



The Thirst for Certainty: Futures Studies in Europe and the United States

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Doch ist die Zukunft ihm entdeckt, dafür hat jedermann Respect. (Goethe, *Faust*)¹

Introduction

This article describes and evaluates some aspects of futures work in the North during the last thirty to forty years, with particular emphasis on the role of European futures studies. The questions raised concern the identity and purpose of futures studies, including the most important factors that have influenced its development during this period.

What was the development of futures studies really like? Was it more a development from within, 'as a young discipline with initial difficulties in becoming accepted, seeking to develop its agenda of research and to find its rationale'? This has often been heard in discussions about the evolution and development of futures studies during the last few decades. Have elements from outside pushed and pulled futures studies through periods of slow growth, sudden international attention, and a very difficult transition period into its present condition of hesitant stabilisation and more peaceful coexistence?

Writing about the history of futures studies certainly has its 'traps'.² Futures studies is so multifaceted that there are a number of histories to be told. A brief look back can only be made in the sense of a broad overview, leaving much space for the great differences that exist within the field. My conclusions, therefore, must be taken as personal observations. In fact, futures studies covers a great variety of methodological, epistemological and theoretical approaches. There are many combinations possible for its subject matter in inter-, multi- and transdisciplinary studies. Subjects treated in futures studies can originate within the whole range of sciences and humanities, but they can also go beyond science and involve more practical, speculative and innovative approaches. Even questions about the overall aims and purposes of futures studies are not easily answered.³

Because futures studies is such a heterogeneous field, it is important to explain one's own position. From my point of view, futures studies is not about scientifically researching the future; rather, it considers options, possibilities for change, different entry points into understanding a particular long-term problem, as well as new and innovative concepts for problem-solving. Futures studies focuses on probabilities, ideas, desires and hopes, as well as fears people hold or are developing about the future. Futures studies is about thinking and creating alternatives, about enabling and encouraging as well as perceiving possible, even likely, but most importantly desirable futures. *The* future, as something that can be analysed, observed and studied in the academic sense, does not exist: it is yet to come. We cannot make experiments and check results as in the natural sciences. What we can and need to consider, study and research are the development options now available that could be possible openings into more desirable short-, medium- and long-term futures. Human beings play a very important part in how this future may

come into being and what it might look like.⁴ It is this 'part' of the future that futures studies explores.

Futures studies from the 1940s to the 1960s

A concern with the future is as old as human beings themselves. In 1978 John McHale wrote that 'human survival itself is very largely predicated on the conscious capacity to organise present actions in terms of past experience and future goals.'⁵ Indeed it has always been a human desire to find out about tomorrow, be it the farmer who needs to know about coming rains, the emperor who wants to know about the chances of his army in battle, or the businessman who would like to know about the prospects for a new product. When seen from this perspective, there is not much difference between the initial incentive for the pursuit of futures studies then and now. What has changed are the tools and the self-ascribed role of futures studies rather than the desire to know about the future itself.

In the 20th century there was, as in many other fields, much cross-fertilisation between the two culturally, economic and politically dominant centres in the West: the USA and Europe. Regrettably, there was little cross-fertilisation between the West and other parts of the world.⁶ To better understand this Western tradition, it is helpful to make a few distinctions so that differences as well as similarities will become more apparent.

North American futures studies mainly originated from strategic planning. The development of operations research in the 1940s and 1950s was a consequence of this orientation.⁷ The methods developed for strategic planning were often borrowed from mathematics, statistics and economics, and then adapted to strategic planning needs. A number of further techniques were developed for wider applications in non-strategic areas including the scenario technique in particular, but also the Delphi technique, cross-impact assessment, the input-output matrices of W Leontieff, statistical methods of time series analysis and statistical regression methods. They were used especially for technological forecasting and economic analysis and they heavily stressed the role of the futures expert. Large think-tanks like the RAND Corporation or the Stanford Research Institute put themselves on the map. Futures 'research' in the US at that time consisted of forecasting economic and military potential, rates of production, possible technological innovation or the likely damage resulting from nuclear war. In the US, there have also been non-mainstream approaches which means that the overall picture is not a uniform one. People like Buckminster Fuller, for example, who designed new cities and developed environmentally sound concepts for human mobility, or the later development of approaches towards a just world order, go back to traditions in the 1940s and 1950s and even earlier (such as President Wilson's ideas about world federalism and a world unity of people something the later UN system could never fully achieve).⁸

