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Social Networks for Path Creation: Education for Sustainable Development Matters*

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Abstract

This article suggests the role of social networks for Education for Sustainable Development (ESD) as an element of path creation. While past choices and past behavior influence the present, ESD helps to create new opportunities by promoting processes of learning related to sustainable development. To better understand how path creation takes place, the article emphasizes that a further elaboration of Social Network Analysis (SNA) is essential for Futures Studies and suggests an alternative methodological approach which bridges the gap between intervention and scientific analysis. On this note, a case study research design is introduced which addresses networks in five communities that have been distinguished by the United Nations Decade of ESD (2005-2014) in Germany.

Keywords: Education for Sustainable Development, Social Network Analysis, Path Creation

Introduction

"Our biggest challenge in this new century
is to take an idea that seems abstract
– sustainable development –
and turn it into a reality for all the world's people"

(Kofi Annan)

While globalization has reconfigured social relations in the whole world, a "growing international significance" of Education for Sustainable Development (ESD) can be identified (de Haan, 2006, p.19). At the same time, the term "social network" attracted a lot of interest in recent years, and network approaches are becoming increasingly important for several scientific disciplines. Not only mathematicians, physicists and computer scientists but also sociologists and economists frequently draw on methodologies of network analysis in order to analyze and describe technical, natural and social phenomena. However, while Network Analyses are more and more used in many disciplines, the approach needs to be incorporated by scholars of Futures Studies, where we have so far found theoretically based empirical studies to be missing. To better understand how alternative futures are possible and what the possibilities of "making and breaking history" are, we argue research on the role of social networks in Futures Studies is urgently needed.

To shed light on this gap of research, this article suggests the need to analyze the role of social networks for the question of how path creation takes place. Furthermore, it is argued that regional social networks play an important role in the process of implementing ESD in Germany. To support our contention, the article introduces some preliminary results of a research project carried out at the Institut Futur at the Freie Universität Berlin. The project is supported by the German Federal Ministry of Education and Research with the main aim to foster and to analyze the establishment of networks in the field of ESD. With this in mind, the article aims at focusing on the process by which the quality of ESD is enhanced and path creation as a particular moment of innovation takes place.

A definite assumption of this article is that the formation of ESD must be understood from the context of social settings. Futures Studies have thus far not paid enough attention to questions of how knowledge and power structures are being generated. A combination of both, path dependence theory and Social Network Analysis can bridge this gap of research by providing the necessary theoretical and methodological tools for a substantial scientific analysis. Path dependence theory provides answers to questions of why inefficient solutions gain acceptance in societies (Ackermann, 2003; Tiberius, 2010b). Thus, path dependence theory assumes that decisions made in the present can be traced back to decisions made in the past. At the same time, change is path dependent (Håkansson & Lundgren, 1997) and path creation includes the possibility of escaping the path determined in the past by creating a new path deliberately (Schreyögg et al., 2003). That is to say, if the current path is characterized by an emphasis on economic growth that consumes resources without paying enough attention to future needs, education includes the chance for path cre-

ation and innovation. In the context of our project, innovation means to leave current paths and to develop new regional strategies for the establishment of principles of sustainable development. Education, we assume, is a key to sustainable development. ESD plays a substantial role because it conveys the fundamental knowledge about issues like global justice, climate change and other ecological, social, and economic problems. However, education and learning do not only take place in schools or other institutions but also in informal and non-formal ways. Our assumption is that regional social networks are an important instrument to introduce ESD by promoting formal, informal and non-formal learning. Put another way, evoking regional social networks has the potential to foster ESD, and to create a new path deliberately.

However, the approach of our project does not only consider the matter of practical intervention. While scientific studies in social sciences often distinguish between micro level and macro level, our study aims to get new insights by analyzing the role of networks for path creation. What is the role of regional social networks in the process of the implementation of ESD? How can we analyze the impact of such networks on path creation? What implications does the formation of regional social networks have for the quality of ESD?

