Why Futures Studies

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Grey Seal  London
First published 1993 by Grey Seal
28 Burgoyne Road, London N4 1AD, England
Second printing, 1994

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British Library cataloguing in publication data

Masini, Eleonora
Why Futures Studies?
I. Title
303.49

ISBN 1-85640-018-2

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This book is published with the financial assistance of Unesco (Transverse programme ‘Future-oriented Studies’)
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Preface

This book is mainly for the use of university students who have never or only superficially come into contact with future thinking, as well as for other interested people in the same situation. It has developed through my fifteen years of teaching in the area of social sciences at the Pontifical Gregorian University in Rome, where I have had the good fortune to benefit from an interdisciplinary interchange within the faculty and exposure to students from many countries of Europe, Africa, Latin America and Asia, in addition to those from my own country, Italy. The students brought different experiences to my courses and came with different needs, but all shared the common commitment to address some of the problems connected with the interrelated changes that are now taking place in our world and in their own countries.

Through this enriching experience I have been stimulated to think over the possibilities offered by Futures Studies as they have developed in the last forty-odd years. In this I have also benefited from my experience in other countries, as Fulbright professor of Futures Studies in the United States, and during the past fifteen years conducting many Futures Studies courses for students at the Inter-University Centre of Dubrovnik, Yugoslavia. I have also participated in numerous seminars on training in Futures Studies in various parts of the world.

In rethinking the role of Futures Studies, my target has been students from industrialized and developing countries, where the need to look ahead is being increasingly acknowledged. I have tried to gather together the knowledge gained by Futures Studies, as acritically and objectively as possible, in the hope that such studies may be a useful tool for starting to gain a little more understanding of the changes that are taking place and involve the whole world.
This book is, therefore, directed mainly to the young people who will be living and working in the future. It is also directed to all those who, whatever their choice of role in the future—whether academic, operational, politically active or one of social change—are interested not in trying to understand the future (which is not possible since it has yet to occur) but in better understanding their own influence on the future. It is for those who have already reached the stage of wanting to influence the future, having realized that the future does not simply happen, but is built by each and every one of us, from wherever we may come.

I wish to express my gratitude to the many friends who have helped me to feel and think about the future: Elise Boulding, a great teacher of life; Father Pedro Calderon Beltrao, who has taught me rigour and humanity and encouraged me constantly in my research; and the many, many others who, either directly or indirectly, have been my teachers, including Bertrand de Jouvenel, Robert Jungk and Aurelio Peccei. Finally, I wish most especially to thank Margaret Cook Federico without whose patient support and critical understanding this book would never have been finished.

At the end of each chapter I have included an author-title list of books for further reading. I have used the author-date system of notes, which refers readers to the bibliography of books and articles I have found useful.
Why Think about the Future Today?

Principles and Concepts

Although future thinking has always been a part of human history, it is only in the last thirty years that it has produced what are known as Futures Studies. I believe that these studies can now be considered a discipline despite fluctuations and a situation of apparent fluidity in this period. In the 1950s and the 1960s Futures Studies were extremely rich in ideas and activities of different kinds. Though at the start of the 1970s interest seemed to wane, at least in public opinion, by the very end of the 1970s and during the first half of the 1980s, there was a renewed impetus and interest, which is still continuing today.

How can we explain these oscillations in the acceptability and credibility of Futures Studies? The 1950s and 1960s were a time of economic growth and Futures Studies seemed to indicate that this growth would continue. By the early 1970s, with the energy crisis, there was less optimism about the future, and less confidence in Futures Studies, which had not anticipated the energy and economic crisis and seemed incapable of answering the changing needs of society.

At the same time the developing countries also started showing interest in Futures Studies. On the basis of different attitudes and approaches, some thinkers saw such studies as a constructive way of contributing to changing the present situation of inequality between the industrialized and developing countries, and among the latter countries themselves.

With the late 1970s, there again emerged a certain degree of general interest in Futures Studies: it seemed important not so much to be able to predict specific events but to indicate alternative paths to the future. This view is not shared by all scholars engaged in Futures Studies, including some of the experts (notably in the United States) who had actually contributed to the building of Futures Studies, especially in
terms of methodology. The basic idea of alternatives was very much supported by thinkers in the developing countries. At the same time a certain amount of discussion and sometimes even arguments emerged between writers. I shall try to reflect some of this in the book.

At this point there are two basic questions we must ask ourselves. Why should we look at the future? What is the basic motivation of Futures Studies?

I would like to illustrate some of the different motivations. They are linked to future thinking which, in turn, is a need, a choice, a way of thinking of human beings and, as such, is basic to the different motivations for Futures Studies. These three concepts can be understood as a continuous development, one step leading to the other and, at the same time, perceived in different ways by various scholars.

Futures Studies respond to a need that is especially felt in our time of great rapid and interrelated change (McHale 1969). In expressing the need to look into the future, Gaston Berger, the French future thinker, said that the faster the car, the further the headlights must go, in order to avoid dangers and pitfalls (Berger 1964). We need to look into the future because we are part of extremely rapid and interrelated changes, and the faster the pace of change the further forward we have to look.

Future thinking and Futures Studies are not only a need, they are also a choice which each person or society has to make in the present. It is important to make a choice: whether to think about the future or not; whether to think about the consequences of our actions in the future, and the impact that our view of the future might have on our present action (Godet 1979); or whether simply to think about the present.

Future thinking as a need and a choice is particularly important for thinkers from the developing countries. It is interesting to note that many of them refer to Gaston Berger's thinking, and the term and concept of 'prospective', meaning the inclusion of knowledge from the past and the present, imagination and will (this concept will be further developed in chapter 2). These three aspects (in 'prospective') can be traced in Africa (Berger was well known in that region) and can be found more recently also in Latin America.

Indian sociologist and future thinker Rajni Kothari writes thus:

There is a dilemma that faces the futurist. As a reformer and a romanticist which every futurist must be he is guided by a vision
whose fundamental credo is how to leave the past behind and remould the present towards a different world. As a skeptic and a scientist, however, he knows that a total break with the past is both an impossible and a dangerous proposition and that all he can hope to have is a better world (Kothari 1974, p.1).

Looking into the future and, therefore, Futures Studies is at the same time, and as a consequence, a way of thinking, a way of constructing our minds, a way of conceptualizing life, our everyday actions, our every decision. It is a way of thinking about the world, about society, about the relationship of society with nature. This way of thinking leads to the possibility of educating ourselves and others towards the future, towards the fact that the future is part of our whole life as a sort of anticipation of the future itself (Botkin 1979).

We find this element of knowledge, imagination and will, of objectives and dreams, frequently present in thinkers from developing countries. For example, Antonio Alonso Concheiro, who calls to his support poets and scientists from the past, believes a society can be recognized not only by its history, but also by its projects (1984).

In our time particularly, human beings must learn this way of thinking and educate themselves towards the future. This is more important for children, who will find themselves living in a world in which change will be even more rapid and interrelated than now and who will, hence, have to learn future thinking from a very early age. But it is a way of thinking which is also important for adults, who, though already accustomed to taking decisions, must now learn to make decisions, looking into the future.

This way of thinking, though important for all, is perceived as such by many of those striving for changes in society. Romesh Thapar sees a connection between the arrival on the scene of 'futurists' and the awareness of 'the connections between the various elements of a deterioration in the quality of life' (Thapar 1978, p. 14).

**Historical and Philosophical Reasons for Futures Studies**

It can be shown quite easily that thinking about the future has always been in the human mind. According to John McHale, the future is an important symbol by which human beings can make the present endurable and give a meaning to the past (McHale 1969). What he means, in relation to the present, is that in making decisions and
choosing our position in the present, we make it possible to live in
the present and give an order related to what we want in the future.
What he means, in relation to the past, is that what we foresee in
the future gives a value to the past, whether positive or negative. In
the former case, we can say that when we vote for a given candidate
in an election, we are ordering our present in relation to the future.
What we do, in relation to the past, is give a value to our past. As
an example, if we foresee a democratic future, we are also giving
value to the struggle for democracy in the past. We can even say
that the human being becomes such, when he starts to think about
time, about history and the future.

If we look at future thinking, we see that already in ancient times
there existed what might be called a prehistory of Futures Studies
(Cornish 1977). In ancient Greece, when stones were carved, it was
for posterity; when buildings were constructed in the Maja or Aztec
civilization, it was for the future; in the Egyptian civilization, when
the pyramids were built, it was for the future. Historians in the past
have, directly or indirectly, talked about the future: Heraclitus, for
example, said that nothing is more enduring than change, or rather
that nothing endures but change.

Very important at this point is the work of Bernard Cazes, who
describes through history the different expressions of what he calls
an ‘attitude of the spirit’ in the human being from divination,
as described by Cicero, to the search for the essence of history
(Cazes 1986).

If we look at philosophers, and particularly at Greek philosophy,
which is the basis of Western philosophical thinking, we see that
Plato in his Republic describes a future society where the concept
of justice is central to social life and social institutions. In his utopia
(for it is a future that cannot be realized) he opened the way for other
utopias through the times. In a utopia there is always a contrast, or a
dilemma, between individual needs and public and social needs. It is
this dilemma which often is a stimulus for looking into the future, in
terms of opposition to the present. Later on we shall discuss utopia
as seen by a writer from a Third World country which will show its
specificity.

In the City of God, in his effort to restore a deep meaning to
human history, St Augustine speaks of the terrestrial town, which is
based on human ambition, and the divine town, based on the love of
God. The two towns are interconnected, causing contradictions and
difficulties within social structures. Only when the social structures
change, in relation to the love of God, shall we have the town of God on earth. Again we see a contradiction with the present of his time and at the same time the effort of giving a meaning to history.

In *Utopia*, Thomas More, the English philosopher, wrote describing a society in which the common good is central, and education and work are for all, the individual coming after the community. In *The New Atlantis*, Francis Bacon, another English philosopher, wrote of a future state based on the power of the individual. Clearly both views of the future are highly contradictory to the life of the times of their authors; moreover, they are linked to their own conceptions of progress.

We can run very rapidly through the centuries and observe other future thinkers. For example, there are the utopian scientists of the nineteenth century, who wrote a great deal and based their thinking mainly on the principles of the French Revolution. These utopians believed strongly that science would solve the problems of humanity. At the end of the nineteenth century, Auguste Comte and Karl Marx also believed that science and applied science technology would produce progress, would be the motor of social change, and would solve all human problems. This belief is still alive today, even though many events have shown that it is a dangerous way of thinking if taken to its extreme consequences. The Second World War, the danger of the atomic bomb, the mistakes in space technologies, the tragedies of nuclear power plants and chemical factories all show us that science is not the solution to every problem (Ferkiss 1977). It is not a question of rejecting science, which undoubtedly can and has solved many human problems. What we have to understand is that science alone cannot solve such problems and can actually create new ones. This is a basic debate in Futures Studies: the role of science and technology in solving man's problems in the future and its dilemmas. An interesting book on this aspect of history and utopias is that of Thierry Gaudin (1988).

In his important book, *Traditions, Tyranny and Utopias*, Ashis Nandy raises the issue that 'perhaps a part of the power of our visions comes from their very unrealizability from their impractical, utopian scaffolding. It is a creative tension with which some persons and cultures prefer to live' (Nandy 1987, p. 3). This indeed is a more dialectical way of looking at and perceiving utopias, which will be developed further when we discuss *A Third World Utopia* by the same author.
What seems to emerge clearly from this very brief and incomplete historical analysis of future thinking is that both it and Futures Studies, in its formal understanding (see chapter 2), force us to think about the basic questions of life. What are men and women doing on the planet? What is good or bad? What problems do human beings have and how can they be solved? How can change be brought about? What is the meaning of history? Hence, the basic concepts of the human being, of society, of the relationship between society and nature, of the whole world and, if one has a faith, of the relationship with God, emerge as a consequence of future thinking.

This is why asking basic questions about human life produces changes of attitudes towards the future of the human being and societies; this is why it is so important to see the basic issues related to futurists and future thinking addressed in this book within their historical context.

In this analysis, I wish to stress that I am a Westerner who also tries to see the attitudes and important achievements of future thinking in cultures different from my own, in the awareness of the great contribution that such cultures have to make but also with the awareness of my own identity and respect towards other identities and recognition of the obvious incompleteness of the endeavour.

Fundamental Principles

We have been discussing motivations of Futures Studies through history and, linked to them, some philosophical attitudes; we shall now look at some of the basic principles of Futures Studies on which there seems to be some consensus among futurists from different parts of the world.

The First Principle

The first principle is that there is a constant dilemma in Futures Studies between knowledge, on the one side, and desire and fear, on the other. On the one hand, we have a need, especially felt in our time, to know about the past and the present as a basis for looking into the future. On the other (and herein lies the contradiction), our desires and our fears about the future often do not correspond to our knowledge and even contradict it. For example, we have a great deal
of information about the population in the year 2000 and beyond, but our desires and fears related to this knowledge are linked to our basic values. Another example is that, in the field of biotechnology, we have data on the consequences of biotechnologies, we know their effects on agriculture, yet, at the same time, we see the contradictions in the present.

This dilemma is described by Bertrand de Jouvenel in terms of the 'possibles' and the 'desirables'. The 'possibles' are related to what we know, the 'desirables' are what we wish and what we fear (de Jouvenel 1967). Fred Polak describes this dilemma in terms of the present and its contradiction with the image we have of the future (Polak 1973).

Ashis Nandy expresses doubt as to the capacity of utopias to dialogue. He cites Jacques Ellul: 'Whenever men have taken utopian descriptions seriously, the result has been disastrous' (Ellul 1976, p. 25; Nandy 1987, p. 1). Nandy's point is that utopias have to be understood in their context, with all their weaknesses and strengths; he believes that in dialogue both the former and the latter surface. His doubt is related precisely to the inability of utopias to dialogue: by definition, they are legitimate in their own eyes only, but risk losing the legitimacy in the dialogue. The inner contradiction of utopias is their incapacity to be self-critical or to accept criticism from others and thus free themselves from their own strait-jacket. The moment a utopia is crystallized, it becomes violent and monopolistic (Masini 1983).

The next doubt concerns the relationship of utopias with history. The ones we know are linked to history; Nandy says they should only be partly so. I agree with him. If utopias are completely tied to history, then they either die or are limited in their choices. This is exactly the opposite to what future thinking and, more so, Futures Studies should do. Nandy even goes as far as to say that 'We are better off with negatively defined utopias than with positively defined ones' (Nandy 1987, p. 13).

This is indeed a different view of the dilemma of the first principle of Futures Studies described earlier.

The Second Principle

The second principle, which has been largely accepted by futurists, is that the only space on which humans can have an impact is the future. The principle can be called the 'principle of future spaces'. There is
little we can do about the past, except analyze it in increasing depth. There is little we can do about the present, because the moment the present is lived, it is already past and linked to what has already taken place. The only area on which we can have an influence thus becomes the future, for it has yet to occur. Antonio Alonso Concheiro writes that the past belongs to memory, the present to action and the future to imagination and will. He thus relates the future to 'prospective', which belongs to the future and is related to invention, creativity and will.

The Third Principle

The third generally accepted principle of Futures Studies is that there is not one future, but many possible futures. If we think or act for only one future, we are determining the future itself. Intrinsically it is not only our own future but also that of others. Indirectly we are determining the future of others. This is what has often been called 'colonizing the future' in temporal terms, just as some countries and peoples have colonized others in spatial terms. The future is in fact related to our values, to our choices, to our basic principles which, as such, are different and alternative among themselves on the basis of generations, culture, disciplines, experiences.

It is important to respect this diversity in relation to both people who are already able to make decisions and others who have yet to begin their life on this planet. Many people think of one identical future for all, whether in ideological or religious terms. It is important that the future be seen as a number of possible alternatives. Futures, not future.

More specifically, we can say that many accept the concept that the future can be looked at in terms of the 'possible' and the 'preferable' (the latter being the 'desirable' to which we referred earlier and which is used mainly in Europe) and the 'probable', which in this context refers to what, among the 'possibles', appears to be more 'probable'. Many American futurists have also added what they refer to as the 'plausible', meaning what, among the 'probables', can actually happen (see Figure 1). Together all these different emphases make up the future.

If we wish to describe Figure 1 in greater detail, we can say that the future can be looked at as 'possible' futures on the basis of knowledge,
data and information; among these, there are the 'probable' futures which, in some cases, can even become 'plausible', insofar as they are the most likely to occur. Of course, there is also the 'preferable' which is more related to personal and social values. Again, according to Alonso Concheiro, we must distinguish prospective as exploration of time from planning, its colonization, remembering that both are value-loaded and come close to political choices. We shall see later.
how close futures are to values and how they can be distinguished from planning.

Practical Motivations

We have discussed future thinking in general, the philosophical motivations of Futures Studies and some basic principles. It is important now to discuss the practical motivations of Futures Studies.

We have already indicated that we are living in a time of great change; although change has always been part of human existence, the changes of the present time, especially of the last twenty to twenty-five years, have been increasingly rapid (Toffler 1980). Another important point to bear in mind is that changes have been increasingly rapid, and that also they have not been uniform. Not all changes have taken place at the same rate. Technological change is taking place at an unprecedented pace. Undoubtedly, within the technological sphere, there are different rates of change. However, on the whole, the time span of technological change has decreased, as indicated by many studies, and can be considered within the dimension of the short or medium term, that is under ten years. Of course, account must also be taken of the different time lag between discovery and innovation, discovery and application, discovery and diffusion.

Changes in the economic areas are also extremely rapid. One only has to note how the changes which occur in the value of any monetary unit have an almost immediate impact on other monetary units in other parts of the world. In other areas change takes place at a much slower rate. In the area of education, for example, changes take much longer, sometimes almost a generation. This may be changing somewhat now, for generational changes seem also to be becoming shorter; however, educational changes certainly require around ten years. Cultural changes in terms of value choices take even longer.

Not only is change extremely rapid, it is also interrelated. It is impossible to think of single changes occurring with a linear rhythm. Changes interact and influence each other. For example, change can start in the technological area with the introduction of microprocessors, and subsequently have an input in the social area, affecting lifestyles, and in the economic area, affecting working conditions. Social conditions, such as migration, have an impact
on the economic, political and technological areas, as such changes have to be faced with more adequate technologies in such fields as transport and information.

With changes taking place with increasing rapidity and interrelatedness, we find ourselves in the position of having to look further ahead. Again we remember what Gaston Berger said three decades ago: the faster the car, the further the headlights have to go. To think only of the year 2000, as we did in the 1970s, is no longer sufficient. We have to look further ahead, because changes now are taking place even faster than they did ten years ago. As recently as 1990, Ralf Dahrendorf in an interview to the press was speaking of the year 2010. For a sociologist, that is a long span of time.

Crisis of Society, Crisis of the Human Being

The rapidity and interrelatedness of change have induced many futurists to discuss the present crisis from different points of view. The crisis of society has been described by John Platt, a systems analyst, as the greatest in human history in the last four billion years. According to Platt, there are changes at the biological and social levels of a magnitude that has never been seen before (Platt 1984).

Alvin Toffler has described the three great civilizations, what he calls the ‘waves’ of change. However, the three waves — agricultural civilization, industrial civilization and information civilization — do not occur in sequence, one after the other. In many countries they are simultaneous. The agricultural civilization is still present in many parts of the developing world, but in some of the more developed of the developing countries the agricultural and industrial civilizations coexist; examples are Brazil, Korea and Taiwan. There are countries which are in the industrial civilization; examples are some of the European countries and the United States, which is in both the industrial and the information civilizations, with a crisis in agriculture due mainly to changes occurring at the international level. Japan seems to be completely in the information civilization. The simultaneous coexistence creates crisis in society at different levels, which decision-makers have difficulty in managing (Toffler 1980).

Daniel Bell wrote of the great changes which would create crisis in the coming society (Bell 1968). In the 1960s, he indicated that the
power in society, which for generations had been in the hands of the landowners or of those who owned the economic resources, would move into the hands of whoever had knowledge. This is exactly what is happening now (Bell 1973).

According to some, all people are conscious of the crisis, but there is great dissent on the extent, meaning, causes and development of the crisis (Beltrão 1985). Roger Garaudy, the French philosopher, and Johan Galtung, the Norwegian thinker, have described the crisis of society as the crisis of Western civilization in its entirety, and not simply of one element or another (whether economic, political or educational) — a crisis of the very principles, concepts and mentality of Western society.

According to Ashis Nandy, 'no vision of the future can ignore that institutional suffering touches the deepest core of human beings, and that societies must work through the culture and the psychology of such suffering, in addition to its politics and economics' (Nandy 1987, p. 26).

Mahdi Elmandjra stressed that many forecasters have overlooked the changes occurring in developing countries (Elmandjra 1986). He refers specifically to Africa, highlighting the capacities of the younger generation of that region and the will to overcome their situation, even in the presence of vast economic, political and environmental difficulties. In considering the status of Futures Studies in Africa, Elmandjra states that such studies are never value-free and that 'Africans, in embarking in Futures Studies, must first rediscover their past and assert their present, before they are able to reclaim their future' (Elmandjra 1984).

The crisis of society seems to be also the crisis of the individual, who has to live in that society and face its challenges. The relationship between the human being and society, the human being and nature, is deteriorating as a result of human activities, which are producing, for example, deforestation and desertification, and endangering the biosphere as a whole, thereby hindering mutual understanding and communication. In the last fifteen years, very serious problems have developed between the North and the South of the world, a crisis of relationships among human beings which has led, and is leading, to ever-growing conflicts. At times they appear to be local, but they are indications of a deep-rooted malaise. This issue has been the topic of the work of many future writers, some of them members of the Club of Rome, the most recent being Eduard Pestel's study on man and growth (Pestel 1989).
Futures Studies cannot ignore crises of this nature, for they are the crisis of the individual in society and the crisis of society itself. This is not to say that there are no solutions, but it is to stress the importance of examining the different ways that futurists look at the crisis of society, and at the future as a whole.

Optimists and Pessimists

Futurists have often been divided into optimists and pessimists, which is a simplified dichotomy since it is difficult to be completely optimistic or completely pessimistic. Futurists can be optimists in one field and pessimists in another, but it is, of course, a question of emphasis rather than of polarization.

This dichotomy can also be related to different perspectives and even different cultures. Over and beyond the division between pessimists and optimists, thinkers from the developing countries are basically for change, and consider future thinking as a means of overcoming the present situation and achieving a different world more to their liking in the future. This, as Rajni Kothari puts it, means making value choices that are indeed different in different cultures (Kothari 1974). (The relationship between values and Futures Studies will be discussed in chapter 4.)

Jay W. Forrester, who can undoubtedly be included among the pessimists, was the first to use the system dynamics approach to look at global problems. In 1971, he detected the interrelationships between growing population at the planetary level and growing industrialization, and the use of non-renewable resources and reduction of the arable lands (Forrester 1974). His followers, Dennis and Donella Meadows, used more or less the same variables as Forrester. In looking at the future to the year 2100, they talked of the catastrophe of the planet if strong decisions were not immediately taken (Meadows 1972).

An Italian futurist, Roberto Vacca, sees the crisis of society in pessimistic terms due to the complexity of the world which makes it unmanageable and ungovernable. His only indication of hope is in relation to a continuous effort towards knowledge of the interrelationships among phenomena (Vacca 1973).

Herman Kahn should be included among the optimists. He described our time as an ‘époque of malaise’, but was confident that the world would find a solution, that science and technology
would provide an answer to the growing needs of an increasing population and to the many problems of the world (Kahn 1977).

Robert Jungk, the Austrian thinker, is also an optimist, though his view of the future is completely different from that of Herman Kahn. Jungk believes that each man or woman is able to choose and build his or her own future and that if all people were to educate themselves to this, future society would be completely different (Jungk 1977).

Pessimists can be identified in relation to environmental (Worldwatch 1984-91) and occupational (Golini 1988) issues, optimists in relation to technological (Naisbitt 1982), educational (Botkin 1979) and even political issues.

My personal position is very close to that of Robert Jungk: I believe that it is only by learning to look ahead and by learning to conceptualize and understand the future as a complex whole of alternatives — from which to choose freely — that we can think optimistically of the future (Masini 1982, 1989). At the same time, I believe in the need to assess the situation of the present as clearly as possible, taking into account its challenges and dangers. (Of course the indication of optimists or pessimists is a widely used typology. Here I use it only as an example.)

The complexity of alternatives is also related to the existence of different values at the basis of different cultures and the consequent existence of differing world visions. This is an important point to keep in mind, as it is both in the acceptance of being part of a culture and a set of values (that should be clearly visible to whoever reads or uses Futures Studies), and in the recognition of the fact that we are but one of the cultures and one of the visions of the future, that the future can be considered really open.

Further Reading

Daniel Bell, *Towards the year 2000.*
Bertrand de Jouvenel, *The art of conjecture.*
Michel Godet, *L’avenir autrement.*
——— *Crisis in forecasting.*
Rajni Kothari, *Footsteps into the future.*
Harold Linstone, *Futures research.*
Definition and Characteristics

Definition

At this point it is important to refer to some definitions, the first of which is related to the term I prefer to use, 'Futures Studies' (the plural is used because of the principle 'not one but many futures' described in the first chapter and further explained in this chapter). According to John McHale, Futures Studies are a discipline that includes all forms of looking into the future from trend extrapolation (the easiest and most used way) to utopia (McHale and Cordell McHale 1976).

A classic definition is that of Eric Jantsch, who has defined a forecast as a probabilistic, relatively scientific affirmation on the choices and consequences of problems related to the future (Jantsch 1967). Forecast is related to the principle of 'what, if', 'what will happen, if'. It is important to understand that in this definition we have an affirmation, we have the choices, and we have the consequences of the choices in relation to future problems. It should be stressed that Jantsch actually uses the term 'probabilistic', but not the words 'relatively scientific' used here. This point has been the subject of a recent discussion I have had with Giorgio Marbach, an Italian statistician interested in Futures Studies (Marbach et al. 1991). The scientificity of Futures Studies is indeed one of the most debated topics.

