is ‘sustainable’ economically, environmentally, socially and culturally.

**What is ‘sustainable tourism’?**

With the advent of cheap international flight travel from the 1990s onward, global tourism has grown enormously. According to the World Tourism Organisation, tourism worldwide currently accounts for 9% of global GDP, one out every 11 jobs, and generates US$1.3 trillion in exports (UNWTO, 2014). But while the positive economic outcomes from tourism
are clear to see and easily measurable, tourism can also have very damaging impacts if not properly managed. At the local environmental level, unchecked tourist development may lead to a number of negative consequences (UNEP, 2014): depletion of natural resources through overconsumption of water, food, energy and other raw materials that may already be relatively scarce; construction of specialised tourist facilities can degrade the land they are built upon and their surroundings; pollution in the form of CO2 emissions, noise, light, solid waste, litter, release of sewage, oil and chemicals, etc., may be exacerbated; and fragile ecosystems can be endangered through disturbance of flora, fauna and microorganisms, as well as their physical environment and the natural cycles that sustain them simply as a result of human activity – even seemingly innocuous activities like recreational fishing or bushwalks.

There are also a number of negative impacts at the global level: loss of biological diversity when land and resources are overstretched, and exploitation of vegetation, wildlife, mountain, marine and coastal environments and water resources exceed their carrying capacity; depletion of the ozone layer from overuse of refrigerators, air conditioners and propellants in aerosol spray cans, which all contain ozone depleting substances such as chlorofluorocarbons and halons, as well as jet aircraft emissions; and climate change resulting from the movement of people from their
homes to a holiday destination, accounting for about 50% of global traffic with much of that via plane (UNEP, 2014).

Not surprisingly, consideration of these types of impacts has resulted in myriad efforts to obviate these negative impacts through the promotion of “sustainable tourism”. But just what the concept is has been widely interpreted to mean different things to different parties. Like anything sustainability-related, the basis for arguments about sustainable tourism stem from the 1987 Brundtland report *Our Common Future* and its oft-quoted definition of sustainable development as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs” (Brundtland Commission, 1987, p.16). Debate has raged over the ensuing decades, however, as to what sustainable development really means in practice, and such debate is mirrored in the “confusion and ambiguity” in discussions over sustainable tourism (Butler, 1999). This confusion is exacerbated by the various types of “alternative” tourism commonly grouped together under the broad heading of sustainable tourism and which are marketed as being inherently “better” than traditional mass tourism, e.g. ecotourism, geotourism, cultural tourism, etc. Differentiation from mass or conventional tourism plays a significant role in the debate, allowing each individual to claim that his or her appropriation of the term “sustainable” is most applicable (Wheeller
1993, as cited in Butler, 1999) with the result that “the wide acceptance of the term...in many cases is simply acceptance of the phrase but not its implications” (Butler, p.9).

Butler pinpoints two problems with the automatic acceptance associated with this idea that mass tourism is clearly not sustainable and thus has nothing to do with sustainable development. Firstly, no type of tourism development is without some impact on its locality. The notion that nature-focused tourism is intrinsically sustainable can be erroneous and even harmful. For example, alternative forms of tourism are often located in highly sensitive and fragile environments with little to no infrastructure where even moderate levels of human activity can have a damaging impact no matter how small because of the potential cumulative effects. Secondly, one should not necessarily take it for granted that all mass tourism is unsustainable – there is not enough evidence to say so one way or the other. The risk in the meantime is that this type of attitude may detract from understanding how mass tourism can be made more sustainable. After all, mass tourism logically forms the vast majority of tourism opportunities in the world and it will remain that way for the foreseeable future.

Another problem with defining sustainable tourism is that impacts occur across a range of environments. Too often the discussion focuses almost exclusively on the influence of tourism development on the
natural environment, particularly in the Third World where it is easier to critique development on ‘green field’ sites. But in reality tourism impacts can be just as extensive on the human cultural, social and economic world as on the physical world. Not many researchers have focused on the multi-dimensional aspect of the ramifications of tourism in the developed world and this is a field ripe for more in-depth exploration, particularly in relatively small countries like Iceland experiencing an unprecedented surge in tourist arrivals.

In order to advance our knowledge of the impacts of tourism and clarify the concept of sustainable tourism, we need to grapple with three issues identified by Butler, all of which apply to the Icelandic context: carrying capacity, control of development and operations, and the relationship of sustainable development to mass tourism. Firstly, although it is a blunt measure, we need to know the maximum number of tourists a destination can adequately cope with and the infrastructural development and landscape modifications associated with it. Every destination has a limit to the number of visitors it can accommodate beyond which undesirable impacts begin to occur. Researchers and policy makers need to formulate tools for measuring sustainability in the tourism context despite certain conceptual challenges such as the aforementioned difficulty in agreeing on an unequivocal definition of sustainable development, the diverse contexts in which
it is applied, and the difficulty of achieving legal compliance (Castellani & Sala, 2010).

Secondly, there are usually next to no authorities whose job it is to control tourism once it has been developed. Related to this lack of oversight and a lack of research into the issue is the politics of tourism. “The absence of research and discussion on the political aspects of tourism – and the reverse, the ignoring of the political implications of tourism development and the changes it brings by decision makers and their advisors – is yet another example of the isolation of tourism from the world in which it exists” (Butler, 1999, p.17).

Thirdly, what many commentators and critics of mass tourism forget is that it is hugely popular and is not likely to disappear anytime soon. Anybody from the developed world with a disposal income, a busy job and/or a young family knows that the all-pervasive “all-inclusive” holiday package at a foreign location is the easy choice to make when there is no time to organise and plan a potentially “sustainable” alternative. Tourism is simply a modern phenomenon that shows absolutely no sign of abating, and even new forms of “alternative” tourism in future could become so popular that they are also perceived as part of the mass market.

To date there have been too few in-depth evaluations of the impacts of tourism and what levels of sustainability have been achieved. This case study does
not provide the type of longitudinal research and auditing required for such evaluation, but it does offer areas in the specific case of Icelandic tourism that should be assessed more widely and which might hence provide models that could be emulated further afield, particularly for similarly small states. One particular area of potential for sustainable tourism that is highlighted in this study is that of the value of traditional beliefs and institutions or what might be called “social capital” or “social cohesion” that help nations cope with the rapid change that Iceland has experienced through its tourist boom (Scheyvens & Momsen 2008).