In order to give answers to these questions, the article is divided into six sections. Subsequent to this introduction, the important role of social networks for ESD is introduced. Third, the combination of Futures Studies with analyses on sustainable development is exemplified. The fourth chapter proposes Social Network Analysis (SNA) in order to better understand how path creation takes place. Fifth, the article refers to a research project carried out at the Freie Universität Berlin that introduces a new research design based on a further elaboration of SNA. On this note, the combination of both intervention and accompanying empirical research as well as quantitative and qualitative methods are suggested to provide an exceptional data basis in order to analyze how path creation for sustainable development may be evoked. Finally, the last section summarizes the major arguments and outlines some prospects for further research.

Understanding Social Networks in Education for Sustainable Development

Since lately, scholars of various disciplines observe the growing importance of social networks for national, regional and global governance and the lack of theoretically based empirical studies in this field. At the same time, there is an apparent need to analyze the role of networks for ESD as both the constitution and the effects of these types of governance (Wald & Jansen, 2007) have consequences for the implementation of sustainable development. Equally, they are of crucial importance in terms of learning to shape the future through ESD. Not least, education has considerable impacts on processes of change and may be connected with visions on sustainability in the future.

"Where a major mental shift is primarily involved, we must encourage the processes for changing awareness among individuals–and this can only be accomplished through learning. In this context, major competencies are demanded from the individual in participating in and self-organising communication and decision-making processes, such as independent acquisition and assessment of information, the capacity for communication and cooperation, and foresighted planning in linked systems" (de Haan, 2006, pp.20-21).

Likewise, social networks in the area of ESD have the potential to influence how ESD is formulated and how the actors involved understand their concerns with respect to corresponding norms like development and growth. The integration of ESD in social networks has the ability to draw on innovative legitimacy sources because it gives new meaning to existing norms and ideas. Hence, the approach of our study is based on the awareness that the neglect of social networks in the area of ESD is highly problematic. Ignoring the role of networks in the process of embedding the principles of ESD (BNE Portal, 2010a) provides at best a narrowed view of sub-national development processes. Looking only at individual examples to showcase "Best Practices" inhibits us from discovering the potentials of network governance. Further, models of social network analysis have frequently been used metaphorically for another purpose. Anyhow, metaphorical uses of models can be harmful. "Relying on metaphors as the foundation for policy advice can lead to results substantially different from those presumed to be likely" (Ostrom, 2009, p.23). This observation holds also true for ESD.

In general, ESD can be defined as an education that empowers people to foresee, face up to and solve the problems that threaten life on our planet (BNE Portal, 2010b). It has the aim to integrate the principles of sustainable development into all aspects of education and learning in order to promote changes in behavior that will shape a more sustainable future.

"If we want to steer the world community towards creating a society that will provide a sustainable life both for generations to come and for each and every human being on the planet, Education for Sustainable Development is an issue of the utmost importance" (de Haan, 2009, p.5).

In the scientific literature about SNA, there are many different understandings about what a social network is all about. A quite common definition of social network has been expressed by Stanley Wasserman and Katherine Faust:

"A social network consists of a finite set or sets of actors and the relation or relations defined on them. The presence of relational information is a critical and defining feature of a social network" (Wasserman & Faust, 1994, p.20).

According to our understanding, networks can be defined as a certain type of governance that may even boast advantages over the other forms of governance - markets and hierarchies. Generally, governance can be defined as the coordination of interdependent activities (Wald & Jansen, 2007, p.93). Beyond that, SNA can overcome the gap between the micro level and the macro level (e.g. Bögenhold & Marschall, 2010, p.387), and allows us to analyze path creation from an alternative starting point.

