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Reports
to the Government

Netherlands Scientific Council
for Government Policy

The next twenty-five years

A survey of future developments in the Netherlands

SCIENTIFIC COUNCIL FOR GOVERNMENT POLICY

TO: The Prime Minister
FROM: The Scientific Council for Government Policy
RE: 'The Next Twenty-five Years: a Survey of the Future of the Netherlands'

The Hague, november 14, 1977.

Herewith the Scientific Council for Government Policy submits the report 'The next twenty-five years: a survey of the future of the Netherlands'. This report is the work of the Committee for a General Survey of the Future, established by the Council in 1974.

It is the Council's opinion that this report can contribute significantly to the thinking about the possible long term course of Dutch society.

According to the law establishing the Scientific Council for Government Policy, part of its task is 'to furnish scientifically-based information about developments which can affect society in the long run in order to assist in Government policy formulation' and 'to develop a scientifically-based framework which might serve the Government in the establishment of priorities and the execution of a coherent policy'. In conformity with this assignment, the Council, after an orienting phase of about one year, decided to initiate the General Survey of the Future. The purpose of the project was to arrive at a coherent long range view of the future in the Netherlands by bringing the expectations about future developments in various areas together in a systematic and integrated manner. To this end, the Council decided at the beginning of 1974 to establish the Committee.

The Committee was composed of a few members of the Council, of staff members of the five Government agencies which are connected to the Council through advisory membership, as well as of other experts.*)

The Council member Prof. J. S. Cramer chaired the Committee and the secretariat was provided by K. Vijlbrief of the Council staff.

As is apparent from the composition of the Committee, primary reliance was upon external experts. The most important reason for this was that scientific expertise in the various areas of the proposed survey was not available within the Council. The Council hoped that, through the cooperation of scientific institutions and persons within the Committee, expectations about the future in various areas would be brought together and examined in an integrated context. The work of the Committee was often discussed in the Council on the basis of interim reports and of drafts of the final report.

The fact that the Committee is responsible for the final report, however, means that the Council had no power to change it. With the presentation of this final report, the Committee has completed its activities, and it has been dissolved by the Council.

The report presents future developments expected by the Committee in several areas. The explorations within these areas have been examined in the light of their inter-relationships, whereby the Committee strove, by means of repeated consultation, to arrive at the formulation of a coherent view of the future. To foster the elaboration of the components and their integration, the Committee in an early stage set out a number of basic assumptions in the

*) The five Government agencies are the Central Planning Bureau, the Central Bureau of Statistics, the Committee for the Development of Policy Analysis, the Central Physical Planning Agency and the Social and Cultural Planning Office.

memorandum 'Assumptions for a surprise-free survey of the future' (May 1975).

It should be noted that the task of the Committee was concerned with expected future developments; that is to say that it was not a question of an examination based on predetermined goals but of an exploratory survey.

In regard to some of the assumptions, there were conflicting expectations for the future among the members of the Committee, among which, on the basis of plausibility alone, no choice could be made. This raised the question what alternatives were so weighty as to lead to variation in an integrated picture of the future. After lenghty discussion in the Committee and in the Council, it was finally decided to vary the assumptions regarding economic growth and to develop two alternatives: alternative A with a continuous annual increase in production of 3%, and alternative B with a slow decline in the rate of growth of production down to zero by the end of the century. The descriptions of both A and B led to the formulation of a number of bottlenecks. The fact that the expected developments in a number of areas proved to be insensitive to changes in the growth-rate had led, in the presentation, to a single description of the common developments and bottlenecks of A and B.

The Council is of the opinion that the Committee has successfully completed its task and has produced an impressive work which can be of importance both for government policy and for futures research.

The projections of the future and the bottlenecks which the project has yielded have not been elaborated primarily with a view to the formulation of policy recommendations.

Their most important function lies in the field of dissemination of information to foster further discussion and to stimulate constructive thinking about societal developments. Although no specific recommendations for policy are offered, the report clearly presents the need for anticipatory political decision-making and thereby fosters the preparation of government policies which are oriented towards the future.

The project has not only produced a report of importance but has also served, according to the opinion of the Council, as an experiment.

It has yielded a significant amount of experience concerning the possibilities and limitations of futures research. To give this second, more process-oriented purpose further content, the Council is preparing an evaluation of the project.

The appreciation of the Council for the Committee's report does not preclude comments. Before making these, the Council wishes to emphasize both the complexity of a general futures survey and the many difficult problems which have also been indicated by the Committee. Thus it appeared that in almost all of the areas there is a total lack of explicit expectations in regard to long-range developments. The components for an integrated picture of the future do not lie at hand; this is not surprising when one realizes that every statement about the future in any one specific area depends on assumptions about what will be happening in other areas. Moreover, there is a general lack of methodology for establishing such expectations.

The Council wishes also to point to the problems which arise with the creation of an integrated image of the future. In the beginning it was thought that it would be possible to construct a general picture of the future by coordinating existing expectations and examining their interrelationships. In spite of all attempts to coordinate expectations in the various areas into a consistent entity on the basis of common methodological starting points, this was in fact not possible. As the Committee rightly states, the knowledge needed for integration is lacking.

Finally, there was a tension between the time it took to complete the project and the duration of the validity of the forecasts on which it rests. Specifically,

during the time of the project, the Committee was confronted with changes in the economic and demographic forecasts. When such changes are not of passing concern but, as in the case, have a permanent character, they have consequences for a survey of the future. This means that futures surveying has to be an on-going process and that it should be continually adjusted in the light of new information.

Although the Council is well aware of the complexities of futures research, it still wishes to comment on the Committee's report. These comments regard both method and content. They can be summarized in five points:

a. Although mention is made of important differences in some areas such as economics, energy and land-use, the two alternatives A and B display many similarities. This is understandable, because for many areas the time-span between 1980 and 2000 can be called a short one. One can deem it important in itself that expectations for the future are relatively insensitive to the rate of economic growth. But this should not be taken to mean that future development is more or less preordained and not open to influencing. It should be recalled that the two alternatives that are presented with the approval of the Council rest on the change in a single assumption, namely that regarding the growth-rate. It is possible that by letting another parameter vary the two pictures of the future might be made to differ more strongly. This would take away the impression that the future is the outcome of a more or less independent process. Moreover, one may question whether the variations of the growth-rate would indeed have so few consequences for the various areas. In the Council, for example, it was noted that it is quite conceivable that a lower growth-rate (i.e. decreasing to 0%) as a result of a different attitude towards work might have consequences for education, and that this would show up in a more detailed treatment of education.

The question which can be posed in this connection is whether the 3% growth is handled sufficiently explicitly in alternative A. The impression is that the authors did not always keep the selected growth-rate sufficiently in mind. Because of this, problems arose in the elaboration of case B, dependent on the treatment of alternative A. At the same time, the Council wondered if the narrow divergence between the two cases is not connected to the fact that both are described on the macro-level.

b. Large, wide-ranging changes in comprehensive value patterns are not discussed in the report. The Council is aware that changes in values and norms are difficult to predict. The Council considers this hardly regrettable because predictability assumes controllability, and controllability might deny the possibility of shaping future society freely.

The Council, though, does believe that exercises based on changes in value patterns can help in formulating opinions about the desirable development of society. In this way, one should be able to get an impression of the possibilities and limits of the changeability of society.

At the same time, the Council believes that one of the tasks of futures research is to demonstrate that future developments in particular areas may render a change in values and norms necessary. The present opinions about values and norms could turn out to be inadequate for the manner in which future problems will have to be approached.

c. The explicit assumptions about the developments in our neighboring countries form a vulnerable element of the report. The Council believes that, in the future, more attention should be given to developments outside our country.

In any case, not only is the outside world treated superficially, but so are other areas such as scientific developments, culture, political developments and technology.

In contrast, the Committee has given much thought to social developments, The fact that technology has had insuffucient attention is important in regard to the situation of the labour market, for example. Because the Committee expects that there will be many new employment possibilities created in the services sector, the increasing supply of labour will be absorbed. In the Council, the fear was expressed that this view is overly optimistic since the technological processes which lead to substitution of labour by capital in the industrial sector may also take place in the services sector.

d. Bottlenecks which will appear after the year 2000 cannot be inferred from the picture of the future, however likely they might be. This applies, for example, to developments in regard to the size and composition of the population, the supply of fossil energy and the dangers connected with the generation of nuclear energy in case A. The reservation in this connection is that anticipating bottlenecks which arise after 2000 certainly may require policies to be set in motion long before 2000. This applies, for example, to energy where the long lead times for energy production do not permit postponing government action until real shortages are experienced. It is also possible that bottlenecks which are felt before the year 2000 might become less important after 2000 because of subsequent developments. In many places, the results, whether one takes case A or case B, support the opinion of the Council that in futures-surveying one should preferably begin with a timeframe within which bottlenecks can be identified which can reasonably be deemed relevant to present policy.

e. The assumption of a restrained attitude on the part of the government, so that the problems of policy formation are brought more clearly into the open, does not appear to be equally applicable to all areas. Because of this approach, certain areas manifest themselves more sharply than others.

Thus it is assumed, for example, that fiscal policy in regard to married women will adequately deal with the problems that arise. In other areas, such as the labour market and the division and humanization of labour, for example, it is suggested that the problems will not be solved before 2000.

The substantive elaboration of the different areas does not necessarily reflect the opinions of the Council. Yet the Council, for various reasons, is reluctant to express criticism of the report.

In the first place, the Council realizes that the existence of opinions other than those which are expressed in the Report is inherent in the character of the survey. It is based on the expectations about the future held by a certain number of institutions and persons which were recruited by the Council for the Committee. Naturally the composition of the Committee has had consequences for the content of the survey of the future. The Committee also admits that it is concerned with 'a' view (and not with 'the' view) of the future; in other words, it is not the only nor necessarily the best view that one would be able to imagine.

In the second place, the Council realizes that the non-exhaustive and somewhat arbitrary character of the bottlenecks is connected to the fact that, following a decision of the Council, it was decided that the survey would not be based on specific issues.

In the third place, the Council is aware that other opinions in one area could have consequences for other areas and for the composite picture.

The Council is of the opinion that the report of the Committee should become the subject of broad public discussion and brings it, with this wish, to the attention of the Government.

The next twenty-five years

a survey of future developments in the Netherlands

Committee for a
General Survey of the Future

CONTENTS

CHAPTER 1. ORGANIZATION AND RESULTS OF THE STUDY

1.1. Organization and procedure

Background

1 According to the law of 30 June 1976 establishing the Scientific Council for Government Policy, the Council, among other things, has the task of 'furnishing scientifically-based information about developments which can affect society in the long run' and 'to develop a scientifically-based framework which might serve the Government in the establishment of priorities and the execution of a coherent policy'.
In the Royal Decree by which the Provisional Council was established and in the legislative proposal of 1973, similar passages appear. The Royal Decree speaks of the task of the Council 'to advise the Government about the development of society in the long run' and of an 'integrated, long-term framework'; the legislative proposal describes the task of the Council as 'to deepen the understanding of the Government about possible societal developments in the long run'.

2 In view of these passages the Council decided, soon after its creation as a provisional body in November of 1972, that, in addition to other projects, it would begin an investigation of developments which could affect society in the long run. In February of 1973, a working group of the council was charged with establishing the guidelines for an integrated, long-range planning model. This might take the form, e.g., of a consistent pattern of relationships which might or might not be quantifiable and which would have a coherent character, dealing with all sectors and facets in their interdependence. Such a model would then be used as a tool for exploratory futures research.
The working group laboured intensively for almost a year, but the proposed goal proved to be too ambitious. Various methodological questions arose which led to a discussion of the general principles of systematic futures research. It also appeared that the development of an integrated model is not possible without a distinction between fundamental and peripheral elements, which can only be made when one has at least some idea of future developments. One thing and another led to the conclusion that method and model could only be decided upon after experience with substantive futures research.

In December 1973 the Council decided not to postpone such research any longer and to start a systematic and integrated investigation of as many existing projections about future developments as possible. This project was called the General Futures Survey.

Goals

3 The fact that the project was undertaken with the express purpose of experimenting and of gaining experience does not detract from the importance of the substantive purpose. This was the creation of an integrated, long-range picture of the future for our country, based on expected trends of a number of elements that would make an evaluation of the development possible.

Further explanation is called for.

To begin with, we speak of 'an' integrated picture of the future. This means that it is not the only one nor the best one – we will return to that later. Initially, we did intend to complete a single view of the future out of the many that are possible; eventually, however, as will be apparent, we posited two alternatives next to each other.

Furthermore, there is mention of 'elements' and not of 'variables'. This is done on purpose to resist the inclination, perhaps unconscious, to restrict the field to measurable magnitudes. This indeed did not occur.

The term 'expected trends' stands in contrast to 'desired trends'. It is not the Council's task to formulate goals for society or for the Administration. The investigation of the future by the Council was in principle exploratory and not normative, and it did not rest on specific goals. This does not rule out the possibility that the Council might turn to exploratory research on the basis of various possible goals. In the present project, however, this is not the case.

4 Finally, the view of the future must lend itself to evaluation. This requirement is related to the function of the desired outcome, and it is important to explore this further.

The rationale for futures research is that it permits anticipation. Besides, it is hoped that the sketched outline of the future will evoke discussion, formulation of opinion, political decisions, and eventually policy. This process, which should take place outside the limits of the project itself, will determine whether the projected image is 'self-fulfilling' or 'self-defeating'.

In short, the picture of the future must be relevant for government policy. It has, therefore, to include at least those elements and problems which are important to that policy. This also means that one cannot address oneself to the final future situation only but must also pay attention to the intermediate developments which lead to it. Only then is it possible, after all, to draw consequences for present policy.

As is so often the case, here, too, the actual application of general principles ran into difficulties. It was not always feasible beforehand to indicate where the selected path would lead, nor on which elements it would depend, nor when problems will appear. Thus we have opted for a very general survey in the hope that specific problems would became evident in the process.