So now let us look at the specific endowments that Iceland has that provide the country with both the potential and restraints to sustainable tourism, including its extraordinary landscape, its wilderness, and its national identity.

The natural ecosystems of Iceland

The geographic nature and position of Iceland, an island at the northern limits of the temperate zone and in the middle of the North-Atlantic Ocean, have a decisive impact on its biodiversity (Jóhannesdóttir, 2013).

Iceland is located in the border area between the temperate and the polar climatic zones; the lowland areas are situated in the temperate zone. The climate is strongly influenced by a relatively warm sea current coming from the south and a cold current from the
north (Hansen, 2009). Precipitation is very much less in the north due to the prevailing winds from the south and southeast which produce the main precipitation in the south. The temperature is considerably lower in the highlands than on the coast, while the frost intensity is also higher there, which leads to a higher frost process (Einarson, 1994).

The wildness that defines Iceland is characterized by glacial rivers, massive lava flows and volcanic ash, ongoing erosion by water and wind, and most of all, isolation from other countries. Iceland’s natural environment has been disturbed by human settlements for over a millennium, beginning 11 centuries ago. Deforestation and excessive grazing have gradually led to soil erosion, although Iceland has managed to maintain very interesting biodiversity, although it is a fraction of what it was before the arrival of man.

**Flora and fauna**

Only 1% of the country is covered with birch forests and woodland, whereas in the past it was 25% or even more. The vegetation that was present before the settlement of humans has been greatly reduced. Nowadays maybe only 25% of the country bears this kind of vegetation (Thórhallsdóttir, 2007). Half of the area of Iceland is highland plateau, largely lying at 400-700 m a.s.l. (Thórhallsdóttir, 2007), and at elevations above ca 550 m a.s.l., the plateau is like a desert with not more than 5% vegetation.
Phytogeographically and floristically, Iceland forms an interesting link between North America/Greenland and the Scandinavian Peninsula (Hansen, 2009). The flora of Iceland includes 470 native vascular plant species (i.e. land plants that have lignified tissues for conducting water and minerals throughout the plant), half of them survivors of the last glaciations from the Pleistocene era. Approximately 97% of Iceland’s plant species are also found in Norway.

Jóhannesdóttir (2013) describes five types of Icelandic habitat: wetlands that are usually fully vegetated unless they have been overgrazed by horses; semi-wetlands which have aquic soils but partial drainage leads to a mixture of pure wetland plants and species more common within the dryland vegetation classes; rich heathland which is dominated by small shrubs such as common heather and black crowberry, sparse grasses and moss, and is often rather dry and hummocky; grassland dominated by grasses and sometimes flowers (indicating a groundwater level too low for sedges) and which include some former wetland areas that have been drained; and poor heathland dominated by mosses, small shrubs and sometimes lichen, and which has largely been shaped by grazing.

In terms of flora, some of the most common plants that can be found on almost any part of the island are the birch tree and mountain-ash, which form small forests. The fields and marshes of Iceland are populated
with heather and in the rocky areas the most common plant is sea pink, so named because of its pink flowers. Common plants include a species of orchid, *Dactylorhiza maculata*, that frequently grows in low altitude areas. Among the plant species with particular interest for tourists there is *Epilobium latifolium*, known as Dwarf Fireweed, or River Beauty Willowherb, and *Platanthera hyperboreana* or the Northern Green Orchid.

In regard to fauna, the only native land mammal in Iceland is the Arctic fox. Other mammals, such as wild reindeer and mink, were deliberately introduced by people, while some animals like mice and rats, were introduced accidentally. The American mink was imported to Iceland in the early 1930s for the purpose of fur-farming, and the reindeer is of Norwegian domestic stock (Icelandic Institute of Natural History, 2001).

Although they are not native, polar bears are frequently seen in Iceland, especially on the north or northeast coast. They come from Greenland, traveling on the ice-floes. The reason is probably the need for food, since Greenland’s summer lasts only a month and they don’t have enough time to eat and prepare sufficiently for the winter.

Although there are very few terrestrial mammals, this is not true of marine mammals. The waters surrounding the island are inhabited by seals, walruses, dolphins and whales. In Icelandic waters there may be over 20 different cetaceans. A special place among the
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marine mammals is represented by the whale. Long summer daylight and the constant exposure of light to the water favours a good environment for plankton from the photic zone, which represents the primary source of food for whales.

Due to their diversity and large numbers whale watching tours are very popular in Iceland. The number of tourists is growing from year to year as a result. In recent decades, the number of whale watchers continued to grow from just over 30,000 in 1998 to nearly 114,000 in 2008 (an annual average increase of 14%), although the number of tour operators remains relatively stable. Whale watching activity is concentrated in Reykjavík (which accounts for 51% of whale watch visitors) and Húsavík in the north (36%). Other locations are Dalvík and Hauganes, also in the country’s north, which account for 6% of whale watch figures; Olafsvik and Drangsnes in the northwest, with 5%; and the Vestmann Islands in the south, with around 2% (O’Connor et al., 2009).

Large vessels are used for whale watching, some of them with capacity for 145 passengers. The best time to go whale watching is June – August. Up to 11 species can frequently be spotted, including minks, blue and humpback whales, white-beaked dolphins, orcas, cachalots, northern bottlenose whales, long-finned pilot whales, harbour porpoises and, according to one of the operators, sei and fin whales can very occasionally be seen (O’Connor et al., 2009).
With the increasing number of tourists coming to watch for whales, the number of whales killed for food has also risen.\footnote{Iceland does not recognise the International Whaling Commission’s ban on commercial whaling and resumed whale hunting in 2013 after a two-year suspension (Vidal, J. (2013). Iceland resumes fin whale hunting after two-year break. The Guardian. Retrieved from http://www.theguardian.com/environment/2013/jun/19/iceland-fin-whale-hunting-greenpeace).}

Besides mammals, there is a rich invertebrate marine life in Icelandic waters, represented by echinoderms, molluscs and arthropods.