"Social network analysis (SNA) is a way to re-incorporate context and bridge the gap between the micro and the macro, the cells constituting the animal, the individuals constituting groups, or the actors constituting a political system. SNA allows researchers to retain the traditional units of recording but simultaneously broadens the perspective by including information about the relationships across these units. This additional structural information allows researchers to address existing research questions with new tools and to approach them from a different theoretical angle" (Friemel, 2008, pp.10-11).

The present study introduces SNA as a distinct research approach and argues that "relational ties (...) between actors are channels for transfer or 'flow' of resources (either material or nonmaterial)" (Wasserman & Faust, 1994, p.4). Thus, we take exception to the assumption that the behavior of a specific unit does not influence any other units. This opens up the possibility to analyze the way ESD may be introduced by networks as a motor for change.

Sustainable Development for Futures Studies: A Motor of Change

In the scientific literature, there is a general consensus about the impossibility of predicting *the future* as *one occurrence*. In the long view there are alternative futures (e.g. Graf, 2003, p.356). The term 'sustainable development' also refers to future developments, without providing definite solutions with respect to the problem of how to generate knowledge about the future. In the last years, an increasing number of politicians, NGOs, business representatives and scientists have come to use 'sustainable development' and to integrate the term into their activities. The inflationary usage of the catchphrase goes along with a conceptual vagueness. 'Sustainable development' has not yet been clearly operationalized nor are there any conventions with respect to its definition (Kolleck, 2011). The definition of the Brundtland Report "Our Common Future" (United Nations, 1987) seems to be the most commonly used. It was introduced in 1987 and stresses:

"Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (United Nations, 1987).

Until the end of the 1980s the term has turned into an integral component of the political vocabulary of western democracies (Schreurs & Papadakis, 2007, p.202). Nevertheless, in the praxis the concept is rather handled flexibly and various actors fill it with different meanings.

"A key part of the argument here is that sustainable development has been selectively interpreted and mobilized as a way of taking forward regional planning and economic development practices, leading to a set of tensions about what sustainable development means and how best to operationalize it" (Haughton & Counsell, 2004, p.138).

The lack of regulation and the difficulties for national and international controls foster this phenomenon. Sustainable development contains ambivalences that lead to

uncertainties with regard to its implementation, its operationalizations and the general understanding about what sustainable development is all about. One example is the ambivalence between preservation and development, between the demands of the present and more or less probable demands of future generations. Predictions about what will be are uncertain[1]; objectives to be achieved are not self-understood. There is no fixable status quo for an ever changing nature and a restless world. Development is the only alternative, and development consumes resources. While negative impact is secure for a couple of technical applications, others are unknown or yet unknown. Even restrictions which are imposed in favor of sustainability may have a negative impact in unpredictable ways (Kolleck, 2009).[2]

However, despite a far-reaching consensus about the need to integrate Sustainable Development into educational issues, the shaping of the specific contents and dimensions to be achieved is highly controversial. In order to introduce ESD as a pre-eminent concept, further processes of its transfer are urgently needed. Hence, the shaping of ESD can be best accomplished through encouraging processes in social networks.

Social Network Analysis and Path Creation

While the call for a discipline which focuses on the future can be traced back to the nineteenth century, relevant academic degrees did not emerged until the 1960s (Tiberius, 2010a, p.135). At the same time, the scientific literature point out that SNA is a relatively young field of research. Today, network approaches are mainly used in the United States of America and have not yet attracted a great deal of attention in other countries (Stegbauer, 2010). Nevertheless, the chances of social networks in making and breaking history are especially high so that there is an urgent need to implement and further develop SNA in the area of Futures Studies. The same can be observed in the area of regional science: While SNA has been mainly dominated by sociologist and anthropologists during the 1920s, scholars of regional science didn't apply the method until the mid 1990s (Vyborny & Maier, 2010, p.402). However, the aim of Futures Studies lies in both discovering and inventing possible, probable and desirable futures as well as in analyzing and assessing them. Scholars of Futures Studies are interested in describing and interpreting aims, moral values, correlations, trends, framework conditions, and alternatives (Graf, 2003, p.362). Thus, regional social networks need to be considered as a fundamental dimension for shaping the future.