A third important definition, 'prospective', is the French term used by Gaston Berger, initially in the 1950s. More recently, it has been defined by Michel Godet as a newer and better approach than forecasting (Godet 1979). It can be described as emerging from the deterministic influence of the past and the present, on the one hand, and the choices, will and action of the present, on the other. I consider it a valid concept in relation to what I see as the basic
typology of Futures Studies. It appears to be quite well accepted in both the developed and developing worlds. This concept and approach is used by many in Africa, especially French-speaking Africa, and in Latin America as indicated by Antonio Alonso Concheiro. The prospective concept seems to be the most suited to those who look at the future in terms of change, wherever they may happen to be.

It is interesting in this respect that Ziauddin Sardar in his *Future of Muslim Civilization* defines ‘forecast’ in the same way as Eric Jantsch and I do, and Futures Studies as the study of the future in general (Sardar 1987). Sardar underlines that, in studying the future of Islam, Futures Studies have the task of exploring various alternative futures. Forecasting and long-range planning for this author are two activities of Futures Studies that can help decision-makers (see chapter 7). According to John McHale, Futures Studies can be ‘descriptive’ or ‘prescriptive’, whereas other authors have used the terms ‘extrapolative’ and ‘normative’.

Descriptive or extrapolative Futures Studies are related to what we know of the past and the present. They can, hence, project into the future, in terms of possibles, or probables among the possibles, or plausibles among the probables. The possibles are the alternatives that might possibly happen, the probables are the alternatives that might possibly happen, the probables are the alternatives that are quite likely to happen, and the plausibles are those even more likely to occur. There are also the desirables, in relation to which Bertrand de Jouvenel has said ‘we would really be very lucky if the desirables were to appear also as probables’ (de Jouvenel 1967, p. 35 in Italian edition).

For Olaf Helmer, de Jouvenel’s desirables can also be prescriptive or normative, with Futures Studies in this case constituting proposals for actions (Helmer 1983). Sardar’s long-range planning could come close to this view. According to many other authors, whether normative or prescriptive, Futures Studies postulate the futures from which one looks into the present for those processes which will then realize the postulated future. In a way, we work our way backwards.

The following could be an example of extrapolative Futures Studies: on the basis of the knowledge we have of the past and the present, we know that deforestation is eroding the arable lands with serious repercussions for the whole future biological cycle. In areas where deforestation is taking place, we can project possible,
probable and plausible futures in terms of loss of arable land. We can do the same if we plan to put a stop to deforestation and start a process of reforestation.

In terms of normative studies, we could take the example of a developing country, whose objective is to extend primary education to the entire population. We would work backwards, looking at what action is needed to achieve this result in five, ten or more years.

Daniel Bell also has a typology of Futures Studies related to social change (Bell 1973). According to him, there are different ways of looking into the future of society:

1. By social extrapolations from the past and the present into the future.
2. By studying historical and fundamental elements of social change, which implies a careful historical analysis, in order to identify the dominant trends.
3. By choices, as parts of specific frames of reference, from which trends are projected into the future.

Scholars from the developing countries find these last two approaches much more acceptable, which is easily understandable on the basis of the references made in the previous chapter. The last approach of Bell’s typology appears to be the most acceptable: Rajni Kothari stresses that the specific frames of reference in looking at the future indeed make a difference, and Ziauddin Sardar writes of long-range planning.

This is in any case a more sociologically-oriented typology which is very useful for social scientists in search of an epistemological basis for forecasting.

Characteristics

By characteristics of Futures Studies we mean those qualities that distinguish Futures Studies. Some of the characteristics we shall describe apply also to other disciplines, but taken as a complete set we believe these distinguishing qualities define Futures Studies as a whole. These characteristics are: transdisciplinarity, complexity, globality, normativity, scientificity, dynamicity and participation.
Transdisciplinarity

I prefer to use the term transdisciplinarity rather than interdisciplinarity (for a discussion of the latter, see Counelis 1984). It is notably one of the most difficult, most important and best known advances of scientific analysis to have taken place in recent decades. Clearly problems can no longer be analyzed by a single discipline, given their complexity and the many aspects of each problem. If, for example, I analyze the family from the sociological point of view, I realize very quickly that I need the assistance also of psychology, history, anthropology or even political science. This is even more true in Futures Studies, where changes are looked at in their dynamic development, meaning that possible aspects of an issue not yet present must be foreseen.

Not only do we need different approaches and different disciplines in analyzing the same problem, but also these same disciplines must offer their approaches, their assumptions and their methods in a joint effort of exchange (something which is not easy) that goes beyond a parallel contribution. This is already happening in Futures Studies, at least at the methodological level. In the Delphi technique, psychology joins forces with mathematics and sociology; in scenarios, sociology, mathematics and history work together in their approaches, assumptions and methods; in global models, mathematics, sociology and statistics join together in an effort to understand the complex problems of the future.

Fred Polak says ‘all kinds of separate, fragmentary portions of the jigsaw puzzles are of little avail, unless they are fitted together in the best possible way, to form an image of the future depicting a number of main areas of development’ (Polak 1971, p. 261).

For some authors, the concept of transdisciplinarity is enriched by multidimensionality. Yehezkel Dror says that in Futures Studies there is not only a relationship between disciplines, but also the contribution of different backgrounds, different schools of thought, as well as different cultures, from which the disciplines have originated (Dror 1974). Multidimensionality requires taking into account the different points of view of scholars from eastern and western Europe, as they used to be called, from developed and developing countries, as coming from different experiences, different historical backgrounds, and having different outlooks into the future. This does not mean integration, but rather an indication of the greatest possible number of alternative futures.
Multidimensionality and transdisciplinarity are the opposite of specialization, one of the characteristics of the industrial age, which is part of the search for greater and greater detail in the natural as well as in the social sciences. In his well-known book, *The Third Wave*, Alvin Toffler speaks of specialization in what he refers to as the 'second wave', meaning industrial society, and advocates the need for a post-industrial or information society, with multidimensional and interdisciplinary approaches (Toffler 1980).

Other authors have presented multidimensional approaches in their studies. For example, Michel Godet's definition of 'prospective' indicates a multiple future emerging from different approaches (Godet 1979). Harold Linstone has also recently developed a multiple approach in Futures Studies (Linstone 1985). His approach takes into account not only different disciplines but also different ways of looking forward, in order to endeavour to indicate futures in a more diversified and hence realistic fashion while, at the same time, describing problems as they are most likely to develop in the future. (The multiple approach will be more extensively described in chapter 7.)

Certainly if we take as a starting point the definition of Futures Studies in the broadest sense, it is only through multidimensionality that we can understand the concept of utopia, as expressed by Ashis Nandy (1987): the danger represented by the incapacity of self-criticism and the strength by the capacity to be enriched by other utopias through dialogue.

**Complexity**

Complexity is in some way connected to transdisciplinarity, but while the latter is more an approach, complexity refers more to content. The content of Futures Studies is clearly complex; a transdisciplinary and multidimensional approach is essential. At the conceptual level, complexity has been a much-debated topic in Futures Studies in recent years, indeed in science in general and the social sciences in particular.

It is especially important to understand the concept of complexity in relation to Future Studies, particularly as related to uncertainty. The more a problem is complex, the greater the level of uncertainty; the more variables required to describe a problem, the greater the level of uncertainty; the more the future of a problem is deterministic,
the less uncertain it becomes; the more possibilities the future of a problem has, the greater the level of uncertainty.

Many studies of futures have concentrated on the possibility of managing complexity — an extremely difficult task since complexity is constantly increasing. I think it is more realistic to share Donald Michael’s view that Futures Studies should contribute by teaching us to live in complexity, to live with complexity, rather than to manage complexity (Michael 1973). Complexity is not necessarily a limitation, it can also be a positive quality. If we consider learning to live in complexity as a part of the process of learning, both individually and at the level of society as a whole, then perhaps we might see that complexity is important, and better understand what society is, in relation to each human being, thus distinguishing the individual and, at the same time, perceiving a society which is more than just the sum of the individuals who compose it.

Complexity may be faced by what Sohail Inayatullah has called ‘a cultural interpretative mode’, in which each culture sees time and space in a different way (Inayatullah 1990). How do different groups see the future This question is indeed tied to the complexity of the content of Futures Studies. (Complexity will be further discussed in chapter 3.)

**Globality**

Globality, another way of looking at complexity, is again related to the transdisciplinary approach. Globality in this case is planetary, as related to the entire planet earth. The world is shrinking because of the enormous and amazing changes taking place in transport and communication. We can now communicate in a minute, when we used to need hours, weeks or months; we can cross the world in hours, when we needed months or years. The world is shrinking not only in our perception but also in our capacities; hence, in looking into the future, problems have to be seen in their entirety, in their globality, in their planetary dimension.

Although many of today’s and tomorrow’s problems have to be seen at the global level, the immediate consequences of and solutions to such problems are local. A good example are those related to the oceans, their pollution, their use for fishing and food, the need to conduct research (Feather 1980). The oceans are a global heritage and a global problem; however, the consequences of the use or
misuse of the oceans are local, and the laws that govern them continue to be mostly local. For instance, within a certain distance from the coastline of a given nation state, the use of the ocean is the prerogative of that nation, and solutions to misuse are taken by that state with its specific laws. Only recently has this problem been faced at the global level, and a certain number of global laws have been approved in the so-called ‘law of the sea’, which takes into account the fact that, for example, certain damage to the sea adjacent to the coastline may also have repercussions on the rest of the sea or ocean (Borgese 1986).

Similarly, we have problems that emerge as local, for example an economic crisis in a given country, but become global because of the interdependence with other nations, regions or even continents. Changes on the New York or Tokyo stock exchanges have an almost instant impact on the rest of the world, including Europe and the developing countries. We can see an example in the economic crisis of what used to be the Soviet Union and its present and future impact on the rest of the world. Hence, the constant progress been made in the field of transport and communications in recent years and the increasing speed at which such progress is expected to continue in the years to come, have made the world ‘smaller’ and, at the same time, more globally interconnected.

A point that has emerged forcefully in the debate within the international sociological community is that we are living in a society which is becoming more and more global, at a scale that could not have been foreseen some time ago and for which the sociological tools do not seem to be adequate. This is another perspective that re-enforces the need to recognize and work within this characteristic of Futures Studies.

**Normativity**

In Futures Studies, normativity is considered in slightly different terms from how it is generally considered in the social sciences, where norms are considered codes of behaviour related to values. In Futures Studies, normativity indicates the relations of these studies with specific values, desires, wishes or needs of the future.

We have already discussed extrapolative and normative studies and said that in Futures Studies extrapolative studies are related to the knowledge of the past and the present, from which one looks into
the future, while normative studies are proposals for action or for postulating a future. According to Olaf Helmer, normative studies are proposals for action, or for postulating a future and, from that, searching for the transition in the present to realize or prevent it.

In these first two chapters I have made frequent reference to the importance attributed to values in Futures Studies by scholars from developing countries, although they have different perspectives. This point will be further developed in chapter 4.

In Futures Studies extrapolative studies were mainly elaborated during the 1950s and the 1960s; more recently, there appears to be a greater interest in normative studies. Developing country scholars have made important contributions to such normative studies.

According to Mahdi Elmandjra, Third World future thinkers and planners must become increasingly aware that both Futures Studies methodologies and planning techniques are value-loaded (Elmandjra 1984, p. 223). In 1986 I wrote: 'Future thinking is highly normative. This means that concepts in Futures Studies can only be seen in a historical perspective' (Masini 1986, p. 25).

We can say that in Futures Studies values are always present to some extent, and it is really a question of emphasis. In extrapolative studies, the choice of the object of the study, or of the variables to describe the future situation, are clearly related to values. The mere fact of projecting reinforces, or weakens, developments through a direct or indirect expression of hopes and fears. Normative studies, where values are more present, can become almost deterministic if presented as uniform. They must be described and studied in alternative terms in relation to alternative values.

Eric Jantsch talks not so much of values as of the fundamental polarity that exists between exploratory (extrapolative) and normative studies, in relation to technological forecasting. Polarity, he says, is related to action, reaction and opportunity orientation in exploratory studies and to mission orientation in normative studies (Jantsch 1967).

Many authors have discussed the presence of values in Futures Studies, especially in relation to normative studies. Yehezkel Dror speaks of a 'value sensitiveness' which is always present in Futures Studies (Dror 1973). Mihai Botez recognizes the importance of what he calls the 'hidden hypotheses' that are present in many Futures Studies, especially when related to social events (Botez 1975). One of the major criticisms to the global model method, which was so popular in the 1970s (see chapter 10), is that over and beyond the
explicit hypotheses indicated there are implicit hypotheses, such as those related, for example, to the belief that development is only a question of continuing economic growth.

It is important to understand and accept that values and the normative aspect are practically always present in Futures Studies. Another point, related to normativity, is the importance in Futures Studies of imagination and creativity for indicating what is really new in the future. Creativity and imagination are also strongly related to values, since they indicate preferences, desires and fears.

**Scientificity**

Scientificity is the most debated of the characteristics of Futures Studies and indeed, according to many scholars, is not to be considered a quality of Futures Studies at all. Bertrand de Jouvenel even spoke of the danger of considering Futures Studies a science, preferring to refer to them as an art.

Notably, whatever is experimental, repeatable and, hence, forecastable is scientific. In referring to or examining the future, we are referring to or examining something which has yet to occur and which therefore, has been neither experimented, verified nor repeated. In the view of Olaf Helmer, Futures Studies have no hard data; he argues that just as we cannot speak of experimentation in Futures Studies, so also we cannot speak of experimentation in many other disciplines such as some of the social sciences (Helmer 1983). He claims that it is possible, however, to speak of pseudo-experimentation, i.e. experimentation through models or simplified representations of reality. This method has been used in many different sciences, for instance in political science or economics, and not only in Futures Studies, and experimentation proper has been used in disciplines which one might have thought could not be experimented, such as biology and psychology.

The other point that Helmer makes is related to the much discussed difference between exact and inexact sciences. In the former we have universal laws; in the latter, though we cannot speak of universal laws, we can speak of quasi-laws, which are related to explanation through quasi-laws, and hence also to prediction. Helmer gives an example of a quasi-law which can be applied also to our time, noting that before the French Revolution all but not absolutely all French naval officers had to come from aristocratic families. Relating this to the
present, we could say that all but not absolutely all the students of a given state university in the U.S. come from the state where the university is located, or in the case of Europe from the region of the university. Again a quasi-law which is at the basis of explanation and, hence, prediction.

Helmer's conclusion is that it is not the subject matter of a discipline that makes it scientific because we have explanation and prediction, but rather the way we approach the knowledge. In these terms, the epistemology of social sciences is different from that of other sciences. The epistemology of Futures Studies also is not related to the subject, but rather to the approaches and methods adopted. Thus it becomes a question of finding methods that have the necessary scientific rigour to give the explanation and hence the prediction. On the basis of this reasoning, Helmer proposed what is known as the Delphi method (to be discussed in chapters 7 and 8), which is based on the tapping of knowledge of experts with a view to reaching as close as possible a consensus. Though subjective, through this approach it is possible to reach a certain level of objectivity due to the presence of many opinions.

Many authors have debated the scientificity of Futures Studies. Yehezkel Dror has spoken of the need for a clinical approach that must be coupled with a human approach. As we are speaking of what has yet to occur, there inevitably must also be a certain degree of subjectivity and normativity. Other authors, such as Clive Simmonds, believe that in Futures Studies it is essential properly to define the problems and their structures (Simmonds 1977). In a famous phrase, Einstein said that the questions are important and should be correct, rather than the solutions. It is important to put the right questions, to use the methods correctly. Only then can we speak of scientificity in Futures Studies.

On this subject a totally different approach is taken by scholars from developing countries. At a basic level we find the analysis by Ashis Nandy, for whom modern science with its 'values of objectivity, rationality, value neutrality and inter-subjectivity' draws heavily on the human capacity to isolate some aspects of life from reality (Nandy 1987). What happens then to futures, meaning many possible alternatives? Maybe some of the answers come outside the realm of science (as Western science) through the different options deriving from traditions which, though not cited by science, may bring alternatives to science itself. In a parallel direction one can consider the 'current efforts to rediscover a contemporary style of
science that can be legitimately called Islamic’, discussed by Ziauddin Sardar (Sardar 1989), or the scientific creativity of the Third World described by Susantha Goonatilake (1984).

In presenting the macro-history of Sarkar (in his opinion the greatest thinker of our time), Sohail Inayatullah counterpoints science and consciousness (Inayatullah n.d.). Science attempts to put knowledge outside history. Here he comes close to Nandy, but perhaps going further than proposing alternative sciences. He speaks about a science of society, where the spiritual and the material, the mind and the body, join. The joining occurs in the consciousness. The universe is constantly created and re-created, and nothing is simply natural.

**Dynamicity**

I believe that the sixth characteristic of Futures Studies is dynamicity. No other discipline is required to change, in relation to changes in reality, as much as Futures Studies. This can be seen very clearly in the changes undergone by the various methods used in Futures Studies over a period of time. For example, since its origin in 1964, the Delphi method has gone through many different stages; and scenario building has been constantly developed to fit in with changing situations.

The concept of living in uncertainty, of accepting error, of living in a complex situation, of needing to understand continuous change implies the need for Futures Studies to follow and understand such dynamic changes. To this I wish to add the growing awareness of people, minorities, women, the young and, in general, the people of the developing countries and, more recently, of eastern Europe, which, as an ongoing process, increases the dynamicity of looking into the future.

**Participation**

The final characteristic of Futures Studies, participation, is part of the continuing debate on the scientificity of such studies, which has not yet been completely clarified and possibly cannot be. Many futurists would not accept participation as a characteristic, though it has been advocated by people such as Robert Jungk (1973).
Jungk has discussed the need for anyone who is to participate in the future to be a part of and an actor in Futures Studies. According to Jungk, young people especially, the actors of the future, must participate in the choice and the building of their own future.

Similarly, in the United States, the project Hawaii 2000 and a group on alternatives (of which Jim Dator and Clem Bezold have been the facilitators) have asserted that all those who are to be part of the future must participate in decisions related to the future and the building thereof (Hawaii 2000 1977-8). The project, which originated in the state of Hawaii in the early 1970s, used the media to involve the whole state population in a debate and discussion on their future. In The Third Wave, Alvin Toffler also discussed this possibility of participation. He believed it would increase through the use of the computer at home (what he refers to as the ‘cottage economy’), with citizens being increasingly part of decisions related to the community, state and country without having to move from home.

An increasing number of these studies are being contributed by the developing countries, their authors constantly underlining the need for Futures Studies to be flexible, suited to different cultures and not always Western-based, which is definitely a characteristic of the future of Futures Studies.

In conclusion, participation as a characteristic of Futures Studies is related to a specific view, based on the values of democracy and the participation of citizens in decision-making and the building of their own futures whatever the culture. Of course, it is a characteristic that at this point of development of Futures Studies is highly utopian, except at the level of local experimentation. But participation is the future of Futures Studies, if authoritarianism is not to govern in such studies.

Further Reading

J.B. Fowles, Handbook of futures research.
Olaf Helmer, Looking forward: a guide to futures research.
Harold Linstone, Futures research.
Donald Michael, Learning to plan and planning to learn.
Spatial and Temporal Dimensions

The rapidity of change within Futures Studies and the spatial and temporal dimensions in which Futures Studies develop and are examined require discussion beyond the references made to them in the previous two chapters.

As space and time concepts are strongly related to cultural perspectives, in this chapter I shall refer to views of Futures Studies as expressed by scholars of different cultures. I shall present mainly the views of specific, existing Futures Studies, which may indeed be different from those expressed in Western culture. Different approaches are important precisely because in the future they can contribute to an understanding of Futures Studies and even influence them and the future itself.

I shall also briefly refer to perceptions of time in different cultures, which may well affect Futures Studies and future thinking in the years to come. I would finally note that for many non-Western cultures, the separation between space and time does not exist. They are only a reflection of the whole being. It is also worth noting that Fred Polak wrote about the enormous complexity of the process of considering space and time as independent units, in which 'here' could be both yesterday and tomorrow (Polak 1973).

Spatial Dimension

Some aspects of the space dimension have been outlined in chapter 2 in the discussion of globality and complexity as distinguishing qualities of Futures Studies. The space dimension is related to the context in which the area of interest of a specific study operates.
For example, in looking at the future of formal education in a given nation, we must also link formal education to the whole region, or to the basic trends of education developing throughout the world. Interdisciplinarity and cross-cultural education are now world trends, which must be taken into account when examining the future of education for a specific region or country. Naturally there will always be some indications and requirements specific to that region or country, and these too must be considered.

A serious problem of our time has often been that in many countries education is not related to the present or future needs of young people. Vocational training fails to meet the changing requirements of the labour market or the specific context in which it operates. Clearly the requirements in Japan, for example, cannot be the same as those in Southeast Asia. As in other areas, indications for the future have frequently been examined out of context, without consideration of global and regional trends, thus creating serious problems with long-term consequences.

Granted that it is essential that Futures Studies should extend well beyond the specific area of interest, a major problem that arises is exactly where to set the limit. This has been solved in a number of ways by futurists. The concept of globality, discussed in theory in chapter 2, is now considered in more concrete terms, in relation to the specific area of interest to which we apply Futures Studies. Global trends are considered inasmuch as they are relevant to a specific country and a specific area. As an example, the telecommunications area of a specific European country must be seen in relation to global and general European trends, while the consequences of changes in food production will have to be related to the country in question.

While recognizing the need to look at the broader context in Futures Studies, care must be taken not to go to other extremes: very often Futures Studies have been global (planetary), which has not necessarily been relevant for decisions taken at the national or local level. It is important to establish the level at which decisions are to be taken and give indications in that specific direction, while at the same time bearing in mind the general context.

One important and accurate Futures Studies of recent years was prepared by the International Institute of Applied Systems Analysis (IIASA 1980). It is a long-term global forecast in the field of energy that has turned out to be one of the most reliable of the forecasts in this sector. It is important to note that at the
time IIASA had the support of the academies of science of many countries, including the United States and the Soviet Union. The IIASA studies continue to be extremely important. In presenting a study to the Italian Senate in 1981, the former president of IIASA, William Hafele, said specifically that, although the Institute had prepared long-term forecasts at the global level, for such forecasts to be of use they had also to be taken into account at the national and regional level in political decision-making (Hafele 1981). Now, more than ten years later, we are seeing the consequences of the failure to do so.

It should also be noted that frequently the data we have at our disposal at the global level are insufficient and even inaccurate. We find ourselves extrapolating at the global level when the available data are only related to the national (federal in the case of the United States) or regional level. In the United States during the Carter administration a specific effort was made with the elaboration of the *The Global 2000* study, which was based mainly on data collected at the federal level by individual state departments (*Global 2000* 1981). Another study of global data, *The Globus Model*, was based on data supplied by twenty-five different countries (Bremer 1987). The data was essentially economic and political and related to international interrelations. In both cases, the use of national data at the global level required sophisticated methods of analysis in order to be useful.

Other global studies exist for specific countries, such as Peru, Mexico and Korea, which are all excellent studies even though they have to rely on global data. This is as it should be, but there is a danger in using global studies at the national level, even as a context which must be taken into account. The reliability of data in terms of quality, credibility and usefulness is essential for Futures Studies. On certain issues, the data available in some countries has simply not been reliable enough to be of use.

In conclusion, the following levels have to be considered in terms of the spatial dimension of Futures Studies: local, national/state, regional and global. All four must be taken into consideration from whichever level one chooses to start the projection, from global to local or vice versa. Moreover, care must be taken to develop an awareness of the issues and problems briefly outlined above with respect to inter-relations between the levels.

For some writers, the concept of space should not be a linear process. Ashis Nandy makes it clear that the space of future
Why Futures Studies?

thinking, specifically in utopia, should not be of a linear kind, but should include elements at different levels such as the psychological level (Nandy 1987). Much of the suffering is written in the paths leading to any utopia, he says. The space of such suffering changes with the growing awareness of its people and, as such, space is dynamic. To my understanding, this space has no limits. In other words, the suffering of the oppressed is not limited by historical, spatial and temporal theories. This process further opens the space for awareness and in so doing, in my view, also for future thinking and ultimately change.

Temporal Dimension

Closely linked to the spatial dimension of Futures Studies is the temporal dimension, which is of crucial importance insofar as it frequently defines the specific futures study.

John McHale underlines the 'temporal dissonances of time' with some kind of discontinuity and refers to the breaking of temporal ties between generations, a change in the cycle of life, with a currently prolonged adolescence and a longer retirement time (McHale 1976). In this context, reference should also be made to the great difficulty that developing countries have in adapting to new forms of organization that clash with traditional cultural values and at times even destroy them, thus producing tensions and even conflicts that are often not perceived as the origin of more visible conflicts (Masini 1981).

Some preliminary, albeit not exhaustive, thoughts about time dimensions seem appropriate. In an editorial of the UNESCO Courier (April 1991), there is an important statement: 'To dominate an anguish shared by all mankind, each culture has shaped its own conception of time.' Perhaps to overcome this anguish, human beings have come to use the same time system — the system Lewis Mumford would call the 'clock system', which now directs the whole world.

Here it is interesting to note that the Chinese have always linked time, space and nature, clearly shown by their linguistic rendering of the words 'world' and 'universe'. Time is never seen as an abstract measure. The savouring of time, as well as of beauty and other aspects that lend charm to life, is conveyed in the depth of the time and space concept of the Chinese. This does not mean,
however, that the Chinese did not measure time: the sundial, the water-clock and the clepsydra are all Chinese inventions, and a functioning calendar existed in China from the second millennium before Christ.

In the same issue of the Unesco Courier, we find Honorat Aguessy's description of the African concept of time as one of living in a shifting kaleidoscope. 'Time in African society is complex, dense and opaque', says this sociologist from Benin. To understand this concept, we need to remember that in Africa time is not only individual but also collective time since the former overlaps with, and is modified by, the latter.