5 In conclusion, let us return briefly to the secondary purpose, that of gaining experience in dealing with the practical problems of futures research. What these are should be evident from these pages; some have already been introduced, and others will follow. In this respect, we have tried to indicate as clearly as possible what choices had to be made and how we made them. Whenever possible, we indicate briefly our reasons for those decisions, but that does not mean that another choice would not have been possible. A short review of the organization and course of the whole project can be found below.

Content

See: 2

6 As was mentioned earlier, the Council originally believed that a general picture of the future could be put together by collecting existing forecasts in various areas and by examining them from the point of view of their interdependence. The content of the project would be defined at the beginning by a list of 'relevant factors'.

Such a list is difficult to make. There is the risk that one is influenced by

present circumstances and therefore cannot recognize future problems. In principle, one has to begin with a comprehensive list; it may turn out that certain suggestions can be disregarded, but this has to come out of the investigation, and no issues should be excluded beforehand.

Following this train of thought, one has to begin with a very general check-list, so that one can least start work and become aware of the limitations as they reveal themselves in practice. The 'Classification of Administrative Goals' of the Committee for the Development of Policy Analysis could serve such a purpose. One alternative was tried which was based on the needs of the individual, and several attempts were made to find criteria or systematic directions for the construction of such a check-list. Over and again, however, it was concluded that general principles gave no basis for a clear specification.

Guidelines were finally found in a list of 16 broad categories which would all have to be considered. These are briefly listed below; originally there were further descriptions of some of the items, but these were later found to have little importance. The results of the project are the best indication of what happened to the various items. The list is as follows:

1. Protection against natural disasters
2. International security
3. Standard of living
4. Housing and residential environment
5. Nature
6. Soil, air and water
7. Health
8. Education
9. Social services
10. Labour
11. Leisure
12. Social participation
13. Social competence
14. Participatory decision-making
15. Public order
16. Communications

7 This list was originally used to decide which sectors should be considered. Item number 2, international security, was discarded early on, since it did not appear possible, within the range of the project, to give sufficient consideration to this vast subject; instead of an independent examination, a few simple assumptions were made. On the basis of later methodological choices, item number 1, protection against natural disasters, changed its character so that practice it became 'climate'. The three items numbered 12, 13 and 14 were treated as one which later got the name of 'participation and control'. Other items on the list were changed as well in the course of the work – differently described, joined with others, split off.

There is little point in enumerating the changes that have led, finally, to the organization of the central chapters.

8 In conclusion, we wish to remark that the list was meant to be a minimum with which the final results would have to comply, always based on the criterion of relevance or evaluative potential. Naturally, it could be anticipated that in their elaboration, other subjects such as demography or national income would come under consideration because they affect several of the specified areas. On methodological grounds, these other subjects were not listed beforehand; they were to be incorporated into the project automatically as the need arose. This indeed happened quite quickly.

The same holds for the values and norms which are decisive for human behaviour and thus for social development. They do not appear in the check-list of the 16 areas. The expectation was that we would automatically come up against the underlying changes of opinion in the analysis of specific areas or of previously recognized underlying factors. This indeed happened; particularly in regard to the family and to work, consideration was given to changing opinions. Relatively modest changes are involved; large, far-reaching alterations in coherent value patterns do not come into play, nor do value changes as a result, for example, of different land-use patterns. The subject is certainly of importance, but it is a very difficult one and, with the available knowledge, not too much can be achieved.

Method

9 On January 10, 1974, the Council created the Committee for a General Survey of the Future in order to bring together expert organizations and individuals, to collect futur-oriented forecasts in several areas, and to examine their interdependence. The Commission was composed of a few members from the Council and of representatives from the five bureaux which are connected to the Council by advisory membership, namely, at this time, the Central Bureau of Statistics, the Central Physical Planning Service, the Central Planning Bureau, the Commission for Research in Policy Analysis and the Social and Cultural Planning Bureau. At the time of its initial establishment, it was already planned that the membership would expand and this indeed took place.

10 It was originally thought that it would not be difficult to obtain forecasts in the various areas, and that the primary task of the Commission would be to obtain, by repeated adjustments of the individual contributions, a certain coherence and consistency. This turned out to be wrong; not only were precise forecasts lacking for most areas, but it also became apparent quite soon that futures surveying would only be successful if a common methodological and factual background were available against which the developments of the individual areas could be projected. The preparation and discussion of the separate contributions about the different sectors were therefore interrupted in order to bring together a number of fundamental assumptions which were applicable to all areas. These were set forth in the memorandum, 'Assumptions about a surprise-free future survey', of May 1975.

This memorandum contains a number of methodological points comprising the conceptual framework as well as a number of factual assumptions about developments in the outside world, like climate, population, the family and productivity. Much of this is repeated in this final report, but the population forecast has been replaced by a more recent work and the provisional sections on the family, information, inflation, business organization and the economy have been revised.

11 Subsequently, the original working procedure was resumed, i.e., the members of the Committee submitted memoranda about their specific areas, based in part on the general considerations of the 'Assumptions'. These were then discussed by the full Committee and, where necessary, adapted or revised. The secretariat of the Committee, which was provided by the Council, then consolidated them, and this has finally resulted in the picture of the future presented in this report.

Thus far, we have been describing the process involving the A-scenario. For the B-scenario, the reverse path was followed, which means that an adaption

of the whole picture by the secretariat served as the first step for the discussions.

This brief summary does not adequately recognize the amount of work which took place, and the time and care which was spent by the members of the Committee on the project. A more extensive description of the memoranda and the meetings would not, however, add much information about the method of work. Eventually the picture of the future was obtained from an informal, iterative process of repeated consultation within the Committee.

12 As should be clear from the above, the project has been implemented by a limited group of people who were each in principle responsible for one specific area or sector; no use was made of larger groups of experts or of panels. The main reason for this is that the project had to be implemented under a certain amount of pressure and had to be completed in a very limited time. At the beginning of January 1974, it was already obvious that the work could only take three and a half years at the most; the tenure of the present Scientific Council for Government Policy ends on 1 January 1978, and a project of this magnitude can hardly be passed along to successors as unfinished business. Because the work of the Committee was largely a subsidiary activity for most of the participants, which had to be undertaken besides or between other activities, and because of the fact that the Commission was only fully staffed by 1975, the time for completion was rather short.

13 At this point, an explanation concerning the responsibility for the report is in order. The text was adopted by the Committee as it was composed at the completion of the work. In particular, the substantive forecasts were accepted by the Committee, although several of its members probably think otherwise about specific parts than is apparent from the established text.

In a few instances, this is expressed in a footnote, wherein a member of the Committee has formulated a dissenting viewpoint. This does not mean that he is alone in this stand; it is quite possible that other members share his dissenting opinion, but this has not been recorded.

See: 1–8

Moreover it should be borne in mind that the Committee had been set a task by the Council. Certain basic assumptions, mentioned above, were not therefore really discussed. Moreover, the composition of the Committee did not remain unchanged over the years, and several members joined in the activities after the 'Assumptions' memorandum of May 1975 had already been written. They thereby accepted methodological starting points which they might have preferred to be different.

14 The influence of the Council was greatest in the period which preceded the establishment of the Committee. Naturally the work of the Committee, once it got started, was discussed in the Council on the basis of interim reports and accounts of the proceedings. The Council was moreover represented on the Committee and provided the secretariat. The present report by the Committee, though, is presented to the Council on the understanding that, although the Council could certainly add its comments, it would not change it in any way.

Composition of the Committtee

15 At the time of the final report, the Committee was composed as follows:

Prof. Dr. J. S. Cramer, *chairman*
member, Scientific Council for Government Policy

Mr. E. Bloembergen
Chairman, Executive Board, VNU/United Dutch Publishing Companies

Prof. Dr. H. A. Brasz
Professor of Public Administration, Free University, Amsterdam

Drs. J. C. van den Brekel
Chief, Population Statistics Section, Central Bureau of Statistics

Ir. A. Dekker
Deputy Director, Provincial Physical Planning Agency Overijssel

Prof. Dr. C. I. Dessaur
Professor of Criminology, Catholic University of Nijmegen

Drs. H. de Graaf
Associate, Netherlands Institute for Social Work Research

Drs. F. Th. Gubbi
Staff, Central Office of the T.N.O.

Prof. Dr. H. H. W. Hogerzeil
Professor of Social Health, University of Groningen

Dr. G. Hupkes
Deputy-director, AGV (Advisory Group of Traffic and Transportation, formerly Center for Transportation Planning)

Dr. R. Hueting
Chief, Environmental Statistics Section, Central Bureau of Statistics

Drs. W. P. Knulst
Associate, Social and Cultural Planning Bureau

Drs. J. Kooyman
Chief, Macro-models and Middle-range Planning Section, Central Planning Bureau

Dr. G. R. Mustert
Associate, Scientific Council for Government Policy

Prof. Dr. B. M. S. van Praag
Professor in Western Economics, University of Leiden

H. Schaafsma
Director, Cultural Council for North Holland

Dr. C. J. E. Schuurmans
Chief, Section of Forecasting methodology, Division of Meteorological Research, Royal Netherlands Meteorological Institute

Mr. Dr. I. Th. M. Snellen
Political Scientist, N.V. Philips

Dr. H. M. In 't Veld-Langeveld
Member, Scientific Council for Government Policy

W. A. W. van Walstijn
Associate, Scientific Council for Government Policy

Prof. Dr. S. Wiegersma
Professor of Industrial Psychology, University of Amsterdam

Drs. K. Vijlbrief, *secretary*
Staff member, Scientific Council for Government Policy

Mr. Schaafsma, who was a member of the Committee from May 1975, was no longer able to take part in the activities after the beginning of 1976 because of a serious illness.

See: 9

As is apparent from the above list, two of the agencies which had sent official participants to the Committee were not represented at the completion of the work. This happened because Messrs. Dekker and Gubbi, who had been sent from the Central Physical Planning Agency and the Committee for the Development of Policy Analysis respectively, changed jobs at so late a stage in the project that it was agreed that they would continue to assist under their new titles without being formally replaced.

16 In addition to the members named, we have to mention others who have taken an active role in the preparation of the report. Prof. H. A. Brasz was replaced during a long period of foreign travel, by Drs. F. Fleurke, Associate, Social Science Institute, Division of Management, Free University, Amsterdam.

Drs. J. C. van den Brekel replaced Dr. J. B. D. Derksen who was, until 1 July 1975, Chief of the Statistical Analysis Section of the Central Bureau of Statistics.

Prof. C. I. Dessaur was assisted by Drs. L. Gunther Moor, Associate of the Criminological Institute of the Catholic University in Nijmegen. Drs. H. de Graaf was preceded by Drs. G. K. Kronjee who was, until 1 September 1975, an Associate of the Netherlands Institute for Social Work Research.

Dr. R. Hueting was assisted by Drs. G. J. Baayens (associated with the National Institute of Conservation), Drs. Rookhuizen, Drs. B. Daemen and R. Meyer (Landscape and natural environment), Drs. J. J. C. Karres (Water pollution from biodegradable organic material), Drs. W. Tinbergen and Ing. P. Schaake, M. I. Chem. E. (energy consumption, air pollution, radioactivity), all associated with the Environmental Statistics Division of the Central Bureau of Statistics.

Drs. W. P. Knulst replaced Dr. H. Nauta, deputy Director of the Social and Cultural Planning Office.

Drs. J. Kooyman replaced Prof. P. J. Verdoorn, who was, until 1 September 1975, deputy Director of the Central Planning Bureau.

Dr. J. Kremers stepped down in 1 August 1977 as Chairman of the Council; until then he had taken part in the activities of the Committee.

Ir. P. G. Meyer of the National Physical Planning Agency attended in the initial phase, as did Drs. B. G. Zandstra-Andela of the Committee for the Development of Policy Analysis. Prof. B. M. S. van Praag was assisted by Drs. J. J. van der Gaag and Drs. F. F. H. Rutten, Associates of the Ministry of Public Health and Environmental Hygiene, seconded from the Economic Institute of the University of Leiden.

Further, special contributions to the project came from Drs. J. C. F. Maas, Associate of the Central Division of Marketing and Costs of the Post, Telephone and Telegraph, and from Dr. W. M. de Jong, Staff member of the Council, together with Prof. Dr. G. W. Rathenau, member of the Council.

Finally, both the secretariat and the members of the Committee have made extensive use of the opinions and knowledge of third parties. It is not possible to list all these contacts here. We mention all these contributions with gratitude. The responsibility for the final result is the Committee's, as it was composed at the time of the completion of the Report.

1.2 EXPERIENCES

17 As already mentioned, the project which forms the basis of this report was undertaken with the express purpose of acquiring experience in future research. Attention is again called to this experimental character, because our project differs from others in at least two respects. In the first place, it had no basis either in a particular ideology or vision, nor in a particular issue. Our picture of the future is not based explicitly on a predetermined model of society – either utopian or frightening – nor has a particular area, such as energy supply, been selected as a means of entry to a wider examination. In the second place – and that is related to the above – the various areas were considered on an equal footing, as were the individuals who each worked on a specific area of the project. There was no specific technique prescribed for the participants; we wanted their ideas. There were (and are) no other studies we know of which display these two characteristics.

18 We will be brief about the positive experiences with the project: it is completed and has led to this report. The judgement about the importance of this result is best left to the reader.

The shortcomings of organization and procedure which appeared will be enlarged upon, so that they can be avoided in subsequent futures research (and may such a project follow quickly!). We will successively review the expectations when we started, the organization of the project, and the procedures employed.

19 At the beginning, we thought that the project would revolve primarily around the integration of existing forecasts in various areas; it was particularly in this sphere of integration that we wanted to acquire experience. We were disappointed in this for two reasons.

In the first place, it was a mistake to believe that there would be more or less elaborated forecasts in various areas which one had only to bring together in order to begin to integrate them. These forecasts did not exist and a great deal of time and trouble was spent creating them.