European futures studies has a different background. Names like Thomas More, Francis Bacon, Giambattista Vico, H G Wells or the 'early socialists' of the nineteenth century like Saint-Simon, Robert Owen and Charles Fourier come to mind. Even if such traditions are not always clearly visible, they are 'in the back of the mind', still influencing how European futurists conceptualise their work and the kinds of questions they ask. The twentieth century witnessed the emergence of a particularly strong futures tradition in France with Gaston Berger and Bertrand de Jouvenel founding the 'Futuribles' school which stresses the value of human potential in choosing and shaping one's own future. In contrast to schools of technological forecasting or trend extrapolation, the study of the future was seen by de Jouvenel as an art that involves creative and imaginative thinking, writing and living rather than expert judgements or the conduct of scientific modelling experiments.

There was, however, also a reciprocal influence between Europe and the US. Futurists like Ossip K Flechtheim and Robert Jungk lived in the US for many years and brought their impressions back to Europe. On a methodological level too, there was a lot that each side could learn from the other. For example, the scenario techniques developed in North America soon became among the most widely used tools in Europe. Nevertheless, the differing origins of futures studies within Europe and the USA remained the basis for the differing developmental paths taken by futures studies in the West since the 1940s and 1950s. It is therefore helpful to distinguish three main aspects of futures studies that are

differently emphasised in the US and Europe.⁹

The first aspect is extrapolative. It emphasises prognosis, planning, technological and economic forecasting. It is establishment based and politically conformist. Techniques and methods were mainly developed in the US. The future is seen as quantifiable and the main focus is on the private sector. The second is normative. This emphasises utopian and imaginative thinking, visioning and the consideration of social and cultural dynamics. It tends to be non-conformist and critical. It is rooted mainly in European traditions of social utopias, sociology and philosophy. Futures are seen as qualitatively different. The main strongholds of this work lie within intellectual and academic circles. Finally we can distinguish a pragmatic emphasis. This seeks economic social and political realisation, perhaps through participation and empowerment. It too may be non-conformist and critical. It is rooted in issues of social democratisation. It suggests that the future can largely be shaped by human action. Finally it is directed towards the political activist and the political community.

These three approaches provide a basis for a rough structural and methodological classification of futures studies. Current futures studies generally includes elements of various methodological schools, usually from at least two of the above categories. Such distinctions help illustrate the diversity and multifaceted character of the field.

Another feature of the first generation of twentieth century futures studies needs to be mentioned: the intellectual debate of the 1950s and 1960s tended to group people into two strongly opposed camps. The debate centred on 'optimism versus pessimism', 'abundance versus scarcity' ('growth versus zero-growth') and 'ecocentrism versus technocentrism'.¹⁰

The people taking part in this debate often viewed their contribution as supporting a particular camp. Today there arguably less polarisation within futures studies a fact that makes it even more difficult to establish the self-identity of the field.

'The golden period': the late 1960s to the late 1970s

In the late 1960s the picture suddenly changed. Developments that had formerly been restricted to the national or at least the regional level suddenly achieved international renown. Not only the inner circle of futures studies research institutes, but also large parts of international academia as well as the wider public, encountered the newly developed tools of 'futures forecasting' or 'futures research'. They were especially fascinated by the obviously miraculous possibilities of the computer as a tool for prediction. Futures studies was up and running and well-respected international journals carried futures articles. Many joined the bandwagon in these years and quickly left when things changed again.

Hermann Kahn's books: *The Year 2000* (with A Weiner 1967), *Things to Come* (with B Bruce-Briggs 1972) and *The Next 200 Years* (with W Martel 1978) were among those which contributed to this upsurge in international attention. Alvin Toffler's *Future Shock* (1973), the first report to the Club of Rome entitled *The Limits to Growth*, Edward Goldsmith's *Blueprint for Survival*, and the report of the Commission on the Year 2000 all drew public attention to the future.¹¹ Tomorrow was seen as a 'new' dimension with implications for scientists, business people and politicians alike.

In particular, the report to the Club of Rome achieved enormous publicity. It sold some ten million copies worldwide and is probably to this day *the* most successful nonfiction publication. It stirred a debate about 'zero growth' and subsequently 'qualitative growth' so that, despite its inherent inconsistencies (such as its reference to 'one world' as though it looks no different when viewed from North or South), it can be seen today as a forerunner to the ensuing sustainable development debate. 'Sustainable development' turned into another worldwide debate with the publication of the Brundtland report and the 1992 UNCED World Summit in Rio de Janeiro.¹²

The publication of *The Limits to Growth* influenced the development of futures studies in a number of ways. It was the start of a whole range of world models that were prepared in the 1970s and 1980s.