It is important to note, however, that the use of network analyses for predictions is more common in other disciplines than it has yet been in social sciences. By the way of example, in physics, it is quite obvious to use network approaches in order to forecast probable developments:

"In physics, network topologies are used to predict other dynamic processes such as the spreading of diseases, the movement of traffic, or the dissemination of information. Often two processes co-evolve: the growth and change of an underlying network structure and the dynamics of the processes operating on this structure. The latter are frequently described as the changing status of a node or link" (Pyka & Scharnhorst, 2009, p.7).

Scholars of Futures Studies need to engage with theoretically based empirical studies of SNA. Some fruitful initiations can already be found in the scientific literature. Oelsnitz and Tiberius (2009) refer, for example, to the relevance of social networks for educational issues by emphasizing the importance of learning, cooperation and competition in business networks. Schubert (2010) integrates SNA in order to enhance predictive probability. Haughton and Counsell (2004) describe regional planning as a fundamental process to shape the future operations which offers "a forum for deciding what types of future settlement patterns society wishes to see" (Haughton & Counsell, 2004, p.135). Asheim and Cooke (1999) emphasize the importance of integrating learning organizations in broader social structures in order to meet the challenges of a global economy. Furthermore, they point out that learning is localized and not a placeless process. Thus, it cannot be captured without considering its institutional context.

Our project primarily considers the ideas and concepts of Granovetter to be fruitful starting points for the theoretical fundamentals of an empirical analysis. In this sense, we start with the assumption that "the behavior and institutions to be analyzed are so constrained by ongoing social relations that to construe them as independent is a grievous misunderstanding" (Granovetter, 1985, p.482). But while Granovetter (1985) concerns the embeddedness of economic behavior, it is the aim of this article to deal with the embeddedness of actors that are engaged in projects on ESD. It is also vital to affirm that Granovetter has already referred to the importance of analyzing processes of change with SNA.

"The most pressing need for further development of network ideas is a move away from static analyses that observe a system at one point in time and to pursue instead systematic accounts of how such systems develop and change. Only by careful attention to this dynamic problem can social network analysis fulfill its promise as a powerful instrument in the analysis of social life" (Granovetter, 1983, p.229).

However, we propose SNA to be a fruitful complement in order to better understand how path creation takes place. Thus, actors are taken as a fundamental source in creating and shaping new paths over time. This does not mean that path creation only takes place when social networks are evoked. On the contrary, we only suggest that social networks have to be considered as indispensable by analyzing the construction of alternative futures. Conceptualized as a product of power generations, social networks may also mobilize diverse elements of power in order to shape ideational, structural and institutional processes. Thus, this form of governance is also crucial for innovations that enable changes and have the potential to produce the creation of new paths. The integrity of a network influences how fast an innovation is spread within the network itself. Actors with central positions are rapidly informed about a novelty and tend to test an innovation at a very early stage (Jansen, 2006, p.94). They can also have an important role in empowering the coherence of the network and develop, implement and spread innovation. Having this in mind, the role of weak ties within networks should not be underestimated. As distinct from strong ties that do mostly consist of fast friendships and deep trust, weak ties are built on more distinct acquain-

tances. Granovetter (1983) finds that weak ties can be very important dimensions in processes of establishing strong networks. Low-density networks could be even more useful for actors than a network of close friends. Thus, they have to be seriously taken into consideration if one wants to observe how path creation takes place.

> *"Weak ties are asserted to be important because their likelihood of being bridges is greater than (and that of strong ties less than) would be expected from their numbers alone" (Granovetter, 1983, p.229).*

The argument we put forth in this article is that a plenitude of weak ties can facilitate the diffusion of new insights and innovation. In our research project at the Institut Futur we propose, however, a shift from path dependence to path creation by suggesting the promotion of social networks. In other words, we conceptualize embedding dimensions as strategic variables in order not to describe the social system but to analyze and to encourage actors to shape and create new futures, as the following section will demonstrate.