In the second place, the actual integration of the forecasts in different areas was only partially successful. It was easiest where common parameters were obviously acting upon the various spheres and where there was an easy test to determine if a quantitative limitation had been met. The simplest example is that population figures, the labour-force and participation in education are mutually consistent: the figures add up, and that must be so regardless of further assumptions. As a second example, connections exist between the costs of various developments and the economy, between land-use and spatial developments, and finally between economic and spatial development on the one hand and environment and nature on the other. These connections are based on calculations, although debarable assumptions may underlie the figures. In this manner a certain consistency in the forecasts could be established for partically all areas which could be quantitatively approached.

There was also some degree of integration of qualitative judgement. Thus from the beginning, the forecasts about social welfare and health care were developed in close connection. Often, though, the knowledge was lacking to effect a harmonization of separate societal developments. Of course one can deduce certain kinds of relationships intuitively, but when it came to the test, we were unable, for example, to demonstrate how participation influences productivity or what relationship might exist between the length of the working week and the need for health care and social welfare.

The creation of a coherent societal picture, systematically tested for consistency, was thus outside our reach. This inadequate ability to integrate,

along with a number of other factors, also contributed to the fact that the two alternatives A and B differ only relatively little. Finally one finds echoes of the difficulties involved in testing the different developments for their mutual compatibility in the discussion of bottlenecks which are defined as expected inconsistencies.

See: par. 1.5

Substantive integration of forecasts regarding societal developments was an important goal of the project. In practice, it was apparent that the knowledge needed for this was often lacking.

20 At some points the integration has not been as thorough as we would have liked, due to the purely practical consideration that time did not allow it. This, in turn, was connected both with the need to combine quantitative and qualitative elements and with the procedure whereby independent experts, coming from various institutions, worked together. The view of the future is, therefore, not the result of a single model, nor was it conceived by a single mind. It was sometimes impossible to revise the fairly comprehensive computations for a particular area even if one had wanted to. For example, in alternative B, a development in regard to the family is sketched which could perhaps lead to an adjustment of the demographic forecast; whether this would make much difference or not cannot be decided as long as the computations have not been made. That, though, was found to be impossible within the stipulated time period. The same thing applies to the forecast of the world production of primary energy.

21 Further, it was our experience that the discussion of methodology, of which we have mentioned some highlights above, continued even during the execution of the project. The reason for this was that the selected points of departure offered an insufficient foundation. The choice of a general and exploratory survey precludes both a partial articulation of the problem and a predetermined societal vision as a directive element. Thus one is only sure of what one does *not* want, and such a negative formulation is not sufficient when concrete choices have to be made during the process. In that regard, it is much easier if there is a predetermined standpoint, however arbitrary, to provide a frame of reference.

22 Finally, the selected time horizon of about 25 years turned out to be too short for some areas; with hindsight, we would have set population, energy supply, countryside and natural environment in a longer perspective. This period would then have had to apply to the other areas as well, to remain faithful to the original purpose. Where a quantative approach was not possible, specific dating is often absent in the forecasts. Most of the forecasts indicate the direction of future developments without further differentiation with respect to timing: an elaboration in the sense of 'first this and then that' is already quite specific.

23 For a committee of experts who were not relieved of other work for this task, the process turned out to be very time-consuming. Almost everyone who worked on the project had another primary job and had therefore to fit Committee activities into an already busy schedule. Once the integration stage of the work is begun in earnest, the inter-connections prescribe a certain sequence, and serious delays can easily occur. And this happened — the process took much longer than had originally been planned.

In itself, this is not unusual. With futures surveying, though, the result is that new information becomes available which quickly gives cause for revising the forecasts.

If one does not deliberately resist this temptation, it is possible that the project will never end with a final report. If one does resist it — as we have

done – then it is possible that, at various points, forecasts and opinions are stated which were made one or two years ago, and which have since been overtaken.

A shorter working period for the creation of a view of the future is, from this point of view, preferable. This would be feasible by giving the work to a staff which had been specifically designated for it and which had no other tasks, or by retaining external experts who would try to free themselves from other work for a few months so that they could concentrate completely on such a short-term project.

1.3. FORECASTS, ALTERNATIVES

Expectations of the future

24 What, then, is the character of the view of the future which was the outcome of the described procedures? To begin with, it depended on the choices described earlier, and on a few methodological starting points and general basic assumptions which are presented below. Within that framework, the final result rests on the expectations or assumptions about actual developments in the future expressed by the individual members of the Committee. To be sure, the forecasts were discussed in the Committee, revised, and whereever possible brought into agreement with one another; but in the end, the basis is still the expectations of the individual experts – whose expertise is in a certain discipline, not necessarily in the future.

See: 1–8

This picture therefore reflects what future developments the Committee expects. About the *validity* of such pronouncements there is little to say; the reader will have to judge for him- or herself. One cannot even expect very much from subsequent testing with hindsight. The limitations which were introduced on methodological grounds might turn out to be in error. Moreover the picture of the future, as mentioned above, may have some significance for the administration, and this could lead to a situation in which its realization is either consciously fostered or consciously avoided. If the view of the future has a useful function, it is valid for today and it is more important that this function be fulfilled than that, later on, it comes true.

See: 67
See: 4

25 Not much can be said, either, about the *certainty* with which the pronouncements about the future have been clothed by the Committee. At best, one might consider indicating an ordering; and in a few cases, the doubts of the authors has been indicated. In general, though, we have not reiterated the obvious qualifying phrases 'possibly', 'as it would seem' etcetera, since this would have made the text unreadable. One should certainly not conclude from this absence, however, that our expectations are meant to be taken as absolutes.

The only guideline offered to the reader in forming his own opinion is that, insofar as possible, the arguments underlying the major assumptions are briefly recapitulated. At times, for example, we expect something to happen as a result of something else; often the forecast is based on a continuation of a process of change starting in the past. The reader will have to be content with this kind of justification. No new scientific research was undertaken for the project, even though at various points in the elaboration there appeared to be a greater lack of knowledge than had been suspected before – especially about the interrelations between various separate developments. Certainly in the original design of an 'easy' project, emphasizing an experimental, speedy and fairly superficial exploration, there was no time for in-depth studies.

26 Finally, the individual forecasts of each member of the Committee have not been systematically submitted to colleagues, nor has the end result been submitted to a larger circle – although, of course, the informal opinion of third parties has often been sought. There was no time for systematic consultation; as was mentioned earlier, we ran out of time as the project was being finalized.

See: 12

Two alternatives

27 The attempt to reach a consensus over methodological starting points was successful in the sense that everyone was willing – with or without enthusiasm – to accept them as the rules of the game. In regard to the actual future developments, one can continue to disagree; if reasoning and discussion cannot result in a consensus, there are hardly criteria for decisions between opposing forecasts. In the beginning, therefore, some room was allowed for the formulation of alternative assumptions about those points where reasonable doubt existed in the Committee as to whether events would go one way or another.

At a later stage, the question was raised which alternatives were weighty enough to lead, after further elaboration, to a variation of the entire picture of the future. Given the exploratory nature of the project, it was not intended to posit several visions of the future which would merit attention either as utopias or as nightmares, but only to acknowledge alternatives between which, on the basis of plausibility, it had not been possible to choose.

28 Naturally some alternative assumptions are more important than others in the sense that they have broader consequences for the development of various areas. Alternatives with little relevance beyond the area for which they are formulated might be mentioned in an aside, but major differences could only be treated properly by extensive elaboration so that finally a limited number of fairly complete pictures of the future could be juxtaposed.

Extensive discussions were devoted to the question what alternatives should be considered after it had been decided in an early stage that in any case two alternatives would be introduced in regard to economic development. Specifically, consideration was given to the suggestion of introducing a distinction in the treatment of 'life-style', or in the manner of community decision-making and the role of public administration. In further specifying what this would entail, however problems arose which could not be resolved, and so finally there remained only two alternatives which differ primarily in regard to the expected economic growth.

29 The crucial difference between these two alternatives is the growth of labour productivity and hence of real national income, both technical terms with an established definition. The fact that we adhere to these definitions is important, because it implies that we need not specify which corrections would have to be made if one should want to use these magnitudes as a meaningful measure of the standard of living. Such corrections would after all be called for insofar as the growth of national income is partly the result of a shift from housework to paid employment of women, or again of greater efforts for environmental protection. The difference between the two alternatives is thus expressed in terms of economic development, with a reservation about its significance for the standard of living.

In the elaboration, the accent was shifted from the growth of productivity to the growth of production, which is of course subject to the same reservation. For the period until 1980, no alternatives are introduced; for the period after 1980, alternative A is based on a persistent growth of production of 3%,

while in alternative B the growth rate declines gradually until it reaches zero by the end of the century.

This is the most important distinction, but there is more to it. Economic growth does not occur by itself; it has all kinds of consequences, and also certain causes. The growth of production is a simple and vivid characteristic to distinguish between the two cases, but this development is not autonomous and is itself the result of other factors. The difference between the two alternatives will have to be further elaborated.

Dr. R. Hueting appends the following:

The alternatives A and B form, in fact, lower and upper limits to the expectations in regard to the growth of production between 1975 and 2000. In elaborating the alternatives, we have come to the conclusion that both limits are much too high. The following arguments support this point of view.

1) In support of the 3% growth of productivity in A, it is claimed that this percentage is about 50%lower than the growth-rate of 1960s. The 3% is, in fact, applied to a volume which in 1975 is almost twice as high as in 1960. In the A-alternative, this volume increases between 1975 and 2000 by a factor of 2.3; in the B-alternative, by a factor of 1.6.

2) This enormous increase in the annually produced and consumable amount of goods and services is reflected in a decrease of open space and in the fragmentation of the countryside. We consider it unlikely that the population will be willing to accept the increase in the volume of goods in exchange for such a large limitation of spatial functions and an impoverishing of nature and landscape.

3) The assumption of a rapid introduction of optimal purification techniques of air and water is extreme. Even with this extreme assumption, there will still be an increase in emissions and in violations of the standards for concentrations of some polluting substances. It is unlikely that this will be tolerated.

4) In our view the chances are large that the supply of energy will not be able to keep up with production growth, as a result of the shortages in the supply of oil and gas, the growing resistance to the construction of breeder reactors, the difficulties and time-demanding character of the transition to coal and of the introduction of solar energy, and the labour-intensive character of the energy conservation programs.

Also on these grounds, we deem it unlikely that the production level in 2000 will be higher by a factor of 1.6 to 2.5 than in 1975.

5) In the prediction of industrial growth there is no differentiation according to type of industry. Regardless of the availability of resources, an increase in the entire production by a factor of 1.6 to 2.5 between 1975 and 2000 can only be attained by a higher growth in specific sectors such as the chemical industry. We think it not unlikely that there will be problems of distribution and of over-capacity in these specific sectors of industry as well as in agriculture, because of which the expected growth will not be reached.

On the basis of these points, we consider a more rapid stabilization of production probable than is presented in the B-alternative.

30 In case A, there is continuing economic growth of about 3% per annum accompanied by satisfactory employment opportunities. Underlying this development, which naturally pervades many other spheres, is the expectation that much new employment will be available in the services sector. Because the growth of labour productivity is smaller in this sector than in industry and agriculture, this in itself leads to a slackening of the growth-rate which at 3% p.a. is considerably lower than in the preceding decades. This also reflects the forecast of a certain shift in demand and of saturation in international trade; and it leads

to a reduction of the increasing deterioration of nature and the environment, without, though, implying a change for the better; after all, the level of production activities still continues to rise.

Alternative B is based primarily on the expectation that this last development either is not possible or would not be accepted. The gradual leveling-off of growth which would reach zero around 1990 is attributed to an increasing awareness that the environment and nature can or may no longer be so disregarded.

Limitation of growth will in fact be forced by reaching natural limits and by legal measures which will reflect this attitude. Concern for the environment is deeper in alternative B than in A. At the same time, along with this, there will be a change in the labour supply, which is based on a different attitude towards work. In the elaboration, it is also assumed that within the family there will be another division of rôles between the parents. In comparison to alternative A, these changes in environmental concern and labour-supply lead to the decline of economic growth suggested earlier.

Drs. W. P. Knulst thinks it improbable that the gradual decline in the growth of labour productivity after 1980 in alternative B will come into being primarily the result of primarily spontaneous changes of attitudes towards work and production which now – according to recent polls – are held only by small minorities of the population. No more probable does he find the concomitant expectations about equally spontaneous changes in the division of roles between men and women in the family and the related changes in consumption patterns. Conditions necessary to effect the changes expected by the Committee in the orientation of labour and in consumption patterns seem to him to mean an intervention of the part of the government, for example, in the distribution of jobs, in the distribution of income and in the forms of consumption which, from the viewpoint of the environment or of energy supply and use, could be damaging. With the exception of the latter, the Committee expects no interventions other than a directed influencing of behaviour by means of education and the mass media. The picture presented by the B-alternative is, therefore, according to him, founded on a weak basis, because it is virually dependent on spontaneous changes in mentality.

31 We confine ourselves here to the initial differences which lead to the divergent courses of the two cases; for the consequences, we refer to chapters 3, 4 and 5. Two additional comments are, however, in order. First, it should be recognized that each alternatives implicitly assumes a comparable development in the neighbouring countries. Economic development in our country is too much bound to the course of events in the outside world that neither alternative is conceivable without compatible expectations about developments in the countries with whom we trade and compete.

See: 95

Secondly, it is to be noted that neither of the two cases has an extreme character. In alternative A, there is no implication of maximum economic growth, and in B, the deterioration of nature and the environment does not entirely cease. The choice was made for alternatives which differed in only relatively narrow ways in the hope that, in this fashion, the consequences, although modest, would still reflect realistic projections.