Global modelling suddenly became funded by United Nations agencies, a few multinational companies and some governments.¹³ The book also supported recognition of the environment as one of the central problem areas in the future. This in turn helped futures studies to become more widely recognised since the late 1980s, especially within the sustainable development debate.

It was also during this time that formal organisational and network structures for futurists and futures studies in the US and in Europe were established: eg. the Washington-based World Future Society (WFS) and the World Futures Studies Federation (WFSF) whose secretariat moves from country to country every few years. Besides these, many new institutes were founded and older organisations often succeeded in receiving more research funding. The RAND Corporation, the Hudson Institute, the Institute for the Future, the international Batelle Institutes, the Science Policy Research Unit in Brighton (UK), Futuribles in Paris, the Secretariat for Futures Studies in Stockholm, the Zentrum für Zukunftsforschung in Berlin and the Scientific Council for Government Policy in The Hague all experienced a growth in their projects and activities.

From another historical perspective, however, outside factors played a larger role in the sudden international renown enjoyed by futures studies. The above-mentioned futures publications came just at the 'right time' during a peculiar economic situation of the late 1960s and early 1970s. The growth of systems sciences, as well as the new, widespread openness towards change expressed in social movements in Europe and the US, all had an effect. The student, peace and environmental movements were only the most visible part of a new openness towards new societal structures. They criticised the old political elites and their unpreparedness to engage in progressive transformation: change was suddenly sought by large sections of Western societies. This was an atmosphere within which futures studies could prosper.

However, it lasted for only a short period. The first interruption came with the 'oil shock' caused by the OPEC embargo in 1973. The pursuit of progressive change declined further in the late 1970s with increasingly militaristic US policies, neo-conservative economic monetarism and Taylorism in the Anglo-Saxon world, and a new period of growing mistrust between the First and Third Worlds.

The crisis of prognosis: the late 1970s to the mid-1980s

The success of the first global models and the publicity enjoyed by futures studies publications raised general expectations. The strong interest of companies and governments in 'futures research' was welcome, as long as research funding was flowing. The forecasting work itself, however, was of variable quality. Good work was published side-by-side with 'predictive' essays or examples of 'pop futurism' as discussed in Slaughter (1989).¹⁴ Of particularly questionable quality was some extrapolative work carried out in the area of energy forecasts, both in Europe and the US. In too many cases this work amounted to mere linear extrapolation that overlooked the regulating role of rising prices and the possibility of societal change. The low quality of this work became obvious with the oil price embargo and the resulting effect it had on further undermining the perceived direct relationship between economic growth and energy input.

This had been underway for a number of years, but it had escaped the attention of forecasters. Due to the OPEC oil embargo there was a sudden price incentive and a perceived need for energy efficiency. Gross energy consumption immediately fell with the adoption of simple energy-saving practices. Simple trend extrapolation was particularly vulnerable to trend breaks, while the understanding of societal change remained limited. A much too static picture had been drawn which did not allow for sudden changes or interruptions in trends.

Due to the inaccurate forecasts made at the time, many government and private bodies wondered why they had invested so much in futures studies earlier. Growing scepticism and reduced research funding were logical consequences. This caught the still-young field of futures studies unprepared: it had only just started to develop its own methodology and a sense of identity. It was not so well established as to be able to take the waning public trust and loss of funding lightly. Many futures studies institutions

closed and universities that had started futures studies courses reduced or discontinued them. Mistrust from other university departments and the private sector was now stronger than ever before. The consequences of this development persisted for some time. One of the immediate consequences was a reduction in the complexity of problem areas considered by futurists. This affected the regional scope of futures studies as well as the timeframe under consideration. But most importantly, the 'predictive' elements within futures forecasts had to be handled with much more care. One of the strategies pursued thereafter was the involvement of the funding agent and the client in the study process. Delphi sessions and scenarios are now often conducted with the users of the information taking a much more active role.¹⁵