Evoking Regional Social Networks on Education for Sustainable Development

In order to get new insights into the role of networks for path creation in the area of ESD, the Institut Futur at the Freie Universität Berlin undertakes a research project. The main objectives of the project are to foster and to analyze the establishment of networks between communities and their projects which have been distinguished by the UN Decade ESD (2005-2014). Furthermore, we aim at supporting the transfer of a complex understanding of ESD within localities as a global guiding principle.

The UN Decade ESD has been declared by the United Nations General Assembly in December 2002. Its intention is to facilitate international initiatives in order to embed the principles of sustainable development in education worldwide. In Germany, the Federal Ministry of Education and Research supports the implementation on the basis of the resolution of the German Parliament (Deutscher Bundestag) and the German Commission for UNESCO (Deutsche UNESCO Kommission). The German National Committee for the UN Decade awards innovative projects in the field of ESD. Successful applicants are recognized as an "Official German Project for the UN Decade". By now there have been almost 2000 applications for permit of these just over 1000 projects have been successful so far. The selection process is guided by a jury which belongs to a national committee. Basic requirements for the distinction are: At least two of the three pillars of sustainable development (economic, social, and ecologic) have to be integrated, projects need to be innovative and the idea of the project has to have the potential to be transferred and diffused.

The approach of the mentioned project can also be assigned to a research program which refers to central premises of regional (Benz & Fürst, 2003) and educational governance-perspectives (Altrichter, Brüsemeister, & Wissinger, 2007). The networks in the communities are seen as viable places of formal, non-formal and informal learning in their respective communities and identified through a participatory-based quality assurance and development activities.

It is important to note here that the UN Decade ESD achieved primarily project participants that are already characterized by a high level of motivation. Actors that have been distinguished by the Decade distinguish oneself in a commitment to sustainable development or to ESD. A high level of motivation is a precondition for the participation in the UN Decade ESD. Furthermore, the actors involved in distinguished projects refer to the diffusion of sustainable development as the most important benefit of the distinction by the UN Decade ESD (Michelsen & Rode, forthcoming). Thus, we assume that the actors in the communities do already have a deep interest in fostering social networks for ESD. At the same time they do not have necessary information in order to provoke path creation. Empirical results of SNA can, however, provide a valuable basis for change.

In order to shed light on the questions of how social networks are able to promote the implementation of ESD as well as if and how networks have the potential to improve sustainable performances, our project proceeds as follows:
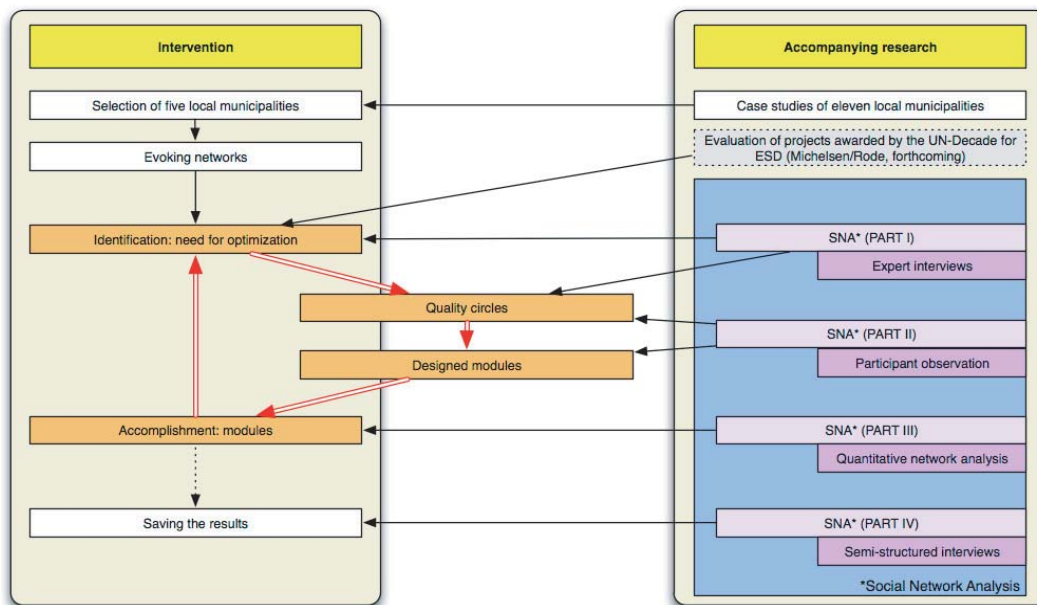