32 From the beginning, a deliberate choice was made to work out both variations fully and to posit them next to each other. Any suggestion that one alternative constitutes the principal case while the other is less important or less likely would be inappropiate. As will appear shortly, however, the differences turned out to be too slight to warrant presentation of both cases in their entirety, one after the other: a major part of the text would consist of repetition.

After due consideration, we decided to devote chapters 2 and 3 to develop-

ments that are common to both cases, and chapters 4 and 5 to those areas where differences occur. Even then substantial repetitions remain which could not, however, be avoided in the interest of a complete presentation. We have tried to help the reader by typographic indications.

1.4. Summary of the two cases

33 The picture of the future which follows has come into being by bringing together divergent expectations in various areas. That process was based on a few conceptual assumptions which, of course, contributed substantially to the results. Still we did not go so far that from the beginning the participants of the project were given a complete, if broad, picture of the future in which they would only fill in the details. If we now, in this summary, sketch a broad outline of the results, this is an interpretation which was subsequently derived from the projections. It is difficult, in this regard, to decide whether these broad lines were established by the choice of the conceptual assumptions or if they represent the common denominator which evolved tacitly during the process of integrating the individual insights.

34 The selected points of departure are, of course, responsible for the absence of sudden, shocking changes and for the fact that, in both alternatives, the future is initially characterized by the continuation of developments generally recognized at present. This holds particularly in regard to the environment, land-use and the economy. In the future, the same bottlenecks will be present that we are already aware of, although there may be slight nuances of difference.

35 The deterioration of the countryside, nature and the environment will continue. In regard to environmental pollution, in case A there are certain aspects, such as water pollution, which will show some improvement and, moreover, the pace at which pollution increases will be reduced. This is the result of a vigorously expanded effort on the one hand and of a smaller rate of economic growth on the other. In case B, in addition to some improvement in water pollution, there will also be a slight improvement in air pollution compared to 1975.

In regard to the countryside and the natural environment, the situation is quite different. The deterioration in this area is the result of long-standing cumulative processes, and a slowing down of economic growth only means that the deterioration will proceed at a somewhat slower pace. The long range elaboration indicates that the growth-rate in the two alternatives will only begin to diverge substantially after 1985, and this will have no significant effects within the period under consideration.

The shortage of space, also, will become steadily more serious and the need for a more interventionist regulation of land-use more imperative. In alternative A, this is hardly effective and we expect that housing, the growing number of cars, the addition of roads and other constructions and strongly increasing pressure for outdoor recreation will all continue to demand more space; only in regard to recreation is effective regulation envisaged. In alternative B, this process is tempered after 1985 by the declining growth of income and by policies which are more directed to the protection of nature and the countryside. In this regard, though, it is not possible to undo the cumulative damage of the past. Still there will be a noticeable difference between the two alternatives in regard to land-use by the year 2000.

36 One of the starting points for the alternatives regards economic development. In case A, continued growth is projected after the economy recovers in the coming years. The rate of about 3% annually is, though, lower than in the past.

The major question in this respect is how enough employment opportunities will be created. We expect that this will happen though vigorous growth in the services sector, combined with a resurgence of self-employment, which will be made possible in part by a significant expansion of social security to the whole population, whether employed or not. This completion of the collective character of a whole range of facilities leads to a further expansion of government intervention, also in regard to the financing of investments. This development implies that the public is willing to accept continued growth of the collective sector and of public income transfers.

The comprehensive transformation which this entails will become apparent between 1980 and 1990, because the need for new employment opportunities for the generation entering the labour market will then be felt at its strongest. Even so, the forecast growth in this alternative will still leave room for a modest annual increase in the standard of living, even after allowing for the large expansion of the collective sector.

In case B, a similar development is expected, accompanying a gradual decline in the growth rate after 1980, which has an even more problematic character. We indeed take account in this alternative of a more limited increase in the labour supply and of the fact that investments will make smaller demands on available funds, but this will in no way remove the problems. The shift in demand towards services which is expected between 1980 and 1990 will be more difficult because of limited growth of income; and the growth of the collective sector in the final decade will be accompanied by a real decrease in the funds available for private consumption.

37 A substantial difference is shown by the two alternatives in regard to energy consumption. In case A, this will increase until in the year 2000, it is 136% higher than at present; in case B, the increase will be 51%. In both cases conservation measures are taken into account; the difference is directly related to the more limited economic growth and to a decline in the use of automobiles in case B.

38 Effects of changes in the size and especially in the composition of the population are of very great importance in several spheres. In addition to the impact on the labour market, which makes itself felt 1985, there is a decrease in the number of pupils in education, and, more generally, a shift in age structure whereby older groups will become more important and the preponderance of the young will decline.

39 The specific consequence for the labour market is that the supply will increase sharply in the beginning of the 1980s. This is partly the result of a larger supply of married and divorced women; not only will they increasingly wish to work, but this desire changes character in the sense that, much more than at present, they will want a genuine career. This applies about equally in both alternatives. In B, however, a change in the attitude towards work will occur around 1980, with the result that the supply of labour, particularly of men, will increase less rapidly than in A, because some of them change to part-time work.

40 According to our expectations the social and cultural development will be marked by a continuing dismantling of the traditional social networks on almost every level and in almost every sphere. For society as a whole, this means an increasing diversity, a progressive fragmentation into groups with divergent opinions and attitudes, which will coexist on an equal footing with each other. Divisions according to social status and religious affiliation will become continually less important; division into established groups, each with a clearly defined profile, will disappear; instead there will be a situation of changing

coalitions in which groups find themselves on either side of the dividing line, depending on the issue. Even the smallest unit, the nuclear family, will decline in societal importance, although this varies in degree between A and B.

This development is reflected in a larger degree of freedom of expression and independence of the individual, related to a continuing increase in participation in education and to the enduring influence of mass communications.

In the sphere of education, we expect a certain adaptation of the structure to the new tasks which will be assigned to it. This adaptation of structure will aim at achieving even further individualization, whereby the individual student will be offered a larger choice in regard to his curriculum. The costs of education will show only a small increase. In regard to mass communications, we expect these to be directed increasingly to the provision of information to special, distinct groups. This would be a result of the earlier suggested tendency towards a greater diversity.

41 All this has many consequences.

In the first place, we expect a further expansion of government intervention in almost every area. The character of this will change, though, from regulation from above to consultation and negotiation with the many groups which are affected by the decisions. This is related to the increasing out-spokeness of the individual and to the absence of tighly-knit groups who can support, in the longer run, a coherent policy which is pursued at the national level.

There will thus be a tendency towards the decentralization of decision-making, which will be influenced more and more by competing participation of groups with divergent interests. Control of society by the execution of policy defined at the top will give way to a process of consultation and negotiation which will take place in regionally and functionally decentralized units.

Outside the administration we expect a similar transformation in the regulatory process. This will entail a larger measure of interlocking among enterprises, a greater degree of participation by employees and by interested public groups in the enterprise, with a place as well for the government between the parties, as representative of the interests which are not defended by any of the other organizations. A hierarchy based on authority will make way for a functionally-oriented management structure.

In alternative B, there is the additional consideration that the decline in economic growth because of environmental concerns, even if accepted by the public, will entail the same kind of pervasive government interference as that indicated above.

42 In both cases, a weakening of the function of the family is indicated, as well as increasing full-time work by married women, greater frequency of divorce and increasing numbers of single-person households. In A, this development stretches out over the whole period and over the whole range; in B, it will have a different character. There the family will retain its importance in the phase during which the children are reared; and the increased participation by women in full-time work will go together with a changed division of parental roles and with increasing part-time work by men. In broad lines, in both cases, there will be a tendency towards the individualization of fiscal regulations and of social security which will reinforce the whole process. In A this will apply over the whole range, also to the families with small and adolescent children.

In alternative A in particular, the need for social services and assistance will increase and new structures will take over the functions which until now have been performed the family. This will have consequences for social services, which will be expanded and made more professional, and for social assistance

and health care. It will also reinforce the need for expansion of social welfare facilities: collective transfers will replace direct income transfers within the family and household.

In alternative B, social assistance will undergo a shift towards the informal provision of services within the district and neighbourhood, with volunteers playing a larger role.

43 In case A, the described course of events is linked to an expansion of the (commercial) services sector, which was mentioned earlier. In B, there will be less need for this, and the growth of the service sector will be correspondingly smaller. Finally, in both cases, there will be an adaptation and generalization of assistance, whereby health care will become a component of a broader type of assistance which will also be concerned with psycho-social needs. We expect that this adaptation will eventually come into being, although with difficulty and more slowly than would be necessary for an adequate level of assistance. With all of this, increasing government activity will contribute to control of costs.

44 In this summary and in the more extensive description of the future in the following chapters as well, it is noticeable that the two alternatives differ very little. This is partly the result of the procedures adopted and of their short-comings; partly as well, it is a valid result of the survey.

Before we explain this more thoroughly, remember that the principal difference between the alternatives lay with the course of economic growth. This difference was in large part attributed to differences in expectations about what the environment will tolerate, and to a lesser extent, to a difference in labour supply. This latter is attributed to differences in attitudes and opinions, not only about work, but also about the family.

In further elaboration, the rate of economic growth has direct consequences for energy, land-use and certain forms of environmental pollution. Along with work and the household, recreation and the social services also will change in character. For the rest, the picture of the future in both cases differs very little.

45 As with the integration of the various spheres into a single picture, in the elaboration of A and B it turned out that the insight, for example, about the consequences of a certain growth of consumption, was inadequate. In a few cases, there was no lack of ideas of the means or the time, such as the (unaccomplished) revision of the population forecast in B.

46 In the second place, the similarity between the two cases often comes about because they are formulated so broadly. In several areas we limit our consideration to a high level of abstraction and to strongly aggregated quantities; that *at that level* there are no differences does not mean that there would not be some in a more detailed consideration. Good examples of this are that the differences in employment are barely worked out for distinct professions, and that no attention has been given in education to the division by discipline in the tertiary stage. Because of this, changes in regard to labour do not result in changes in education. Also in the sphere of control and organization of society, the highly abstract level of discussion practically precludes a differentiation between A and B.

47 The next point is that the two alternatives are the same until around 1980 – this was done deliberately – and only after that do they begin, slowly but surely, to diverge – and this while the horizon of the present study lies around the year 2000.

These substantive and procedural reasons together led to the result that slow and cumulative processes in both cases could barely have different effects –

the difference would only appear after 2000; at least, that is what one might surmise.

A striking example of this is the narrow differentiation in regard to landscape and the natural environment. That this difference is so limited, at least until 2000, between a 3% economic growth rate and one that declines to zero, is unexpected. In education as well, although to a lesser extent, it is a question of slow and gradual processes which only after a much longer time-period are really affected by what has happened elsewhere.

48 Finally, it must be understood that the capacity to provide labour-intensive activities is not nearly so sensitive to the rate of economic growth as one might think, because real labour costs rise and fall proportionately to the real standard of living of the whole population. The *relative* burden of labour-intensive services, therefore, does not vary a great deal between the two alternatives. For education and health care, there are additional factors which will favorably influence costs. In education this is the demographic change by which the number of pupils will decline. For health care, a strong control of costs by the government is assumed. That there will be no differences caused by economic considerations in these areas is, to be sure, dependent on these specific assumptions, but it is still an unexpected result of our research.

1.5. Bottlenecks

Introduction

49 In the passages in the directives of the Scientific Council for Government Policy dealing with insight into future development, that insight is always connected with monitoring *bottlenecks*. The precise meaning of this term is not laid down, although it is obvious that it refers to unfavorable developments which are of particular importance for government policy.

This point deserves further attention because we have indeed attempted to fulfill this monitoring function by indicating which problems will arise in the view of the future that we have obtained. There are various possible interpretations and we will discuss these briefly first and then indicate which concept we finally accepted.

50 In the first place, one could expect that a futures survey would indicate evident *catastrophes* such as floods, wars or epidemics. That such disasters should be avoided or minimized goes without saying; just as true, though, is that they have a sudden and virtually unpredictable character. The best we can do in this regard is to point to the threat that they might happen.

51 In the second place, there might be a question of *undesirable developments* in the light of societal goals for which the government already carries the responsibility or might do so in the future. This additional phrase indicates that, in regard to this category, differences of opinion can easily exist about whether events are relevant to government policy or not. Also, the very question of what is undesirable evokes differences of opinion. In spite of this reservation, it is still possible to label a number of developments as bottlenecks in this sense, because there is (practically) consensus about their undesirable character. This is true, for example, for unemployment, environmental pollution and the desecration of nature.

52 In a view of the future which stretches out over a long period of time, one could also argue that developments should be judged by goals which will hold in that future. On good grounds one can suggest that it is important to anticipate changes in societal attitudes.

Now we have at times, within the framework of this study, allowed for changed attitudes, but this does not mean that we are prepared to judge developments by goals that do not yet exist; we have in fact abandoned this idea.

The principal reason is that we were unable to indicate how the goals would change from the present. In the final analysis it is, moreover, doubtful if it is at all possible to judge a development by goals which are still in the offing; they are difficult to pin down, for it is not really possible to distantiate oneself from attitudes prevalent today, particularly in regard to goals and to criteria of what is undesirable. All the same the present Report offers others the possibility to shape a coherent picture of the consequences which would occur in the various societal sectors if they should want to realize other, diverging values or goals in one of the areas under discussion.

53 In the third place, it is possible that there might be *factual contradictions* between the forecasts for various areas. Such a potential contradiction would have to be solved in due time. How that happens is often a matter of government policy.

54 If one looks over the list of bottlenecks which follows below, then it is often a matter of choice whether one and the same point is seen as a threatening disaster, as an undesired development or as a contradiction. For example, it is obvious that a contradiction exists between the expectation on the one hand that our country-side will not be further despoiled and on the other that the demand for open-air recreation will be satisfied. If one accepts that nature will get the worst of it, that is an undesired development; if one accepts that this will not happen, then there is the danger which still threatens and which can be avoided only with difficulty. Moreover, in the latter case, this is also an undesired development in that the demand for more recreation will not be satisfied.