Elements of continuity: the early 1970s to the 1990s

Some areas within futures studies showed more resistance to the swift changes of the 1970s and 1980s. One of them is the tradition of policy advice that originated in some of the institutions founded in the early 1970s. The Dutch Scientific Council for Government Policy in The Hague and the Swedish Secretariat for Futures Studies are examples of this subgroup. Both institutions were founded in 1972 and are still in operation. Even though they certainly had their ups and downs, both succeeded in establishing a relatively independent advisory position with their respective national governments (the Scientific Council being somewhat closer to the political machine than the Institute for Futures Studies in Sweden). Especially in recent years, their advice has been more focused on specific issues, and the timeframe is usually medium term (five to fifty years). Their reports deal carefully with specific forecasts emphasising possible policy measures and preventive action. The term 'no-nonsense futures research' was coined by some people within the Scientific Council as an expression of a more cautious approach, and in opposition to the highly ambitious futures projects of the time. Of central importance for both institutions is firstly, their relative independence, and secondly, the possibility of being heard by politicians. This is a position not all futures studies institutions providing policy advice can claim. Many depend on the party in power and can be readily replaced by competing futures institutes at the next elections.

Again, there are interesting external factors that have contributed to the relative success of the Scientific Council and the Institute for Futures Studies. In fact, the Netherlands and Sweden are countries of roughly the same size, with political and economic rationalism, as well as Protestant ethics, ranking high in their respective cultures. Both countries have traditionally paid great respect to political elites. They have centrally organised political structures and a political culture that tends to be oriented toward consensus. A country like Germany, for example, with a political culture favouring highly controversial debate and state federalism, has never succeeded in establishing such independent policy advisory instruments at the state level, despite a number of attempts.¹⁶

Another element of continuity is the national studies that were prepared since the 1960s, often focusing on the year 2000 (from *Hawaii 2000* published in 1973 to *Czech 2020*). The timeframe moved on to 2010, 2020 or further ahead, but the approach remained similar: they attempt to describe development options for the entire country, and often depict economic development as a starting point for analysis. Most of them also include many other factors and integrate them to create a full national study. Among the best known is the *Global 2000 Report* to the then US President Carter.¹⁷ Although the report was ignored in the US (because of the election of Reagan in that year), it had considerable impact outside the country and was subsequently taken as a model for national reports worldwide. In fact, the second report to the Club of Rome entitled *Mankind at the Turning Point* had already stressed the necessity of building national models that would need to be far more sophisticated than the usual national economic models.¹⁸ A series of 'Twenty-First Century Studies' took on this role within futures studies from the mid-1970s.¹⁹

A third type of activity within futures work that has remained strong to this day is environment-related studies. This is especially the case since the late 1980s with the publication of the Brundtland report and even more so since the UNCED conference in 1992. Futures studies and environmentalism actually had a similar development history in the 1950s and 1960s. But when futures studies was running into

difficulties by the end of the 1970s, concern for the environment was growing stronger. Nowadays, the concept of 'sustainability' is a key one for many futurists. The sustainability paradigm does, in some cases, play a unifying role for people who were not speaking the same language before.²⁰ However, 'sustainability' is not the only concept that futurists would claim is of central importance. More technocentrist-oriented futurists tend to argue that an even stronger role for human beings should be accepted than that advocated by the environmental management position. They see solutions more in the context of the 'governing evolution' paradigm.²¹

New roles for futures studies

The diverse and multifaceted character of futures studies can be regarded both as a strength and a weakness. It is a weakness because the variety of terminology and methodology is often viewed with scepticism from those outside the field. This has certainly hindered its integration into normal academic spheres. The diversity of approaches and goals within futures studies, however, is also a great strength. To my knowledge, there are few other fields that allow for such diversity and consequently provide a suitable platform for the cross-fertilisation of ideas between scholars from virtually all disciplines as well as business, planning, political activism, project coordination, NGO's, governments, etc. The agendas of various societal actors could be much more widely used to contribute to the development of futures studies' advice, study, consultancy, and networking.

One way to see Futures studies is as a 'border science'.²² The borders are part of science's interdisciplinary, multidisciplinary and transdisciplinary work, but the field also has borders between itself and the worlds of science, politics and business. This special position enables futures studies to perform a mediating and information-brokering role. The exchange of information made possible by the field is most meaningful if it can contribute to more focused and praxis-relevant conclusions. The problem is not that we do not have enough information: there is clearly an over-supply of it. What's missing though, is a sufficient number of people who think laterally and are able to bring together and summarise possible solutions with information from many individual fields of study.

Futures studies also has a networking role. Within interconnected problem areas as in the case of sustainable development, networking has become an essential component of finding solutions. Charley and Christie in their book *Managing Sustainable Development* (1992) describe action-centred networks, and suggest that 'action learning' could stand in relation to sustainable development work the same way that 'action research' did in the 1970s and early 1980s. Action learning could be one of the tools to investigate ever more complex problem situations, none of which have simple answers. In any case, the openness and diversity of its concepts prepare futures studies to better facilitate networking and the understanding of different approaches.