In Islamic culture the vision of time is multifaceted, related to religion, philosophy, tradition and science, and in the present time is becoming more evident. The relationship between tradition, religion and science will be discussed later in this book.

Scientific time is like an arrow and is related to quantitative ways of defining it according to Sohail Inayatullah (1990). Indeed, changes have occurred in this concept with Einstein's view of time perception in relation to the observer and his or her impact also on the dimension of space. If we move to time as an historical perception, through history we see that time goes in cycles, as with Vico, Spengler and Kaldoun or, specifically in Futures Studies, with Fred Polak and Johan Galtung, or pendulum-like as with Pitirim Sorokin (1974).

The different perception of time in cultures and the understanding of history, visibly or not, underlines Futures Studies. This connection would be a study on its own of great interest. In this context I am mainly trying to show how time is utilized by Futures Studies as a discipline. We must remember that it is difficult to think in the medium or long term. If we look at our own lives, we see that frequently we think in terms of the immediate future, i.e. next year; a little less frequently in terms of events that we expect to occur in the next few years; less frequently still in relation to what will happen throughout the course of our lives; and hardly at all in terms of events that will occur in the lives of our children. Naturally this factor is also related to age, but it has been generally accepted (and psychologically analyzed) that we all have difficulty in thinking ahead more than a few years. It is the sense of the 'forbidden', as Fred Polak calls it. Indeed, this is precisely what Futures Studies are trying to do: to think ahead in the long term; hence, their importance especially in relation to education (see Figure 2).
In Futures Studies the short term is considered to range from the present to five years; the medium term from five to ten years (for some authors up to twenty years); and the long term from twenty to fifty years. National planning is usually short-term; generally speaking it is not more than five years, and corresponds more or less to the period between political elections or policy changes in enterprises.

In Futures Studies the temporal dimension is closely related to the area being considered. For example, in agriculture or, more generally, in ecology, Futures Studies are normally related to the long term, albeit with some differences depending on the type of crop, forest, tree, etc. In education, forecasts also tend to be long-term, over ten years, since this is the time span required to educate a new generation of teachers. On the other hand, energy forecasts generally (though not always) tend to be much shorter, since they are related to technological development.

We have already indicated that temporal and spatial dimensions of Futures Studies are closely related. The broader the horizons of futures, the further we must look into the future. Projects such as *The Limits to Growth* analyze data that go from the year 1900 to 2100 (Meadows 1972). Thus the importance of qualifying the dimension of the forecasts in Futures Studies, i.e. whether it is related to the future in terms of five, ten or twenty years or even in blocks of years, as from five to ten or twenty years. This must be stated explicitly, so that it is clear from the start of the studies exactly which temporal dimension is being considered.

**Complexity and Uncertainty**

Another characteristic of Futures Studies, closely related to the spatial and temporal dimensions, is the concept of complexity. In recent years this aspect has been analyzed and examined in some depth by a number of writers.

An author who has approached this issue within the specific context of Futures Studies is C. West Churchman, who writes that whenever we make a forecast, whatever the area of interest, the entire system must be considered (Churchman 1971, 1977). We have already stressed the need for a global approach, the need to consider the entire context, within its limitations, in referring
to the spatial dimension. A consequence of this globality is the increasing complexity of forecasting in general and of Futures Studies in particular.

In addressing the problem of complexity, Churchman suggests that we ask ourselves questions such as:
Why Futures Studies?

1. Does complexity exist in the real world? (clearly an ontological question, posed by a number of authors)
2. If complexity does exist and if the world, is therefore complex, is it really possible for us to know it and, if so, how? (an epistemological question to which Futures Studies can also contribute)
3. Is complexity useful to the human being and to society in general? (an ethical question which until now has hardly been approached)

Churchman does not attempt to answer these questions, but even the fact of raising them contributes to clarifying the problem.

It is a problem which many authors have addressed at both the ontological and epistemological levels. In a sense, we can say that the global models of the 1970s were already an attempt to give an answer to complexity in methodological terms, by providing us with a method of forecasting that attempts to approach complexity: the simplification of reality by describing it with a few chosen variables. As we have already said, complexity is related to uncertainty; the greater the complexity, the greater the uncertainty; the more variables needed to describe a complex situation, the greater the uncertainty we have to face (United Nations University 1984).

There have been many studies on uncertainty within the broader context of Futures Studies. According to Donald Michael, 'uncertainty is a characteristic of our time.' He writes that complexity can be related to rules (Michael 1973). If we have a regularity of variables, we have a certain continuative behaviour, which means that we have a certain stability and can forecast. In complex situations, where rules are present as well as a certain degree of continuity, it is clearly easier to forecast. If complexity is turbulent, rules cannot be traced and continuity cannot be detected. Consequently there is no stability and nothing on which to base forecasts. While turbulence, as a concept, is generally utilized in the physical world, it has recently been adopted in the social sciences.

There are different levels of complexity, whether in a situation of turbulence or not. If there are no rules, no continuity, no stability and therefore no possibility of forecasting, we have absolute turbulence. Michael claims there are many different reasons for absolute turbulence: a new theory in knowledge, a change in behaviour so radical as to prevent any rules of continuity. He stresses that, although it is not possible to control such changes, we must learn to live with them. By learning to live with complexity, we can survive and look
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into the future: we can even learn to understand complexity and uncertainty by living within them.

Donald Shon claims that in order to live in complexity it is necessary to choose between two alternatives: a position of risk and a position of uncertainty (Shon 1971). We have a position of risk when the variables describing the complexity are known. In this case, the risk element is the choice between the variables. Although we do not know the probabilities of events, we know the variables. The position of risk is thus one of knowledge and awareness. In the position of uncertainty, the variables describing the complexity are not known, and it is therefore not even possible for us to attach probabilities to them.

In the opinion of Yehezkel Dror, the distinction between risk and uncertainty can be taken a step further (Dror 1971). He speaks of primary and secondary uncertainty. In primary uncertainty, we have a situation very close to the absolute turbulence described by Michael. We do not understand the consequences of the present, we do not know the variables and we cannot attach probabilities to events. In secondary uncertainty, we know the consequences of present situations and therefore the variables. Dror’s secondary uncertainty is therefore similar to the risk described by Donald Shon. In secondary uncertainty, though we know the consequences of present situations and therefore the variables, we cannot attach probabilities to them. It is a situation close to risk.

We can find many examples of this type situation. In the case of nuclear energy, for instance, we know the variables and the consequences of its use, but we are unable to attach probabilities to the events and to the consequences of nuclear energy. If we look at deforestation, we are aware of the increasing amount taking place in the Amazon or in Bangladesh, but are unable to attach probabilities of events to the consequences, of which we know the variables. In some cases, we even have a primary uncertainty, albeit not total: if we look at the use of microprocessors in education, although we know some but not all the variables, we do not know the consequences or, even less, the probabilities.

In Futures Studies we are therefore dealing with complex systems that become even more complex in the case of social systems. The situation of uncertainty must thus be examined in relation to complexity. It is important that we detect a situation of risk and uncertainty in a complex present. Even in our normal everyday lives we have to accept risk and uncertainty; we have to face up to them
and try to understand them with the tools that are gradually being developed. Futures Studies will never be able to give us certitudes, but they can help us to lower the level of uncertainty through a careful structuring and analysis of problems. There has been considerable debate on complexity at the philosophical and scientific levels, as emerged clearly at an important symposium held in Montpelier in 1984. According to Edgar Morin, 'aspiring to complexity means aiming at a multidimensionality', for complexity 'does contain an element of incompleteness and uncertainty' (Morin 1984, p. 63). Incompleteness and uncertainty also mean risk and challenge, which are also elements of future thinking.

**Discontinuity**

The concept of discontinuity was first presented by Peter Drucker. John McHale defined discontinuity as a complete rupture from one situation to another, while Drucker identified four areas of discontinuity (Drucker 1969). More than twenty years later, it is interesting to analyze these areas in the light of the events which have subsequently occurred.

The technological area is the first area of discontinuity analyzed by Drucker, in whose view technologies can create or provoke complete discontinuity in society. The radio, the transistor, the computer are but some of the more recent innovations that have transformed our society. In analyzing the discontinuities provoked by technology, it is extremely important to remember that the time frames are highly differentiated in relation to specific technologies.

Drucker then analyzed the economic area. One of the main points he makes is that national markets are fast becoming one extended international market. What is surprising is that Drucker reached this conclusion as far back as 1969. It is undoubtedly increasingly true that what happens in one particular market has repercussions that extend beyond national borders. Recent examples are the 1987 crash of the New York Stock Exchange which had worldwide consequences; the European Community and U.S.-Japanese debates on the production of various goods; and the collapse of the former Soviet Union as an economic power. In a world of global markets, goods can be produced in one part of the world, assembled in another and sold in yet another; the existence of a truly international global market
has already brought about many important transformations and will continue to bring about more in the future.

In presenting the concept of discontinuity, Drucker also refers to the political arena, particularly as regards political institutions. This is a topic that has been developed also by the World Futures Studies Federation (WFSF) in recent years. The results of its findings were presented at a Stockholm conference in 1982 (Page 1983).

The crisis of the nation state and the difficulties encountered in maintaining national borders at the economic level have political repercussions in all states. The classic example is the European Community. Though created as an essentially economic community, it had from the very start political repercussions (positive and negative), which are destined to increase with the creation of the Single European Market in 1992.

The role of political parties has recently been challenged in general terms, including even the capacity of political parties to influence the public life of a country. The welfare state, which in the 1960s and 1970s was seen as the solution to many problems, is also challenged because of the growing demands and needs of citizens and the state's apparent incapacity to meet them. Drucker was among the first to perceive these discontinuities in the political area, which were destined to produce radical changes in general and in the political environment particularly.

Drucker also described discontinuity in relation to knowledge. He claims that the transformations in the area of knowledge are destined to bring about unprecedented discontinuities. He believes that the progress in knowledge and education would produce an increasing number of jobs. Although in many ways much of Drucker's approach is still valid today, and much of what he suggested still applicable, his claim that increased knowledge would lead to more jobs has in fact not proved true. There are fewer rather than more jobs in most areas, although in the even longer term he may come close to being right. However, the fact that knowledge brings discontinuity has proven to be very true.

In conclusion, it is important and even vital to underline the spatial and temporal dimensions of Futures Studies, however we wish to identify them, in relation to the pace and rapidity of change in our society. Moreover, the complexity of situations that emerges at both the physical and social level must also be related to the uncertainty. The greater the complexity, the greater the uncertainty. Futures Studies are a tool for addressing complexity and reducing
uncertainty. In this context, the thinking of Peter Drucker in terms of discontinuities, transformations and radical changes in society continues to be of great use for us today.

**Further Reading**

Eleonora Barbieri Masini, *Space for man.*
Ashis Nandy, *Traditions, tyranny and utopias: essays in the politics of awareness.*
U.N. University, *The science and praxis of complexity.*
Philosophical and Ethical Elements

The basic ideas of Futures Studies through which one attempts to answer future-related questions are the philosophical elements, to be found in all Futures Studies as a whole area of study. The indications of norms of behaviour implied or to be followed by Futures Studies are the ethical elements.

Relationship between Science and Values

We shall look first at the relationship between science in general and values, then between social science and values and, finally, between Futures Studies and values.

Science, or rather the paradigm of science, has undergone a major change in the last century. The Newtonian system of mechanics (i.e., the system prior to the great discoveries of Max Planck and Einstein) indicated that the universe was a machine in which cause and effect were closely linked as in a mechanical clockwork device. According to this view, which prevailed in nineteenth-century science, free will was only an illusion, since men and women, like everything else in the universe, were subject to the cause-and-effect link.

In the twentieth century this deterministic view was modified and completely superseded by the Einstein theories of relativity and quantum mechanics, the latter being the cornerstone of modern physics. According to Robert Ayres, 'in quantum mechanics, causal relationships exist only on a macro-scale. . . . Cause-and-effect relations become probabilistic (i.e., statistical)'. A basic implication is that, even in principle, one cannot know everything about the past, present and future. Robert Ayres has described this theory in
relation to Futures Studies: the limitations of knowledge have been expressed by the so-called 'Heisenberg uncertainty principle', which states that 'the product of statistical uncertainties of complementary variables (say, momentum and position) can never be less than the fundamental physical "unit of action" known as Planck's constant' (Ayres 1978, p. 17). The implications are enormous.

Beyond a definite limit one can determine the track of a particle with very great precision only by sacrificing knowledge of its speed on that track! Similarly, it might be suggested that to know every relevant detail about the historical trajectory or path of any social or economic variable of possible consequence would require such intensive and disturbing scrutiny, as to cause significant and unpredictable changes in its trajectory. (Ayres 1978, pp. 17-18)

At this point the social sciences which, in principle, had adopted the same mechanistic view, could no longer separate that 'which is' from that 'which should be'; although this separation, and the awareness of the two parts, is very important, it is increasingly difficult to attain.

If this is true in science in general and in the social sciences in particular, it is even more important in Futures Studies. It is a principle related to the change in the relationship between science and values, which, though apparently clear in the physical sciences, is less clear in social sciences. An instance of lack of clarity in this field was in evidence at the 1982 World Conference of the International Sociological Association in Mexico City, during which this relationship was still being discussed and the division between that 'which is' and that 'which should be' was seen as being very important. Ashis Nandy criticizes science for trying to render objective analysis by abstracting it from its social context, manipulating and correcting things and processes, 'threatening to take over all of human life, including every interstice of culture and every form of individuality (Nandy 1987, p. 105). This process is producing rebellion and supplying authoritarianism with supportive elements. Another approach is taken by Ziauddin Sardar, who underlines that in Islam there is no contradiction between values and science since there is no difference between the means and the ends of science, both being subject to the ethical and value parameters (Sardar 1984). Susantha Goonatilake writes:
Non-European cultures, especially those of Asia and the Islamic lands, were not without rich intellectual and scientific traditions of their own. The historical continuity and the flow of the scientific and socio-economic processes...were interrupted by the European hegemony of the last five hundred years. (Goonatilake 1984, Introduction)

These attitudes that I have very briefly described were hardly considered by Western science and not at all by social science. This is a broad area for discussion that opens most challenging avenues for scholars of both Western and non-Western cultures who might consider the important critical views of the relationship between science and values. The capacity of science to freeze a subject in order to study it, and to create a distance from it in order to analyse it, is radically challenged by these attitudes.

In the previous chapters, we have already underlined the importance of seeing the possibles, the probables and the plausibles on the one hand, and the desirables on the other (de Jouvenel 1967). It was also stressed that, to some extent, values are always present even in the possibles and the probables, at least at the level of choice of variables and frames of reference. It is extremely important to bear this in mind for, as a consequence, there is the need for a careful rethinking in this field — rethinking which comes from scientific and historical change, from the emergence of a growing awareness that moral and ethical issues do influence science.

In addressing this issue, Bertrand de Jouvenel distinguishes the facta, events that have already happened in the past or the present, from the futura, events yet to occur. This does not mean that facta are not susceptible to values but that they are less so because they have already occurred and, as such, are only susceptible to choices. Events which have yet to occur are much more subject to values, as bases for ‘desirables’ or ‘preferables’.

We must then deduce that in Futures Studies values are always present, for what has yet to happen is in some way influenced by desires and fears, whether at the individual or the collective level. The failure to consider this constant presence of values in the past has frequently led to a loss of credibility of Futures Studies.

Many of the people working in Futures Studies after the Second World War became aware of this problem, even when Futures Studies were still being equated mainly to technological forecasting. The question of where we are going, and where we want to go,
was already being posed at that time both in military technological forecasting and in technological forecasting in general.

A series of forecasts in various technological sectors had already been produced by the systems analyst Hasan Ozbekhan, who was interested in the social consequences of technological forecasts and had already posed himself the basic question related to the presence of values in Futures Studies. He wrote that we have to distinguish between that 'which will be' and that 'which we want to be'. In a study still of great importance, Ozbekhan writes that once human beings have the capacity to bring into being a technology, they are practically compelled to produce this technology and to use it. In his view, this is a great danger in our times, because 'can implies ought'. As soon as we are able to do something, there is a compulsion; hence, the will of the human being is substituted and the technology comes into being (Ozbekhan 1960).

A consequence of this concept is the idea that every human and social problem can be solved by technology, an idea which is one of the causes of the present political, economic and social crises. If an analysis is not undertaken to establish whether there exists a real need for such a technology, or if the technology will create other problems, then in some sense the technology takes over, even if it cannot be said to possess a real force of its own.

In order to overcome this problem, Hasan Ozbekhan distinguishes three kinds of forecasting; normative forecasting, based on what we desire to happen in the future; strategic forecasting, the drawing up of a strategic plan of what we wish for the future; and operative forecasting, the application of the indications of strategic forecasting. According to Ozbekhan, in normative forecasting, values are extremely important, hence, the need to make a very clear distinction between the three types of forecasting, depending on the degree to which values are present.

It is interesting that Ozbekhan, a systems analyst, underlined the values aspect, an extremely important aspect of Futures Studies, right back in the 1960s. Of course, certain types of forecasts are richer in values than others; nonetheless, values are always present and a distinction must be made precisely on the basis of the degree to which they are present.

This point was underlined in relation to Futures Studies in global change, in advocating the basic idea 'that futures researchers (in their professional activity) have to make a special and joint effort as people who come from different countries, who have different
value systems, different backgrounds and social histories, and who, perhaps, even different goals for the future' (Masini 1984, p. 470). On that occasion I underlined the need for an ethical commitment by futures researchers.

Responsibility of Experts

In the light of the presence of values, those engaged in Futures Studies clearly have a specific responsibility to those forecasts, in turn linked to specific choices that will have a direct or indirect impact on the future. The values in question can be of the forecaster or of the user.

Once we speak of responsibility, we immediately enter the sphere of ethics, which directs the behaviour of people through norms. During an interdisciplinary course held some years ago at the Pontifical Gregorian University in Rome, Josef Fuchs said that every man and woman is morally bound to look into the future (Fuchs 1977). Beyond the specific responsibility of those involved in Futures Studies, there is a general duty to look forward and feel responsible for the future.

Futures Studies are not the only discipline to be in this position in relation to values and responsibility. Several other disciplines, for example policy science, which in one way or another have a direct influence on decision-making, share this same responsibility. It is essential that disciplines such as Futures Studies and policy science be rigorous in their approaches and analyses, precisely because of this strong presence of values that cannot be ignored.

The philosopher Peter Henrici has looked at Futures Studies in terms of their being related to the environment of the human being. He claims that a direct relationship between the human being and nature was only possible in the very early primitive societies and that very soon culture (built by the human being) came to act as mediator in the relationship between the human being and nature (Henrici 1977). This process of mediation has undergone many changes through time and history, and is currently dominated by science and technology, which in turn answer to priorities and values that are different from those of the past.

Indeed, our culture will be increasingly dominated by science and technology in the mediation process between humans and nature. It is important that the impact of this be fully understood for the
future of humanity, at the same time taking into account the different views of science and values previously described. We can say that the values are different when the mediation (culture) is different. Are we going to be living in a culture in which the mediating force between the human being and nature is to be increasingly dominated by science and technology? Are we going to have to accept that, in this situation of scientific and technological domination, values and priorities also change, and indeed are destined to change further, under the impact of science and technology? As we have already seen, Ashis Nandy, Ziauddin Sardar and Susantha Goonatilake seem to be of the opinion that not only are science- and technology-oriented values being challenged by cultures that are different from Western ones, but the ‘isolation’ process conducted by science is also being questioned from different sides, also within Western culture itself.

It is unrealistic, though, to expect values to remain unchanged, to expect to live as we did before, when the mediating culture was not dominated by science and technology but by other priorities, such as knowledge in general, reflection or meditation. At the same time, choices cannot be linked only to science and technology, as the human being, the carrier of the values is their creator.

It is extremely important that the choices which derive from such a culture, and such a cluster of values, are analyzed. Behaviours are also different because they are dominated by different values, norms and principles, and it is at this point that ethical elements also emerge. Personal and collective responsibility become crucial, with even personal responsibility having a public outcome. This point emerged very forcefully, and was possibly the most important point to emerge, in a debate in 1977 at the Polish Academy of Sciences. On this occasion, a group of experts of Futures Studies met with a group of planners from eastern Europe, on the initiative of the Poland 2000 group, to debate the ethical issue of responsibility. It was felt that planners, unlike Futures Studies scholars, usually do not feel responsible in terms of values and ethical principles, and stressed that futures experts and planners must endeavour to get as close as possible to the ethical aspects of Futures Studies, and recognize their social and individual responsibility in relation to the future. History has recently shown how this lack of responsibility has seriously damaged people and whole societies.

More recently, Olaf Helmer has underlined the need of ‘wisdom, courage and sensitivity to human values to shape a better world’ (Helmer 1984, p. 2).
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The Presence of Values in Futures Studies Schematized: A Theoretical Proposal

Through the years I have developed a method of schematizing the presence of values in Futures Studies, looking at the problems from the ethical and philosophical points of view. The starting-point was the article by Peter Henrici on the why and how of futurology.

The future can be seen in three different ways. The first approach is on the basis of the past and the present, building what some call 'prognosis' and what I would call 'extrapolation'. The data, the information, the knowledge, which we have from the past and the present, is used to look at what may happen in the future in relation to the sources analyzed.

In this way we give meaning to our choices for the future that are related to choices in the past or in the present in terms of data, information and knowledge, but at the same time are linked to our frame of reference, which, indirectly, indicates to us which data, which information, to choose. As Bertrand de Jouvenel writes, we search for the possibles and the probables in the present. In this approach values are present, but only to the extent that they are present mainly in the choice of area and data.

This was the most widely-used approach in the initial historical period of Futures Studies after the Second World War, and can be said to have lasted up to the end of the 1960s or early 1970s, although many scholars still use it.

The second approach to the future is the one called 'utopian'. It has been in the history of humankind for many centuries, from Plato to Thomas More and Bacon, to the utopian-scientists and to many other thinkers. Utopias could perhaps be said to have finished with H.G. Wells as the Nobel laureate Dennis Gabor once said.

Utopia is the building of a future different from the present. The data from the past and the present are not important, although, if we analyze the different utopias, we see that they are related to the present and are often in contradiction with the present. What is important is invention, innovation, imagination, and the production of what can be a utopia (a positive ideal not liable to being realized) or a negative utopia (a negative ideal). In this approach, values are of great relevance, for they determine both our desires and our fears. As indicated in an earlier chapter, utopias can also be seen in the terms described by Ashis Nandy as liable to become authoritarian unless they are open to self-criticism, and criticism from outside.
And, though this approach may be as old as the human being himself, it indeed expressed the anxiety vis-a-vis what is different and not yet known.

The third approach to the future is the one which I call 'vision'. It is different from utopia in that it is an approach in which we take into account both extrapolation (prognosis) and utopia, with the latter not being separated from the past and the present, but taking into account the emerging trends from which it may receive strength or weakness; it searches in the present for what can realize the utopia and, as a consequence, a 'vision' is born (Masini 1983).

The vision is also a step towards the creation of a project, for there is the will to see the vision realized, and thus the capacity to build the future. The future is built on the basis of the data of the past and the present, of the facta described by Bertrand de Jouvenel, but with the addition of the utopia, the desirable or the fear, and its connection with the real world. The project is based on the vision, which is not in itself the project: for it to become a project of the future, there must be the conscious will that it become one. Values are very much a part of this approach, though not unconditionally, as in utopia, but critically, in relation to the real world.

It is important to search for vision-oriented Futures Studies. In this context I will cite the recent Challenge to the South, which may be called a vision, although the authors would never call it Futures Studies (Challenge 1990). I believe that Futures Studies have been characterized by this approach in the 1980s and early 1990s. In a world undergoing constant change, there is a growing need for the future to be seen as being linked to the present, and for a greater awareness of the need to have an impact on the future, if disaster and catastrophe are to be avoided.

If we look at the future of Futures Studies, I believe we can say that vision and project building is the direction in which they are now moving and will continue to develop (Masini 1982, 1989, 1980).

Further Reading

Pedro C. Beltrão, Pensare il futuro.
South Commission, The challenge to the south.
Eleonora Barbieri Masini, The future of futures studies and Visions of desirable societies.
5

Limits

The limits in Futures Studies have already been touched upon in the previous chapters. As it is mandatory in a new discipline to understand the subject’s limits, we shall examine the issue in greater depth in this chapter through the six I have singled out.

Self-Altering

The moment a forecast is made public, it produces consequences that alter the reality in which it operates. In other words, it self-alters. This concept was originally debated by Robert Merton, who describes prophecies as being self-realizing or self-defeating. The point Merton makes is that an immediate consequence of the production of a forecast is the alteration of the forecast itself. The mere fact of being offered to public opinion shifts the attention of the public and the prophecy is either realized or destroyed (Merton 1940). For example, as soon as it is forecast that a bank is about to go bankrupt, all those who have their money deposited in that bank draw it out, and the bank, in effect, goes bankrupt; or, in an election in which one of the candidates is presented to public opinion as a loser, the forecast self-destructs itself because of the psychological reaction of the public in favour of the underdog, who therefore defeats the other candidates. In this situation, the forecast that a given candidate would lose is not confirmed because the candidate gets elected as an effect of the pre-offered message.

Merton says that the event is not a consequence of the forecast itself, but rather of the public’s refusal or acceptance at a given time and in a given fashion of that forecast which, therefore, is either
realized or destroyed as a consequence of this reaction. Hence, frequently the forecast needs the backing of public opinion. This factor must be taken into account if we wish to understand the impact of Futures Studies.

*The Limits to Growth* project is another example of forecasting that can be interpreted as a self-altering prophecy (Meadows 1972). In this project it was forecast that a world catastrophe would result from the ever-increasing and rapid interrelationship between the use of natural resources, arable lands, growing population, growing industrialization and pollution.