55 In this case, there is obviously a bottleneck, even if it is not possible to categorize or define it precisely. Presumably there is always an element of contradiction or potential contradiction involved, because, in our view of the future, many serious problems are solved by much too simple assumptions.

See: 67

This procedure, which only became apparent with hindsight, rests on the same reasoning which from the beginning put great disasters outside consideration on methodological grounds. If a picture of the future indicates that in 1985 there will be a world war into which our country is drawn, then this single event dominates all the rest and only a partial analysis will be developed for a very specific situation. Exactly the same is true for less sudden and spectacular events, such as a gradual but irresistible increase in unemployment until this would include more than half the population of working-age in the year 2000. It is obvious that in this case as well there is not much of importance which can happen in any other area.

Developments which are too extreme are therefore usually avoided on these – seldom explicitly stated – grounds, with the result that many future difficulties are all too easily assumed away. The danger of course is that such a solution cannot be realized. The problems then turn up in the list of bottlenecks.

56 In various respects, a serious reservation has to be made in regard to the signalized bottlenecks. On the one hand, as a selection of relevant points for future policy, they form the main substantive result of the project. On the other hand, the reader should realize that they are just as limited and uncertain as the view of the future upon which they are based. In regard to the limita-

tions it has already been indicated above that sudden disasters have been excluded on methodological grounds. As will become obvious, a second limitation is that the view of the future is restricted to the Netherlands, and that developments in the outside world are taken care of by relatively simplistic assumptions. In the third place, our survey does not stretch beyond the year 2000. Bottlenecks which will occur after that date cannot be extrapolated from our picture and are not listed, even though, on the basis of a partial analysis, it can be surmised that they will appear. This is particularly valid with respect to population change in regard to size and age-structure, with respect to the supply of fossil fuels and in respect of the dangers related to nuclear energy in alternative A. We would, however, violate the basic premises of the project if we were to abandon the framework of a coherent and comprehensive survey by suggesting bottlenecks in these areas considered in isolation.

57 The uncertainty of the view of the future, and thus also of the bottlenecks, has been stressed. We repeat this with more emphasis in the formulation of the bottlenecks than in the pictures of the future, where we are satisfied with a once-for-all reservation. One last reason for looking at the bottlenecks with some reserve is the general and comprehensive but also fairly broad and superficial character of the present survey. Precisely because it is important to present the bottlenecks concretely, they have sometimes acquired a more specific character than the broad nature of the survey would warrant.

The result of all this is that one should look at the bottlenecks more as major points which merit further consideration than as direct points for policy-making. Our list is not exhaustive and the analysis given here will time and again have to be confirmed before it can play an actual role in policy making.

Results

58 From the two views of the future, a number of bottlenecks arise which are the same for both; these follow.

See: 137, 281A, 281B

a. Within the labour sector, there is a large discrepancy between whishes in regard to work-content and the organization of work. The level of training of the labour supply will become higher and with that the demands of employees regarding the content of work will also rise. These cannot be adequately met by autonomous developments in the labour sector. Only a far-reaching rearrangement of work, with a redistribution of the inevitable, tiresome jobs and of the intrinsic aspects of work can offer a solution. The rearrangement will be difficult to effect, and the discrepancy noted will still exist in 2000.

See: 169, 170

b. Individual assistance will not be adequate to deal preventively or restoratively with complaints and their origins with a societal component. Because of changes in the nature of the complaint, it will be necessary to adapt the assistance through more intensive collaboration between the general practitioner and other first-line social workers through a change in attitudes and through changes in the organization of the training for the various welfare systems. This will only happen with a great deal of trouble and effort and more slowly than is necessary for an adequate provision of assistance.

See: 216

c. When the demand for higher education increases sharply after 1980, capacity problems will arise because the necessary reorganization of the educational system will not have been completed by that time.

See: 131 ff. especially 137, 138, 139, 144

d. It is very questionable whether a new system for the regulation and control of society will have been inaugurated in time, gradually replacing the existing system which is losing its legitimacy. The traditional hierarchical

structure will be replaced by one that offers room for negotiation and consultation among all the interested parties. This fundamental change in the organization and method of decision-making i) in businesses and other organizations will run into strong opposition from the established interests, ii) in the government will be in opposition to existing opinions about political responsibility and the role of the central government, iii) will often cause a problem among the rank and file because of the representative character of participation in the new system. Because of this, the legitimacy of the new system will be endangered.

See: 145, 146

e. The certainty of the law for the individual will be diminished, even though equality before the law will increase. There will be fewer fixed rules than at present, more room will be given to individual initiative, but the results of the process will be more uncertain for all of the people involved.

See: 249

f. Public opinion about the continuing increase in criminality means that the call for heavier punishments will not be silenced. This is in contrast to endeavors towards further humanization in the administration of criminal law.

See: 177, 240, 251, 347A

g. The protection of personal privacy will be threatened by two developments, namely by increased pressure, on technical and economic grounds, to link data systems which contain personal data, and by the reaction of the government to increasing political criminality.

59 Secondly, there are a number of bottlenecks which appear in both variations but which show some difference in effect or in weight. This applies to the following points:

See: 284A, 284B

h. The suggested economic growth will be heavily dependent on the fight against unemployment in the immediate future and on the creation of jobs in the services sector in the longer run. It is uncertain whether the attempt to push back unemployment to 150,000 in the next five years will succeed and whether it will be possible later to create enough new jobs. If this is to happen, a strong shift towards services in consumer demand in our country will have to occur, and also in the outside world; the exports of services will have to increase sharply, even more so since the benefits from our natural gas resources will decrease.

These shifts towards services will be larger in case A than in B. If they do not happen, then the path will lead either to unemployment, an unfavorable balance of trade and less economic growth than even in case B, or to a stronger growth than in case A, particularly in industry – with all of the concomitant consequences for the environment and for energy consumption.

See: 275, 276A, 276B

i. Even if the goal of reducing the number of unemployed in the next years to 150.000 does succeed, there will be serious problems in the labour market in the period between 1980 and 2000. In the first half of the 1980's, the growth of the labour supply will outdistance labour demand. Moreover, for the whole period it will occur more and more often that persons with certain skills will not be able to find appropriate employment. In the middle of the 1980's we expect that there will be a surplus in educational and medical personnel, for example; in contrast there will be a shortage of people for less skilled jobs. The increasingly high standard of training of the labour supply means that generally people will have to take jobs which call for less training than they have.

There are other specific problems connected with this. In case A, more and more married – and divorced – women will want to take an active role in the labour process, but they will not always be able to succeed. Particularly when

there is a surplus of labour, there will be much hidden unemployment in this category. We estimate this for 1980 to be about 125,000 people; it should, however, disappear before 1990.

In case B, the labour market problems will come from another direction, namely in regard to part-time workers, both men and women. In the long run, too, these groups will have problems even after the difficult years for the labour market during the 1980's because the organization of employment will be insufficiently oriented towards the needs of the part-time worker.

See: 342A, 342B

j. There is not enough space; perhaps this can be better expressed by saying that recreation, suburbanization, expansion of the infrastructure and industry will demand a great deal of space at the expense of natural environment areas and agricultural lands, and that the quality of the remaining open land, moreover, will be unfavorably affected. This development will speedily lead to limitations on the expansion of outdoor and sojourn recreation. This bottleneck is worse in case A than in B, in the latter case, gradual stagnation affects the growth of income, and therefore suburbanization, mobility and the concomitant demand for recreation.

See: 89, 109, 310A, 310B, 311A, 311B

k. For various reasons, it is possible that energy consumption in our country will not be able to increase in accordance with the anticipated demand. In the first place, there will be many difficulties when our country in due time has to change from domestic natural gas to imported energy. The transformation of the fairly abundant coal into electricity and/or gas will cause problems in regard to space and environment. In the second place, the possibility exists that energy consumption itself, because of the dangers which threaten the climate both nationally and internationally, will have an upper limit. These difficulties appear in both alternatives. In case A, there is the additional consideration that, in order to provide for the rapidly increasing energy needs, an expansion in the number of nuclear reactors is foreseen, but this might not happen because there would be too many objections.

See: 345, 346A, 346B, 347A, 347B, 376A, 376B, 377A, 377B

l. Economic development will lead to an increasing violation of nature and of the human habitat. The diminishing and fragmentation of natural and agricultural areas, together with an intensification of agriculture will lead to a serious decline in the number of plant and animal species.

The environment of people, plants and animals will be attacked by air and water pollution. The discharge of hydrocarbons and nitrogenoxide will increase the change of smog, and the increasing discharge of sulphurdioxide will lead to the violation of established standards.

In regard to fresh surface water, until 2000 the effluents of sewage treatment plants will continue to contain phosphates which, by accumulation in the mud, will form a continuing source of eutrophy (excessive nutrients). This in turn will lead to a far-reaching decline in the number of plant and animal species in the water. The discharge of heavy metals and of persistent compounds which accumulate in organisms and food chains will increase still further. The increased discharge of coolant water will raise the chance of botulism which can also be dangerous for people. Finally, the chance of calamities, as a result of the storage, transportation and processing of chemicals and fissionable materials, will increase because of the steadily larger scale on which these activities will take place.

Naturally, these things are more pertinent to case A than to B; thus, for example, in alternative B, there will be a slight improvement in air pollution in comparison with 1975, but the differences are smaller than would perhaps be expected.

There are two reasons for this. The first is the fact that, even in case B, the level of most productive activities will increase, even though the growth-rate declines. The despoiling of countryside and natural environment and some

forms of environmental pollution will not decrease but will only increase at a slightly slower pace.

The second reason is that in many areas the effects will only become noticeable in the long run, as a result of the process of accumulation. This means that, even when there will be an obvious change for the better, the results for the countryside and natural environment will only become apparent in time.

Within the period until 2000, the distinction between the two alternatives for countryside and natural environment is only slight.

See: 129, 130, 147, 343A, 343B

m. The isolation of individuals will increase sharply. This is the result of a number of developments which reinforce each other. We mention changes in the family: there will be individualization, married women will go out to work more often, there will be more divorces. Additionally the shrinking of the family-size, the increasing number of the aged, and the new life-style will mean more loneliness. Further we expect that the traditional networks of social integration, such as the confessional groupings, will lose still more importance. This change will be more striking in case A than in case B. The difference is that the individualization in case A also holds true for the family during the initial period of child rearing. In this case, even for the children, there will be an increasing isolation of the individual. They will become independent at a younger age, and juvenile delinquency will also start at an ever earlier age. In case B, the family in this phase will remain more intact, and this alternative offers district and neighbourhood contacts as a modest compensation for the disappearance of the traditional networks of social integration.

See: 212, 213

n. In many areas, the accessibility of schools for childeren will decline and the choice among schools of different confessional or educational leanings will be seriously limited. Educational changes will mean that the primary and secondary schools will become bigger while at the same time the number of children of school age will decline.

This development, which will be particularly apparent at the end of the period under consideration, will be reinforced in case A by continuing suburbanization. In case B, this will be less important.

60 Then there are two bottlenecks which are specific for case A.

See: 320A, 324A, 343A

o. Continuing suburbanization will lead to a loss of function for the older cities where the population which will remain behind will have an unbalanced composition. For those who leave, the need for more transportation will increase. To a large extent, this will be provided by one or more automobiles per family. If the road-network is not expanded accordingly, (and this would entail high costs), traffic congestion will increase. Walking and bicycling and public transportation will be in difficulties, so that those who have to use these modes will come into steadily worsening circumstances. This bottleneck will not appear in alternative B because both suburbanization and private car usage will be discouraged by the declining economic growth.

See: 156, 157, 158

p. The family will not adequately adapt to the striving of married women for a place of their own in the labour market. Married women, increasing numbers, will want satisfying work outside the home, and this preference will be reinforced by the social and fiscal legislation directed to it. Insofar as women succeed in their desires for careers outside the home, they will be burdened, because, in addition to their jobs, they will still retain the primary responsibility for family and children; there will not be enough day-care centers for the children.

In case B, by contrast, precisely in this phase of child-rearing it is expected that the family will remain intact, with a change in the distribution of parental roles.

61 Finally, there are two bottlenecks which are specific for case B.

See: 238, 285B, 378B

q. In this alternative, economic growth is moderated because of environmental considerations. This will require, for implementation, far-reaching government intervention; yet within the period under discussion it will not have any striking results in the desired sense. Such a policy will set high demands on the understanding of the public. The major question here is whether the population will continue to go along with the balancing of environmental interests against economic growth as it is projected in this alternative. If that does not happen, then this will lead either to greater economic growth, with all the contingent consequences for the environment and for the demand for energy, or to a decrease in production which would work favourably for the environment but would drastically reduce the standard of living.

See: 296B, 305B

r. In this alternative, in the decade from 1990 to 2000, there will be decline in real consumption volume of about 1% annually. The question arises as to whether, under these circumstances, the expansion of social insurance and the (fairly moderate) increase in the share of the collective sector can be realized.

CHAPTER 2. CONCEPTUAL FOUNDATIONS, GENERAL ASSUMPTIONS, EXOGENOUS DEVELOPMENTS

Introduction

62 In this chapter, a number of assumptions and expectations are brought together which are common to both alternative pictures of the future. It first contains a few methodological starting points which were established at an early stage, as were a number of general assumptions adopted largely on methodological grounds. In stating these we have attempted an explicit formulation of limiting assumptions which are often considered so self-evident that they are tacitly adopted. As the reader will see, one is quickly driven on methodological grounds towards certain substantive decisions. We close with factual expectations about exogenous developments in the outside world and in the climate. These are the same for both alternatives because they are not sensitive to events in our country. In regard to national defense this is not necessarily so, and it was a deliberate choice on our part to assume that developments in this area are largely determined by events in the outside world. Once that choice had been made the subject belongs in this chapter.