The particular position of futures studies in society also contributes to a greater ability to act as a 'capacity builder' and to encourage the empowerment and participation of people. The creation of futures workshops, visioning techniques and other participatory methods have been successfully employed in projects like the Regio Forum Basel.²³ They are also evident in the restructuring efforts of regions dominated by heavy industry such as the ship building industry in the north of Germany and the south of Sweden. In recent years, the communicative and participatory elements within futures studies have become much stronger compared to the 1960s and 1970s. This is a positive development, making futures studies again more attractive to industry, research institutions, governments and non-governmental organisations.

External factors in the development of futures studies

Futures studies has certainly had mixed fortunes. It may be concluded that as a 'young discipline' it has experienced the usual vacillations between failure and success. Although it has had its teething problems, it may be able to get to grips with those problems now. From this perspective a more sober approach within the field would contribute to more realistic expectations about its own capabilities, more rigorous methodological applications and, in particular, the ability to understand complex events.

Indeed, this is one possible metaphor for explaining the developments within futures studies during the past thirty to forty years.

Yet in my view, this is not enough. Futures studies has been strongly influenced by external factors. The first and perhaps biggest of these was the high expectations held by the business and political sectors. Futures studies may be described as a field that has been overloaded with expectations from the very beginning. 'The future' who does not want to know about it? It is a most seductive area of enquiry. Anyone who carries the name 'futurist' raises enormous expectations. Could they ever be fulfilled? Probably not.

Even if, after some thought, it is accepted that futures studies can never fully foresee complex future events, this remains exactly what politicians or businessmen want. More modest attempts to consider fragments of possible developments, options and dangers lying ahead that could help us to prepare for likely events and, most importantly, to create desirable future options, are, and remain for many, not good enough. They want the impossible: to know exactly what will happen. The expectation that someone dealing with 'the future' will be able to foretell coming events is persistent. This is the 'zero assumption', or better, the 'zero expectation' many people have when coming into first contact with futures studies. Since this is not what they get, frustration is a possible consequence. Futures studies will always have to deal with such unreasonable expectations.

Another decisive factor was the overall economic and political development in the West. The futures studies of the 1950s and 1960s were largely children of the very unusual growth period of that time. Especially in the US, futures studies developed tools for securing dominance in strategic as well as in economic matters. Futurists were busy preparing scenarios for nuclear and non-nuclear wars, and creating ever more stable economic growth curves. The stress on expert knowledge, that is on 'top-down futures studies' (ie. not involving the users of a product or the victims of a political decision, but merely focusing on the expert who 'knows all about it'), is an expression of the belief in a relatively stable situation. When this belief was proved wrong by the beginning of the 1970s (after the emergence of OPEC) coupled with the serious economic crisis that lasted until the end of the decade (which in turn changed many parameters of international politics), people in futures studies were already looking at the problem from a global perspective and in a more interactive manner than traditional economists. As early as the end of the 1960s, it was felt that the economic growth of the previous two decades would not last. The paradigm of 'development' (as declared to the world by Harry Truman in 1946) was not an attractive concept outside the First World. It was clear that this notion would be questioned in the long run. However, not many futurists understood this at the time.

A consequence of this general (outside) development was a new uncertainty that grew among business, industry and politicians. Futures studies was then regarded as a welcome instrument to perhaps foresee what could be expected. Many businessmen to this day still hope that the futurist will be the person who helps to detect, avoid and overcome the dangers lying ahead. The model-builder or computer expert became the 'medicine man' of this age. Companies and politicians alike asked for his or her advice. The strong growth of interest in futures studies at the end of the 1960s and into the early 1970s can therefore also be seen as an attempt by business and politics to counteract the sudden sense of uncertainty that opened up before them.

In sum, the expectation that the futurist can help with exact technological, economic and societal forecasting is incompatible with what futures studies really can achieve. The basic attitude of those who want to know exactly what is lying ahead is often fear of change. The attitude of serious futures studies is quite different. Change as such is seen much more positively as a chance to develop something new, to create a better and more desirable situation and to let more people gain from it. The openness of futures studies towards change is thus often greater than that of the clientele drawn toward it. Such widely divergent attitudes and worldviews are not easily tackled. The 'mood of the time', or *Zeitgeist* of a certain period, becomes an important factor. It remains to be seen how futures studies can deal with this. One thing is clear: no matter how well the field develops its theoretical and methodological foundations, futures studies and the desire for certainty will remain uneasy bedfellows.