A forecast such as this, by now accepted as basic in political economy, can be considered a self-defeating prophecy. Its impact on public opinion, and on decision-makers, whether in the political or economic sphere, is such that a situation may emerge in which a catastrophe does not occur. The forecast acts as an alarm. Clearly there may also be other reasons for the realization or the non-realization of some of the other future-oriented projections contained in *The Limits to Growth*, but the fact remains that it is important to be aware of the influence these projections have had on the individual or collective behaviour of great masses of people. It is a book which has been translated into forty-four languages and its impact has been global.

**Psychological Aspects**

In some ways the second limit to Futures Studies is related to the previous one; we can define it as a psychological aspect of Futures Studies. In this book it has been repeatedly stressed that one future for all does not exist but, rather, a series of possible alternatives. Among these, some are probable and others even plausible. It is often said that the future is in our own minds; this is certainly so, but the future is also in the minds of others, of many others, both individuals and groups.

There has been much debate among scholars on this psychological aspect of Futures Studies. Research has been conducted on how the different members of society, such as the housewife, the scientist and the manager, look into the future. A general indication that emerges from these studies is that everyone encounters psychological difficulties in looking ahead; it is even more difficult to look at the future in alternative terms in relation to the present. A fear of the
unknown seems to prevent us from looking ahead, especially in the long term, and in terms of alternatives. Other studies have shown that children have a great capacity to look ahead, and in alternative terms. The relationship between age and formal education and the capacity to look at the future has yet to be theoretically demonstrated, but empirical research with children shows a decreasing capacity with age, perhaps caused by loss of creativity or the emergence of fears. In some ways these two aspects may coincide.

Another important observation to be made in relation to the present situation is that Futures Studies are still influenced by historical situations and their values, as well as by concrete experiences and public opinion. The fact that future thinking in the industrialized countries should have overlooked the changes taking place in developing countries is considered by some scholars, for example Mahdi Elmandjra, to be one of the failures of Futures Studies. This can be considered a psychological limit on the part of the experts of industrialized countries, indicating also a certain degree of fear and arrogance. Mahdi Elmandjra describes some of the significant Futures Studies exercises developed in Africa in recent years, and refers to the Symposium *What Kind of Africa by the Year 2000* held in Monrovia as far back as 1979 (Elmandjra 1984). The increased interest shown in Futures Studies in recent years in developing countries may also spring from a psychologically understandable refusal of the past and possibly of the present.

Another aspect under the psychological dimension of Futures Studies is an element that has been underlined by Harold Linstone, who averred that when human beings look at the long term (i.e. beyond ten years), they look at it in pessimistic terms. They seem not to have clear solutions in relation to the problems being forecast (Linstone 1977, ‘Confessions of a forecaster’). On the other hand, these same people will probably be optimistic in the short term, because they believe that the problems can be solved. The tendency for pessimism or optimism to prevail is therefore related to the temporal dimension of Futures Studies.

This can be related to another psychological aspect of Futures Studies, again underlined by Harold Linstone, who defines it as ‘discounting the future’. In this case a phenomenon of economic origin is applied to Futures Studies. For example, in their calculations, businessmen seem not to take into account future changes which may occur in the dollar or on the stock exchange in general, whether in positive or in negative terms. The mind of the business man is
linked to the present and to the value, in the present, of the dollar or the stock: without being aware of it, he or she applies a discount operation in looking to the future. It is like looking through the wrong end of a telescope, reducing rather than increasing the possibilities and opportunities for the future generations affected by decisions taken by others. This psychological limitation may well be applied to other events, such as the ethnic conflicts emerging throughout the world.

How is this natural but harmful attitude to be avoided? Some of the scholars working together with Harold Linstone have come up with a number of suggestions. First, future crises, which are distant in time, can be described as being closer, thus stimulating choice and action in the present, which is more related to the possible changes. Second, futures crises, which are distant in terms of space (i.e, far removed from where we are operating), can be described as being closer. An example of the first case could be to bring forward an economic disaster forecast for the future, and look at it closer in time. In the second case, a problem which is removed in terms of space, for example the need for education in developing countries, can be brought closer to us. In both cases we would be forced to act as, unfortunately, we usually are by unexpected events (such as the explosion of the Chernobyl nuclear power plant or the recent Gulf crisis). In other words, to cite the authors of *No Limits to Learning*, it is a question of ‘learning by shock’, whereas what is needed is ‘learning by anticipation’ (Botkin 1979). The third suggestion is as follows. An even more important way of learning to bring nearer the problems which we should be looking at in the long term is to educate ourselves and others towards the future; to learn to think in the short and the long term, as well as in alternative ways, for this is what educating towards the future really means. As Michel Godet has written: ‘In rising uncertainty in technical, political, economic and social fields, a ship navigating through a storm in a fog needs a heading, a compass and a lookout, if it is to arrive safely in port’ (Godet 1987, p. xiv).

Irrational Aspects

In Futures Studies it is of the utmost importance that the problem under examination in relation to the future be correctly formulated, and its structure rigorously analysed, insofar as this is possible.
As mentioned in previous chapters, the function of both time and space must be clarified; we must also understand the social consequences that future events may produce. Every possible tool must be used in order to understand the problem in every one of its future aspects.

At the same time, in future processes and events there is always an element not quantifiable in any way which could be defined as 'the irrational'. Clearly we cannot forecast the irrational: we might know some of the variables of the future event involved (in the irrational), but we certainly do not know the probabilities. Is it possible to forecast when an irrational element will explode and come to the surface?

There are many examples of this irrational element in recent history. An example is the Iranian revolution: no one had foreseen it, although some variables could have been detected in the behaviour of Iranian refugees in Paris prior to the revolution. There are several irrational elements that it would have been possible to predict in events in Libya. Much of what occurred in countries on the Mediterranean Basin between 1985 and 1989 could also have been predicted. It was also possible to predict many of the cultural and religious underpinnings of the Gulf crisis, which had been in the making for at least a decade if not for centuries. However, it was not possible to foresee the events as a whole.

We have discussed the importance of uncertainty and risk operating within rationality, with the possibility of knowing variables and probabilities of occurrence in relation to variables. In a situation completely dominated by the irrational, it becomes impossible to forecast.

Implicit Hypotheses

Like all other studies, whether in social science or in other areas, Futures Studies have a number of implicit and explicit starting hypotheses. Anyone who intends using Futures Studies must find a way of detecting the implicit hypotheses.

Many recent Futures Studies imply, either directly or indirectly, that economic growth will per force continue, that the domination of the developed countries cannot be changed, that only technology can solve problems related to social change, etc. It is essential that hypotheses of this type be detected. Being hidden, they are frequently
more powerful than they would be if explicit. During the first twenty years of their existence, Futures Studies were considered mainly objective. This has had a damaging effect on recognizing implicit hypotheses by distorting reality and, thus, also on the credibility of Futures Studies themselves. Much of the criticism and concern felt in relation to Futures Studies by developing countries is a consequence of this trend.

**Data Availability**

The availability of reliable data is essential for Futures Studies. Science in general, and social sciences in particular, come up against this problem in many fields in our time of growing complexity and change. In Futures Studies this problem is even greater. In some cases we are unable to go back as far as we would like because of the lack of reliable data; in others, we lack sufficient historical series on which to base our forecast, or comparable data for different countries or regions.

In all cases, lack of data is a limitation. Futures Studies must be based on data, whether quantitative or qualitative. The knowledge of the past and the present is essential to search for the possibles and the probables. Obviously this data must be reliable and go as far back in the past as is necessary, or be as reliable in the present as is useful. The availability of comparable data in general terms or in specific areas is a very serious problem in many parts of the world, in both the developed and the developing countries. For example, although the situation has improved somewhat more recently, one generally encounters great difficulty in Italy in obtaining data on women’s work that can be used for projecting into the future (Commissione Nazionale 1985).

In other cases, the problem is not one of areas but of regions. For example, the Economic Commission for Africa has been trying to homologate the retrieval of data in Africa on the household basis; however, not all nation states in Africa have been willing to follow its indications and thus it becomes extremely difficult to use such data in comparative terms. There is also the already stressed problem of using these data at the global level since they are an aggregation of unreliable local data.

In conclusion, if forecasts are to be reliable, data must be rigorously considered and evaluated.
‘A Posteriori’ Verification

The fact that Futures Studies can be verified only ‘a posteriori’ is another limitation. Clearly we only realize if a study has been useful once the events forecast have taken place, although Michel Godet writes that ‘not necessarily the correct forecast is the one which turns out to be true’ (Godet 1987, f. 11).

It is around forty years since the beginnings of Futures Studies and this, in my opinion, is long enough to evaluate some of the first forecasts made and methodologies used in the course of these years.

A good area to look at is technology and the forecasts made in relation to the development of innovative technologies and processes. In the 1960s there were some very precise and detailed forecasts indicating that the greatest developments would take place in space technologies and that development in this area would by far exceed that in other areas, for example biotechnologies. More recently we have seen that the space technologies have slowed down with respect to the biotechnologies, which have instead developed dramatically, especially in the agricultural sector.

Clearly it is very important that Futures Studies be evaluated and errors acknowledged, whether in the assumptions, the methodology or the impact on public opinion.

Conclusion

These six limitations should in my view be considered in Futures Studies in the short, medium and long term, and at the global, regional and local levels. We must be very aware of them if we want to avoid making forecasts that are unrigorous and superficial mistakes that cause Futures Studies to lose credibility.

Further Reading

Mahdi Elmandjra, ‘Reclaiming the future: futures studies in Africa’.
Michel Godet, De l’anticipation à l’action and L’avenir autrement.
Harold Linstone, Futures research.
Terminology and Development

The focus of this chapter will be mainly on the origins and evolution of Futures Studies, with a brief indication of basic terminology, which clearly is related also to the place and the period of development.

Contrary to other disciplines, there is no universally accepted terminology of Futures Studies, which may be because it is a relatively new discipline or that the common agreement on a single theory has yet to be concluded. Although the debate is still open, agreement has been reached on certain basic terms and a consensus is now possible on some of the basic guidelines, something that would have been out of the question only a few years ago. Some terms are generally accepted by the various schools in different countries (Masini 1973).

Terminology

**Forecast.** According to the best definition, as expressed by Eric Jantsch, a forecast is a 'probabilistic statement, on a relatively high confidence level, about the future' (Jantsch 1967, p. 15). A probabilistic statement is already a rigorous definition; at the same time, we have a relatively high confidence level. It is important to consider the use of the word 'relatively', which is related to the uncertainty we have already discussed. The use of the term 'high confidence' shows, however, that assurance is strong. Forecast is still widely used although challenged by many authors in terms of content, as we shall see in describing 'prospective'. Ziauddin Sardar stresses that as forecasting is one of the activities of Futures Studies tending to search for data and trends, as such, it is full of difficulties and uncertainties. For Sardar, it is more important that
Futures Studies should explore the various alternative futures than work on forecasting (Sardar 1987).

Prospective. This extremely important term originated with Gaston Berger in the 1950s in France. Berger defined 'prospective' as 'a way of focusing and concentrating on the future by imagining it full blown rather than by drawing deductions from the present' (Berger 1964). Michel Godet understands 'prospective' as reflecting 'awareness of a future that is both deterministic and free, both passively suffered and actively willed' (Godet 1979, p. 3). It is important to stress the 'deterministic' aspect that derives from the past and the present and, as such, cannot be undone, and, at the same time, the 'willed' element that moves to the future since it indicates choice and action. It is a term that has become quite well known in recent years. According to Godet, while forecasts have failed, by illuminating the present, 'prospective' is a form of thinking-geared action. The term and the concept have been accepted and are widely used in developing countries, insofar as expressing the element of will, choice and, hence, change.

Prevision. Here, as Bertrand de Jouvenal writes in his Art of Conjecture, we have a theological matrix; it is a term only rarely used in English or in French.

Prediction is 'a non-probabilistic statement on an absolute confidence level about the future' (Jantsch 1967, p. 15). In this definition by Eric Jantsch, there are two elements to be underlined: (1) the non-probabilistic statement has a rigorous meaning, and (2) the absolute confidence in the future, which is much stronger than the confidence level expressed by the term forecast. Prediction is a much stronger statement about the future, based on hard data. Future thinkers generally avoid using this term.

Projection. By this term we mean the analysis of trends which go from the past and present into the future in a linear process of current trends. It is mainly used in economics and demography, when we have some data as a starting-point from which to project into the future.

Prognosis has the same meaning as forecast, used mainly in Germany and eastern Europe. Fred Polak used the term in the broad sense of Futures Studies in general as indicated later in this chapter.
Anticipation is the model of a future which is built on the basis of logic. Hasan Ozbekhan is the scholar who uses this term the most (Ozbekhan 1960).

Futuribles. This term is widely used, especially in Europe: it indicates the complex of possible alternative futures (de Jouvenel 1967). Since its emergence in the 1950s, the term has successfully underlined with one word the existence of alternative possible and probable futures as mental constructions, as against only one future.

Basic Typology

In discussing the different approaches of Futures Studies, we must refer more extensively to some definitions that have already been discussed: the extrapolative and the normative forecasts. Extrapolative forecasts, which, according to Eric Jantsch are opportunity-oriented, are those based on the past and the present and on which it is possible to visualize the future. This approach constitutes a group of methods, projections being one of them. Normative forecasts are mission-oriented, according to Jantsch. They are those forecasts which start from what will be needed, from goals and objectives in the future, and work backwards. They may direct choices and actions in the present on the assumption that the variables considered will continue at the same rate and in the same direction.

In relation to technological forecasting, Joseph Martino speaks of exploratory, or capability and normative, or goal-setting methods of forecasting (Martino 1972).

Futures Studies as a Discipline

We can speak of Futures Studies in general in terms of discipline (McHale and Cordell McHale 1977). It includes all ways of looking into the future: from projections to utopia, from extrapolations to normative visions. We use the plural form, Futures Studies, to indicate and stress the existence of different alternative futures.

Again, in terms of discipline, Futurology was first described by Ossip Flechtheim as a search for a logic of the future in the same way as history is a search for the logic of the past. Flechtheim's
conceptualization of Futurology is that of a science in its own right which, by projecting the present into the future, tries to detect evolution and trends and distinguishes the unavoidable from the avoidable. According to Flechtheim, by this distinction it is possible to search for the consequences of the past and the present in the future (Flechtheim 1966).

More recently, the term ‘futurology’ has been used indiscriminately to indicate any way of looking into the future, and has, unfortunately, lost credibility in the process. The term was not generally accepted in the eastern European countries and is still not accepted in developing countries, since it is considered to be related to highly industrialized societies. In any event, this was not the intention of Ossip Flechtheim’s analysis: he believed that capitalist and socialist societies might possibly converge in the future. In some ways history seems to have confirmed this theory.

The term ‘Futuristics’ indicates a discipline that is used only in the United States. Its meaning is similar to that of Futures Studies.

**North America and Futures Studies**

We can say that Futures Studies were first born as a discipline in the United States, although there are many, especially in the U.S., who claim that they originated in Europe, and specifically in France. The truth is that Futures Studies were born more or less simultaneously in the U.S. and Europe towards the end of the Second World War, though with different indications. Indeed, not only was the cluster of future thinking as a discipline born on the two continents at the same time; the thinking of such people as Herman Kahn, Bertrand de Jouvenel, Dennis Gabor and Eric Jantsch was also produced practically simultaneously in the early 1950s when some great minds produced futures thinking. According to Harold Linstone, no such individual minds exist today.

In the United States the first Futures Studies were undertaken in the field of military aeronautics, an area which had, per force, to be future-oriented. The first indication of a future study was done for the Army Air Corps by Dr Theodore Vankarman; not only did this study project new kinds of arms, it also used judgemental scenarios. This U.S. future study was the first to envisage the possibility of using guided missiles, something that was to become a reality many years later. At the end of the Second World War, the Battelle Memorial
Why Futures Studies?

also started working on technological forecasts, and indicated their importance.

Although Futures Studies in the United States were initially related to military, and especially aeronautical, technological forecasts, in the 1950s a number of important ad hoc research groups emerged, including the Rand Corporation which was involved in the 1960s and 1970s in developing different future-oriented approaches. The Hudson Institute, in which Herman Kahn worked for many years, was created as an offspring of the Rand Corporation. Then, in the 1960s, the American Academy of Arts and Sciences was to create the Commission for the Year 2000, whose work went beyond technological forecasting. This Commission was directed by sociologist Daniel Bell and constituted one of the most important groups ever to have been created on problems of the future, in terms of the human being as a whole in society. Almost thirty years later, rereading the report of the Commission for the Year 2000 is an extremely important and interesting exercise, in relation to the hypothetical future, to values and priorities, to the importance of a meritocracy and the non-acceptance of inequality, and to the nature and limits of forecasting.

Other research groups were created at the University of Minnesota in Minneapolis and at Portland State University, whose Systems Science Programme is still active. The Center for Integrative Studies of the State University of New York at Binghamton, now at Buffalo, produced several extremely interesting studies. In the same period the World Future Society was established in Bethesda, near Washington, D.C., and has contributed to the diffusion of future approaches in different U.S. circles. Many U.S. universities became interested in Futures Studies, holding courses with different emphases and different ideas. Some important curricula were developed in the 1960s, as we can see from the work of Wentworth Eldredge (1970).

In addition to the universities and research groups, private enterprises also became interested in Futures Studies and developed the discipline for their own purposes: IBM, other electronic enterprises, Exxon, Shell, General Electric, Bell. They were particularly interested in long-term futures, not only from the technological point of view, but also from a more social angle, thus indicating an interest in the changing requirements of society.

Although the interest in Futures Studies and activities was still strong in the United States in the 1970s (as is clearly shown by the people involved in them), we see signs of scepticism as to their
capacity to foresee the future and links with different interests, or even their lack of an accepted theoretical basis. This attitude still persists in varying degrees and in contradictory terms. Some institutes have problems due to the lack of research funds, while on the other hand, Futures Studies have developed significantly in Hawaii at the University of Manoa, with interest spreading across the Pacific to Australia.

Given that this can be only a very rapid and therefore incomplete overview, I would like to discuss in more detail the people in the academic world in the United States who have contributed most to Futures Studies. We can divide scholars and research institutes of Futures Studies in the United States according to the specific emphasis of their interests which can be technological, sociological or globalistic. It must be stressed that this specification is a question of emphasis.

**Technological Emphasis**

This type of Futures Studies was the first to develop in the United States, in the period immediately following the Second World War, and lasted more or less until the end of the 1960s. It was essentially quantitative in data and linear in approach, as was the case during that period for Futures Studies in general (Masini 1978; Masini and Gillwald 1990). Among the most important figures in this field, we must remember Herman Kahn who, in the 1960s and 1970s, produced some very interesting forecasts to the year 2000, which had a great impact in the U.S. and other countries. Kahn believed that humankind was living in an extremely important period of transition, which would come to an end around the year 2000, by when solutions would have been found for some of the essential problems of humanity: increased food and resources for a growing population, more housing, education and work. He proved, with quantitative data and historical analysis, that this was possible, that thanks to technology the problems could be solved. He described this future, not only for the U.S., but also for Japan, France and Great Britain. Kahn remained convinced until his death in 1983 that continuous technological development should be supported in order to meet the growing needs of the population of the world. He even claimed that the planet could answer the needs of a population much larger than the six billion forecast for the year 2000.
Olaf Helmer is another expert who has had a great influence on the approaches and the methodologies of Futures Studies in the academic field. This scholar has worked, and indeed is still working, on the rigour and the epistemological basis of Futures Studies, from which he draws important indications for many of the methodologies used to this day. Helmer worked for the Rand Corporation for many years, and then for the Institute for the Future which, together with the Hudson Institute, was one of the most important institutes working in Futures Studies in the United States.

The work of Emilio Quincy Daddario was also extremely important in the 1960s, for it was Daddario who started the field of ‘technology assessment’, i.e., the analysis of the social consequences of technology. Though Daddario’s work, which was related to the U.S. Congress, seemed to become less important in the 1970s, it undoubtedly had a considerable impact throughout the 1960s (Daddario 1970). Interestingly, in recent years there has been a return to Daddario’s ‘technology assessment’, which is being used once more in the U.S. (Office of Technology Assessment 1989) and is spreading to Europe (this process first began in the 1960s, especially in the Netherlands, but was then abandoned) as well as in Australia. Clearly it is extremely important to understand the consequences that technologies have and can have on society.

Joseph Martino also contributed significantly to rigorous methodological analysis in relation to technological forecasting (Martino 1972).

More recently, John Naisbitt has written on the answers which technological development can offer to many issues, ranging from such as employment to North-South trade (Naisbitt 1982, Naisbitt and Aburdene 1990).

Sociological Emphasis

The work of a second group of North American experts, who were concerned mainly with forecasting from the second half of the 1960s to the present time, when social problems all over the world came to the forefront in the United States, France, Italy and Germany, can be described as having a sociological emphasis.

The sociologist and artist, John McHale, worked in long-term Futures Studies for many years and wrote numerous books, including
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the extremely useful *The Future of the Future*. McHale worked at the State University of New York, Binghamton, and also at the University of Houston. Some of the important forecasts he made about the information and communication society are still useful today; he also wrote a number of studies on the future in relation to human needs for food, housing, education and work, which opened the way for many such studies later (McHale 1969). Another scholar working in this direction is Wendell Bell, who has, I believe, written the only text linking Futures Studies to sociological theory (Bell and May 1971).

The work of Alvin Toffler, a sociologist and journalist (thus linking the capacity of analysis to the diffusion of ideas), also has a sociological emphasis: while technology is important in answering the future needs of the world, it is the human being as a person and as a social being who is important in the decisions taken in relation to technology. Toffler is the author of *Future Shock*, a book which earned him international fame; *The Third Wave*, which has had enormous impact in the world; and more recently, *Powershift: Knowledge, Wealth and Violence at the Edge of the Twenty-First Century* (Toffler 1975, 1980, 1990).

The work of Daniel Bell, the director of the already cited Commission for the Year 2000 of the American Academy of Arts and Sciences, has a sociological emphasis. In his analysis of society, Bell actually forecast in 1968 the emergence of a post-industrial society that would be dominated by the tertiary sector, i.e. by services in which power would no longer be in the hands of those with economic or financial assets but of those with knowledge (Bell 1969). Over twenty years later, we can say that Bell was right: in inventing the phrase ‘the power of meritocracy’, he was actually forecasting the future. One very important point made by Bell was that, in a rapidly changing world, there will also be a need for new social institutions and structures that can coexist with the new technologies.

**Globalistic emphasis**

The work of a third group of North American Futures Studies scholars can be described as having a globalistic emphasis. The concept of global interrelations became extremely important in the 1970s. The so-called system dynamics approach for urban systems was first developed at the Massachusetts Institute of Technology by
Jay W. Forrester in this period. This approach has opened the way for a specific group of methods which will be described in chapters 7 and 10 as systemic methods. In Forrester’s work the future world is analysed on the basis of five variables: growing population, industrialization, use of resources, agricultural production and pollution. The variables are interrelated and produce a global system as a web of interconnections (Forrester 1971).

Various scholars continued his work, mainly Dennis Meadows, who produced what is considered to be the first global model (Meadows 1972). This model was produced for the Club of Rome, a group founded in 1968 by Aurelio Peccei and Alexander King with about one hundred members from different countries and disciplines, who were driven by a common concern for the future of the world as a whole.

As *The Limits to Growth* will be analysed in depth later in this book, we shall only briefly mention here that the authors believed that one should look at the world as a complex of interrelationships among variables and not only as a complex of variables (i.e. the systems principle). Though it was done with some variations, this approach was also utilized subsequently by Mihailo Mesarovic and Eduard Pestel, whose model will be described later.

The Institute for World Order Policies (WOMP), now known as the Policy Institute and directed in the 1960s and 1970s by Saul Mendlovitz and Richard Falk, can also be grouped in this globalistic category. According to its global view of the world, negotiations would lead to a world order which, in turn, would produce a situation of peace (Reisman and Weston 1976).

In terms of global thinking we also have to recall *The Global 2000* prepared by Gerald Barney for the Carter administration and presented not long before the start of the first Reagan administration. This study will be described in some detail later in this book, but it seems important to include it among the works that have a globalistic emphasis, since it has had an influence on many of the subsequent '2000' studies in such developing countries as China, Peru and Mexico (*Global 2000* 1981). Many of these studies have been collected in a volume published by Unesco in 1991 (Barney 1992).

The difference between the technological and social-oriented view on the one side and the globalistic view on the other seemed to become less marked in the 1980s. The globalistic thinkers, working mainly in international groups and organizations, started to show an interest also in technological and social aspect (Cole 1987). The
technological emphasis is still very much present, but future thinkers can no longer disregard the effects of technology on society.

Some scholars in the U.S. believe Futures Studies are currently experiencing a loss of momentum, primarily because of its recent positivist-oriented history. For Harold Linstone it is time for a multiple approach, which is at the same time technical and analytical (T orientation), based essentially on extrapolations and, therefore, on applied mathematics and modelling; personal (P orientation), based on invention, innovation and personal influence; and social-organization (O approach), based on social priorities and processes (Linstone 1984, 1985). According to Linstone, no personalities seem to be emerging in Futures Studies, as in the 1960s and 1970s, and this would explain the current lack of momentum in the subject in the United States.

It is important to note that women were particularly active in the United States in the 1970s and 1980s, generally as interpreters of non-technological emphasis. Some examples are the artist Magda Cordell McHale; the economist Hazel Henderson; the sociologist Elise Boulding; Barbara Hubbard; Heidi Toffler; Marilyn Ferguson, author of *The Aquarian Conspiracy* (Ferguson 1981); Duane Elgin; and Donella Meadows, co-author of *Limits to Growth*, who was initially a globalist and is now more humanistically oriented.