2.1. Conceptual foundations

Futures surveying

63 As the first, most general statement, we mention that our expectations were determined by the conditions and attitudes which prevailed at the time of their formulation. The whole organization of the project is time-bound because the people involved in it were simply not able to isolate themselves from present society. In some sections, it is true, account is taken of changing values and changed behaviour, but it was not possible to distantiate oneself from the presently held values and norms throughout. In this sense, the present report teaches the reader more about 1977 than about 2000.

See: 4

64 This strong bond to the present holds equally well for the factual situation. As stated earlier, we want not only to outline the final circumstances in the year 2000 but also the evolution which leads there. This means that the forecast future begins in the present. In practice, this has important consequences.

65 Future expectations very often rest on assumptions of continuity, of the continuation of certain characteristics of today and yesterday. It makes a big difference, though, to what phenomena these assumptions pertain. One can assume that the *circumstances* do not change (extrapolation of zero order), that recent *tendencies* continue (trend, extrapolation) or that certain *relations* or *behaviour patterns* remain unchanged (causal models). It also makes a difference if one applies these assumptions to absolute quantities (for example, the number of invalids), to ratios (absenteeism in percentages) or other statistics (length of nursing care). The assumption of continuity does not at all preclude significant, though gradual, changes in the situation.

Deliberate rupture of the continuity by considering extreme and sudden changes, however, belongs to contingency planning.

66 Another characteristic of most predictions is the distinction between a

limited number of variables, the interplay of which one carefully examines (the scenario) and a broader context which is generally left unchanged or which is not dealt with at all. This is the case not only for many traditional economic, land use and demographic predictions but also for many scenarios. It is indeed so difficult to imagine changes that one often confines oneself to the most obvious elements. The school of Forrester – the 'system dynamics' school – goes furthest in the attempt to 'cut loose' from present circumstances by making everything in the model in principle variable. But even these models contain only a limited number of variables selected from specific areas. Moreover the question arises whether the results which have been obtained in this way can be considered as predictions; this is usually denied. It is rather their function to indicate what bottlenecks will appear under certain conditions.

67 Constraints of time, manpower and imagination led us to impose two limitations on this general, coherent futures survey.

In the first place, we gave no thought to sudden and extreme happenings with far-reaching consequences such as the beginning of a new ice-age. As far as is known, the chance that this event will occur is very slight; but if this were not so, we did not see any sensible place for the assumption that our country would become uninhabitable by, say, 1980. The survey would thereby lose its general character. We will try in what follows to indicate explicitly what limitations this entails, although we will not completely succeed.

In the second place, we will be biased towards the existing situation. Certainly, we consider the obvious and known tendencies and relationships, but in cases of serious doubt we opt for the continuation of existing circumstances. These two limitations together are indicated in earlier memoranda as 'surprise-free' constraints; experience has taught, though, that this term evokes misunderstanding.

68 The reason for these constraints is that we really could not do much else. The first one flows from the continuity principle; the second offers a way out in case of doubt. It might be possible in the latter case to introduce alternatives, but if that happens frequently, the number of combinations quickly becomes unmanageably large. It is also very difficult to figure out whether various changes in divergent areas are mutually compatible.

We opted thus for a broad picture of the future based on continuity rather than for a specific prediction in a narrower area or for an unmanageable number of alternatives. This may be disappointing. Does such a timid survey of the future have much point? We shall see; even with the exclusion of fundamental changes it can point to future problems.

69 Until now we have discussed the two constraints consciously introduced at the beginning of the project. The first (exclusion of disasters) is based not only on the principle of continuity but also on the reasoning that the general character of the survey would be lost if we considered catastrophes.

With hindsight it appears that this reasoning, even though not explicitly, also played a role in regard to events which occur less suddenly than an ice-age or a world war. Indeed, a high degree of unemployment, for example, would dominate the picture so strongly that it would get an extremely onesided character. Such a view of the future points out only a single problem. We wanted to avoid this and, if one looks back, that decision did influence our work and led to the result that future developments are firmly based on the present, and that solutions to future problems are occasionally built in.

See: 55

Government policy

70 In spite of all these reservations, we will, of course, project a number of changes and assume that these will evoke the usual consequences. Growth of

the fertile generation in itself leads to more births; increase in labour productivity leads (with other things) to shorter working hours. These are examples of *unchanged behaviour* of an age group and the production sector respectively.

For the government unchanged behaviour means unchanged policy; but what this means in the long run is not clear. The one extreme is that all the regulations, rules and laws which are in operation now would continue completely unchanged. In the long run this would lead to absurd consequences. The other extreme is that policies are adapted in such a manner that 'unchanged policy' corresponds to an undiminished adequacy of response to changed circumstances. This carries the danger that problems remain unnoticed because it is implicitly assumed that they will be solved by a sensible (but in fact unknown) policy.

See: 317A

71 Our guideline was initially to treat the government less well than other groups, and not to accept too readily that an adequate adjustment of policy to new circumstances would occur. The reason for this standpoint is naturally that the purpose of the present survey is precisely to illuminate problems so that subsequent discussions would determine how they should be solved; the survey itself should not anticipate in this regard.

In the elaboration it appeared that this standpoint was not easy to maintain because, in many cases, it would lead to great difficulties which could overshadow the whole picture. The methodological issue which arose has been explained earlier in the discussion about policy goals and bottlenecks. As was stated there, it is reasonable in such a case to assume some policy adjustment, whether or not that conforms to already established intentions. In this respect, it again appeared that the range of the initially formulated general standpoint only becomes apparent when one begins to work with it, and that one occasionally has to deviate from it. We did try, however, to be quite explicit on this point by clearly indicating the assumed course of government policy whenever the need for this arose.

See: 52

2.2. General assumptions

72 We now attempt an inventory of the assumptions which were tied to the methodological starting point of continuity. As was mentioned, we exclude sudden, extreme and far-reaching events from our future, such as the commencement of an ice-age or of a world war. We can pay attention to the threat of such events but not to their actual occurrence. This is a matter arising from the approach we have adopted, not from substantive expectations. The assumptions we formulate below therefore rest on a *methodological* limitation.

See: 67

The survival of our country

73 We note:

– Our country or its territory will not be directly involved in an armed conflict of any significance.

– There will be no violent revolution in our country.

– There will be no natural catastrophes of any significance in our country.

– There will be no epidemics (for example because of the appearance of resistent viruses) or environmental disasters of any importance in our country.

There is little to add. These propositions do not rest on a judgement of what in fact might happen; each one would call for a separate, detailed study. The first statement does not imply that the world political situation is going to unfold in a peaceful manner and that the chance for conflict is diminished; the contrary is the case.

See: 79

The world

74 In regard to the world, we assume that it will also continue to exist with many of its present traits. In stating this we take a stand vis à vis recent studies of the future of the world. We have borrowed certain suggestions from these studies which are worked into our assumptions but see no reason (and also no possibility) to build our survey on any single specific scenario.

75 The growth of the world's population and its distribution over the continents is the best documented long-term development; there are tens of studies devoted to this, often in connection with the question of whether the earth will be able to feed the increased population. Answers to this question are not unanimous. In addition to population growth and agricultural production, a first attempt to look at economic development on a world scale over a period of 30 years was made by Colin Clark in 1940*). Outside the circle of demographers and agricultural experts, hardly any attention was given to projections of this size for a long time after this. Changes came in this regard with the studies of Kahn and Wiener, of Forrester, Meadows, Mesarovic and Pestel**).

In addition to these broadly conceived studies, highly disturbing publications about partial problems such as pollution, imbalance of the eco-system, pollution of the atmosphere and the dangers of climatological changes have also appeared in recent years.

76 All these studies are concerned with the future in the range of decades and are about topics which are of importance for the whole world. They attract attention and make an impression.

Still it seems to us unjustified and also not feasible to base our own survey on them, even though we will borrow a few suggestions. This is something else, though, than adopting a single one of the available projections as our basis.

This standpoint requires explanation.

In the first place, these studies, which after superficial examination by an amateur might appear very similar, are not at all unanimous: they all point to impending dangers but not to the same ones. In regard to the climate, for example, some fear a new ice-age, others predict an equally disastrous increase in temperature. The prospects according to Meadows differ from those of Pestel and Mesarovic, and in the work of both, diverging scenarios are lined up next to each other in order to illustrate different dangers. If one wants to accept *one* of them in its full consequences as a plausible prediction, one will then have to make a choice.

In the second place, after publication these studies were subjected to critical objections which raised doubts about the propositions which had been stated so positively. This is particularly true for the studies which have strong scientific and methodological pretentions. From the nature of things, there is a lag of several years between the publication of such a work and criticism by the profession. As examples, we mention the critique by Stone of Clark, by Nordhaud of Forrester, and by Cole and others of Meadows***). This raises doubts.

We feel that as yet there is not enough certainty to choose any one of the

*) C. Clark: *The Economics of 1960.* London, 1942.
**) H. Kahn & A. Wiener: *The Year 2000.* New York, 1967.
J. W. Forrester: *World Dynamics.* Cambridge, 1971.
D. H. Meadows et al.: *The Limits to Growth.* New York, 1972.
***) See Economica N.S., vol. 37, p. 24; The Economic Journal vol. 83, p. 11 56;
H. S. D. Cole and others, Thinking about the future. London, 1973.

suggested scenarios – with all of the far-reaching consequences that would have – as our basis.

77 Uncertainty about the precise nature of the impending dangers can, of course, also lead to another reaction to the warnings which many of the cited authors link to the continuation of the present course of events. This reaction is that, without further specification of the dreaded catastrophes, one decides to terminate or at least drastically to reduce the growth of population, production and consumption. The limitation of growth is then an independent policy goal. In this view there is no need to indicate which danger is the most imminent; the various risks lead to the conclusion that continuation of growth is undesirable.

With the present state-of-the-art, this is a political choice which does not necessarily follow from the available studies. Because of the exploratory character of our futures survey, this choice is only relevant when one deems it plausible that it will dominate future government policy. To a certain extent, this is true for the alternative of zero-growth, in which, in addition to physical constraints and a change in attitudes, an appropiate adjustment of government policy is also assumed. Whether this is an independent policy choice dictated by vague anxieties or rather a necessary readjustment in the light of changed circumstances is difficult to determine, and it really makes little difference.

78 We have borrowed from the world studies three concrete forecasts. The first is that world population will increase and that its distribution over the world will change. This will lead to a shift in relative positions of strength and to a reduction in the supply of food and raw materials. This is the second development, which is further reinforced by the exhaustion of minerals, oil and natural gas. The third is that we recognize dangers which will threaten the environment. These will not be specified on the world scale, but in our elaboration we want to take account of these dangers and of their local consequences.

We now present an elaboration of our specific assumptions regarding the world. We place methodologically established assumptions, which indicate what will *not* happen ('no world war') next to substantive factual judgments about what will ('no world war but continued tension').

79 We expect no world war but similarly no transition to harmonious relations in world politics. The struggle of interests between regional blocs and the application of political and economic means of pressure will continue without lessening or might even increase in force; local armed conflicts will continue to occur.

Although we have excluded the possibility of a world war and of an armed conflict into which our country will be drawn, we are not optimistic about world politics. This is based both on a continuation of the developments of the last decade and on the fact that increasing pressure of the growing world population on available raw materials and food production will magnify contrasts and increase tensions.

80 Further:

– The economic and political unification of Western Europe will continue, although not necessarily within the institutional framework of the European Community.

– In the struggle of interests on the world scale, Western Europe forms a single bloc. The relative position of strength of this bloc vis a vis the Third World will decline; this will be reflected in economic disadvantages.

The first proposition will be further elaborated in paragraphs 82 and 93 and will there focus on our country. Here it serves as a bridge to the second, which means that Western Europe, whether it wants to or not, will be treated as a single unit in world political conflicts of interest and therefore will be forced to behave in that way. Disregarding relations with other blocs, such as North America and Eastern Europe, in this statement we look at just one bloc, the less developed countries. According to various predictions, in these countries – particularly in South America but also in Africa and Southeast Asia – population will grow more rapidly than elsewhere, while Japan, Western Europe (including the Soviet Union) and China will remain relatively behind.

If the sizeable population increase in the less developed countries is realized, this will necessitate economic development; if the population growth is hindered by lack of food and other materials, this will lead to a sharpening of the conflict situation.

By a rational division of labour, economic growth in the developing countries can lead to expanded trade with Western Europe, with advantages to both parties. We expect, though, that the terms of trade of industrial goods for raw materials will become less favorable, either through united action on the part of the raw materials suppliers or through increased competition from the developing countries on the demand side of the market, for example, in regard to grain. The greater political power of the developing countries will also contribute to a change in relative positions in their favor. Another possibility is that appropriate transfers will take place in the form of development assistance. Whether it is a question of the terms of trade becoming less favourable or of development assistance, the effect is practically the same and will mean an economic disadvantage for Western Europe.

2.3. Exogenous developments

Raw Materials

81 To begin with, we will further elaborate the assumptions concerning the world from the previous section. It will be seen that assumptions, originally chosen on methodological grounds, by further elaboration acquire a more factual, substantive character. This is particularly true when we focus assumptions about the world more directly on our country.

82 Following through on the first statement of paragraph 80:

- In regard to the supply of raw materials, the Netherlands is part of Western Europe. This means that there is free trade in goods within the European Community and that, in regard to independence from the rest of the world in respect of supplies of energy, mineral resources and agricultural products, the Netherlands cannot be treated separately but must be considered as part of the Community as a whole.

83 The issue of the provision of raw materials can be approached in two ways. The first places the physical supply of certain raw materials, minerals and agricultural products in the foreground. One would then have to examine the dependence (or independence) of the Netherlands or of Western Europe for a large number of separate goods. In this case, possibilities of international trade and of substitution would be ignored. In the second approach, which we follow here, account is taken of an adjustment to specific scarcities. Changes in scarcity are thus expressed in the relative prices of a few large groups of goods. Thus it is assumed that, except for temporary incidents, no physical shortages will occur.