Iceland’s avifauna is one of the most attractive tourist themes, especially for bird watchers. About 370 bird species have been recorded in Iceland, of which only 75 species make a permanent nest on the island, the rest of them being migratory birds or summer guests, transitory birds (stopping to rest or to feed) and incidental birds.

The transitory birds that have been identified in Iceland are geese and waders that stop to feed before continuing their migration from Canada to Europe or vice versa. Rare species like the white-tailed eagle, the gyr falcon and the grey phalarope are protected by law.

\textbf{Geography}

Many scientists and enthusiasts of volcanology are attracted to Iceland because of its volcanic activity and
its genesis. The most important destination for them is the Mid-Atlantic Ridge, which passes right through the middle of the island, separating Iceland at a rate of 2.5 centimetres per year. A large fault can be seen crossing the rock formations and splitting down the middle.

The current distribution and disposition of active volcanoes in Iceland has resulted from the superposition of the spreading plate boundary over the Icelandic mantle plume, as well as the relative motion of these structures. The surface expression of this interaction are the neovolcanic zones – discrete 15-50 km wide belts of active faulting and volcanism. There are five active volcanic systems within the 70 km wide and 200 km long North Volcanic Zone (Thordarson & Hoskuldsson, 2002).

The Icelandic basalt plateau is situated at the junction of two large submarine physiographic structures, the Mid-Atlantic Ridge and the Greenland-Iceland-Faeroe Ridge. The plate boundary is where active spreading and plate growth take place. It can be viewed as a structure where the crust is being pulled apart and molten rock wells up to fill the fissure (Thordarson & Hoskuldsson, 2002).

All this tectonic activity that keeps Iceland moving has generated a rich geodiversity that supports its biodiversity, although the latter is not so rich due to its rocky soil with low mineral content.

Moreover, the temperate oceanic climate with polar influences prevents many species of plants and animals
from adapting and thriving. The only plants that have found a place on the island are the tundra and some shrubs. Due to these conditions, ecological niches are occupied by very few animal species.

**Man’s impact on the environment**

After the colonization of the island in the nineteenth century, humans became one of the important limiting factors of the environment. They started to cut down the trees to build their houses and then, for firewood. Gradually deforestation led to a drastic reduction of forest wildlife. Today only 1% of Iceland’s surface is covered by forests.

The natural ecosystem is characterized by the interdependent relationships between plants, animals, people and natural resources. This stable balance is very sensitive to outside influences and every change can affect the entire ecosystem. The main threat for the natural ecosystem is tourism, particularly in terms of water pollution, deforestation and waste management. In addition, the increasing population could have a negative impact on water resources, soil fertility and animal habitats.

Sustainable tourism tries to minimize the negative impact of travellers on natural ecosystems and to educate the local inhabitants and visitors about the value of the local nature. In addition, this type of tourism promotes sustainable resources and the development of tourism infrastructure, recycling,
alternative energy production and the rational use of water.

One proposal for restoring Iceland’s natural ecosystem is the planting of trees, especially in the geysers area where the warm soil and water may enable better growth, and this could perhaps lead to incipient reforestation and a return to the wild landscape of the past.

**The national identity of Iceland**

Looking at the national identity of a country through the lens of tourism in general can show both positive and negative aspects. Tourism enriches the local and regional culture of a country, for example, with new types of behaviour, habits and customs. Tourism also engenders qualities like tolerance or cultural exchange with the local people. But the continuous growth in numbers of tourists in Iceland also has a negative impact on national identity. Through tourism, social differentiation and exclusion can be exacerbated (Bozetka, 2013). This section looks at the positive or negative influences both mass and sustainable tourism may have on the national identity of Iceland.

*The historical development of the Icelandic national identity*

Historically, Iceland has had a strong connection to the other Scandinavian states. Iceland was originally inhabited by the Norsemen. From the late ninth to the
thirteenth century an Icelandic Republic evolved. At this that the landscape was completely different from the today’s (Olafsson, 2003). The whole island was covered with forest, but as noted above only 1 percent of the island is covered with trees today (Sæþórsdóttir et al., 2011). At the end of the thirteenth century Iceland came under the influence of the Norwegian and later the Danish crown (Olafsson, 2003). Both nations influenced the development of Iceland over the following centuries. In the nineteenth century a new national identity was created. Nationalists referred to their age-old culture to legitimise their fight for political independence from Denmark. They promoted sagas from the tenth and eleventh century and the ancient Scandinavian language in particular. But other aspects such as race, religion, history or economy were also attached to the native soil. Thus a lot of national narratives still exist today (Helgason, 2007; Hálfdanarson, 2001). These sagas connect the people to each other and give them something they can anchor themselves to. They also help them to form a connection with the world they live in. Some perceived values and cultural goods were transferred from the past to the present, such as endurance or stability (Palsdottir, 2002). The sagas are very important today because a lot of people still compare the landscape of the sagas to the actual topographic landscape of Iceland today. So the Icelandic people take a great pride in their ancient sagas because most
of them are from a time where Iceland was an independent nation. Since the 19th century onwards, the saga regions have been well visited by tourists from the island itself and a limited number of tourists from abroad. The reason why the sagas were so important for the local people was that in Iceland the life of the people depended on the land they lived on for a long time. Therefore, a very strong connection to the land was built up over this time (Wyatt, 2004; Sigurðsson, 1996).

Even today a lot of people relate their national identity to the land they live on. This was especially the case after the economic crisis in Iceland. After 2008 there was an increased tendency for people to think of themselves as closely related to the landscape of their country and their ancient sagas. As a result, many more people also became quite reserved towards tourists compared to before 2008. The reason for that is that they are afraid that the people who come into the country via mass tourism were changing the landscape they are so connected to. This is the reason why they prefer sustainable forms of tourism because the people who participate in such tourist ventures are much more aware of the environment they spend their free time in. So sustainable tourism can have a great impact on the national identity of Iceland because if the environment and the landscape are treated more responsibly by the tourists they help preserve the national identity of the local people.
Besides this great connection between the Icelandic people and their county, the language also plays a very important role for national identity. It has been suggested that the theme of national identity is seen as a “private” topic which is of interest mainly to the Icelandic people themselves because the local literature is written in a language which is only spoken by 300,000 people worldwide (MT Recordings, 2013).