Our analysis of U.S. Futures Studies would be incomplete without reference to the rest of North America. Futures Studies in Canada developed significantly in the 1970s and 1980s, the emphasis being mainly globalistic, with the emergence of groups such as the GAMMA group and the Association of Futures Studies in Canada. It is interesting to refer to Kimon Valaskakis’s description of the advantages of a biculture in Canada. In Futures Studies this has resulted in a combination of the ‘prospective’ and the mainly extrapolative forecasting approaches (Valaskakis 1979, 1988).

**Futures Studies in Australia**

Mention must also be made of Futures Studies in Australia, which first started in the course of subject contacts with the United States and Japan. The Commission for the Future, at government level, and a group at the Queensland Institute of Technology, focusing on the future of communication, have been particularly active in developing Australian Futures Studies.
The work of the Commission for the Future, a group established by the Commonwealth government to inform citizens about possible options for the future, and the commitment of several very active individuals testify to the increasing development of these studies in Australia.

Western Europe and Futures Studies

Futures Studies in western Europe differ from those in the United States; indeed in many ways, they differ from country to country within Europe. The conceptual basis is the thinking of French scholars, such as Bertrand de Jouvenel and Gaston Berger, and more recently Michel Godet. Berger is the inventor of the term 'prospective' that takes into particular consideration the choices and actions in the present which can realize the future, over and beyond the trends that come to the future from the past and the present. The 'prospective' approach accepts that 'there is a multiplicity of possible futures at any given time'.

An important point to be made concerns the impact that European Futures Studies have had on governments. In Sweden and the Netherlands, for example, many groups are government-funded. Generally speaking, this is not the case in the United States. Although Futures Studies experts have acted as consultants to Congress (for which an information office has been available) and, more recently, consultancy has been provided by the Alternative Futures group, there has never been a government-financed group of Futures Studies.

Going back to the initial activities of French Futures Studies, we must refer also to Pierre Mass, who also used the term 'prospective' in the 1950s and 1960s but for government purposes (Mass 1967). An example of this is the use of the word 'prospective' as a basis for starting planning settlements at the regional level by the Délégation d'aménagement du territoire et de l'action régionale (DATAR), as well as for the Commissariat Général du Plan set up since 1946 to operate planning at the national level (Hatam 1992). Many departments of the French government subsequently, and at different times, used Futures Studies and long-term planning experts.

Generally speaking, Futures Studies in France have been used for a number of different purposes in both the private and public sectors, in different historical and political moments. These studies continue to be well known in France, thanks also to the activities
of the Association Futuribles, founded by Bertrand de Jouvenel and currently directed by his son, Hugues de Jouvenel. Numerous meetings and conferences are hosted by the Association (until 1991 under the presidency of Mahdi Elmandjra) where a well-equipped library is available for members.

The Netherlands also has a tradition in Futures Studies which goes back to Fred Polak, whose main interest was in the philosophical and epistemological fundamentals (Polak 1971). Again we see that, in the initial phase in Europe, philosophers, political scientists and economists were most interested in Futures Studies, whereas in the United States mathematicians and technologists showed the most interest.

More recently in the Netherlands, the government-based Netherlands Scientific Council, which comes under the responsibility of the Ministry of Cultural Affairs, Recreation and Social Welfare, has also been extremely active, and has developed a number of important studies and projections that have been used by the government in different sectors. For many years the Council has been producing an extremely valuable annual report.

In Sweden Futures Studies are highly respected. During the 1970s and part of the 1980s, the Swedish Secretariat for Futures Studies developed a number of important studies in the fields of energy, labour and health. The Secretariat, like the Netherlands Council, produced indications for government use that have been used in many political decision-making processes, such as in writing the country's energy policy. Recently an office of prospective studies, the Institute of Futures Studies, has been operating in conjunction with the prime minister, thereby indicating how important these studies are seen to be in the Scandinavian countries. Numerous other experts have been operating in Futures Studies in Sweden, including Olaf Palme himself, Alva Myrdal, one of the initiators of such studies in Sweden, and Inga Thomson, who has worked at the international level, mainly on disarmament and peace issues.

In Finland the Society of Futures Studies and the Club of Rome chapter have been active. More recently the Secretariat of the World Futures Studies Federation has been moved to this Society, after being hosted by the Institute of Political Science in Hawaii. Mention must be made of the work in Norway of Johan Galtung, one of the founders of Mankind 2000 and the World Futures Studies Federation. In the Scandinavian countries women are more active in Futures Studies than in any other part of Europe.
Though more fragmented and less institutionalized, Futures Studies in Great Britain have been very creative. The highly committed journal *The Ecologist* conducted an important fight against the abuse of the environment, and in the 1970s produced *The Blueprint for Survival*, still an extremely important document. The Science Policy Research Unit of the University of Sussex has played an important and critical role in Futures Studies not only in relation to Europe but also at the world level. This group, which was directed by the economist Christopher Freeman and the psychologist Marie Prehoda, has produced some important studies in a number of fields, including the most recent ones on labour and employment in Europe for the European Community.

In the last few years, there has been an interesting revival of Futures Studies in Germany, in both the public and the private sector, and in different contexts. Germany has had several Futures Studies scholars of great interest. There is Ossip Flechtheim, mentioned earlier as the inventor of the term 'futurology', which in this context has a different meaning from the customary one (Flechtheim 1966). As already indicated, it was invented to show the logic of the future as history searches for the logic of the past. Robert Jungk has had a great influence on Futures Studies in Europe, in many moments of its recent history through his books, newspaper articles and television appearances (Jungk 1975). He has been working in these studies for many years, especially in relation to specific democratic choices for the future and the role each citizen, especially young people, must play in this process.

Italy showed intermittent interest in Futures Studies in the 1950s and the 1960s as indicated by the journal *Futuribili*, edited by Pietro Ferraro, and the work conducted by the Istituto Ricerca Applicata, Documentazione e Studi (IRADES) which closed in 1975. Many of the people working in the field did so on an individual basis rather than as part of a group: among these mention must be made of Aurelio Peccei (1984) and Roberto Vacca (1973). A recent development is the interest of private enterprises and a flourishing of publications and meetings which, though mainly enterprise-oriented, extend beyond the technological and economic areas to social and cultural issues.

Spain has shown some interest, especially in the field of education; at the moment the Club of Rome chapter and also the Centre Catala de Prospectiva are taking a very active part in Futures Studies.

From this brief description it emerges clearly that Futures Studies in western Europe have been marked by moments of development
and by moments of relative stasis. I would say that recent years have been a period of development.

Eastern Europe and Futures Studies

In eastern Europe Futures Studies developed mainly in the 1960s. They were based on the search for historical regularities within social evolution, as related to the scientific and technological revolution. It was felt that in this way these studies could contribute to the first phase of the plan. The future was seen as a stochastic principle (not just a projection of the past and the present into the future) and, as such, as part of historical dialectics. It is interesting to note that many highly qualified women have always been involved in Futures Studies in these countries.

Futures Studies developed on this theoretical basis in eastern European countries for many years but with differences from one country to the other. The Polish school developed mainly around Poland 2000, a group working since 1967 within the Polish Academy of Sciences. The interests of Poland 2000 were basically in the culture of society; more recently there has perhaps been a greater emphasis on economic aspects, but this trend now seems to be changing again. The Romanian group, also operating within the Romanian Academy of Sciences, is basically mathematics- and methodology-oriented, and has made an important contribution to the global models debate. The Hungarian group, which works within the Hungarian Academy of Sciences, is currently the most active and has a strong interest in economic development. Its important book, *Future Research in Hungary*, has methodological indications on the uses of Futures Studies in the eastern European countries (Bodra et al. 1983). It is developing its activities in a variety of different fields ranging from agriculture to the new technologies and their impact on society.

Bulgaria is now interested in long-term studies with a special interest in the fields of ecology and economy. Czechoslovakia produced some very interesting studies in the 1960s and is now developing various studies. Recently the political forces have also been showing an interest in such studies. Yugoslavia has some very important future thinkers, and is developing a school within the Academy of Science at Novi Sat.

The former Soviet Union has an Institute of Social Prognostics within the Institute of Social Sciences of the Soviet Academy of
Sciences in Moscow. There are also other institutes in other parts of the country, for example, in Kiev and St Petersburg, all of which operate extensively in Futures Studies. In 1991 an All-Russia Futures Centre was created in Moscow with the aim of catalysing studies of this kind in the different republics. Of course, institutions are currently changing. Throughout eastern Europe, with the possible exception of Hungary, Futures Studies are in a state of change and some time will be needed before we can evaluate them.

Clearly in the past, Futures Studies developed extensively in the whole of eastern Europe. This fact appears not to be generally known, possibly because only a few texts have been translated into English or French. Their development is currently undergoing considerable change, which is easily understandable following the dramatic political events of 1988-9. What should be highlighted is that, in the past, Futures Studies in eastern Europe were frequently an area of relatively open debate, supporting the alternative thinking of many intellectuals, and were therefore considered an opening towards views of the world that differed from the accepted internal views.

Developing Countries and Futures Studies

An increasing number of people in developing countries are also beginning to show an interest in Futures Studies.

It is not easy to provide a clear description of Futures Studies in Latin America, since the situation there is one of constant, rapid change. However, in very general terms we can say that of the Latin American countries, Mexico, Venezuela, Argentina, Brazil and, more recently, Peru and Colombia have made the most use of Futures Studies. Activities vary, of course, depending on the political situation. In Mexico we can cite the Colegio de Mexico and, in the past, the Centro de Estudios Economicos y Sociales del Tercer Mundo, but especially the work of the Sierra Barrios Foundation which has developed considerably, acting as a consultant to the government (although it is an independent institute) and developing for the very first time a useful network throughout Latin America. Antonio Alonso Concheiro is one of the few to work on the fundamental issues of Futures Studies as related to developing countries.

In Costa Rica the State University and the United Nations University for Peace are very active. A global model produced in
1975 in Argentina by the Bariloche Foundation will be described in chapter 10. In Chile a number of different studies are being developed. A specific interest is directed towards Futures Studies courses, as emerges in the various texts, among them *Los estudios del futuro* by Joseph Hodara (1984). Interestingly enough, some very exceptional women have contributed to Futures Studies in Latin America in relation to global models, including Graciela Chichilniski of Argentina and Lourdes Yero of Venezuela.

In Asia the vision of the future is very much part of the culture, based on a continuum of historical and human developments that are seen to be important. Although Japan is not a developing country, I have chosen to include it here because of its geographical location. In Japan there is an important association whose members are extremely active in the economic and technological sectors, and many enterprises have also been active since the end of the 1960s. In this context it is worth recalling that the second conference on Futures Studies (and the first really extended one) was held in Kyoto right at the start of the economic development of Japan. Hidetoshi Kato, a sociologist interested in communication and education, has been a great promoter of Futures Studies in Japan, and indeed we can say that the economic development of the country has in some ways greatly enhanced such studies. Yoneji Masuda, whose studies on the information societies are widely known, should also be recalled (Masuda 1980). One could cite many names, especially those related to the Club of Rome, who have been influential in their country.

In India there are government and independent groups, the former mainly interested in advanced technologies and the latter in the problems of developing countries and issues of self-reliant development. Romesh Thapar (1978), Rajni Kothari (1974) and Ashis Nandy (1987) are figures to be remembered in this context, for their contribution has been great both in theoretical terms as well as in terms of transforming Futures Studies into change-directed action.

In China Futures Studies have been developing at a rapid pace since 1978. The Chinese Futures Studies Association used to have at least 5,000 members and groups in different towns in China (Qin 1981). A China 2000 project has been developed as well as many other studies on population, resources and the urban rural configuration. The World Futures Studies Federation held its Tenth World Conference in Beijing in 1988 on *The Future of Development* (Masini et al 1991) in its various aspects: cultural, scientific, economic
and political. This, and the quality of the Chinese contributions to the meeting, indicated the great and deep interest in future thinking in China. In more recent years not much is known of the development of such studies in China, except the ongoing participation of Chinese scholars in international meetings.

Other Asian countries are also showing an interest in Futures Studies. Two studies have been prepared in South Korea (Korea year 2000 1986). Thailand, Taiwan and Pakistan are also now beginning to take initiatives in the field; country studies to the year 2000 were developed by Unesco in the 1980s in many Asian developing countries (Unesco 1988-9).

Futures Studies have recently started to develop in Africa: in Egypt, mainly in relation to natural resources; in Morocco, for planning; in Kenya; in the Ivory Coast; and in Benin, where the Association Mondial de Prospective Social is active (AMPS 1984).

Mention should also be made of the work prepared by the World Futures Studies Federation with Futuribles, the Association Mondial de Prospective Social, and the United Nations Development Programme, Rethinking the Future: A Manual of Futures Studies for African Planners (WFSF 1986). It is intended as a methodological tool for the use of planners in Africa.

Going beyond countries and regions, it is important to stress the increasing interest in Futures Studies and future perspective by Islamic thinkers. The special issue of the journal Futures entitled ‘Islam and the future’ is a most significant contribution to the understanding of the development of a line of thought in this direction (Sardar 1991). Among the articles is ‘Rethinking knowledge: Islamization of the future’ by Merryl Wyn Davies, where the marginalization of Muslim identity and the Islamization of knowledge is considered central to Muslim futures and, I would contend, to the world today. Other articles address issues that concern the future of Islamic economics, science and political views. All show a strong emergence of thinking far removed from the fundamentalism seen by Western authors. The already cited Future of Muslim Civilization by Ziauddin Sardar is an important analysis of how Futures Studies can be of use to the futures of Islamic civilization. In this view a deep spiritual and scientific attitude is of considerable interest, especially when two main alternatives are described: the so-called ‘aimless’ future towards which Muslim society is moving on the basis of current trends (e.g. poverty, technocratic or West-dependent states) and the so-called ‘planned future’, based on the will to construct it.
Generally speaking we can say that there has been a growing interest in Futures Studies in developing countries. There is an increasing awareness of the rapidity of change and, hence, of the importance of looking ahead. The future for these regions should not be the continuation of a bleak past but one of opportunity. This is probably the reason for the use of the concept ‘prospective’ in the French-speaking part of Africa, over and above any linguistic reasons.

International Organizations and Futures Studies

Numerous intergovernmental and non-governmental organizations are currently working in the field of Futures Studies with different approaches and in different areas. Among the non-governmental organizations we can cite the World Futures Studies Federation (WFSF), founded in 1967. Its membership consists mainly of professionals and organizations working in Futures Studies, from over eighty countries. The Federation has been highly instrumental in catalysing Futures Studies in different parts of the world over the years and keeping alive the concepts of its founders that the future is open and has to be built and not colonized.

Another international organization working in Futures Studies is the Club of Rome, whose main aim is to influence decision-makers at the global level (Peccei 1977). In the last twenty years, it has had an important impact on public opinion and decision-makers in relation to global issues in different parts of the world. It has a maximum of one hundred co-opted members from different countries and walks of life.

Reference must also be made to the International Institute of Applied Systems Analysis (IIASA), whose headquarters are in Laxenburg, Austria, and which is financed by a number of different academies of the various member countries. It has produced several long-term studies, especially in the fields of energy and agriculture, some of which have been important both from a decision-making and a methodological point of view. There has been a great deal of discussion with IIASA on the methodologies of global models. Indeed almost all the global models of the 1970s were first presented and discussed at IIASA.

Some intergovernmental organizations have developed Futures Studies within their different mandates: Unesco (United Nations
Educational, Scientific and Cultural Organization) is developing its plans in two directions – Future-oriented studies, with the aim of influencing all the activities of the UN, and development and prospective studies (Unesco 1991-3); UNEP (United Nations Environment Programme); UNITAR (United Nations Institute for Training and Research) made some valuable studies in the 1970s and early 1980s, and has recently also become interested in Futures Studies; and UNU (United Nations University).

From this very brief description it is clear that despite the emergence of a number of controversies on specific issues and within specific countries, Futures Studies are becoming increasingly related to the social, political and historical situation existing in the different countries (indeed this may be the cause of the controversies). This parallelism between Futures Studies and historical events must be borne in mind when discussing the presence of values in future thinking, when considering the importance of normative Futures Studies in setting goals, and in relation to the different cultural perspectives which influence Futures Studies and their authors.

Further Reading

Annie Battle, *Les travailleurs du futur*.
Daniel Bell, *The twenty-first century*.
Wendell Bell and James A. Mau, *The sociology of the future*.
J.B. Fowles, *Handbook of futures research*.
Michel Godet, *The crisis in forecasting and the emergence of the prospective approach*.
Eric Jantsch, *Technological forecasting in perspective*.
John McHale and Magda Cordell McHale, *Futures directory*.
Romesh Thapar, *The waste and the want: thoughts on the future*.
World Future Society, *The futures research directory*. 
Methodological Lines

Futures Studies methods have been identified according to different criteria by various authors, including Joseph Martino, Eric Jantsch, Robert Ayres and others. In chapters 2 and 6 we described Futures Studies in terms of extrapolative and normative forecasting. In this chapter we shall look at the different approaches of the various methods rather than focus on the starting point of futures thinking. These can be objective, subjective and systemic (Masini 1973). It is interesting also to see the Italian text by Giorgio Marbach and his co-authors (Marbach et al 1991).

Objective Methods (Extrapolative or Normative)

We have described in some detail the extrapolative (opportunity-oriented) and normative (mission-oriented) methods as the starting points for futures thinking. Whether they are extrapolative or normative, objective methods are always based on information and data. The more information we have at our disposal, the more reliable the use of objective methods will be. Objective methods use variables and indicators to describe reality. We can define variables as the elements that describe a situation, an event, an area; clearly they are apt to change in relation to the context they are supposed to describe, although some global variables are also possible. In the area of education, the ratio of alphabetization in a given population is an example of a global variable, whereas the ratio between teachers and students is a relative variable, for clearly it is destined to change.

The choice of variables in objective methods of Futures Studies
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is extremely important, for they tend to change in time and in space. Over time we see that certain variables become increasingly important and others less so. The variable of natural resources in a given country, for example, has become of prime importance in recent decades.

Indicators are of crucial importance in relation to variables, for they describe the different variables. Peter Lazarsfeld has defined indicators as all that which is observable and visible and which indicates a deeper dimension that can be used for decision-making purposes (Lazarsfeld and Bauer 1966). This definition underlines the fact that indicators bring to the surface what often does not emerge but what can be useful for decision-makers. Indicators may also change with time: the gross national product (GNP) of a country was once considered an important indicator of development, but we now know it is not enough to describe development in purely economic terms. It is a complex issue and some elements of development are not quantifiable (Masini 1977). This point is also repeatedly stressed by scholars from developing countries, such as Mahdi Elmandjra, who has shown that development issues are strongly related to cultural differences and, hence, are difficult to quantify.

Indicators can be quantitative, i.e., related to numerical entities, or qualitative. In the case of education, the number of students per teacher or classroom is a quantitative indicator, whereas qualitative indicators are the level of development of the students or the capacity demonstrated by students to operate in a given society. Variables and indicators are important in extrapolative and normative studies that take into account quantitative and qualitative data, whether the analysis moves from past to present or future to present. In extrapolative methods we find more emphasis on the use of quantitative indicators, while in normative Futures Studies the tendency is to make greater use of qualitative indicators.

Although many writers indicated that objective, extrapolative and normative studies are not mutually exclusive, from the 1950s most Futures Studies have been objective and extrapolative. In the 1970s there was an increase of interest in systemic and subjective studies and in the 1980s a tendency to use a mixture of approaches. For example, the Delphi method, which is a subjective technique, is used with scenario building, which is objective and can be extrapolative or normative, or with global modelling, which is a systemic technique.
Extrapolative Objective Methods

In general terms, we can say that extrapolative objective methods:

1. Analyse the retrievable resources, which are the basis of the system under analysis, with descriptive data and information on it, and analyse the technological and social potentials traceable in the system.
2. Describe the system itself, in relation to the resources and the social and technological potentials.
3. Analyse the impact of the pertinent future event on the system itself and, possibly, the entire social system of which the system is part.

If our area of interest is employment in a given country and, for example, the effect of the use of computers on employment in the future, we shall look at the resources available and at the technological and social potentials; we shall describe the system of employment in the country as well as the country itself; and we shall describe the future impact of the event (in this case, the introduction of computers in given areas) so as to depict the forecastable increase or decrease in employment rates in that given country.

Normative Objective Methods

In normative objective methods the steps are the same as in extrapolative objective methods, but the order is different:

1. Indication of the goals which the system under analysis wants to reach in the future.
2. Analysis of the technological and social potentials of the system and of its resources (technological, scientific, human or natural).
3. Impact of the future event on the system, on the analysis previously described and on its environment, in relation to the goals which constitute the starting-point.

We see that in this case the goals are set first. They are the starting-point for the analysis of the changing system. If the goal of the country is full employment of the age group between
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twenty-five and forty-five in the year 2010, from that point we start our analysis of the resources, of the potentials of the system itself and its environment, of the impact that a future event (introduction of computers in certain areas) may have on the system in the time frame between now and 2010.

Clearly, in normative objective Futures Studies, the identification of goals and future events is of the utmost importance. Examples of application of such approaches can be seen in relation to the year 2000 in China (Wang and Li 1986), Korea (Korea year 2000 1986), Peru (Garland 1990) and Mexico (Alonso Concheiro 1990); incidentally, these studies have been published in one volume (Garrett et al 1991).

In objective methods, whether extrapolative or normative, historical analogy is often used when the basis of data or information is not sufficient. In this case, the specific unit of analysis is an event. An interesting example of the method is related to the technologies developed in the past for the railways. Once the system of railways as a whole could no longer absorb the technological innovations, the same technologies were used in other fields. By historical analogy, it has been forecast that once space technologies have been absorbed by the system to the limit, they may be used in other fields. It is becoming increasingly difficult to use historical analogy, owing to the rapidity of change and the complexity of interrelations between variables.

Some Specific Objective Methods

Trend Extrapolation

The most basic method in objective forecasting is trend extrapolation. Trends, which were originally used to describe the course of a river or stream, are currently used to describe how events move through time (extrapolation of temporal trends). Trend extrapolation can offer different indications: an exponential growth of linear forecasting in time; rapid logistic growth at the start, with the standard saturation then being reached and the curve diminishing; cyclical growth, with the curve following cycles, increasing and decreasing, at different moments.

It is extremely important that trend extrapolation be analysed within its context. If we look at the growth of a child, as forecast at his or her birth, we shall see that the growth is exponential up
to a point, and during the very early years of the child's life. It cannot go on growing at the same speed beyond a certain period. If we look at the prices of small computers, we see that in 1950 they cost U.S.$100,000, and that by the 1980s the price had dropped to U.S.$1,000. Prices are not expected to drop much further, because of the context.

Population growth is an important example of exponential growth. The decline in the mortality rate is not compensated by the decline of natality: thus the average annual geometrical rate of demographic trend continues to increase. The doubling time of the population in fact results from a 70-year/rate of growth ratio: if this is one, the doubling will occur in 70 years; if it is two, it will occur in 35 years; if it is three it will occur in 23.3 years and so on.

Variations of Trend Extrapolations

There are many variations of trend extrapolations in Futures Studies methods. Among them are the following.

Morphological Analysis. This technique seeks to identify every way of achieving given goals. One method is to list all possible variables, which are then analyzed in themselves and in their possible combinations. There is a stochastic element in this process since a stochastic process is composed of a series of multidimensional variables that, being dependent on time, are probabilistic.

Historical Analogies (already described). It might be interesting to add that extrapolation in general is related to temporal dimensions, but there is also what Eric Jantsch has called extrapolation of time series on a phenomenological basis. In this case the unit of the analysis is the phenomenon. The extrapolation can therefore be based on the characteristics of the phenomenon itself (Jantsch 1967, p. 115).

Scenario Building is a method that can be extrapolative or normative, like other objective methods, depending on the starting point. According to some futurists, scenarios are systemic methods since they are based on interrelated variables. The inclusion of the method in one or other of the approaches depends on the emphasis in its development. In the case of scenarios, it is whether the emphasis is objective or systemic.
Scenarios are descriptions of sequences of events so as to show, starting at the beginning of a given situation, that we can move step by step to a future situation. The scenario must have a specific time dimension: futures thinking to five, ten, fifteen, twenty years. Scenarios are always alternative: more than one scenario is always built. The starting point which is the description of the present situation is based on quantitative and qualitative data, hence, the possible inclusion of scenario building among the objective methods.

Another important point to make in relation to scenarios is that they are used for decision-making purposes. They are not simply descriptions of future situations given a present situation, but, rather, of what might happen if certain decisions are taken or certain events occur. They are very useful in decision-making in terms of clarification and of lowering the level of uncertainty.

In discussing objective extrapolative methods, we should refer to the distinction made by Eric Jantsch in technological forecasting: there are techniques that generate new technological information, such as trend extrapolation, morphological analysis and techniques that take into account processes and feedbacks (such as historical analogies and scenarios). This explains why scenarios have been considered by many as part of systemic methods (Jantsch 1967, p. 115).

Although there are many more objective methods, the ones described above are probably sufficient for a general overview.

Subjective or Intuitive Methods

Instead of relying only on data and information, the subjective or intuitive methods of Futures Studies mainly rely on the knowledge, experience, talent and intuition of experts. The following are the best-known subjective methods:

1. Panels of experts present their experiences face to face, in an open and unstructured manner.
2. Brainstorming among experts, developed in a series of meetings based on simple rules and geared mainly to stimulating an open discussion, is centred on a clearly defined topic, with every possible idea related to the topic being considered (even indirectly) in an
unprejudiced, open debate. It is a process that tends to explain but not to solve.

3. The Delphi method is the subjective, intuitive method par excellence.

4. The cross-impact matrix as a more complex development of the Delphi method.

The Delphi method was invented in 1954 by Gordon Resher, Olaf Helmer and Norman Dalkey with a view to addressing specific military problems (Helmer 1983, Dalkey and Rourke 1971). Harold Linstone has formulated one of the best-known definitions of the Delphi method: 'Delphi may be characterized as a method for structuring a group communication process, so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem' (Linstone 1975, p. 3).