Notes

1. 'But if the future to him is detection/for that everyone is paying him respect (Goethe, *Faust*)
2. The term 'futures studies' is preferred here instead of 'future research' or others because it indicates a slight independence and difference from purely scientific approaches, and also because the plural points to the fact that the future is open and undetermined.
3. Jib Fowles (ed.) 1978, *Handbook of Futures Research*, Greenwood Press, London, provides an early survey of the great variety of futures thinking. The handbook was published in the days of already waning euphoria for the new 'discipline'. It tried to show the appeal of a new academic discipline that includes a great variety of approaches and methods. However, the approaches of many of the authors involved were probably too incompatible to form a 'normal' discipline.
4. See W T Anderson 1987, *To Govern Evolution*, HBJ, Orlando, Florida.
5. John McHale, 'The emergence of futures research' in Jib Fowles (ed.) 1978, *Handbook of Futures Research*, Greenwood Press, London, p. 5-15.
6. There are many notable exceptions on the personal level. Many Eastern, South American or African futurists fortunately do influence their Western colleagues, but the overall Western economic, political and cultural dominance is still strong. In some instances, there is at least some 'revolt' against this dominance (see, for example, the work of Ziauddin Sardar), but this is not enough.
7. See for example Olaf Helmer 1983, *Looking Forward - A Guide to Futures Research*, Sage, Beverly Hills, pp. 79-98.
8. As expressed in the work of the World Order Model Project (WOMP), New York and the work of people like Saul Mendlovitz, Rajni Kothari, Richard Falk and Johan Galtung, who also worked for WOMP.
9. See also Peter Moll 1991, *From Scarcity to Sustainability - Futures Studies and the Environment: The Role of the Club of Rome*, Peter Lang, Frankfurt, pp. 135-51.
10. See for example Hermann Kahn and A Wiener 1967, *The Year 2000: A Framework for Speculation on the Next Thirty-Three Years*, MacMillan, New York; Donella Meadows et al. 1972, *The Limits to Growth: A Report to the Club of Rome*, Universe Books, New York; Edward Goldsmith et al. 1972, *Blueprint for Survival*, Houghton Mifflin, Boston.
11. Bell, Daniel (ed.) 1967, *Toward the Year 2000: Work in Progress*, American Academy of Arts and Sciences, Boston.
12. WCSD 1987, World Commission on Sustainable Development, Oxford University Press, Oxford.
13. See for example Sam Cole 1988, *Global Models and Futures Studies - Garbage In - Guidance Out?*, Institute for Futures Studies, Stockholm.
14. Richard Slaughter 1989, 'Probing beneath the surface - Review of a decade's futures work' in *Futures*, vol. 21, no. 5, October, pp. 447- 65.
15. See for example, Rob Bijl 1992, 'Delphi in a future scenario study on mental health and mental health care' in *Futures*, vol. 24, no. 3, April, pp. 232-50.
16. See Peter Moll 1995, *Zukunftsstudien und Zukunftsgestaltung in den Niederlanden (Futures Studies and Futures-Shaping in the Netherlands)*, Secretariat for Futures Studies, Gelsenkirchen. There are a number of groups now active on the Liinder level in Schieswig- Holstein, Northrhine-Westphalia, Lower Saxony, Rhineland-Pfalz and Hesse.
17. Gerald O Bamey, Council on Environmental Quality 1980, *The Global 2000 Report to the President*, US Government Printing Office, Washington.
18. Mihaljo Mesarovic and E Pestel 1974, *Mankind at the Turning Point*, New York, Dutton.
19. Martha Garrett et al. (eds) 1991, *Studies for the 21st Century*, UNESCO, Paris.
20. See for example Lester W Milbrath 1989, *Envisioning a Sustainable Society - Learning Our Way Out*, State University of New York Press, Albany.
21. See for example Walter T Anderson 1987, *To Govern Evolution*, HBJ, Orlando, Florida.
22. P Moll 1991, op. cit., pp. 251-60.
23. Robert Jungk and N Mijllert 1983, *Zukunftswerkstdtten - Wege zur Wiederbelebung der Demokratie*, Hoffmann & Campe, Hamburg; Hartmut Arras and W Bierter 1989, *Regio Forum*

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