In the early 1830s, a group of Icelandic students initiated the fight for an independent Iceland. The reason for the creation of an independence movement was the social problems throughout the eighteenth century and inspiration from the nationalist ideas of the time. In this period the Icelandic population was relatively homogenous. They spoke a distinct and relatively unified language and had more or less the same religious faiths (Hálfdanaraon, 2001; Sigurðsson, 1996; Karlsson, 1995). Their language was spoken throughout Scandinavia during the Viking Age. This language survived only in Iceland and is still spoken there today. Since the Middle Ages their literature has also been written also in this language. So they preserve a very old language which was seen as a very important cultural icon (Sigurðsson, 1996).

In the nineteenth and early twentieth century, Iceland was one of the poorest countries in Europe, but it developed into a very modern and affluent society during the last century. This was possible due to the fact that the Icelanders are strong individualists and
the society supports market friendly values like competition, meritocratic rewards, entrepreneurship and open markets for business. But equality in all its dimensions (status, sexes, opportunity and so on) also played an important role. This feature is shared with the other Scandinavian states (Olafsson, 2003).

In general, it can be said that the national identity of any state today – in the twenty-first century – is largely influenced by globalization. National identity has changed with the radical process of social and economic changes that have accompanied globalization and is influenced by the national development of the state itself. The same is also true of tourism, which as the world’s largest single economic activity has a great influence on national identity (Clancy, 2009). As outsiders, we have a rather stereotypical image of Iceland. We see Iceland for its natural and geological features as an island of fire and ice, which has been reinforced in recent years by scenes filmed there for the enormously popular television fantasy spectacle Game of Thrones\textsuperscript{12}. It is also often associated with Norse mythology, the 1980s pop band The Sugarcubes, and the singer Björk. But the socio-cultural context is often neglected (Zarrilli, 2011).

From an economic point of view three sectors are essential for Iceland’s economy: the fishing industry,
the production of renewable energy and the tourism industry. Iceland experienced economic growth from World War II to October 2008. In the 1990s, it was mainly the banking sector and the financial sector that grew. In 2008, the global financial crisis hit Iceland very hard. This also influenced their national identity because the associated problems had a tendency to emphasise national characteristics. Returning to traditional behavioural norms has helped Icelanders to deal with the economic crisis much quicker than other countries affected by the economic crises. One reason for this was that Iceland tried to promote other important sectors of the economy like tourism and the renewable energy industry. Sustainable tourism is also supported by the Icelandic state for the same reason.

**The branding of Iceland**

Tourism on small islands is a special field of study. This is due to the fact that small islands are isolated from larger land masses and because of their geographical location they all share similar problems. They have a “small population, lack of resources, remoteness, susceptibility to natural disasters, excessive dependence on international trade and vulnerability to global developments” (Bonte, 2006). For these reasons promoting tourism in their country is a challenge. In order to make their island attractive to tourists a lot of countries try to create a specific image for their island. This phenomenon is called “nation branding”
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(Clancy, 2009). Iceland has also been trying to focus on this with the help of the “wilderness concept” in the late 1990s because in the 1980s Iceland was little known as a tourist destination. But from 1995 onwards the number of international tourists increased by an average of 11.7 percent per year (Margaryan & Zherdev, 2011). And as a result, the number of receipts from international tourists has been growing since 1998 (PKF, 2013).

Tourism and tourist marketing hence tell us a lot about the national identity of a nation or a specific region or at least how a nation perceives itself. But, in contrast to other Nordic countries, the Icelandic tourist industry does not market the country to any particular group of people. It simply wishes to attract as many tourists to the country as possible, no matter where they come from. But as Iceland is located in the middle of the Atlantic ocean it can only be reached by ship or plane, and so transport costs are quite high, which limits potential tourists to reasonably affluent people (Sæþórsdóttir & Karlsdóttir, 2009; Sæþórsdóttir, 2011).

For the Nordic countries as a whole, “nature-based” tourism plays a very important role. So Iceland promotes itself – like several other high latitude and polar regions – via the “concept of wilderness”. This concept, coined by Sæþórsdóttir et al, also plays an important role in the cultural and natural heritage of the country itself. It consists of a diverse set of images and representations of the wilderness which is influenced by the people and
their socio-cultural environment, history and experiences. The concept invokes associations such as wild, remote, natural areas untouched by human influence and so forth with foreigners as tourists. But these wilderness areas are promoted to tourists as consumer products. Iceland has become a nature-based tourist destination. It is also promoted as Sæþórsdóttir et al. have stated as “Europe’s last wilderness” by the Icelandic tourist industry. Through the promotion of this “nature-based” tourism local people also get involved in tourism and are thus in close contact with the incoming tourists. But the new masses of tourists are continuously changing the landscape through their presence (Sæþórsdóttir et al., 2011; Fredman & Tyrväinen, 2011). This close contact in turn influences their own identity. This could lead to either becoming more open-minded towards foreigners or in becoming more insular by focusing more on their own national symbols like their language or the land they live on.

Sustainable tourism is also promoted through the concept of wilderness. A successful example is a project from the “European outdoor conservation association” in 2011/12. This aimed to protect the sensitive biodiversity of the island through the promotion of sustainable tourism in the Fimmvorduhals (EOCA, 2013). It is a good example of the combination of sustainable tourism and the national identity of Iceland. Through promoting the sensitive use of the Icelandic landscape the national identity of the people,
which is very much connected to the land itself, is also preserved.

The wilderness has not always been a tourist attraction in Iceland. It was only in the 1990s that the highlands of Iceland were discovered as an international touristic resource for the first time. At that time thousands of people wanted to discover the wilderness and wanted to have a special experience in it. The local people had initially tried to settle in the highlands but as this failed they ended up avoiding them for centuries. Most local people only saw the highlands as an obstacle to traveling between different regions in Iceland (Sæþórsdóttir et al., 2011).