In the Delphi method, the process followed to reach decisions and a certain consensus among the experts is extremely important. The experts remain anonymous and never actually meet, so as to avoid problems of leadership (Marbach et al 1991). They are contacted by telephone or mail or by whatever other technique. The reliability of the consensus will be related to the possibility and feasibility of the event.

The Delphi method is evolving constantly and is very much related to the dynamic nature of Futures Studies discussed in chapter 4. The Delphi method will be discussed in more detail in chapter 9.

The Cross-Impact Matrix

The cross-impact matrix concept, as indicated by Olaf Helmer, was 'thought of in recognition of the fact that forecasts of future events, when made in isolation from one another, fail to take their mutual effects into systematic consideration and thus lack a degree of refinement whose addition, it was felt, might well increase their reliability' (Helmer 1983, p. 159). This method, which also relies on the evaluation of experts, was developed with a view to avoiding some of the shortcomings of the Delphi method. It tends first to identify events that might affect the area of our interest and then create links between the possible future events, while monitoring trends that are relevant to the events area. In the cross-impact matrix both events and trends are considered in a matrix. The
impact of trends on trends and of events on trends and events is evaluated with either a plus or a minus symbol and the results are then calculated.

If, for example, we want to look at the future of textile production, we shall look at events such as price of production of textiles, the import-export of textiles, the legal regulations in countries, negotiations that exist at the international level, and of course trends in population of workers, and examine how all these events and trends influence one another in a matrix form. The cross-impact matrix is also being constantly refined and analysed.

Systemic Methods

The systemic approach was born from the need to face the ever-growing complexity of reality and to detect, indirectly, the relationships existing between the component elements. In systemic methods the interrelationships between the component elements of the systems are more important than each separate element. A system can be considered open or closed, depending on whether or not it interacts with the environment.

In future-oriented terms, the systemic approach follows a logic of analysis that first defines the system as a whole of co-ordinated and interacting parts and then defines the principal objective on the basis of which the system survives, followed by an analysis of the direction of the system as we look at its future, its components and resources, and concludes with an analysis of its environment, of which we try to identify the most important elements in relation to the system of interest.

In Futures Studies, the first priority is to find the objectives of the system and, first of all, the objectives of survival; this is followed by the direction or the directions of the system and its time of survival.

Global Models

The global model is the best known of the systemic methods. As we will be describing the applications of this method in great detail later in this book, we shall now just very generally describe the global model as a simplified representation of the reality of the system. The
object of global models is the world system, seen in the function of future development. They constitute one of the solutions proffered by science (mainly in the 1970s) to try to tackle the complexity of history in recent years. Some reasons for adopting global models are as follows.

Our situation (at the time of these motivations, but today this is even more important) is characterized by:

1. The complexity of problems, because of the growing interrelationships of different areas.
2. The high level of social dynamics, due especially to scientific and technological developments (today we can add social and political) which have a strong impact on society.
3. The need for analytical rigour in the analysis of complexity.

Global models have used as a consequence:

1. The systemic approach.
2. Futures Studies methods.
3. Quantitative methods with utilization of mathematical models and computers as tools. (Botez et al. 1975)

Although in the late 1980s there was controversy regarding the use of global models, they were an indication of the awareness begun in the 1970s of the increasing complexity of reality and the need for sophisticated methods of analysis in a long-term perspective. As such, global models are important and are in some way being revisited by Futures Studies. Global models can be descriptive, of alarm, and normative:

1. **Descriptive global models** represent the functioning of the ‘world’ system according to chosen variables. A typical example is the Japanese one by Kaya (Richardson 1978).
2 Global models of alarm tend to answer the questions: what will happen if nothing changes within the world system or, what will happen if changes do take place. This type of global model is based on the principle of ‘what if’, already discussed. *The Limits to Growth* can be considered as belonging to this category, since it answers the basic question of what will happen if things continue as they are in the present (Meadows 1972). The second world model, *Mankind at a Turning Point* (Mesarovic and Pestel 1974) can also
be included in this category, as well as the more recent models by the World Bank (Cole 1987).

3. Normative global models prescribe indications for action in relation to specific objectives. In this group we can refer to the so-called Bariloche model (Herrera et al 1976) and the project *Reshaping the International Order* (Tinbergen 1976), which are crucial models. However, the latter cannot be defined as a global model in a strict sense, since the methods used are mainly qualitative.

All global models have some elements in common in terms of content and methods. Concerning content, we can say that all the models have a global vision, which is both planetary and complex; seem not to consider general economic theory; attribute great importance to the population variable, which tends to become increasingly important as time passes in terms of the gap between developed and developing countries; and agree that the rate of growth of the world population will increase up to around the year 2000 and then decrease.

There is no general agreement on precisely when this decrease will take place, which is still one of the most important topics in relation to the future of the world.

At the same time, what the global models did not take into account in the 1970s, either implicitly or explicitly, was the changing structure of the world population: the growing older population in developed countries and the growing young population in the developing countries. The first signs of the consequences of this difference in the population structure started to emerge in the 1970s, emerged very forcefully in the 1980s and continue to do so in the 1990s.

All the global models share the basic concept that economic growth will continue, although that growth is considered in different ways by the various models:

1. As exponential growth in which the time of doubling is crucial.
2. As logistic growth, in which growth is rapid in the initial stage, and then slows down with the passing of time.
3. As organic growth that is differentiated, as in the organic body; in this case growth is considered as a functional structure.

The concept of organic growth was developed by one of the global projects, *Mankind at a Turning Point* (Mesarovic and Pestel 1974).
It took into consideration a system of interconnected hierarchal parts that all came together in a global growth called organic, in resemblance to the human body. The concept has been enlarged and reiterated in the posthumous book by Eduard Pestel, *L'homme et la croissance* (1988).

**Strategic Management, Environmental Scanning and Issues Management**

I believe that strategic management, environmental scanning and issues management can be considered under the general heading of systemic methods, since they are based on the analysis of systems as sets of interrelated parts. They came into wide use in the 1980s.

Strategic management is a development of corporate planning, long-range planning and strategic planning. It is very much enterprise-oriented, in which both rationality and the human factor are important, the latter especially producing a specific emphasis. According to Michael Godet, 'As a collective human entity, a company is capable of creating, adapting and growing, but may also decline and wither away.' Strategic management consists in 'providing a coordinated transformation of its four sets of resources (human, technical, commercial and financial) leading to a desired future' (Godet 1987, pp. 102-3).

In environmental scanning, which will also be discussed in the next chapter together with strategic management, the environment or context of the area under future-oriented analysis is taken into consideration. With growing interdependence and rapidity of change, this factor has been acknowledged as being increasingly important.

We can possibly go back as far as Ogburn for the very first indications of this new awareness of the general context in looking at economic, legislative and regulatory developments (Ogburn 1933). There now appears to be a general awareness among decision-makers that the complexity of reality is such that it has become imperative to look into the future, beyond any one specific field of interest, taking into account the national, regional or global contexts. In chapter 3 we looked at this need in relation to Futures Studies.

Environmental scanning has been performed in various parts of the world and is considered a conceptual approach rather than a rigid technique. It also contains elements of subjective methods, since decision-makers are involved in the process. In this regard,
reference should be made to the contextual mapping method used in the 1960s, which has been so well described by Eric Jantsch (1967, pp. 171-4).

More recently, issues management has emerged as a tool to use in examining potential changes in the external world in relation to the object of the study (the area, institution or organization). It is one of the most recent methods and can in my view be included among the systemic methods. In issues management the technological, political and economic forces which may affect an organization are identified and monitored and their implications interpreted (Morrison et al 1983). As said in the journal *Technological Forecasting and Social Change* (34:3, p. 203), issues management is ‘a current favourite label for planning activities in corporate America’.

The fact that so many different methods have been developed clearly indicates that the systemic approach continues to be important over and beyond the global models that were so important in the 1970s. It can justifiably be claimed that, as changes increasingly become rapid and interrelated, objective and subjective methods need to come closer to systemic ones, as is the case in scenario building.

**Multiple Perspectives**

The multiple perspective approach was proposed by Harold Linstone; I believe it should be included in this basic methodological chapter because it stems from Linstone’s anxiety about the use of distinct approaches of Futures Studies (Linstone 1984). Linstone’s multiple perspective proposes a technical (T), organization (O) and personal (P) perspective. He uses perspectives to indicate the approach we are using rather than what we are examining. He contends that all three perspectives are equally important and should coexist. The technical perspective was the dominating trend in systems and impact analysis. The organizational perspective sees the world through ‘a different filter’, from the point of view of the affected or affecting organizations. The personal perspective is seen through ‘the individual’s eyes and brain’. The fact that one perspective has prevailed over the others in different studies, or different historical moments of looking ahead, has given an incomplete picture of the world and its future — hence, Linstone’s proposal that the three approaches should coexist.
Futures Studies, Planning and Decision-Making

In this brief methodological analysis, what has strongly emerged is the constant and ever-increasing connection between Futures Studies and decision-making. One important aspect is, therefore, that of planning. As planning has frequently been used in connection with Futures Studies or has come into conflict with such studies, it seems appropriate to include a brief description of the relationship between Futures Studies, planning and decision-making in this chapter on methods. We have defined Futures Studies as all forms of looking into the future from extrapolation to utopia. A plan is a detailed method, scheme or programme for attaining a goal or an objective, or a set of goals or objectives. The method, scheme or programme is the system according to which certain actions are performed in order to attain a given goal or objective defined by the plan, which also provides general guidelines to reach it. We can also recall Ackoff's definition: 'Planning consists of conceiving a desired future and in parallel, the means of implementing it' (Ackoff 1973).

We know that Futures Studies can be extrapolative and normative and that in normative Futures Studies the emphasis is on goals and objectives. But while, in the case of Futures Studies, there are alternative goals, the goals are pre-set in planning in a very specific way. Thus planning, even long-range planning and, hence, programming, are linked to specific goals and objectives. Planning is also related to a limited time frame: two, three or five years, except in the case of long-range planning. Futures Studies are usually related to the medium and long term (in any case, beyond five years). Planning is generally related to one or more specific areas, whereas Futures Studies take into consideration the interrelationships between many areas. In going back to the characteristics of Futures Studies described in chapter 2, we see that we spoke of complexity in content, globality and trandisciplinarity in approach. We can add that Futures Studies always, or should always, take into account as well the context of the area.

Thus we can talk of Futures Studies as having a wider spectrum in terms of topics, a wider time frame than planning in general, and alternative goals; planning usually has specific goals, does not consider alternatives and is usually restricted to a shorter time span.

In this book, we distinguished different types of Futures Studies: we have talked about prognosis, projections and extrapolations,
meaning Futures Studies that look at the past and the present and that project into the future. In planning, the past is only rarely taken into account. In Futures Studies we have referred to utopia, mainly related to goals and images, without considering how such utopias or images are to be brought into being. Planning uses programmes to realize the goals that have been set. We have also spoken of vision: setting the goals and searching in the present for what will allow, or prevent, the goals from being realized. In the latter case, we are closer to planning, but still Futures Studies present alternatives in the medium and long term, while planning operates on a set of chosen goals and in the short term. Finally, while planning chooses the actions to realize the goals in the present, the vision looks back into the historical processes for trends that will allow the vision to be realized or not, and only then chooses the action.

Action is the element that brings some Futures Studies closer to planning. If Futures Studies can be said to be an indication for action, planning is an even stronger indication. The moment the action element becomes important, either in Futures Studies or in planning, responsibility also becomes extremely important. The same applies to indications for action, though with greater emphasis in planning, and to the responsibility of the planner (and the forecaster in Futures Studies). Thus there is some parallelism, but the two are undoubtedly differentiated. We can say that Futures Studies and planning complement each other, but have different functions and, as such, are distinct.

It is important in this discussion to refer to the fact that corporate planning and long-term strategic planning had gained a certain importance in relation to enterprises in the 1960s, albeit with a longer historical background. In the early 1970s, corporate planning, like all forms of forecasting, came under criticism, but, as Michel Godet writes, it was precisely the uncertainty of the context that led to the criticism and required more and more planning and Futures Studies (Godet 1987). In the 1980s, corporate planning was renamed ‘strategic management’.

What can be said is that, when the emphasis on action increases in Futures Studies, their complementarity to planning becomes stronger. They retain the alternatives in goals and in descriptions of future situations, and attribute greater importance to analysis of the context and to the historical dimension in terms of trends and actors. This is at least the present situation of both approaches (Futures Studies and planning), but they are evolving continuously, as their dynamic
characteristic indicates. It is essential then that futures scholars try to understand these continuous changes.

Cultural Aspects

In this book I have stressed the importance of values in Futures Studies. As each culture has its own values and consequent behaviours, it also has a different view and way of greater utilization of Futures Studies. This aspect has become increasingly clear in the last ten years, with the growing importance of mass communication at the global level, the increasing awareness that each country has of its own cultural identity, and the increased diversification among the regions of the world. Developing countries have also been more unwilling to accept trends, based mainly on the model of Western culture, that might lead to a homogeneity of cultures.

As the cultural aspects of Futures Studies are extremely important and will undoubtedly become more so in the future, clearly in methodological terms, I have chosen to include this area in the present chapter.

I would like to draw attention at this point to the ongoing Unesco project on the Futures of Cultures, which deals with possible alternative futures in the different world cultures (Masini 1991-2).

Cultural Aspects related to Futures Studies Goals

From the point of view of goals, in industrialized countries (i.e. North America, western Europe, Japan and Australia) Futures Studies have been mainly extrapolative, tending to base forecasts on past and present events. Generally speaking, stress was not placed on the normative aspects, i.e. the goal-orientation of Futures Studies, until the end of the 1970s, except in the conceptualization of ‘prospective’. The same can be said not only of the global models, but also, up to a certain point, of the future thinking of Alvin Toffler (1980), John Naisbitt (1982) and many of the studies of Herman Kahn (1977).

In eastern Europe the emphasis was also on extrapolative approaches, despite the fact that they were considered the preparatory phase to planning, which, notably, is geared to goals.

In developing countries the emphasis was more on the normative aspects: clearly in this case, extrapolation could not be the best
approach, since the future of these countries must be different from a difficult past and a problem-ridden present. The Bariloche Latin American model (Herrera et al 1976) and the work of the Center for the Studies of Developing Societies, based on the work of Rajni Kothari, Ashis Nandy and others, have greatly influenced Futures Studies in developing countries. The work of Ziauddin Sardar and the Futures Studies of the People’s Republic of China in the 1980s are normative, as well, thus indicating clearly that goals are the most important part of Futures Studies, especially in developing countries. The normative character is also evident in the recent studies prepared in developing countries, such as Korea 2000, Mexico 2000 and China 2000.

Cultural Aspects Related to Futures Studies Methods

Stressing the preference of developing countries for normative Futures Studies, we can also relate the choice of the methods to be used to the culture of a given country. Clearly some methods are being used in some parts of the world more than in others.

Global models have been used in both western and eastern European countries. The Delphi method is widely used and known in Japan, Australia, the United States and western Europe. It was also used in what were formerly known as the socialist countries. Objective methods are used in both western and eastern European countries. The developing countries appear to make no use of global methods or of the Delphi techniques, and little use of objective methods, particularly extrapolation. In Global models the basic hypothesis is that there is one world, something which is not generally accepted in developing countries. With the Delphi method the problem is that experts usually have to come from outside the developing country. Scenario building is the main objective method used in the developing countries. Suited to both extrapolation and normativity, in this method the alternative possible futures are shown. Antonio Alonso Concheiro from Mexico has often indicated the greater adaptability of the concept of ‘prospective’ to the needs of developing countries’ Futures Studies (1984). This concept considers the past and the present, but stresses the element of choice and action for the building of a different future. The same concept has been stressed in African thinking.
In *Reclaiming the Future: A Manual of Futures Studies for African Planners*, an effort has been made to overcome this difficulty by creating a manual specifically for the use of African planners. In this manual the elements and methods, such as scenarios, which are less western-biased than others and might be of use, are taken into consideration and examined (WFSF 1986).

**Further Reading**

Sam Cole, 'Global models: a review of recent developments'.
Michel Godet, *Scenarios and strategic management*.
Olaf Helmer, *Looking forward: a guide to futures research*.
Amilcar Herrera, et al., *Catastrophe or new society: a Latin American world model*.
Eric Jansch, *Technological forecasting in perspectives for decision making*. 
Recent Objective Methods

Developing countries and those wanting a less Western-biased approach will find some of the recent objective methods, especially scenarios, more to their liking. In this chapter we shall consider scenarios, environmental scanning, strategic management, issues management and risk analysis.

Scenarios

There are various definitions of the term scenario, the broadest being that scenarios tend to clarify the present possibilities of decisions by indicating the guidelines for decisions. The term is usually used in the plural because the main characteristic of this method is tied to the concept of there being several potential futures.

Scenario building (or scenarios) can be described as an instrument that aids decision-makers, by providing a context for planning and programming, lowering the level of uncertainty and raising the level of knowledge, in relation to the consequences of actions, which have been taken, or are going to be taken, in the present. The term and method were first introduced into the U.S. by Herman Kahn in the 1950s when he was working at the Rand Corporation. Kahn stressed the sequences of events, defining scenarios as 'hypothetical sequences of events, built in the intent of attracting attention to casual processes and points of decisions' (Wiener and Kahn 1967, p. 6). Ian Miles has a similar definition: scenarios are a sequence of processes or events whereby the present of the world, nation or constitution develops into some future state of the world, nation or constitution (1986). According to Eric Jantsch, 'scenarios are attempts to set up a logical sequence of events in order to show how, starting from
the present situation, they may evolve step by step' (Jantsch 1967, p. 180). Herman Kahn states that scenarios are an answer to two basic questions: how does a hypothetical situation develop in the future step by step, and what are the alternatives in each moment of decision which divert, facilitate or stop the process (Wiener and Kahn 1967).

Joseph Martino sums up these definitions by saying that a scenario is ‘a picture of an intensely consistent situation which, in turn, is the plausible outcome of a sequence of events’, where plausible is an intensification of probable (Martino 1972, p. 267). Finally, Michel Godet defines scenarios as ‘the description of a future situation together with the progression of events leading from the base situation to the future situation’ (Godet 1987, p. 21). This set of events should have a certain consistency. Clearly the central concept of scenarios is that of sequences or processes of events springing from the present which may lead to the future. The second concept is that time sequences should have a certain consistency.

**Scenario Building**

Scenario building is one of the methods most used in Futures Studies. Although there are several scenario methods, which can be defined in various ways, we can consider scenario building to be an objective method, insofar as it is mainly based on data and information; it is also a multiple method, since it considers and uses subjective methods, such as the Delphi techniques, at some stage, either when the information is being collected, or during one of the different steps. It can also be considered a systemic method, since interrelationships between areas and trends are stressed in many cases.

Scenarios are synoptic as well as simultaneous, since various variables are analysed at the same time. The starting point of the method is the present. The main lines of scenarios and the basic assumptions are chosen by the analyst. It is essential that the assumptions be clarified from the start of the exercise since they state the position of the analyst (economic growth is central, progress is linear, changes are needed).

There are also a number of set key moments which, seen over time, are relevant to decision-making and may alter trends. The key moments may be in five, ten, fifteen or twenty years’ time, depending on the area chosen. Clearly, as an example, technology
and education have different time spans. The temporal dimension is an important aspect of scenarios, since they are always time-frame specific. In economic areas we usually have short-term scenarios, in educational areas medium- and long-term ones, while in agriculture they are mainly long term.

The main lines of the scenarios, as well as the key moments, are used to choose and develop possible scenarios. The key decision-making moments underline the usefulness of scenarios as indications for, or of, dynamics of future developments deriving from specific decisions; at the same time, the indication of the consequences in the future of decisions taken in the present tends also to clarify, in part or completely, the present situations in which the decisions are taken.

Aim of Scenarios

Because of extremely rapid change in different areas, scenarios are being increasingly used. The aim is that, at least conceptually, scenarios should enable us to detect all (or as many as possible) alternative futures and clarify, therefore, present actions and possible consequences.

According to Michel Godet, the aim of scenarios is to detect the key variables that emerge from the relationship between the many different variables describing a specific system: these indicate or are related to the actors and their strategies (Godet 1987). Herman Kahn speaks of the key decisions. From key variables and key decisions actors and their strategies emerge, from all of which the development of the system under study is described in alternative scenarios.

Scenarios are an attempt to deal with the complexity of dynamic changes, i.e., high levels of uncertainty, which lead to difficulties in the methodological approaches because of the high degree of social dynamics and value sensitiveness. In such situations that are more often becoming the norm, the flexible scenarios can be used in a variety of situations. Herman Kahn has said that scenarios are useful ‘carry over’ thinking devices that are part of the dynamics of the potential future. Of course there are dangers in information, in choices by the analyst, etc., and scenarios can be susceptible to approximation. In an interview with Eric Jantsch in 1964, Kahn acknowledged that many ‘easy-going scenarios’ had been developed, which though were better than a ‘deliberate blank’.
Typologies of Scenarios

There are always different types of scenarios. One is what Herman Kahn has called the 'surprise-free scenario', Michel Godet the 'reference scenario' and others the 'trend scenario'. In all cases, the events described are the more probable or, as Michel Godet says, 'the best route to the future', the one that leaves out the unforeseeable (i.e. what will happen if nothing changes). The other scenarios (excluding the trend scenario) are either the extreme or contrasting scenarios or, even more important, the in-between scenarios.

Scenarios can be extrapolative and normative. The former use data mainly taken from the present (and sometimes from the past), and follow the main lines in terms of the possibles and the probables. They are mainly trend-based scenarios and the data used are mainly quantitative. They can also be contrasting or in-between scenarios based on the supposition: if (such a decision is taken, such an event occurs) then (such are the consequences). The trend scenario is a sort of guideline along which other scenarios are built.

Normative scenarios describe the possible alternative states of the system in analysis, taking account of the desirables, hence the goals, of a system that lead to alternatives in action in the present. A good example is the 'Images of the Future' described by the Science Policy Research Unit in Sussex, England, in World Futures (Freeman and Jahoda 1978).

In The Year 2000, Herman Kahn describes some well-known scenarios, distinguishing between the determinant and dependent trends, where trend scenarios are set in a hierarchy (Wiener and Kahn 1967). There are also well-known French scenarios, such as those used by the Délégation d'Amenagement du Territoire et l'Action Regional (DATAR), one being France in the Year 2000: A Scenario of the Unacceptable (1971). They are frequently extremely complex scenarios because of the many variables used and the use of quantitative and qualitative data. More recently, the Organization for Economic Co-operation and Development (OECD) has developed what is known as the 'Interfutures' scenario – an important set of scenarios for policy-makers that clarify decision-making. However, the set is not well known or widely used, not being fully accepted in substance or methodology.

Scenarios are the method most widely accepted in developing countries because of their alternative offering capacity and the use of local knowledge rather than outside experts (Hodara 1984).
Development of Scenarios

The first phase in the development of scenarios is related to the researcher's knowledge of the present and the past of the system of interest. This phase must be as complete as possible and is the most time-consuming phase. Various methods can be used: 'Interfutures', which use other Futures Studies developed by different groups; Delphis; experts' experience; brainstorming; interviews. It is important that the system be limited in relation to the objectives of the study, as well as to the basic assumptions, and possibly to the variables chosen to describe the system. The context has also to be studied specifically in relation to the external variables that may affect the system. Environmental scanning is useful for this purpose.

The search for the key variables among those describing the system constitutes the second phase. Again, different methods may be used: Michel Godet proposes structural analysis that 'highlights the structure of the relationships between the qualitative variables, whether they are quantifiable or not, which characterize the system under study' (Godet 1987, p. 32). The key variables indicate the structure of the scenario.

This phase is followed by a search for the actors within the key variables and the foreseeable determinant key decisions (a law which might be approved, a change in policy, etc.). It is at this point that the choice of scenarios emerges. One of them is the trend scenario. The next step is to analyze the decisions or events that may lead to future situations, in the case of extrapolative scenarios, or the images already described as the goals needed by the decisions and the actors in normative scenarios. The key hypotheses emerge and are important determinants of questions for the future (if such an event occurs, if such a decision is taken, along the key variable, then...). It is on the basis of this that future situations are described, taking account of the key variables and actors, and as such alternative scenarios are built.

An example follows. Given the key variables describing the system of formal education in a specific town, given the context (other variables), given the key actors and given the key decision points (laws, change of teachers, etc.), which basic hypotheses and questions will determine different alternative scenarios (five, ten and twenty years scenarios) Hence, which other events leading to the scenarios can be foreseen, if such basic events take place and such decisions
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are made If the scenario is normative, since the goal for the future is, for example, basic education for the population under the age of fifteen, which events, starting in the present, will or will not lead to the desired image In this way it is the future that illuminates the present and not the consequences of the present that determine the future. What are the alternative scenarios (Here simulation is often used.)

In the final phase of development of scenarios, different possible strategies can also be indicated. This brings us to strategic management, described later in this chapter, which seems to be becoming more important throughout the world in Futures Studies.

Limits of Scenarios

We can certainly recognize many of these same limits in scenarios, as discussed in chapter 5, from self-altering to difficulty in having sufficient reliable data. However, being flexible, scenarios can be used more easily than other approaches, particularly in situations in which it is difficult to use more rigorous approaches. One way of overcoming some of the limits may be to use scenarios together with other futures methods; another solution may be continuously to refine the method. One point must be made clear: imaginary alternative descriptions are frequently interesting, but they are not scenarios: they lack the logic of a scenario, which always has a certain degree of scientificity, at least in the use of the method and its techniques.

Description of Specific Scenarios

There are a great number of scenarios: the one developed by Herman Kahn; the 'uncertain futures' developed by Robert Ayres, mainly in relation to population, resources and technology (1978); the 'world futures' developed by the Science Policy Research Unit, which can certainly be considered a normative set of scenarios.