- Changes in the availability of goods, including raw materials, will not lead to a disturbance of physical provision but only to changes in relative prices.

It is self-evident that such changes will not be without consequences and that we will have to specify the expected changes in the relative price structure.

84 We propose to deal with this last point indirectly, by expressing the worsening of the terms of trade of Western Europe vis-a-vis the raw materials countries by an annual decline of net national income. Moreover, there will be a separate accounting of an increase in the price of energy, as will be explained below. For the general tendency, we write:

- Shifts in the international distribution of income unfavourable to Western Europe are equivalent for our country to a continuing decline in net national income by 0,3% annually from 1980.

This assumption is valid from 1980 onward only, because we have adopted an existing economic projection until that year; thereafter the described decline will continue and it will have cummulative effects. By way of illustration we give two interpretations of the figure adopted. It it is expressed as a change in the terms of trade then, with a Western European import quota of 15% from the raw materials countries, this would mean a shift of 2% annually in the price ratio between these trading partners.

If, instead, the assumed changes are expressed in terms of development assistance, the transfers involved reach about 8% of national income by 2000. Naturally in case A this shift involves a much larger amount than in case B.

Energy

85 We devote special attention to the national energy supply in the following fashion. In the separate pictures of the future in chapters 4 and 5, domestic consumption and domestic production are estimated and thus the balance which will be met by imports. These imports are then compared with world production so that one can get an impression of the Dutch share. In those chapters attention is also paid to the consequences of the future development of the world market price for energy.

The results of this approach differ, naturally, in the two alternatives because they each have a different course of economic development and thus a different domestic energy consumption. Energy production within the country will also differ between them. World production of energy and the world market price are, though, the same for both cases. The assumptions we have made in this regard are based on a wide-ranging survey made for this project.

86 One may ask if it correct to use the same estimates of world production and world market price for energy in both cases. The distinction between alternatives A and B is, after all, not limited to a difference in economic development within this country; it is unthinkable that this would diverge strongly from what is happening elsewhere. In principle this difference will also have consequences for the rapidity with which energy stocks are depleted and for the development of world production of different energy sources and the course of the world price. It was not, however, possible within the confines of this project to take this distinction into account. The reason is that the future course of world production and of the market price were predicted at the start of our activities with the help of simple models in which economic growth was not an explicit factor, so that the prediction is not sensitive to the economic difference between the two alternatives. We do concede, however, that this is more a characteristic of the model than of reality. The time and the means were not available to adapt the model. We do wish to draw attention to the fact that a change in economic growth – and of energy consumption – does indeed make a (large) difference in the pace of exhaustion of the world stocks but does not of course replenish these. It remains true in both alternatives that the scarcity will continue to worsen.

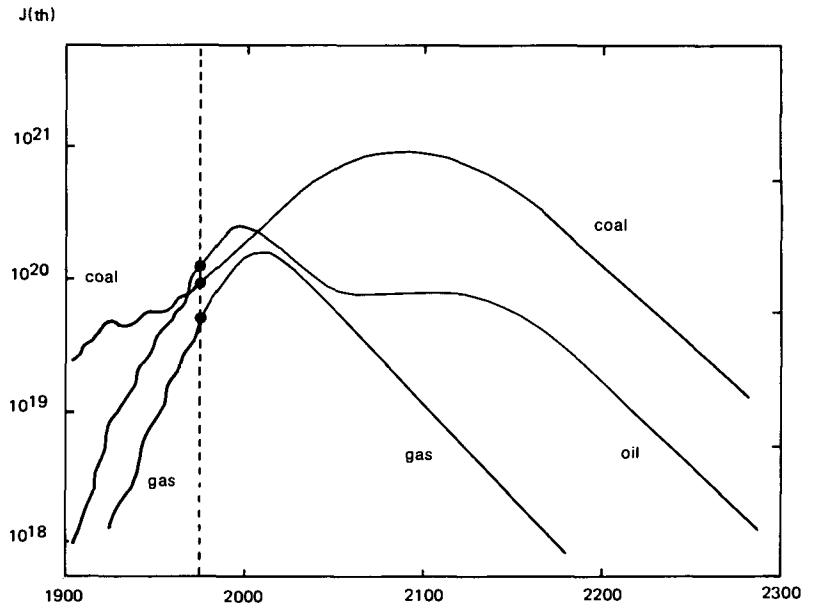
87 The estimate of the future *world production* of primary energy sources deserves further elucidation. The starting point was a global inventory of available supplies. One has to distinguish between the proven reserves and the eventually recoverable supply. The proven reserves indicate what quantity is known to be present and economically recoverable with the present mining techniques and the present price structure. New discoveries and new techniques are considered in regard to eventually recoverable supplies. In table 1, figures are given for both quantities for the primary fossil energy sources. These supplies are expressed in joules of thermal energy, reflecting what quantity of thermal energy is released by total combustion of the supply. The table also shows how many years from now it will be before the eventually recoverable supplies will be exhausted, given various constant annual growth percentages of consumption. We note that in the period 1950–1975, the average growth percentage for coal was 2%, for gas 7.5% and for oil 7%.

Table 1. World supplies of fossil energy sources and the time remaining until their exhaustion

	proven reserves	eventually recoverable reserves	years until exhaustion of the eventually recoverable world supplies an annual growth of consumption as indicated				
	– x 10^{20} joules –		0%	2%	4%	6%	8%
Coal	159	900–4400	1000–5000	150–230	95–135	70–95	55–75
Natural gas	24	25–400	50–800	35–145	25–90	23–65	20–55
Petroleum	46						
Oil sands	6–12	90–350	75–300	45–100	35–65	30–50	25–40
Oil shale	3–12						
Total	235–255	1000–5100					

88 Following many recent studies we assume a connection between the growth of energy demand, the pace of exploration and exploitation of supplies, and the supply of energy sources in usable form. To determine the course of production and consumption over time which results from this, one often uses the so-called *logistic curve*: production shows an exponential growth until the finite nature of the supplies makes itself felt, which leads to a reversal; production declines rapidly at first and more slowly later until the supply is exhausted. The surface beneath this curve for production is of course equal to the total supply. Variants of this curve for the three energy sources, coal, gas, and oil, have been adjusted to the production growth in the past and the estimates of the supply stated earlier. With oil, the supplies in oil sands and oil shales are included, which have barely been exploited as yet. The result can be found in Figure 1.

Figure 1. Projected annual production of fossil energy, in thermal Joules (J(th))



As one can see, according to these estimates the production of oil and gas will reach a maximum just before or just after 2000 and will thereafter start to decline. Coal production will increase for a long time – but quite slowly; in the estimates, production by conversion is also included, for example, by means of liquification and gassification. if we add a contribution from non-fossil sources – nuclear energy, hydropower, solar power – which will increase from 2% in 1975 to 8% in 2000, then the total production of all primary energy until 2000 still shows an annual increase. The rate of increase, though, declines from 4.5% annually in 1975 to 2.2% in 2000. Total world production, with which Dutch import needs will be confronted in chapters 4 and 5, can be found in Table 2.

Table 2. Annual world energy production

	1975	1980	1990	2000
		– x 10^{20} joules –		
annual production	2.5	3.1	4.4	6.1

89 According to these estimates, fossil fuel sources in the world as well as in our country will take first place in the supply of energy until 2000. We will indicate briefly why we have not given more importance to other energy sources.

In regard to nuclear energy, there is no reason to fear a rapid exhaustion of the raw materials if we keep to the idea that nuclear reactors will remain a minor factor in electricity generation. The proven reserves of uranium are 1.8 million tons, with an additional reserve of 1.7 million tons; together this would provide, with present-day reactors, an energy supply of 21 x 10^{20} joules. The eventually recoverable supply of uranium is 3 or 4 times as much; moreover it is expected that, in the long run, thorium can also be utilized. As soon as one converts to nuclear reactors on a large scale, by the year 2000, the cumulative demand for uranium would be in the neighbourhood of the proven and supplemental reserves. Utilization of breeder reactors shifts the limit, because use of these reactors would mean that uranium reserves of 3.5 million tons provide an energy supply of 1350 x 10^{20} joules.

The capacity of the existing nuclear power plants in the world is about 70,000 MWe. Raw materials do not limit the expansion of this capacity, but there are other reservations which are connected to doubts about the safety of this form of energy generation, worry about the consequences – for example, radioactive wastes which no one knows what to do with – and fear of facilitating the fabrication of nuclear weapons. These considerations will, we believe, limit the expansion of the number of nuclear generators and slow their growth.

90 In regard to the other energy sources, the use of water power is well-known. In addition to that, solar energy can offer genuine possibilities in due time, even in our country. At the present level of technology it is however still very expensive. Other alternatives, such as geothermal energy, wind- and tidal energy, are technically hardly developed. Everything considered, we expect that such 'alternative' energy sources will contribute only very slightly before 2000.

91 Finally, an estimate was made for the world market price for energy. We started from the assumption that, at least until the year 2000, petroleum will retain the largest share in world production and will continue to dominate world trade; both coal and natural gas are less easily transported. Taking into consideration the many uses of petroleum, it stands to reason that its price on the world market will be the prime determinant of energy price in the coming decades.

See: 83

Various studies have been made of the determinants and the future course of the oil price which relate this price to production costs from new wells, to the extent of the remaining supplies, or to the behaviour of the OPEC countries. We have used a model in which the price formation for OPEC oil is related to the extent of remaining world supplies and with a secular trend. From now until 2000, this last element is predominant and it leads, in agreement with a number of other studies, to the following proposition:

– the real price of energy will double from 1980 to 2000.

92 In the practical application of this assumption, the question arises how a real price, which is established on the world market, should be expressed for our country. In analysing the world market in the past, we used U.S. dollars at constant base year prices; in applications to future conditions in Holland, we use Dutch export prices. A doubling of the price of energy means that the oil-exporters in 2000 can ask exactly twice as many goods from us for a barrel of oil as in 1980.

The Netherlands and Western Europe

93 We return to additional effects for our country of the expected European unity in areas other than the supply of raw materials and energy. This concerns a number of economic, administrative and cultural aspects.

In regard to the economy we assume, as a result of the propositions of paragraph 80, that

– differences in the returns on production factors among the countries of Western Europe will decline;
– differences in the wage-structure for labour among the countries of Western Europe will diminish.

These hypotheses depend on the free traffic of goods, labour and capital whithin the European Community. The first is connected with free traffic in goods, the second with the absence of large waves of migration to and from our country. the train of thought behind it is that freedom of traffic in view of existing differences in real wage structures would lead to large migrations (and probably capital movements as well), and that this possibility would force a

See: 119 ff.

harmonization: there would be an adjustment of the differentials in the Netherlands to those in the neighbouring countries, and therefore there will be no large movements in and out of the country. Naturally we are talking about a tendency, not about absolute equality: even within countries, there are regional differences which do not disappear because of migration (or the threat of migration).

94 Further we assume, without stating it as a seperate proposition, that the economic development of the Netherlands will diverge from that in the other European countries only where our country has a divergent production structure based on specific locational factors. Regional economic differences are based, in other words, on factors which are not susceptible to harmonization by means of free traffic,such as i) location, ii) natural resources, iii) infrastructure, iv) land-use and v) labour supply. This last element should be understood in the broadest sense and has to do not only with the level of education and similar considerations but also with the mentality of the population.

95 The above propositions state that Dutch economic development cannot be seen separately from that of Western Europe, so that a picture of the future for our country implicitly contains expectations about other countries. This is indeed the case; the two economic alternatives imply differing assumptions about the outside world as well. Moreover the same argument holds for aspects other than economic development, insofar as we assume connections between the Netherlands and the rest of Western Europe in such cases.

96 Thus we expect that economic and political unification, as indicated in paragraph 80, will be accompanied by a harmonization of the law and of administrative regulations, and by a shift of political importance from the national governments to the institutions of the European Community, or perhaps to consultative agencies of the Western European countries. This limits the possibilities of an independent national policy in almost all areas.

97 One might expect that national differences in cultural matters would also disappear in the course of time. In support of that is the fact that tourist traffic is increasing, that media such as film, television and books which have an international character are gaining in influence, and that the English language is intruding everywhere. While this in itself should lead to a greater degree of cultural uniformity, it is expected that it will be countered by a growing tendency to stress regional differences: the larger countries will fall apart into their component parts, as it were. If *one* believes that national borders will disappear and national sovereignty will lose its importance, then what will remain in Western Europe will be basically language areas and possibly cultural areas based on religious denominations.

See: 229, 327A, 327B, 236, 241

We were unable to elaborate on this expectation and its results for our country, and we leave it with marginal comments on the situation which, according to this forecast, will exist towards the end of the period.

In the first place, the Dutch language will occupy a minority position within Europe; this might lead, in case of language conflict, to difficulties. Secondly, the restoration of regional differences within a larger area would draw lines of separation through our country which barely exist at present.

One thing and another could bring changes in our tradition that the administration's cultural policy takes very little account of national and regional identity.

Defense

98 We consider the defense of our country as a function of international political relations and that is the reason why we deal with it here. The starting

See: 79

See: 80

point is that the Netherlands in this regard will always fulfill the demands which are set by circumstances and that the expected international political developments will bring no major changes in these demands.

We assume in this regard that we will continue our membership in the North Atlantic Alliance. Within that framework, changes can, naturally, arise to the extent that European co-operation makes further progress, but for the Netherlands' defense this makes little difference since the need for a national contribution within a larger group will continue to exist. On the one hand, this will limit our freedom of action; on the other, it offers the opportunity for some specialization insofar as the partners can agree on a mutual division of tasks. As stated earlier, one of the limitations of the present futures survey is that no real attention is given to international political relations. The emphasis here lies, then, on the size of the defense effort.