Two perspectives of the same place in Iceland have coincided for quite a while: there was an internal and an external view of the same site. Foreigners just saw the highlands as an interesting place they wanted to visit, whereas the majority of the locals considered them as a bothersome obstacle clogging up the transport links between the North and the South, or the East and the West. But the view of the local people toward the highlands changed from the 1960s onwards some glacier-fed rivers were dammed in the highland areas and used for producing hydropower. Nowadays there are a lot of plans to make the highlands more accessible so that more tourists can visit them, which would support conventional mass tourism. But this development of accessibility for tourists will on the other hand reduce the wilderness of the region
and thus probably its attractiveness for tourists (Sæþórsdóttir et al., 2011).

Sustainable tourism can be a solution to counteract any potential negative effects because it is against the expansion of roads to get more and more tourists to hitherto untouched places. Sustainable tourism promotes sensitive forms of exploring the nature of a country. So the Icelandic state should, instead of expanding the roads in order to transport tourists more quickly through certain places, support forms of tourism where the preservation of nature as it actually is, comes first.

As we noted above, Iceland lacks the rich biodiversity of other countries due to the nature of the climate and soil composition, so the wilderness of the island today is more a “subjective and social idea than a reality”. But this construction of wilderness is important for the tourism industry in Iceland (Sæþórsdóttir et al., 2011). Other than this the tourism industry has also promoted the rural areas of Iceland via culinary tourism. The high quality of local food is marketed to get the tourists to these partially secluded regions (Gunnarsdóttir & Haraldsdóttir 2009). This form of tourism is of great advantage to sustainable tourism because such tourists are trying to explore the local habits, customs and also food of the destination they are staying at. This helps in a way also to preserve traditional recipes so that they are not forgotten in times of globally homogenous food tastes.
The influence of tourism on the national identity of Iceland

Travellers played a very important role in the formation of the Icelandic identity long before the 19th century. This can be seen via the example of one of the first visitors to Iceland. Flóki Vilgerdarson, a Viking visitor to the island, wanted to settle there but the living conditions were so harsh that he left the island. Because of his frustration he called the island Iceland (Gössling & Alkimou, 2006). This example clearly shows that this early form of “tourism” influenced Iceland to a huge extent. Tourists still have an influence on the island in these times of mass tourism because it is so important for Iceland and influences nearly every sector of the economy. Nearly every person employed in the labour market is influenced by the impact of tourism (Einarsson, 1996). The increase of tourism has its roots in globalisation, which arguably started with the age of imperialism and is still gathering pace today. Consequently, very local economies, political structures, or national identities are not as isolated as they were 100 years ago. Such isolated national identities, like Iceland’s, are becoming part of the global system. They have been de-territorialized though globalization and the trans-nationalisation of the culture, media or economy of the state (Anttonen, 1996). But this internationalisation of Iceland also influences the national identity of the people (Einarsson, 1996). The increase
in arrivals of people from different cultural, religious, ethnic or economic backgrounds is changing the previously homogenous national state. Thus, a multi-ethnic and multicultural society is also emerging in Iceland. Not only migration but also tourism has a great impact on the national identity of a state (Anttonen, 1996). One of the main impacts is the change to the nature and the ecosystem of Iceland or also through the government’s attempts to get more tourists into the country. Here sustainable tourism plays a very important role as a form of tourism which preserves the national identity of Iceland. But the continuously growing number of tourists in Iceland has also led to a “commoditization” of the national identity of the local people (Desforges, 2000).

Creating a distinct national identity is more and more important as a result of this process of globalization of national symbols is becoming more and more important. Nation states want to create a unique national character and mentality. So national heroes like Jón Sigurðsson, leader of the 19th century independence movement, are becoming of greater importance to Icelanders (Anttonen, 1996).

The concept of identity is very important for today’s folkloristic and ethnological discourse. Identity is constructed from the national imagination, national characteristics and a shared mentality in the folkloristic context. Tradition plays a very important role in creating the national identity of a group. Through tradition
territorial identification is also created. People express who they are and to whom they belong through their identity. This is often combined with special places (Anttonen, 1996) like Þingvellir in Iceland. So here one can again see the great connection between national identity and the landscape of Iceland. Other important factors for the formation of an Icelandic national identity are the aforementioned icons of language and ancient poems (Sigurðsson, 1996), both of which are closely related to the landscape. So the national identity of Iceland is at most times oriented to the glorious past (Sigurðsson, 1996) and the island’s physical characteristics.

The main tourist attractions for tourists visiting Iceland also sometimes have a nationalist touch. Examples are the Árni Magnússon Institute where medieval manuscripts are kept. These manuscripts symbolise the independence of Iceland from Denmark. Another important place to visit is Þingvellir in the heart of Iceland where the Icelandic nation was formed in 930 and the constitution of the new Republic was ratified by the Icelandic parliament in 1944. But it is also a unique place geologically (Sigurðsson, 1996; Hálfdanarson, 2004). Other than its political importance, this location is also often seen as a reflection of the Icelandic identity (Einarsson, 1996).

**The importance of tourism to the economy**

For Iceland, tourism is essential for the development of its economy. Besides mass tourism, sustainable tourism
also plays a very important role on the island. This form of tourism is less demanding on the sensitive ecosystem of Iceland, which is vitally important to the type of tourist interested in a “sustainable” experience, is also changing because these are the people who want a more meaningful experience. For these tourists, getting in touch with the local people is also very important. But at the same time, as they want a meaningful experience they do not want to intrude on these people, their lifestyle or their way of living. Instead, they treat the people and their traditions with great respect and so help the national identity of the people so that it remains as unchanged as when “regular” tourists were the predominant visitors to the island. For people who consider sustainable tourism to be essential, quality and value are preferred, too, and they want to be in contact with the producers of the goods they consume. So they also consume regional goods instead of global imported goods (Robinson & Novelli, 2005). This is the reason that the niche part of culinary tourism can be successful in Iceland.