Among scenarios looking at the relations between the industrialized and developing countries, we have the Interfutures (Lesourne 1981) and the Agriculture 2000 (FAO 1981). I shall describe them in some detail because they are probably less known to scholars and interested people at the global level. They have been developed
by intergovernmental organizations interested in the North-South debate; in some ways they have not been sufficiently used, either for ideological reasons or because they were ahead of their time in terms of government awareness.

The Interfutures scenario is one of the best examples of a global scenario. Its central assumption is the growing interdependence of the world's countries; another assumption is that some countries are experiencing great and rapid change, which forces them to concentrate on relations among themselves and with the non-industrialized or countries of the South.

The authors of *Interfutures*, directed by Jacques Lesourne, have stated that these scenarios are not forecasts — it is not possible, for example, to make an exact forecast of per capita income, the need for food or industrial production to the year 2000 — but are an effort to understand the different alternatives that emerge in a situation of global interdependence in the present. They can be of use to decision-makers operating in the present situation. In a different way, this same concept is basic to *The Challenge to the South* (1990), a book which changes the view of developing countries by underlining their responsibility and their need for action.

*Interfutures* is based on many of the characteristics of Futures Studies described in this book: complexity in the present world; the need for interdisciplinarity in order to understand such complexity; and looking at the long term, also in terms of normative indications. Interfutures scenarios are directed to specific objectives, on the basis of specific assumptions. Interfutures describes six different scenarios.

### Scenario A

This scenario is based on the assumption of the need for joint management of the OECD regions by North America, Japan and the European Community, in order to attain a high and stable level of economic development. It is a scenario of high economic growth and is based on the following correlated assumptions:

1. The need for joint management by the OECD to sustain high economic growth.
2. The relative productivities of OECD countries which converge in the long term on U.S. productivity.
3. The industrialized society establishes a consensus and gives priority to high economic growth.
4. Value patterns change slowly, primarily in response to growth itself.
5. The increase of free trade.
6. The gradual integration into the world economy of the Third World countries, particularly the rapidly industrializing ones.
7. Large aid flows, but growth differentiation in the economic situation of developing countries.

The images emerging from Scenario A to the year 2000 are as follows:

1. During the last quarter of the twentieth century gross world product (GWP) will increase by a factor of about 3.5, and average per capita income will more than double.
2. The OECD share will drop from around 62 per cent to around 53 per cent, i.e. more than half the world income for only 16 per cent of the world population.
3. The Third World share will increase from 21.6 per cent in 1975 to more than 30 per cent.

**Scenario B**

This scenario is divided into three sub-scenarios.

**Scenario B-2.** In the traditional scenario, in which moderate growth (this was probably one of the reasons for the non-acceptance of scenarios at a time when high growth was considered the only possible goal) persists in a situation of disequilibrium, the assumptions are as follows:

1. North-North and North-South relations are similar to those in Scenario A.
2. There will be no significant unanimously accepted change in values. Many people will be aiming at higher growth, but others will not; others will be demanding their share of GWP. This will give rise to conflicts that will require socioeconomic adjustments. The failure of such adjustments will inhibit economic growth.

The following images emerge to the year 2000:
1. GWP will almost treble from 1975, with a doubling of the average per capita income.
2. The OECD share will drop from 62 per cent to 50 per cent.
3. The share of the Third World, including China, will increase from 21.6 per cent to approximately 32 per cent.
4. Eastern Europe and the former Soviet Union will grow faster than OECD and will increase their share from 16 per cent to 18 per cent.

Scenario B-1. The main difference between scenarios B-1 and B-2 is that, in the former, the assumption is that the new post-materialistic values will be rapidly adopted, thus permitting a consensus on a less market-oriented growth. This hypothesis influences the quality of the other assumptions: for example, it is assumed that it will create a more open attitude towards the Third World. The image that emerges in relation to microeconomic variables is the same as in Scenario B-2.

Scenario B-3. The assumptions are that productivity in Germany and Japan will overtake that of the United States between 1985 and 1990, because of differences in the acceptance of structural adjustment (this concept was at its very beginning at that time), while in some other OECD countries productivity will be below that of the U.S. In global terms, the image of the year 2000 that emerges is not very different from scenarios B-1 and B-2, but the situation could be very different from country to country.

Scenario C

This scenario presents a breakdown in North-South relations, on the basis of the following assumptions:

1. A deterioration in North-South relations in the early 1990s.
2. The Third World avoids establishing links because it believes it has been overly dependent on the North.
3. Aid flows are greatly reduced.
4. There will be a moderate or slow growth within the OECD, depending on the country, since each country will be affected differently by the loss of markets in the South.
5. There will be no convergence of productivities.
6. There will be no significant change of values.

The image of the year 2000 that emerges is one of lower GWP and average income than in any other scenario. The Third World share of GWP will increase, but it will be a larger share of a smaller cake. Japan’s share will drop appreciably and incomes in all OECD countries will be lower. No one will benefit from the deterioration in international relations assumed in this scenario.

Scenario D

The assumptions are as follows:

1. Mounting protectionism in the early 1980s between the major poles of the OECD: North America, the European Community and Japan.
2. The poles will establish preferential aid, capital flow and trade links with developing country regions along historical, cultural and geographical lines and links: North America with Latin America, the European Community with Africa and Japan with Southeast Asia.
3. Growth of productivity in the North will be slow to moderate.

The image of the year 2000 that emerges implies that the problems raised by fragmentation will lead to a consensus on economic and other objectives, thus bringing about rapid political and structural adjustments. Regarding GWP, the image is similar to that of Scenario B, but, at the regional level, there are considerable differences, which are even greater if the projection of the year 1990 rather than 2000 is accepted.

In all these scenarios we see that the choice of the alternative trends determining change at specific historical moments, for instance in 1980, 1990 or 2000, is extremely important. Clearly the choice of specific variables and key values, made on the basis of what is most important to the authors in considering economic growth, is fundamental to Interfutures, as are also the assumptions.

In looking at the project about ten years after it started, we see that some of the scenarios are being partially realized: protectionism; divergence among industrialized countries; tensions and alliances
between the United States and Europe, and between the U.S. and Japan.

*Interfutures* shows the potential of scenarios as a decision-making tool for governments and economic decision-makers. Scenarios may indeed contribute to avoiding making major mistakes.

To these definitely finalized scenarios we should add those implicit in *The Challenge to the South* (1990). These implicit scenarios consider, ten years later, the global problems between the North and the South, in terms of the former not offering aid for the industrialization of the latter but rather supporting the South in its way of viewing global issues and in its effort to solve its own problems. Though not a description of scenarios, it is interesting to compare this book with both *Interfutures* and *Agriculture towards 2000*.

The extremely important scenario *Agriculture 2000*, built by the United Nations Food and Agriculture Organization (FAO 1981), is an attempt to estimate world agricultural development, food needs and production for the population in the year 2000. It is mainly related to developing countries, whose principal problem is agricultural development and the satisfaction of food needs, and is based on information from the data bank which the FAO has been developing over many years in relation to global food indicators. It analyses ninety developing countries (i.e. 98 per cent of the developing countries, excluding only China, which at the time had not communicated data) as well as thirty-four developed countries, though the latter in less depth.

The study develops three mainly quantitative scenarios: a trend scenario, based on the continuation of present trends; Scenario A, which is the most ambitious and which is based on the assumption that developing countries will attain the objectives set out in the United Nations development strategies and increase economic growth; and Scenario B, a scenario of modest economic growth and the improvement of trends in agriculture. Naturally the most important variable of the study is population, taken from the median level projections of the UN. Scenario A reflects the objectives of the UN international development strategy at the time: 7 per cent economic growth in all developing countries as a whole, with 6.4 per cent for those with low income and 7.2 per cent for those with medium income. In Scenario B economic growth for developing countries is considered: 5.7 per cent for all countries, with 5.1 per cent in low-income countries and 5.9 per cent for medium-income countries.
Scenario A is based on the assumption of self-reliance in food for many countries in the developing world, while Scenario B explores the possibility of increasing production, but not necessarily reaching self-reliance. The scenarios are alternative among each other and are both extrapolative and normative. The important assumptions are that developing countries should have a degree of political stability and administrative organization, and that they should try to cease being food dependent from the industrialized countries, particularly those of North America. The study indicates an increase in the yield of various products, particularly cereals.

It is not so much a question of increased production as of better distribution of food. In the Agriculture 2000 scenario decision-makers concentrate on agriculture as the main priority. The industrialized countries open up markets with the developing countries who, thus, have the opportunity to acquire cash. Though self-sufficiency by the end of the century may not be possible for some countries, at least they will be in a position to purchase their own cash by selling their own produce.

Agriculture 2000 is without doubt a possible tool to aid decision-makers, but since its creation many problems have become more serious at the global level. Developing countries, and industrialized countries for that matter as well, are currently suffering from a loss of arable land, whether from erosion, overuse, or loss of pastures due to excessive grazing. The idea of increasing arable land is thus a very difficult perspective, and all efforts are being concentrated on the possibility of increasing yields. Another difficulty is the lack of water and the importance of moving from the development of use of water to that of conservation and preservation. Finally, the impact of biotechnologies in terms of increasing agricultural yield is another aspect to be developed, in relation to either increasing yields or diversifying products.

Basic to all these questions is the fact that it is essential that the developing countries concentrate on agricultural production, in order to decrease their dependency on the developed world, and focus on food production for their own populations, rather than on cash crops, which may bring in more money but do not feed the population.

All these points were either explicitly or implicitly indicated in the scenarios of Agriculture towards 2000, and are in different ways some of the points indicated by The Challenge to the South. One of the functions of the FAO as an intergovernmental body was to influence
the policies of governments that are members of it. Unfortunately, the situation has deteriorated further since the project was produced. Moreover, production has increased in some countries (mainly the industrialized ones), but in others distribution and the use of arable land for producing food for the population as well as for export has undergone no improvement. Agricultural production and food are basic to the survival of a growing population. We have the tools to understand these dynamics, but they are not being used by decision-makers except as theoretical exercises.

I have described the scenarios in *Interfutures* and *Agriculture towards 2000* in some detail because of their global character and their importance in terms of content both in the present and for the future. In methodological terms, they are also a clear indication of assumptions, of consistency and of the choice of key variables, as well as of rigour in the description of the present situation. All these elements may perhaps illustrate the importance in decision-making and planning of putting forward alternative futures (scenarios), based on a comprehensive view of the problems, with a certain level of consistency.

**Environmental Scanning**

Like scenario building, the objective of environmental scanning is not to predict the future but to help managers in a situation of increased uncertainty. For this reason I have chosen to include here a brief illustration of the use of environmental scanning, although methodologically it is to be considered a systemic method. Environmental scanning has become increasingly important, mainly as a consequence of the growing need of planners to have information both on the specific topic of interest and on the environment outside their area of interest. Indeed, with the increase in the pace of change and interrelatedness of areas, forecasters and planners are forced to look at the external world.

According to William Renfro and James Morrison, ‘The environmental scanning system can identify important emerging issues that may constitute either obstacles or opportunities. This process helps institutions allocate their resources in a way that anticipates or responds to changes in the external environment’ (Morrison et al 1983, p. 5). The perspective is an outside-in one that substitutes the inside-out perspective of forecasting and planning. In the early
phase, environmental scanning focused on economic trends, slowly moving to technological trends in the early 1970s, with the first signs of economic crisis; this period coincided with a growing awareness of the impact that the new technologies were having on production processes and even social trends, when social issues, such as the consequences of environmental pollution, came to the fore.

The importance of looking at environmental consequences is at last being recognized by enterprises as well. However it is important to remember that in Europe Bertrand de Jouvenel spoke of facta as indicators of the future and futura as possible future events as early as the 1950s. By facta he meant all issues that influence a given area, including the context and the environment. These concepts can be connected with environmental scanning, though at the time obviously they were not. There are different scanning processes: passive scanning, done more or less consciously, and active scanning, directed to specific issues. The selection of the environmental issues can be made with internal or external people or by a joint committee. Environmental scanning is mainly used for management issues and usually attempts to link Futures Studies and strategic planning or management as an intermediary step or one that precedes other Futures Studies exercises.

**Strategic Management**

Strategic management is a method that is often related to scenarios. Hence, I decided to refer to it in the previous chapter as an aspect of systemic methods, and to describe it more extensively here.

The understanding and use of strategic planning and strategic management have undergone a great many changes over the years in relation to the development of enterprises. Strategic planning can be linked specifically to the development of corporate planning, which can be traced back to the nineteenth century (Godet 1987). In the period between the two world wars, Dupont and General Motors started separating strategic responsibilities (objectives setting) from tactical responsibilities (ways of reaching objectives). In the 1960s, planning in general became important to enterprises; in the United States, sometimes in relation to national plans, it became known as long-range planning. Clearly such methodologies, being medium and long term in orientation, are important in describing Futures Studies. Long-range planning soon became corporate planning, related to the
whole activity of the enterprise. This implied the need for enterprises to have a long-term view in all their activities.

During the 1970s, accelerated change and the importance of the environment in ecological and socioeconomic terms led to a change in emphasis, and what was known as corporate planning became strategic management. The importance of future thinking in relation to the environment, and to specific or all-encompassing general issues, emerged very forcefully in terms of capacity to react to change, and in terms of setting goals which could and indeed had to be attained, thus indicating strategies and the management of the issues and their environment.

Like all disciplines, strategic management developed its own concepts and language. One characteristic is its long-term tension. Although strategic management is clearly more linked to enterprises, it is because of this tension that strategic management is particularly interesting in relation to Futures Studies. Michel Godet links strategic management to scenario building, the latter being the foundation on which strategic management can be grafted, as a basis of alternative knowledge of possible and probable developments.

On the whole we can say that technological assessment, as analysis of social consequences of technologies, and risk analysis, as identification of the future risks, seem to be challenging strategic planning and management into becoming more rigorous, comprehensive and attentive in foreseeing possible changes.

We can also infer that such methods are mainly being used in the industrialized countries in relation to enterprises. However, many of its principles, being long-term environment sensitive, should also be considered important for the Futures Studies of developing countries.

Issues Management

Issues management is a method that can be considered both objective, in terms of being based on data and information, and systematic, as it has to consider interrelations of areas and events. It is described more extensively here than in the previous chapter, where it was described briefly among the systemic methods, because of the importance of data and information for its development.

In the early 1980s, a certain crisis situation, in economic, political, social or environmental terms, began to emerge. As Harold Linstone
writes, even system analysis was eliminated from the U.S. Department of Defence's decision processes and, later, from other business fields, as being inadequate to the crisis situation (Linstone 1987, p. 319).

Between 1965 and 1975 policy analysis and strategic planning had been important in endeavouring to face the crisis situation; later, risk analysis and, more recently, issues management have been acquiring importance. According to Joseph Coates, issues management is a form of futures research (1986, p. 15). Like 'the orchestrating of a positive plan for dealing with issues, rather than merely reaching to them', issues management 'identifies and monitors social, technological, political and economic forces and trends...interprets and defines implications and opinions...sets in motion the shorter and longer term operations and strategic action to deal with the situation'. In his review of this book, Harold Linstone, however, underlines the uncertainty in issues management which reveals itself in fuzziness of the issue, difficulty of seeing the implications, uncertainty in options and knowledge of the unique culture of the organization (Linstone 1987).

Risk Analysis

According to Harold Linstone, 'Physical hazards have always been a feature of life'. There have always been such natural calamities as earthquakes and floods. In our time, however, hazards are often also man-made, for example nuclear contamination or environmental pollution. Hazards have long been in the realm of analysis of engineers, but risk is highly subjective in relation to the knowledge of the variables. The purpose of risk analysis is precisely to capture the dimension of risk. Again, Harold Linstone refers to the three dimensions in analysing risk (the multidimensional approach described in the previous chapter): technological, with the probability calculus and computer models; organizational, with the analysis for political sensitivity, media coverage, etc.; individual, in terms of experience, age, perception, etc. (Bowonder and Linstone 1987, p. 183).

Risk analysis has been discussed by various authors in relation to the Bhopal, Three Mile Island and Chernobyl incidents. It has been applied mainly to technological risks. Very often the low probability but high-risk effects or vice versa are not taken into consideration in future thinking. Many authors are now taking risk analysis into
consideration, and it may well be that this is one of the fields which will develop further in the future.

Clearly objective methods (and only a small number of the most widely used methods are analyzed here) are a vast part of Futures Studies and have to be developed. They often merge with systemic methods, which is understandable. As the interrelatedness of issues increases with the rapidity of change, the systemic approach becomes increasingly important, even though the mathematical models are not used. However, data and information continue to be crucial, which explains why the objective aspect of this approach is so important.

Further Reading

Christopher Freeman and Marie Jahoda, *World futures, the great debate*.
Michel Godet, *Scenarios and strategic management*.
Ian Miles, *The poverty of prediction*.
Subjective Methods

In this chapter we shall describe subjective studies — the Delphi method and the cross-impact matrix — and shall examine Harold Linstone’s multiple approach, which is one of the possible combinations of the three types of method: systemic, objective and subjective.

The Delphi Method

Olaf Helmer, considered to be the founder of the Delphi method, is still the best-known expert in the field. Although it was in the 1950s that Helmer, together with Norman Dalkey, first instructed some researchers in the U.S. Rand Corporation in the use of Delphi forecasting, it was not until 1964 that the method was given a definite structure and used for long-term planning in the scientific and technological fields, rather than being confined to the military sector (Helmer 1983).

Following the publication at the Rand Corporation of a Report on Long-Range Forecasting Study by Theodore Gordon and Olaf Helmer in 1964, a number of experts were involved in an exercise whose purpose was to try to overcome the difficulties encountered in producing forecasts that were objective. While being subjective and, hence, non-analytical, the new method was considered to have the advantage of a fair degree of consensus among the experts contributing to the exercise, with the end result thus being based on the collective judgement of experts. According to Helmer, the degree of subjectivity was thus lower, with greater objectivity being reached through the contribution of a group of individuals.
The Delphi method has been used in the United States, in eastern and western Europe, and extensively in Japan, where one of the most extended Delphi exercises was conducted. An excellent definition of the Delphi method is Harold Linstone's: 'Delphi may be characterized as a method for structuring a group communication process, so that the process is effective in allowing a group of individuals, as a whole, to deal with a complex problem' (1975, p. 3). According to Eric Jantsch, the Delphi method is particularly useful for goal setting where issues are of an historical and political nature. He described the Delphi method as 'a succession of iterative brainstorming rounds in which an attempt is made to avoid the interference of psychological factors that tend to reduce the value of brainstorming sessions' (1976, p. 137). In the glossary of the World Future Society, the Delphi method is described as 'a method of soliciting and aggregating individual opinions and judgements, typically of a group of experts, to arrive at a consensus view concerning such things as what may happen in the future (World Future Society 1977, p. 549). An analysis of the Delphi method is also to be found in the book edited by Giorgio Marbach (1980).

According to an analysis presented in 1977 on Delphi techniques, the method has been used primarily for applied research, sometimes for operational research and only rarely for pure research (Brockhaus and Michelson 1977). This analysis also showed that Delphi had been used mainly in the field of physical sciences and engineering, and indicated that it would be used increasingly in the social sciences. I would contend that this has been true, especially in Europe.

Joseph Martino, who contributed to the development of the Delphi method, believes that group forecasts are an advantage over individual ones: the sum of information a group has is more than the information of one individual; the number of facts a group can consider is 'at least' as high as the number an individual can consider; and a group is more willing to take risks than an individual (Martino 1972). The Delphi method is appropriate to Futures Studies, where the object of research has not yet occurred and so presents a high level of risk. The main characteristics of the Delphi technique are:

1. The feedback iterative effect from the co-ordinating group to the experts and vice versa. As Joseph Martino says, in this 'controlled feedback' the issues are described by the central group or individual who also extracts the information useful
for the clarification and forecasting of issues from the answers to the questions. This is linked to the fact that the goals of the exercise must not be lost.

2. The anonymity of the experts, who do not know each other and are usually contacted by mail (electronic methods are also used). This prevents the psychological effects of groups dynamics and also enables each respondent to change his or her mind. The approach also makes it possible to take each opinion into consideration.

3. The attainment of consensus (at least partial) through different rounds of questions, usually measured in relation to the occurrence and its feasibility. Various technical problems have been encountered in terms of stability in the answers and measurement of agreement levels, and efforts have been made to overcome them.

The Delphi method is divided into various phases, the first phase being rather long and rich in information. The area of interest is explored thoroughly by a co-ordinating team, and the data and information are collected as rigorously as possible.

In the second phase a questionnaire is formulated, and a group of experts is chosen in relation to the problem that is the object of the Delphi exercise. Clearly the selection of the experts is a crucial point; the experts may be from the organization involved or from outside, but in the latter case the choice is obviously more difficult. The aim of the questionnaire is to probe the points of convergence among the experts, in terms of both agreement and disagreement, in relation to the time of occurrence of the event, its importance, feasibility and desirability.

Information from the experts is retrieved by the co-ordinating group in the third phase and is analyzed from an interdisciplinary point of view. The information is sent back to the experts in one or more subsequent round-ups until a certain level of consensus among the experts has been reached. The panel of experts and the co-ordinating group should be interdisciplinary. There can be more than one panel, but this can complicate the issue further. Another important point is the size of the panel. Panels have varied in size, but it is important that there should be neither too many nor too few experts. Generally speaking, seven is about the right number. The answers provided should be neither too long, rendering consensus impossible, nor too short, producing a superficial consensus. A
synthesis report is prepared at the end by the central group or individual.

It should perhaps be stressed once more that the Delphi method is a subjective approach in an area where what is important is the expertise and the knowledge of the experts in enlightening planners and decision-makers. There are, of course, pitfalls, some of which we shall describe in the next section. However, the Delphi method is extremely useful, especially if used in conjunction with other methods, for assessing the results of forecasts that have been developed through such other methods as scenarios or global models.

In conclusion, we can say that there are many ways of using the Delphi method, depending on one’s goal. In the case of a problem which is not suited to analytical techniques, for example, it may be useful to have the view of experts. The same applies to a situation in which the use of objective methods would involve too great an expense, or in which there is excessive disagreement in a team, because of value sensitiveness.

Problems of the Delphi Method

We shall refer very briefly to some of the problems that can arise in using the Delphi method. One set of dangers derives from the group dynamics that can develop within either the initiating group or the group of experts (even though one of the reasons for choosing the Delphi method is to avoid precisely this). Social pressures can be exerted by one of the groups on the members to agree with the majority, even though the members of the group are anonymous. The results can be tempered to reach a consensus. There is always the danger that a strong personality may emerge (Bardecki 1984).

Other basic limits of the Delphi method can be identified in the frame of reference of the co-ordinating team, which can influence the entire process through the selection of experts and the way questions are posed. There is a great deal of debate on whether the experts should be chosen from the organization interested in the Delphi method or from outside, and whether they should be chosen because of their experience and knowledge or for some other reason. In choosing the panelists it is important to select people who have the time and motivation needed to concentrate on the topic being examined as well as to continue answering in the subsequent rounds.
Another problem is the possibility of discounting the future. The questions, for example, may be posed in such a way that the crisis further forward in time may be considered less important than the closer crisis. Clearly, even if the consensus reached is only partial, in terms of time dimensions it can be influenced by the approach. In 'Eight Basic Pitfalls', Harold Linstone says, 'a bitter lesson which every forecaster and planner learns is that the vast majority of clientele has a very short planning horizon as well as a short memory (Linstone 1975).

Another pitfall is to confuse desirability and feasibility. The judgement of experts can be influenced by a particular frame of reference and the desires of the experts or of the co-ordinating unit. Harold Linstone has listed other pitfalls: excessive enthusiasm in using the method; a pessimistic bias in long-range forecasting and excessive optimism in the short range; and excessive confidence in experts.

It is possibly for all these reasons, especially the last one, that scholars in developing countries have rarely used the Delphi method. When they have used it, it has been on narrow subjects. The important role played by the experts in the Delphi method and, hence, the possibility of their influence (whatever the efforts to control this aspect), has made the experts of developing countries wary of this method.

In conclusion we can say that there has been considerable debate on the disadvantages of the Delphi method and a general recognition of some of its dangers. Although there may be many ways to criticize the method, it is still a forum for ideas. In an effort to overcome some of the limitations, other forecasting methods have been developed.

The Cross-Impact Matrix

The cross-impact matrix has been described as a method for 'revising estimated probabilities of future events in terms of estimated interactions among those events' (Dalkey and Rourke 1971, p. 327). In forecasting future events in isolation from each other, the effects that such events have on each other is not taken into systematic consideration. The cross-impact matrix analyses trends in their direction and events in their occurrence. A 'two entry' table is built, with trends and events; the impact that they have on each other is measured, the values indicated and then calculated.
After the decision-maker has chosen the subject, established the time and its breakdown, and prepared a list of events, the cross-impact matrix follows a number of specific steps. It is important to identify the potential events and trends, and to calculate their impact on each other in terms of probability and given values. There is currently a debate on the possibility of considering the impact of trends on trends.

The cross-impact matrix and the Delphi method, both subjective methodologies, can be considered as a family of methods, not as a method per se. The Delphi method indicates the position of different experts, who otherwise would be unlikely to come together, and tries to reduce to a minimum the subjective effects. The cross-impact matrix, which is more analytical and can be considered a method in itself, is being increasingly used.

Clearly, subjective methods can be extremely useful for a discipline whose object is what has yet to occur, and where consensus among experts, even when not unanimous, may almost substitute objective future thinking.

The Multiple Approach

The final approach I have chosen to present among the subjective methods is the one proposed by Harold Linstone in recent years, briefly referred to in chapter 7, under the heading of multiple perspectives. In a world of increasing complexity and interrelatedness of events and areas, Harold Linstone believes that it is necessary to overcome the limitations of the various methods used for looking into the future and instead to use what he has called the multiple approach (Linstone 1985, 1984).