Figure 1. Project Design

As we introduce a new design for our research project, the data we collect is particular. The plentitude of understandings about what sustainable development is all about and the problems with respect to its implementation and operationalization within the distinguished communities provide an exceptional empirical basis for analyzing how path creation may be evoked and what the possibilities of shaping a sustainable future are. With this in mind, our research design is twofold. In the graphics above the two parts are distinguished: Further to the left is situated the box "intervention"; further to the right is located the box "accompanying research". That is to say,

on the one hand, we carry out field research and go into the communities in order to provoke changes. On the other hand, we observe developments by implementing a mixed-methods design and following the rules of triangulation. This provides us with new insights about how futures in the area of ESD may be influenced from the outside.

To describe our approach in detail: In a *first step*, we select five German communities which have already been distinguished by the UN Decade ESD (see German Commission for UNESCO, 2009) to enable them to identify organizational development objectives. Our decision is based on diverse case studies about the sustainable performance of the communities. A further criterion for the selection is the variance of our cases (size, total population, structure of the population, different distinguished projects, and the potential for further improvement of the ESD performance). The first step illustrates the first phase as it has been described by the three-phase-model of path dependence theory (Tiberius, 2010, p.282). The aim of this phase is to approach groups of people in order to introduce new strategies.

Secondly, we support relevant actors to foster networks between distinguished projects. While projects may represent the core of the advancement of organizations on the regional, the national and the international level (Schiersman & Thiel, 2010, p.161), our argument is that processes of change can be supported by evoking regional social networks. By way of example, structural holes can be strategically filled by linking people and, thus, controlling their communication. This step can be described as the second phase in the three-phase-model of path dependence theory (Tiberius, 2010, p.282). The main aim is to define new rules and to foster knowledge-based strategies.

In a *third step*, we carry out standardized interviews with relevant actors in the communities with the aim to get deeper insights into the level of quality of ESD within the projects and in order to detect weaknesses and structural deficiencies.

Subsequently, we arrange quality circles which are combined with participant observations. At this point of our research, the different understandings of ESD, the weaknesses within the network formations and the informal structures of the networks are the center of attention. Hence, in this way it is our goal to get more knowledge about the question of how a lasting quality of formal, non-formal and informal educational processes is possible to be achieved. Beyond that, we compare our results with the evaluation about the distinguished projects of the UN Decade which was carried out at the Leuphana Universität of Lüneburg and will be published by Gerd Michelsen and Horst Rode (Michelsen & Rode, forthcoming).