Being a tourist is also connected with a certain kind of identity. We do not have this identity at home but rather on holidays. This particular identity consists of choosing a certain place for holidaying as well as the type of holiday chosen e.g. mass or sustainable tourism (Robinson & Novelli, 2005). So tourists who book a “sustainable holiday” also take on a certain form of identity because they do not see themselves as
ordinary tourists. They see themselves as cosmopolitans visiting a country and not so much as regular tourists (Robinson & Novelli, 2005). According to this view, they want to keep the place as it was before they arrived and they do not want to negatively influence the people or the environment. Instead, most tourists who could be labelled mass tourists only go on holiday with a quick, comfortable and cheap visit in mind. They do not really care about the consequences of their visit to the country. Both kinds of tourists interact with the places they are visiting. The identities of the tourist and the local people start to interact and so new identities can emerge (Lanfant, 1995). The result of these new identities also depends on the form of tourism chosen because the mind-set of the tourists is also a part of the newly created identity. What this identity looks like exactly depends on the people who they interact with. But in general one can say that sustainable tourism has a much smaller impact on the newly created identity than mass tourism. One reason for this is that when tourism takes off in a given country, certain people and their identities are merchandised for the benefit of tourists. So certain Icelandic people are turned into a stereotypical Icelander and this identity becomes a tourist resource for the country (Lanfant, 1995). And it is not only the identity of the Icelandic people that is changed through tourism, but also the identity of each tourist changes according to the experiences they have during their trip (Desforges, 2000).
The economic situation in Iceland

Iceland has a territory of 103,000 square kilometres and a population of approximately 313,000 that lives mainly along the coast (Jóhannesson et al., 2010). About 60% lives in and around the capital, Reykjavik. During the last decades of the nineteenth century, Iceland was among the poorest countries in Europe when perceived via the usual indicators of modernisation (life expectancy, infant mortality rate and general living standards) (Jóhannesson & Huijbens, 2009). Commercial fishing and the mechanisation of the fishing industry began at around that time, followed by agriculture. Contrary to the experience of other European countries, the Second World War and the accompanying occupation boosted the economy. After the war, Iceland received almost twice as much Marshall aid per capita as any other country (Jóhannesson et al., 2010). In the second half of the twentieth century, Iceland was near the top of the United Nation Human Development Index. In the past, the Icelandic economy had mainly been based on fishing, leaving the economy open to the supply and demand of the open market that resulted in immense economic fluctuations (Jóhannesson & Huijbens, 2009). Systematic attempts at economic diversification were made during the second half of the twentieth century with special attention paid to the harnessing of the rich resources of geothermal energy and hydropower. In recent years,
aluminium production (as a result of energy production) and the service sector have been growing as fast as other Western countries (Jóhannesson et al., 2010).

This resulted in a decline in the contribution of fishing to GDP while that of industrial products and services grew (Jóhannesson et al., 2010). Despite these developments, in 2006 fishing was still the largest source of foreign currency receipts (34%), with aluminium production in second place (17%) and tourism in third place (13%), accounting for 4.1% of total GDP (2008) (Jóhannesson & Huijbens, 2009).

This economic order crumbled in the autumn of 2008. In the beginning of October, 85% of Icelandic banks collapsed and the value of the Krona (the Icelandic currency) plummeted.

The result was an inflation rate of 18.6% in January 2009 and an unemployment rate of 9.1% in March 2009. At the same time, public debt rose to 200% of GDP by the end of 2009 (Jóhannesson & Huijbens, 2009). Six years later, however, the Icelandic economy is flourishing again. As a result of the devaluation of the krona, the export and tourism sectors have experienced major growth. Economic growth (2.6%) was one of the highest in Europe in 2012. Both the budget deficit and the unemployment rate is approaching zero percent.

The development of tourism

Tourism has boomed over the last two decades (Jóhannesson & Huijbens, 2009), indicated by the 56%
increase in registered overnight stays in hotels by foreigners during the period of 1997–2008 (Jóhannesson & Huijbens, 2009).

As noted above, the economic monoculture of Iceland, based on fishing, led to the adoption of tourism as a means to economic diversification.

For much of the twentieth century, the Icelandic government has played a rather passive role when it comes to tourism development and policy. Despite tourism becoming one of the pillars of the Icelandic economy, it has only recently surfaced as a development option and has yet to be promoted as such. The marketing strategies and vision for the development of tourism come from a few dominant firms (Jóhannesson & Huijbens, 2009). They have rationalised their operations and are able to sustain the large growth in visitor arrivals.

Tourism in Iceland is dependent on transport by air and the infrastructure built during World War II. Iceland has a good position between mainland Europe and North America. The airlines play a very important role in Icelandic tourism and are dominant in the market. During the 1940s, two Icelandic airlines were established privately – Flufélag Islands and Loftleióir. Both companies operated international flights to Europe and North America, creating transport links that served as a precondition for tourism on the island (Jóhannesson et al, 2010). These airlines became the two key actors in the development of tourism in
Iceland. In 1973, these companies merged into Icelandair. Icelandair carries 1.6 million passengers annually while the second largest carrier, Iceland Express carries 500,000 passengers from Iceland to mainland Europe (Jóhannesson et al., 2010).

**Icelandic tourism: current state**

According to recent studies, it is primarily the absence of anthropogenic features which attracts visitors to the Icelandic wilderness, as well as the experience of the authentic and the primitive (Ólafsdóttir & Runnström, 2011). An extensive survey by the Icelandic Tourist Board in 2004 and 2005 showed that over 90% of tourists visiting Iceland give the natural landscape as the main motivating factor behind their decision to visit Iceland (Ólafsdóttir & Runnström, 2011). For example, in recent decades access to the interior highlands (a large tourist attraction) has increased mainly as a result of the construction of power plants that has expanded since the 1970s, transforming the wilderness areas in Iceland into recreational areas (Ólafsdóttir & Runnström, 2011). When these great changes in land use occur without any planning and/or management, there is a risk of negative impacts. However, when no comprehensive assessment of the wilderness resources exists, conflicts between the different interest groups, as well as the different types of tourists will most likely only increase with the growing complexity. In Iceland,
the basis for developing and planning long-term sustainable tourism is, moreover, lacking (Ólafsdóttir & Runnström, 2011).

Tourism in Iceland nowadays has to deal with many problems such as distinctive patterns of seasonality and high concentrations of visitor numbers in particular destinations, thereby putting stress on fragile environments (Jóhannesson et al., 2010).