According to Linstone, extrapolative studies are technology-oriented, since they use analytical models of growth: extrapolation, etc. This approach (the T approach) leads to the attainment of greater technical and quantitative sophistication, but may have reached its limit even in its effort to lower uncertainty in decision-making related to the future. This perspective has been dominant in many futures methods, such as, for example, systems analysis, risk analysis, environmental scanning and, more recently, issues management.

The second perspective (the organizational or O perspective) is the one in which forecasts are made through the filter of the affected or affecting organization, state enterprise, institution, etc., and, hence,
through the goals and objectives of the particular organization.

The third perspective (the individual or I perspective) is the most difficult to detect, but is rich in creativity and imagination. Such an approach is linked to leadership or even charisma, as related to futures issues. Examples of the O approach are the visions of Plato and Francis Bacon described in chapter 1. The thinking of Aurelio Peccei, Alvin Toffler and Bertrand de Jouvenel may be considered to be examples of the I approach. The latter two approaches have prompted me to describe the multiple approach here (Masini and Gillwald 1990).

In Linstone’s view, until now these three approaches have been used separately or restricted to a specific historical moment. He contends that they are all complementary, and that Futures Studies would draw great advantage from the three approaches being used together. The T approach in this case would be moderated by the O approach, which in turn would benefit from the rigour of the T approach. At the same time, both approaches would benefit from the creativity of the I approach, which has been lacking in most of the studies undertaken, especially in this last decade.

A greater awareness of the I perspective may indeed be a trend in future-oriented thinking, due to social change and increasing involvement of people, directly and indirectly, in the decisions that may affect their future. People are becoming increasingly aware of the fact that it is difficult, if not impossible, to have value-free decisions in any area. Thus the importance of the I perspective is increasing; I would also say that this is true of the O perspective. Of course the best solution is the one advocated by Linstone: the simultaneous use of all three approaches to clarify the different issues and problems.

This would probably be acceptable to developing country scholars, since it endeavours to overcome both the importance of objectivity stressed by Western scientists (which is unacceptable to developing countries) and the strong stress on experts in the Delphi method. In my opinion, a better understanding of this approach would be beneficial to many experts in different parts of the world.

Further Reading

Olaf Helmer, *Looking forward: a guide to futures research*.
Harold Linstone, *The Delphi method* and ‘What I have learned: the need for multiple perspectives’.
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Giorgio Marbach, Claudio Mazziotta and Alfredo Rizzi, 'Il punto sul metodo Delphi', in their Le previsioni.
Joseph P. Martino, Technological Forecasting for decision making.
Eleonora Barbieri Masini and Katrin Gillwald, 'Futures studies and their societal context, with particular focus on West Germany'.
Systemic methods and global models have been described in chapter 7 in general terms. In this chapter I shall describe some specific global models as typical of systemic methods.

The Limits to Growth

Before discussing *The Limits to Growth* model (Meadows 1972), we must refer briefly to an earlier model built by Jay W. Forrester, who in 1971 first started analysing the elements of the urban system in its various parts and in the relation among the parts. Using quantitative methods and the systems approach, Forrester developed what he called the 'systems dynamics' method. The variables he used as a simple representation of the urban system are the same as those analysed by Dennis Meadows: population growth, capital investment (as indirect measures of both industrial development and food production), pollution and natural resources. Forrester concluded that the population problem was as serious as the industrialization issue, and that the excessive growth of both variables would produce a catastrophe, assuming also that natural resources, land for food production and housing, and the planet's capacity to absorb pollution are all limited.

According to both authors (though this point is stressed more by Meadows), the exponential growth of the interrelated variables will reach a point at which the world system will no longer be able to contain it. For Forrester the year 2000 will be the limit, for Meadows 2100.

*The Limits to Growth* sponsored by the Club of Rome in 1972 is the best-known global model. The particular historical moment in which
it was presented also contributed to determining its importance. It had a tremendous impact on public opinion, was translated into about forty languages, was published, purchased and read throughout the world.

In methodological terms, the model is interesting for its use of the so-called retroactive loop: the retroactive effects of an entity on the causes are seen as having an effect which develops in a sort of closed ring. The growth of population, for example, is governed by two retroactive loops, one positive and the other negative. The positive loop is indicated by the fact that, after a certain number of years, a given population will have reached the reproductive age and affect the cause, i.e. the growth of population, so that the population level will be pushed even higher by its own effects. The negative retroactive loop will tend instead to push the population level down, functioning in the same way. From a given mortality rate, the population growth translates itself in an increase in the number of deaths, until the mortality rate remains unchanged.

In global models, the presence of positive retroactive loops and their prevalence over the negative ones means that the entities, the population or other, grow exponentially. This extremely important concept is the basic methodological concept of *The Limits to Growth*. In the real world things are more complex, and natality and mortality vary (i.e., the fraction of population giving birth and dying each year). For example, life expectancy at birth varies. At the same time the substance of the retroactive loop remains important.

The conclusion of this model is notably that if the trends of the global population, industrialization, pollution, consumption of natural resources and food production continue as in 1972, the world will reach its physical limit in a maximum of one hundred years. The most probable consequence will be an immediate decline (rapid and uncontrollable) of the population itself, of the industrialization capacity, of food production and of society as a whole. According to *The Limits to Growth*, it is possible to change the trend of exponential growth and reach a stable situation, ecologically and economically, through a zero-growth strategy to be started at once (i.e. in 1972, at the time of the project).

Among the many criticisms of *The Limits to Growth* model, one of the most important was that growth is seen as being undifferentiated in the various sectors, whereas we know that the growth of population, industrialization and the variables considered differ depending on the geographical region, as well as in relation to economic and
political differences. Another important critical observation is that the project failed to take into sufficient account the technological and political changes that may occur in different parts of the world. The future of the world is much more complex than the project claimed. However, it was intended as a simplification of world complexity and had considerable impact on both decision-making and public opinion in the 1970s, precisely because it was produced just when growth, especially economic growth, was starting to show signs of decreasing. This was the starting-point in the public’s awareness of physical limits of the planet.

Although the model would undoubtedly be different were it built today, the years that have followed the publication of The Limits to Growth have proved it to be timely and relevant in relation to the central problems of society at that time. Despite its limits, it is still of interest. In fact, many studies have been developed mainly along the lines of this first model.

In a speech given in Rome in 1991 in remembrance of Aurelio Peccei, Dennis Meadows stressed that his recent research has shown that the global system has already reached the limits of sustainability and that, given the delay in taking suitable action, within the next fifty years humanity will be faced by the need to limit itself and economize energy as well as natural resources.

Mankind at a Turning Point

The origins of this model can be traced back to some seminars, held at the Massachusetts Institute of Technology in 1972, on the theory of hierarchical structures and systems elaborated by Mihailo Mesarovic, who co-authored the project with Eduard Pestel (Mesarovic and Pestel 1974). Mankind at a Turning Point is different from the model of Dennis Meadows for the following reasons:

1. It tries to represent the world as a system of interacting interdependent regions.
2. It tries to develop recommendations of political relevance and is, hence, not only of alarm but also moderately prescriptive.
3. It utilizes data, theories and schemes of reference from different disciplines.

On the whole, the model tries to describe the possibility of growth of regions in so-called organic terms, which means a growth that
would be healthy for all the regions in the terms in which they could be judged at the time of the project. The declared theses of the model are that:

1. The world can be conceptualized as a system of interacting parts or regions (in this it is similar to *The Limits to Growth*, but has emphasized regions).
2. Rather than a global collapse, as stated in *The Limits to Growth*, the world will face individual catastrophes in different regions within the next hundred years, and these catastrophes will have global implications.
3. Action must be taken at a global level to avoid such catastrophes.
4. Global solutions can only be reached by finding a balance between the differentiated growth rates of the different regions, and not through an undifferentiated growth or zero growth as indicated in *The Limits to Growth*.
5. Any delay of action may be fatal — a conclusion the same as that of *The Limits to Growth*.

In *Mankind at a Turning Point*, each region is analyzed through a series of economic and ecological submodels related to population, food and energy, which are then seen in relation to each other. This is based on the hierarchal structure theory developed by Mihailo Mesarovic. Because the model uses dialogue rather than monologue, as in *The Limits to Growth*, it means that different levels have been introduced. It is in fact closer to a decision-making model, in which the different analyses emerge to a far greater extent than in any other global model produced. The choices are hypothesized by the analyst; i.e. for the food submodel, and alternative scenarios emerge from the different decisions in different regions.

The model predicts crises with the problems being differentiated at the regional level and with the indication, at the global level, that co-operation among the different regions is necessary for organic growth, i.e. for the growth of the whole planet.

The authors state that the objective of the model is not to forecast, but to give operational indications. In considering the model, it is important to stress the presence of what the authors called the human factor. The objective component, represented by data, is accompanied by a whole series of instruments, which are, on the whole, of a subjective nature and related to decision-making.
The critical objections that can be made to the model are the following: (a) the model analyses different regions in terms of resources, but does not take into account the changes that may occur at the political and technological level (as in *The Limits to Growth*); (b) in more general terms, the model reproduces the mental model of Western thinking. The experts involved in the production of the model were all from the West, which may, of course, have influenced the theoretical basis.

**The Bariloche Model: *Catastrophe or New Society***

Although the Bariloche model (dating from 1975-76) is the only model to have been built in a developing country (if Argentina can be considered a developing country at that time), the mathematical tools used are as highly sophisticated as those used in other models (Herrera et al 1976). This model differs from the other models in that the authors address the development issue in greater depth. The origin of the model was a critical analysis of the Jay W. Forrester and Dennis Meadows models produced by some Latin American experts in 1973 and 1974.

According to the authors of the Bariloche model, the future indications of *The Limits to Growth* and *Mankind at a Turning Point* are based on extrapolations from structures of the global system that already exist and therefore offer no opportunity for change, since they lack the value changes which are necessary to transform the world. The authors believe that only on the basis of changes in the fundamental values of society can we envisage different structures and institutions and so produce a different way of living.

According to the authors' reading of the above models, the hypothesis of global crisis simply reflects the problems and concerns of the developed countries since, at the time of the model, a large percentage of the world population was already in a situation of crisis. In their view, any attempt at reaching a global equilibrium according to the indications of the global models would simply be to perpetuate inequalities. On the basis of these premises, the Latin American group applied itself to building a normative-prescriptive model. It did not indicate what would happen if the present situation were to continue, but instead indicated how to attain the final goal of a world without poverty and inequality.
The Latin American model divides the world into four regions: developed countries, Latin America, Africa and Asia. It considers five sectors: agriculture and nutrition, housing, education, capital goods, and other services and consumer goods. The objective of the model is to reach optimization of existing potentials with the final goal of reaching a more egalitarian world in each of the five sectors in the four regions. The model chooses four basic needs: food, housing, health and education, and links them to the developed countries on one side and Latin America, Africa and Asia on the other. For each of the four needs, calculations are made in relation to their satisfaction in terms of calories, proteins, square metres for housing per person, etc.

Over and beyond these basic indications, the model uses the regressive analysis and calculates, for each region, the life expectancy increases; within a given number of years. Capital and labour are used as control variables so as to rationalize the quality of life in the function of the basic objectives. The import-export elements between regions are considered open in relation to these variables (this is certainly optimistic), and the concept of individual and social responsibility is the basis of the population issue. The model indicates that the satisfaction of needs within the four regions will occur as follows: the developed countries will reach satisfaction if measures are taken within a few years from the date of the project (1975-6); Latin America will reach it within a generation; Africa will reach it within thirty years from the time when the necessary action is taken; and Asia, due to the population growth and the decrease of arable lands, will not be able to satisfy the needs, even by lowering the objectives (for example, reducing the satisfaction of the need for food from 3,000 to 2,800 calories). This is the only feasible limit that the model considers.

More than a decade later, the situation of Asia and Africa has changed completely. Asia, especially China, is limiting its population growth. The loss of arable land in Asia appears not to be as bad as in other parts of the world. Water is less serious than in Africa, where the general situation is more dramatic than had been envisaged: Africa will never be able to reach satisfaction of its needs, within the thirty-year period, due to drought, deforestation and major political issues.

Although the model has been considered by many to be too optimistic, it is undoubtedly interesting: first, because it emerged from a non-Western country, and is one of the first global efforts
produced to underline the North-South issues that uses a specific and rigorous scientific approach; second, because it has specific social and political foundations. It is not very well known and has not had a particular impact on economic and political decisions, perhaps because of its ideological basis. However, despite the passage of time, it is still an innovative model which is clearly normative and prescriptive.

The Future of the World Economy

Based on the development strategies of the United Nations (UN), for which it was developed by Wassilj Leontief, this model dates from 1977 (Leontief et al 1977). The central part of the project is related to the environment and the impact of development strategies on the environment. The conceptual basis and motivation is the need for a new international economic order of cooperation at the global level. It focuses mainly on the relationship between economic growth in the future and natural resources and pollution. Methodologically speaking, the model is an input-output economic model, in which Leontief is a master. Social and political variables are non-existent, while those of political economy and environment policies are crucial. Projections are related to groups of years, and do not have a specific date as do the other models. Fifteen regions are considered in the model, and the economic sectors are specified in forty-five areas. The regional import-export dynamics in relation to pollution is the central objective of the model.

The starting point of the analysis of the model is the international development models forecast by the UN for the second development decade. The objectives are considered globally for the developing countries at an annual rate of 6 per cent for the gross national product (GNP) and at 3.5 per cent for the per capita product, assuming demographic growth to be the average 2.5 per cent level indicated by UN demographic projections.

On the basis of the premises already described, the Leontief model directs its analysis to pollution, which, as a result of the model, is considered manageable through sophisticated technologies. It can be considered an optimistic model in relation to the environmental and economic aspects. In considering the developed countries, for which the growth objectives have not been set, the model considers simple projections in relation to the long-term trends that are indicated at
the level of an annual growth of 5 per cent for GNP and 3.5 per cent for the per capita product. This shows that economic growth does not bridge the gap between the developed and developing countries, which in the 1970s was at 12 to 1, although this was measured on the basis of 1960 economic growth; moreover, in the model there are no indications of the gap diminishing to the year 2000. Thus, although the Leontief model cannot be considered on the whole to be optimistic, it is a useful analysis precisely because of this realistic approach.

The RIO Project: Reshaping the International Order

The RIO project cannot be considered a global model as such, since it is based mainly on qualitative data and uses quantitative data only to reinforce and validate the qualitative ones. The RIO report emerged from the need of the non-allied countries (an international group of countries not belonging to the industrialized world created in 1974 on the initiative of Algeria) to have their own global model (Tinbergen 1976). Scholars from developing and developed countries participated in the project, which has four parts: the need for a new international order, the characteristics of international order, proposals of action in relation to the previous two points, and methodology.

According to the project, a new international order is more important for the future than a new economic order. The international order established at the end of the Second World War only took into account the needs of the Western countries. An increasing awareness has gradually grown in the developing countries. By the 1970s it was clear that, in many developing countries, political liberation had not meant liberation from economic colonialism.

The main objective of the project was to indicate the satisfaction of material and educational needs (education being considered to be the basic non-material need) for the elimination of poverty. The project is mainly normative since it sets itself objectives and tries to see in the present what trends may lead to the realization of the goals.

The project develops many concepts that were subsequently used in international debates, especially North-South ones. The concepts that were new at the time of publication, at least at a clarification level, are self-reliance (the capacity to rely on one's own potential), eco-development (the balanced development of all human beings in
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relation to nature), national sovereignty (to be rethought, and not seen as the only way to protect citizens), and common heritage and the common ownership of natural resources by all citizens.

The studies within the project are interdisciplinary in approach, and the following areas are analysed: armaments, pollution, food, human environments, international monetary order, natural resources and energy, science and technology, transnationals and oceans.

In conclusion we can say that this project:

1. Indicates a new way of interrelating countries and blocks of countries towards a common survival.
2. Indicates a number of areas that are fundamental for the survival of the inhabitants of the earth and, within such areas, gives precise indications in both the medium and long term, grouping the indications in priority packages, which it offers to negotiations among countries.
3. Uses the work already done by other international organizations, suggesting changes and giving confidence to the UN, already being challenged, for the future.
4. Indicates the possibility that world institutions can contribute to negotiations.

The RIO project was a brave message at a difficult international moment. Unfortunately it has not attracted the attention of decision-makers to the extent that it should have. More than a decade later, we see that the model had foreseen the disruption of intergovernmental bodies and the mainly North-South crisis of international relations. It has also given inspiration to the Palme Commission, the Brandt Commission (1980), the Brundtland Commission (World Commission on Environment and Development 1987) and, in a different way, to The Challenge to the South (1990).

The Global 2000

We cannot conclude this overview of systemic methods and global models without referring to a very important study which, though not strictly belonging to this category is part of the consequences of global modelling. The Global 2000 (1981) is a report to the President of the United States that takes into account demographic growth, natural resources and the environment. One of the results indicates
that population growth in the developing countries will be 90 per cent of the growth rate of the world population by the year 2000. This is indeed a crucial point in relation to both the present and the future.

The project provides some important indications: growing deforestation; increasing shortage of water resources due to increasing consumption; general changes in climate; and the destruction of animal and vegetable species.

The project, which was developed from the data of various state departments, was co-ordinated by the Council on Environmental Quality, but it has not been used a great deal, either inside or outside the United States. However, in the 1980s, its real importance started to emerge, and it is being used as a model by many developing countries. Examples are Korea 2000, Mexico 2000, Peru 2000 and China 2000; incidentally, these studies have been grouped together and published in a single comprehensive volume (Garrett et al 1991).

Most Recent Global Studies

In this chapter we have discussed systemic methods and global models. Writing more than a decade later, I believe that it can be confirmed that global models were useful tools of analysis in the 1970s, providing timely indications on the direction the world was going. No other approach appears to have been a substitute for global models in terms of their importance in relation to policy indications. They may be criticized from the point of view of the analysis of data, but undoubtedly they had a view of the future and, in many ways, have proved relevant in the years that have followed.

We can also say that global models have stimulated much discussion, including of course criticism. We can refer to the work done by the Science Policy Research Unit at Sussex University in England, and also to *Models of Doom* (Cole et al 1973), *Worlds Apart* (Cole and Miles 1984) and *World Futures: The Great Debate* (Freeman and Jahoda 1978). In addition many articles were published in the 1970s. Indeed, the entire debate was central in the 1970s and much of it took place at the International Institute of Applied Systems Analysis (IIASA), based in Austria.

Recent years have seen the development of a new generation of global studies which, lacking mathematical formalization, cannot
be considered global models as such. *North-South: A Programme for Survival* (Brandt Commission 1980) attracted the attention of decision-makers and public opinion to the growing deterioration in North-South relations and the need for decisions for the common good of the whole world.

*Our Common Future* (World Commission on Environment and Development 1987) is another global study produced in Europe since the Brandt report. It focuses on the connection between development and environmental issues, stressing, as the Brandt report and the RIO project had done earlier, the danger of environmental issues for the survival of mankind. Interestingly, these European-produced reports place greater emphasis on the North-South issue and on the involvement of northern European countries. There is also a change in historical terms: an increasing need for solidarity for survival is evident in the publications of the 1980s and a decreasing interest in highly sophisticated mathematical tools.

This final element, however, appears to be contradicted by one of the most recent global simulation models, Globus (Bremer 1987) which was finalized in West Berlin in 1988. Globus, perhaps the most sophisticated model produced to date, was stimulated by Karl Deutsch’s thinking in political science, and strives to indicate possible interrelations between economic and political trends in twenty-five countries to the year 2020. It represents an enormous task, which has developed into a research tool and which might also have been transformed into a decision-making aid, had recent changes in eastern Europe not outdated much of the data.

A recent short-term study that is an outgrowth of work undertaken by the UN General Assembly draws on research prepared within different sections of the UN system. *Global Outlook 2000: An Economic, Social and Environmental Perspective* (United Nations 1990) is of interest especially because it is based on UN studies.

In 1990 a completely different global report was presented by the South Commission (1990). This report, which was co-ordinated by Julius Neyerere, stresses the need for the developing countries to solve their problems themselves through ‘self-reliance’ and on the basis of South-South co-operation.

In conclusion we can say that global models, or at least global studies, are still being built, though in different ways. Rather than forecasting efforts, they are more instruments of clarification as we endeavour to understand the complexity of the present and the future.
Global models have stimulated and indicated different visions of the future: technologically oriented visions, as well as socially and politically oriented ones. Global studies show that even within a global context differentiated views of the future emerge from different value systems and choices of frames of reference. This point exemplifies the basic hypothesis of this book: no Futures Study is free of the basic desires and fears of whoever writes or uses such studies. This must be taken into consideration for rigorous reasons of analysis and for reasons of human and professional responsibility.

Further Reading

South Commission, *The challenge to the south.*
Christopher Freeman and Marie Jahoda, *World futures: the great debate.*
Global modelling re-appraised.
Conclusions

In a time of great change, it will be necessary for the younger generations especially to be flexible and capable of living in a world in which the environment, the society of which they are part and, possibly, even they themselves will be in continuous transformation. It thus seems to me extremely important that they should be prepared and able to use tools of forecasting in their different professions or jobs.

In writing this text, I have stressed that the human being has always been interested in the future, although different people tackle it in different ways, depending on the historical period or specific culture to which each one happens to belong. Indeed, there is nothing new in the fact that we should try to forecast or wish to leave something of worth behind us.

It seems to me that we can, however, identify a number of distinctive features of our particular time. One is the unprecedented rapidity in the pace of change, which forces us, on the one hand, to look ahead but, on the other, makes it more difficult to do so. Another is the increasing awareness among people of their role in shaping the future, whichever future it may be. Never before has humanity had at its disposal such a wealth of innovative scientific and technological instruments, created by men and women to be used to their own advantage.

Another important element, as I see it, is the awareness that there is not one ready-made future for all humanity. The credibility of this concept, on whatever basis, is surely dying. This means that there is not one way of looking to the future but many ways, in relation to the cultural, geographical or even ideological roots of whoever is looking to the future, whether with a view to understanding it or building it.
At the same time we now have at our disposal tremendously powerful instruments. We need only refer to the great impact of the media, which enables us to indoctrinate and manipulate people, especially the young, leading them, for example, to believe that the future is centred on material possessions or to accept dead ideologies.

In this framework it is evident that the younger generations need support in looking forward and understanding the consequences in the future of present decisions and action. They must be trained to use their critical capacities and to clarify their goals and convictions, both for themselves and for the world of which they are a part. Futures Studies can help them learn to do both: to be critical in looking at what future is the consequence of what kind of decision, and to clarify constantly their own goals in a changing context that challenges them continuously.

In this book I have also placed great stress on the links between Futures Studies and their historical context. I have tried to show that Futures Studies are not just another tool we can use to manipulate people, but are a way of making people and societies identify and openly declare their objectives, to reveal what I have referred to as their hopes and fears.

Of course, Futures Studies have limits, and scholars from different parts of the world have an important contribution to make in extending and deepening their theoretical basis and fostering more rigour in their use. Despite the limits, I have argued the case that Futures Studies can be considered a discipline not only of the twentieth century, but also for the next one.

I have endeavoured to bring together what has been done in theory and in praxis in the field of Futures Studies, in order that whoever wishes to embark on such studies may do so on the clearest possible basis. To the extent to which it is possible in a didactic text, I have brought together the thinking of a great number of scholars from many parts of the world, particularly the developing countries.

Having worked in the field of Futures Studies for more than twenty years, I believe that it is in the developing part of the world that this discipline, as many others, will develop. The goal of clarification and the function of criticism of Futures Studies, rather than their technical capacities, have been strongly perceived in the developing countries. This same aspect of Futures Studies was also very much appreciated in the recent past in the eastern European countries. Even when the techniques were refined, something that was often done in
the latter countries, the awareness of the function of clarification and criticism remained in the forefront.

For many years the scholars from the industrialized countries, who were the first to embark on Futures Studies and develop them with increasingly sophisticated methods, failed to capture the importance of the two above functions. I believe they are now starting to do so. As a consequence, knowledge and experience are being exchanged among the different parts of the world, and this may help people in the future to avoid misunderstanding, contempt or even exploitation.

Scholars must now share their knowledge and experiences, if the world is to survive. Futures Studies are one of the fields in which this sharing may be anticipated. Because of this anticipatory capacity, Futures Studies may, together with other interdisciplinary fields, be capable of helping humanity to arrive at a better, albeit tentative, understanding of the possible consequences of joint forms of activity.

Such activities will need to be much more than simply interdisciplinary or international exchanges. In looking into the future it is not enough just to exchange knowledge, for the future also brings to the fore differences in hopes and fears. In a global interrelated world such as ours, it is crucial that we learn to understand the hopes and the fears of others. Indeed, the only possibility for the future is the continued coexistence of similarities and differences, with the goals being clear to all and the attitude one of open criticism.

Much has still to be done in the field of Futures Studies. What we have already achieved should be utilized for developing such studies further. I make no claim to have given any basic answers or to have covered every aspect of these studies. My aim from the start was to foster in researchers, teachers and students a renewed interest in Futures Studies and the commitment to continue developing them.

My intention is that this book should constitute a starting-point in interdisciplinary terms for searching for the basic principles of Futures Studies. I have explained very briefly how these studies developed. Hopefully, I have also showed the results and the impact that Futures Studies have already had on decision-making and public opinion.

I would like to conclude by stressing that the vision behind the future thinker is a basic issue. The future thinker can no longer be considered as being in a vacuum, looking at indications. He or she is an observer of the various signals, seen from his or her own
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perspective. Unless future thinkers take this position, they will never be successful in bringing to fruition the very rich contribution they can make towards a better understanding of the complex society in which we are living, and that of the future.


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Why Futures Studies?

Manuscript edited by Colin Hutchens
Typography, cover design and keyboarding, in-house

Composed in 10/12 pt Times Roman
by Action Typesetting Limited of Gloucester

Printed on Felsted Cream Wove and bound in
Linson stamped with Nuvap by
Antony Rowe Limited of Chippenham

Printed and bound in England