Fourth, the insights we achieve by carrying out these steps are seen as a valuable foundation for a thorough quantitative SNA. Empirical results of SNA give us, on the one hand, comprehensive insights into the questions of when, how and why social networks play a decisive role for the quality of ESD. Moreover, we seek to get more knowledge about the possibilities of shaping and breaking future developments. On the other hand, it is our aim to show interesting results of the SNA to the members of the communities. With this in mind, it is also our intention to validate our results by observing reactions of the actors involved. We find that the role of inter-subjective factors in networks on ESD needs to be better understood, and relate the existing gap

of knowledge to broader methodological and ontological approaches. Putting it differently, we draw on Elinor Ostrom who refers to Coleman (1997) in order to stress:

> *"Many norms are learned from interactions with others in diverse communities about the behaviour that is expected in particular types of situations" (Ostrom, 1998, p.9).*

Norms and ideas underlying human behavior cannot be sufficiently analyzed by implementing quantitative SNA. Instead, we enlarge our findings by carrying out qualitative, semi-structured interviews in a *fifth step*. Eventually, this allows us to get deeper insights into the role of the central concepts of SNA such as structural holes, weak ties, cohesive subgroups, and, beyond that, about the dynamic element of network processes as such. The last step sets the thorough foundation for a lock-in and the proper path dependence.

Conclusion

Our analysis suggests the need to examine the role of social networks in order to analyze and support path creation and changes in dominant political ideologies. A research project about the role of social networks in five communities which have been distinguished by the UN Decade ESD carried out at the Institut Futur provided a useful example for this article. In general, we base our argument on three findings: First, the combination of both evoking and analyzing the changes within social networks provides an exceptional data base for understanding how path creation takes place. Second, social networks may provoke ideological changes through processes of learning. Third, social networks play an important role for shaping ESD and helping to embed the principles of sustainable development in education as such.

The present article proposes that institutions which aim to put forward ESD as ambitious and guiding principles may persist because a dense network of social relations is overlaid on the social relations connecting such actors and reducing pressures for integration. Thus, small units embedded in a network structure are essential for the establishment and the further development of ESD. However, while social networks have an important impact on innovation and sustainability, a consistent theory about both cooperation and institutional change is still out of reach. Let us describe this phenomenon with the words of Elinor Ostrom, bearing in mind that social networks are to be considered as just one dimension within the consistent theory as such.

> *"The really big puzzle in the social sciences is the development of a consistent theory to explain why cooperation levels vary so much and why specific configurations of situational conditions increase or decrease cooperation in first- or second-level dilemmas. This question is important not only for our scientific understanding but also for the design of institutions to facilitate individuals' achieving higher levels of productive outcomes in social dilemmas. Many structural variables affect the particular innovations chosen and the sustainability and distributional consequences of these institutional changes (...). A coherent theory of institutional change is not within reach, however, with a theory of individual choice*

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that predicts no innovation will occur. We need a second generation theory of boundedly rational, innovative, and normative behavior" (Ostrom, 1998, p.9).

In the end, future developments in SNA are urgently needed in order to further analyze and assess the role of social networks for path creation in general and for ESD in particular. This may also contribute to the theoretical desideratum and to meaningfully supplement theories of social sciences such as Rational Choice Theory and Systems Theory (Haas & Mützel, 2010). Therewith, theoretically based empirical analyses on social networks in the area of ESD in other countries could be interesting and fruitful. It has to be taken into account that the UN Decade ESD is realized in all member countries of the United Nations. While this article concentrates on the role of German regional social networks, a comparison with regional social networks of other nations could be useful for better understanding how path creation takes place under different circumstances. Especially the role of regional social networks in developing countries and in emerging nations could be of great interest for future research. In addition, future analyses about the social networks evoked by our project could allow longitudinal studies, bearing in mind that social networks change over time. Do the network structures change? And if so, how and why do they change? Do transitions have an impact on the quality level of ESD? Answers to these questions would be highly valuable for improving the understanding of how path breaking and path creation take place and how learning to shape the future through ESD can be improved.

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Notes

1. This does not mean that the authors derive from the idea of 'one' future. In contrast, we find that predictions about 'one future' can rarely be possible.
2. See for instance the development of the governance of bio fuels. By the time, a series of environmental and social problems of some of the products have been recognized and have pushed civil society groups to raise criticism against this emerging industry. Despite increasing interests of business and massive support by governments the future of this industry is currently left in question.

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