Tourism activity is concentrated in the south-west of the island in the so-called Golden Circle region and on the Reykjanes peninsula. In 2007, the total amount of registered overnight stays in the capital was between 58% (July) and 83% (December) (Statistics Iceland 2008). Second in visitor numbers, although much more concentrated in the summer months, is the region around Mývatn and Húsavík because of their natural environment. Recently, whale watching trips have been offered in Húsavík. The island offers numerous other sites of similar attraction that remain underdeveloped mainly due to access, seasonality and human resources (Jóhannesson et al., 2010).

Responsibility for tourism was moved in 2008 from the Ministry of Transport to the Ministry of Industry with the consequent recognition that tourism is an industry rather than a beneficial side-effect of transport infrastructure development. The Minister of Industry set up a committee to outline how the government should deal with tourism. The committee’s terms of reference included: making marketing efforts more
coherent and systematic, integrating regional with national marketing efforts, and creating synergies between marketing by private entrepreneurs and public efforts. There are 78 municipalities in Iceland organized into eight geographic regions. Alongside the national marketing and promotion system, there is an association for tourism development in each region. In addition, there are six regional marketing offices through various combinations of public, municipal and private funding (Jóhannesson et al., 2010). These are run parallel to regional tourist information centres but have no formal ties either with these or with a plethora of smaller information outlets, run by smaller municipalities or privately operated. In terms of what is being marketed, regional specificities have not been defined and it is mostly up to the discretion of private entrepreneurs how they promote themselves via these two channels.

**Economic Opportunities and Challenges**

Iceland has in the past had many of the problems typical of small-island economies, for example, economic monoculture, limited local markets and the high cost of access to external markets.

With a dependence on fish and aluminium production, tourism would appear to be an obvious choice for economic diversification on the island, especially in sustaining the service sector (Jóhannesson et al., 2010). The rapid growth of tourism over recent decades also
poses challenges (growing numbers of tourist arrivals, spatio-temporal concentration and the framework for entrepreneurial activity), and the island has reached a critical stage in its development as a tourist destination. Planning, environment and sustainability, image and marketing, and research and education, the central themes of past directions in tourism policy are still relevant to mark out a path for future development (Jóhannesson et al., 2010).

**Planning.** Planning to optimize the socio-economic potential of tourism and to facilitate entrepreneurship is fundamental. The Icelandic Travel Industry Association (SAF) was created in 1998 as a forum for the industry to meet and work on common interests (Jóhannesson et al., 2010). Not all tourism operators are members of the SAF. Nevertheless, this development has made policy making in terms of marketing and promotion more effective. A number of important challenges, however, still remain to be resolved. In general, there is an urgent need for an overall review of tourism in Iceland with respect to both the country’s resources and to tourism as a resource for socio-economic growth. Economic potential at the regional level, based on newly issued satellite accounts, would play a pivotal role in the regional development rhetoric so prominent in relation to tourism in Iceland. This analysis could form the basis of a more sustained engagement with the social and environmental impacts of tourism (Jóhannesson et al., 2010).
**The environment and sustainability.** Icelandic tourism policy has featured environmental issues as important principles, though in practice only lip-service has been paid to the fragility of the natural environment (Jóhannesson et al., 2010).

In the public discourse on sustainability, the notion of carrying capacity is mostly promoted, although it is based on published research in only three places in Iceland from 2000 and 2001 (Jóhannesson et al., 2010). Thus, while sustainability has been praised, there has been a lack of active engagement by the public authorities (see above). There are a number of firms that are “greening” their businesses, but the main hurdle is that no regulation or legislation is in place that requires tourism entrepreneurs to follow best-practice guidelines. There is a need for unified regulation to guide business on their way to sustainable development and that principally requires a concerted effort by official authorities and private stakeholders (Jóhannesson et al., 2010).

**Image and promotion.** In the general promotion of Iceland as a holiday destination, a constant challenge is how to integrate regional marketing with national marketing and thus make it more coherent and systematic. A proposal by a group of stakeholders, officials and academics is to draw together existing marketing resources to make the control of promotion more centralized (Jóhannesson et al., 2010). Nature is by far the most prominent element in the image of
Iceland as a tourist destination. Current tourism policy underlines the need to enhance and protect the image of pristine nature as it is the prime resource of the sector. It is proving to be a complicated matter as there often seem to be gaps between the interests of the tourism industry and other economic activities promoted by the state (Jóhannesson et al., 2010).

**Research and education.** The importance of research and education in tourism has been long recognized by the public authorities but, as with the discourse on sustainability, action for enhancing this area has not always followed in equally strong terms (Jóhannesson et al., 2010). In respect to tourism education, there has been a long-term division between vocational training for careers in tourism and university-based tourism studies. Tourism research in Iceland is only in its infancy, at least compared to research into the other two main contributors to the economy. The Marine Research Institute enjoys by far the greatest standing, reflected in contributions from the national budget as well as energy research in Iceland. The only tourism research institute (the Icelandic Tourism Research Centre) does not get any direct financial support from the state. The lack of interest in research by stakeholders may be explained partly by the organizational structure of the industry. Small entrepreneurial firms do not have the resources to take part in research and development projects. In this area the major challenge lies in the lack of
knowledge and weak support for research (Jóhannesson et al., 2010).

**Possible Strategies:**

We suggest a number of strategies that could assist in fostering and encouraging the growth of sustainable rather than traditional mass tourism in Iceland that would contribute to the island nation’s overall sustainable development:

- Sustainable tourism should be supported by the Icelandic government so that it would be financially attractive for the local people to work in that branch and create new opportunities for it. More sustainable tourism options would then lead to more tourists choosing this type of holiday. This in turn would help to preserve and restore the biodiversity of the island. It could additionally assist in preserving the local identity of the people as it is today.

- The tourism industry needs to develop new ways for attracting tourists throughout the year so that the numbers coming to Iceland will be spread over the whole year and not concentrated only during the peak summer season. This could possibly be achieved by placing greater emphasis on local food specialities, special tours offered only during winter months and so on.

- Sustainable tourism and mass tourism do not currently compete against each because what they
offer are too different from each other. They should therefore try to work together more closely so that they can create a synergy from which both kinds of tourism could benefit.

- The government should support the development of sustainability throughout the whole tourism industry. Every visitor should have the feeling that she/he will not cause any harm to Iceland’s environment during their stay. This would go at least some way to justifying the high price that tourists pay for the privilege of staying on the island. Iceland as a very safe holiday destination should also be highlighted by the tourism industry.

- The mass tourism industry has earned a lot of money and continues to do so. Some of that money can be used to develop sustainable tourism together with NGOs and government over all Iceland to release the pressure of large concentrated tourist numbers on the natural ecosystem. In this way tourism will remain an economic factor of great importance without harming the natural environment.

- The island’s location could work in its favour if it were marketed, for example, as an ideal place for international conferences because it lies directly between North America and Europe.

- To attract a greater number of tourists, Iceland could organize an annual music festival that emphasised sustainable lifestyles and sustainable tourism, perhaps along similar lines to the famous
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Burning Man festival in America that includes various activities like thematic routes which could become the traditional festival of Iceland.

- To maintain and reinforce the link between the natural landscape and the national character of the Icelanders the tourism industry should be encouraged to place as great an emphasis as possible on domestic and locally produced goods, from consumption of local cuisine and translations of the great Icelandic sagas to environmentally sensitive explorations of the island’s coastline and hinterland, i.e. hiking in the summer months and cross-country skiing in the winter months.

The tourism industry in Iceland is a progressive factor in the island’s economy. As discussed, Iceland as a small economic entity is dependent on natural resources and tourism. As a tourism destination, Iceland relies on its natural phenomena, which are the biggest motivation for visitors to travel to this North Atlantic island. It is also not a destination for mass tourism – it is more likely to attract individualists and adventurers. As a matter of fact, Iceland’s biggest problem is its reliance on tourism for economic growth which poses the risk of encouraging the numbers of tourists usually associated with mass tourism. But there are already attempts being made by investors and the government for development regarding sustainability and green tourism, in which Iceland already found its niche.
• Although there is an obvious paradox in relying on growth in incoming tourist numbers to maintain a healthy national economic foundation since it risks attracting a number of visitors usually associated with traditional mass tourism, any potential negative impact could be ameliorated by investing in sustainable tourism projects such as new or expanded nature parks and conservation areas. This could be undertaken in concert with an expansion of transport infrastructure that is sensitive to the local ecology (marked hiking and cycle trails, agreed “jump-off” sites from public roads to ensure controlled access to nature trails, etc), and accommodation and restaurants that stress environmental awareness and friendliness.

• Another factor is seasonality. Since there is only a relatively short tourist season in Iceland there is a need to provide visitor attractions over the whole year. It is not only the economy that relies on tourist growth, but many members of the population who make a living from tourism.

• Within Iceland’s government, tourism is a part of the Ministry of Industry. As tourism is a rather important factor in its economy it would be advantageous to establish a dedicated department for tourism. Special taxes could also be imposed on foreign visitors to go into a dedicated fund for the preservation of natural phenomena.
Conclusion

Referring back to the research question, it was asserted at the start of the article that Iceland relies on its natural environment and the consequent tourism that it begets, and also that the mass tourism that accompanies it could be a threat to the ecosystems and have a negative impact on national identity. But it was also stated that there are already attempts being made concerning sustainable tourism in Iceland.

“Tourism is changing ecosystems through biodegradation” has become a truism. Mass tourism in particular is definitely a danger to ecosystems. Iceland is promoted as a wilderness destination because of its limited vegetation and rough landscape. Though its geodiversity is very high, its biodiversity is low. This results from limited fertile soil due to its genesis and near polar climate. The soil is mostly rocky and very few plants are able to exist there. The major influencing factors in how Iceland looks at its volcanic activity and the influence of humans on the island as they clear felled the trees for survival and to make a living and thus increased erosion as a result. Ecological tourism works to ameliorate the worst impact of this by saving what there is to save, for example planting trees to increase the island’s forestation. Geotourism is a major factor in the island’s tourism structure. The land itself suffers from the impact tourism brings, such as the expansion of infrastructure (new buildings and roads) or people hiking through the terrain.
and dumping waste and other dangerous material. The damage to the land is not as disastrous as it is at sea. Whale-watching is a popular attraction for tourists, but the whales are also frightened away by the increasing number of visitors.

The popularity of Iceland as tourist destination is a contemporary phenomenon which has led to both mass as well as sustainable tourism. It relatively sudden emergence over the last two decades has also influenced the national identity of Iceland. As the people of the island are closely connected to the wilderness of their country and the uniqueness of their nature, tourism has had a rather positive influence. The strengthened bond with their land has encouraged protection of the landscape in a positive way. Changes in infrastructure or mass visits to certain places has caused damage which needs to be remedied. It also affects the population’s opinion of sustainable tourism and the advantages that accrue from it. Also, tourism and the aspect of globalization have brought the isolated country – due to the location – “closer” to the rest of the world. The most important aspects of national identity in Iceland is nowadays the connection to the land, the pride of their ancestors and the close connection to literature and language.

From the Second World War to the early 2000s the big sectors were agriculture and fisheries, as well as the mining of aluminium. Throughout the late 20th century Iceland was one of the leading nations in the Human
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Development Index and the economy was very stable, resulting from fishing, aluminium production as well as tourism. From an economic point of view, tourism is very important for the country and the national budget. As nearly all of the population is somehow tied to tourism a decrease in visitors would have a negative effect on virtually the entire populace. Due to the small size of the population and the island’s location in the Atlantic the tourism market is very small and the import duties are very high which has a flow on effect on the cost of living. This can also be seen as a threat for foreign visitors. With respect to sustainability there are already ideas regarding green tourism and the chances of a soft tourism, which could help to prevent possible damage. Strategic planning with a correspondingly positive image and marketing, close cooperation with researcher and the education sector could foster sustainability, and not only in tourism.

Iceland is still one of the few countries that attaches utmost importance to sustainability. This should be emulated and seen as an example where tourism has influenced a country’s ecosystem and even identity. This influence has had positive and negative aspects, but with clever planning and astute actions a stable and sustainable future for Iceland can be achieved.

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