99 For the years 1975 to 1983, we keep to the intentions of the Defense Memorandum of 1974. The accent there lies on the quality of the defense effort: the number of personnel will gradually decline and personnel costs are reduced in favour of matériel replacement. This choice is based partly on the rapid rise in personnel costs, even for conscripts, during recent years.

For the period from 1983 to 2000, we assume that the demands on the Dutch defense system will not basically change after the early 1980's. In addition, a further international division of tasks can lead to a different content of the defense effort but not to a lower level of the requirements it must meet.

100 This does not mean that the level of matériel expenditures – both investment and exploitation costs – will remain the same. Technical and tactical innovations will mean that, for a given task or function, the volume of the required expenditures on military matériel will continue to rise. The real costs of such matériel demanded for a particular task will also increase. This will be true only for the military matériel which is only part of material defense expenditures; another part consists of normal industrial products for which the cost advantage of productivity increases will continue to apply. Economies of scale will also appear with international role specialization, and standardization can to some degree moderate the cost increases of specific military matériel. Everything taken together, we estimate an annual increase in volume of defense matériel expenditures of 3%, reckoned from 1980.

101 In the preceding, it was not assumed that, after the beginning of the 1980s, there will be a further deliberate shift from personnel to matériel. There is no basis for this, because we expect that the structural improvement in wages and labour conditions of the military will be about completed by that time, so that subsequent personnel costs will behave like labour costs elsewhere in the economy.

If no further policy shifts take place, the need for personnel will be determined by the earlier considerations that the task to be done will remain basically the same and that military technology will be further developed.

This means that, for some tasks, fewer people can suffice who must, though, have more intensive training. For many other tasks, more manpower will continue to be needed. Among these are the tasks which continually have to be fulfilled so that this need, given a trend toward further reduction in working time, will lead to higher manpower figures. On balance, we expect that total personnel needs will remain constant at the level reached in 1983.

Within this total, there will be a slight rise in the share of career personnel and volunteers who will serve longer than is necessary for the completion of their national service.

102 These expectations lead to the estimates of Table 3.

Table 3. Matériel expenditures and personnel needs of defense

	1975	1980	1990	2000
matériel expenditures (volume, 1975 = 100)	100	129	174	233
personnel (x 1000 man-years)	135	123	121	121
of which: civilians	29	26	25	25
career	51	41	35	35
volunteers	7	15	25	30
conscripts	48	41	36	31

Four categories of personnel are distinguished. The number of civilian personnel and of career military have been kept just about constant after 1980.

We have further made a distinction between the volunteers, who are more or less professional manpower with contracts for, say, five years, and the conscripts, who at present serve for 14 months. In these two categories there will be a further shift towards volunteers in connection with the ever higher demands which are set, but there is no assumption of a complete transition to a volunteer army and the abolition of national service. We maintain that national service will continue to provide a source of quickly mobilizable reserves.

In this view, it is obvious that, with the shift to a larger proportion of volunteers, a further division of tasks would be introduced whereby the duration of national service could be shortened. According to the Defense Memorandum, by 1983 this would be about 12 months; for 1990 we have kept this period, but for 2000 we have set it at 10 months.

103 On the basis of these assumptions and the figures from Table 4, the size of the draft can be estimated so that a comparison can be made with the size of a generation of 20-year-old men according to the population predictions. The same generation must also provide the volunteers with service contracts of 5 years; the same is true for the career military, but their number is insignificant. This is reflected in Table 4.

See: 113 ff.

Table 4. Share of the male youth in service

	1975	1980	1990	2000
generation of 20-year old males (x 1000), of which	119	125	107	81
– conscripts	41	35	36	37
– volunteers	2	4	6	7
% in service	36%	31%	39%	54%

As can be seen, the changes in the composition of the personnel on the one hand and of the birth figures on the other will lead to a change over time in the percentage of young men who will go into military service. Towards the end of the century there will be an increase, which need not however lead to difficulties – certainly not if women, in due time, begin to fulfill more functions in defense.

104 The total demands of defense – matériel expenditures, personnel costs and military pensions – will remain in alternative A a relatively constant share of national income, given the assumptions made. Until 2000, defense expenditures will take just over 3% of the gross national income. In alternative B, the relative demand of defense will increase, and by 2000 it will take up 3.8% of the gross national income, because the same defense expenditure as in case A is compared with a smaller national income.

Climate

105 A succession of a number of dry summers or mild winters sometimes gives the impression of a change of climate. If one looks, though, at a period of 30 years or longer, then such a succession is seen as a completely accidental fluctuation. In contrast, on the basis of climatological data from the past, it can be established that there are certainly long-range fluctuations in the climate. One can conclude that, during the last centuries, the range of these long-term fluctuations in the Netherlands and the neighbouring countries for periods of 30 years has been limited to the values given in Table 5.

Table 5. Long-term variation in temperature and percipitation

	Fluctuation	long-term average
average annual temperature	about 1°C	about 9°C
average summer temperature	about 1°C	about 16°C
aberage winter temperature	about 2°C	about 2°C
average annual precipitation	about 150 mm	about 750 mm
average summer precipitation	about 75 mm	about 220 mm
average winter precipitation	about 50 mm	about 160 mm

The numbers in the first column of Table 5 give an order of magnitude for differences between 30-year periods in the past 250 years. For successive 30-year periods the differences are much smaller. In the second column are the averages over the complete series of 250 years.

106 Long term fluctuations can sometimes cover centuries and even millenia. In regard to the latter, we think particularly of the ice ages, of which the last one reached its peak around 18,000 years ago. The average annual temperature in our location was about 10° lower than it is now. Although there are indications that the process which brings about an ice age can suddenly increase in rapidity, the changes that an ice-age will originate within the next century can be estimated at one in a thousand to one in a hundred at most.

One of the stronger fluctuations which has taken place within historical time is a temperature decline of 1° to 2°C. in the average century temperature between the Middle Ages and the 17th century. The difference in temperature between this so-called Little Ice Age and the 20th century is about 1°C in our location. The chance that during the coming century another Little Ice Age will come into being can be estimated at 10%, based on the assumption that such a fluctuation has a completely random cause, i.e. that the specified fluctuation is a statistical result of fluctuations on a shorter time-scale.

107 Although the causes of long-range climate fluctuations have not yet been ascertained, statements have been made about the course of the climate on the basis of provisional theories and on the basis of a weak periodicity which can be discerned in climatological time-series. In addition to the natural course of the climate, we also have to consider the possible influence of man's activities on the climate.

Unintentional influencing is already taking place, certainly on a local scale (cities and industrial areas). Whether the climate on a world scale is already being influenced by, for example, the increased CO_2 content of the atmosphere is not ascertainable from observations, because of the variability of the natural climate. In addition to the release of carbon dioxide gases, heat radiation generated by energy consumption may lead to an increase in the temperature at the earth's surface. On the basis of an estimated increase in the world's consumption, the forecast increase in temperature in the next 30 years would be of the order of 1°C.

108 Given what has been stated about long-term fluctuations and the conclusions about man's unintentional influence, the following can be assumed about the climate in our country over the next 30 years:

– When compared to the past 30 years, the climate will be on the average less than 1°C colder and at most 1° to 2°C warmer.

The calculations do not allow reliable conclusions about expected changes in the precipitation as a result of the increased CO_2 content of the atmosphere. Any conclusion about precipitation in the coming 30 years can therefore only be deduced from data from the past. The magnitude of the fluctuations in average precipitation over periods of 30 years is given in Table 5. In addition, it can be remarked that statements about the expected level of precipitation have only limited importance for hydrological and agricultural purposes. Specifically, the occurrence of drought is determined not only by the absence of precipitation but also by the rate of evaporation and by the season.

In a more general sense, the various societal sectors, such as agriculture, energy- and water-supply, traffic and transportation, recreation, etc. are dependent on the climate in a fairly complicated manner. Because these relationships are to a large extent unknown, the consequences of possible climate changes cannot be indicated.

109 In the above, the climate for the Netherlands is considered as a completely exogenous factor. Still there are developments which might conceivably make the climate here less independent and autonomous than it has been until now. One can think in this connection of the climatological consequences of further urbanization or industrialization of our country. Changes in the nature and the roughness of the land surface, but perhaps even more in air pollution and heat radiation, might cause changes in the air circulation, in the radiation and the water systems.

See: 363A, 363B, 369A, 369B

Energy consumption in cities and industrial areas in the Netherlands accounts for about 25% of the received solar energy on an annual basis. Part of the so-called 'thermal island' effect of a city is attributable to this. Much of the released heat spreads into the atmosphere above the city and the meteorological consequences of this are not known. Where they exist, they are probably of purely local importance. On the average over the whole of the Netherlands, total energy consumption is about 2 to 3% of the received solar energy. On the basis of increasing energy consumption in the coming years, in the Netherlands as well as in adjoining countries, it is not inconceivable that the heat supplied to the atmosphere will then influence the air-flow in our country in such a way that climatological effects will be noticeable. Without a thorough theoretical examination, though, it is not possible to indicate even the direction which these consequences might take. All the same, there is the risk that such considerations may in time lead to the imposition of upper limits on total energy consumption in our country.

See: 310A, 310B

CHAPTER 3. SOCIETAL DEVELOPMENTS COMMON TO BOTH ALTERNATIVES

Introduction

110 This chapter begins with demographic predictions and continues with cultural developments, the governance of society, the family, social services and assistance, health care, education, leisure time, communications and information, and the criminal justice system. With the exception of the family, the forecasts for both alternatives differ very little if at all; and for the topics of this chapter, any slight differences which might exist between the alternatives can be mentioned briefly without disrupting the presentation.

Much more than in the previous chapter, with its primarily methodological and exogenous character, the question arises why the differences between the alternatives are so slight. The answer to this question, which has been given before, is particularly pertinent to this chapter. We will repeat it now and then review the areas under consideration.

111 In the first place, some of the differences between the two cases never appear because of technical characteristics of the present survey. The time-period of almost 25 years is really too short when the process of change is slow, as in the case of education and population. Further, our survey is on an abstract level; these broad speculations do not recognize differences which a more detailed description would bring to light.

The ideas about order and governance of society, for example, are expressed in very general terms. Another example is that participation in education is not specified by the type of professional training.

Finally, in a few cases, we were simply unable to make a change which we wanted to introduce. In this chapter this is the case for population. In the light of expected developments in the family in cases A and B, we had wanted to work out the effect on population even though noticeable differences would not have appeared before 2000. We have been unable to do so in the allotted time.

112 In some sections there are also substantive arguments for the absence of large differences. The developments in the spheres of health care and social welfare and of education are primarily determined by internal factors; economic growth plays no important role here for two reasons. In regard to health care, it is assumed that there is a strong policy of cost-control even in case A; in regard to education, the absolute number of pupils will decline towards the end of the period as a result of demographic changes. Moreover it is true for all labour-intensive economic sectors, such as the social services, that wage-costs, which weigh so heavily, are tied to the growth of per capita national income. The result is that the share of national income devoted to labour-intensive services does not differ very much in the two cases.

3.1. Population

113 For the size and composition of the population, we used the calculations of the Central Bureau of Statistics of 1976, to be precise the so-called alternative B.1 which is based on a low birth rate and a fairly large international migration.

See: 148 ff.

The first condition is in agreement with our forecasts in regard to marriage and the family, the second with the continuation of the Netherlands' position as a relatively attractive country with a positive net immigration, but without very large population movements. It is a pattern of migration following that of the past years rather than of the large-scale inter-European migration which we precluded earlier.

See: 93

114 Strictly speaking, the CBS does not provide a forecast but a hypothetical projection. Whatever it is, our use of the figures means that we accept the hypotheses on which they are based. These are described below, first in regard to natural population change and then for international migration.

115 In regard to mortality, it is assumed that the declining tendency of the past years in regard to infants in the first two years of life and in regard to women over 55 will continue with some moderation. For the remaining categories, the age specific mortality patterns remain as they are. Thus, no consideration is given to a spectacular lengthening of life-expectancy.

116 In regard to marriage, a distinction is made between the first and later marriages. The pattern for first marriages undertaken by successive generations of women can be mathematically described using the median marriage age and the percentage of women who marry before their 50th birthday. This percentage, influenced by a number of societal changes, will begin to decline over the next years. Because of the gradual increase in the practice of cohabitation before marriage and a reduction of the so-called 'forced' marriages, the median marriage age will first gradually decline and then begin to rise somewhat. No changes will appear in the pattern of remarriage for widows and divorced women.

The significance of the dissolution of marriage due to the death of the spouse will not change. Marriage dissolution due to divorce will increase from 6 per 1000 married women annually now to 10 in 1985 and will thereafter remain the same.

117 The birth of children in wedlock is dependent on the year of the wedding, the duration of the marriage and the number of children already born. The fertility trend for married women is extrapolated until 1980, after which it is held constant for the following marriage cohorts.

In its lowest alternative, which we use, the CBS assumes a further decline in the average number of children per family to a level of 1.44, which will be reached in marriages which take place around 1980. In this respect, it is assumed that the number of children in marriages which took place in 1970 will be 1.74 and those from 1975 will be 1.53. We are working, then, with a fertility rate which is below the 'replacement' level. This level at which a population will reproduce itself exactly is 2.16. In addition to a change in marriage fertility, account is taken of changes in the timing of births during marriage.

In regard to childeren born out of wedlock, the CBS assumes in their calculations that these will stay at the same level relative to legitimate births as in past years.

118 All this leads to the CBS case B, the demographic picture which is reflected in Table 6. The principal datum is that the growth of the population declines rapidly and towards the end of the century has stopped completely. This does not imply that the population of 14.3 million will then be stationary; even before the year 2000 there will be a slight reduction in the population. If the calculations are continued beyond 2000, the population decreases even more.

Table 6. Projected estimates of the population of the Netherlands, exclusive of migration (as of 1 January)

	Total population*) ('000's)	increase in % annually**)
1975	13,600	
1976	13,660	0.46
1977	13,720	0.40
1978	13,760	0.35
1979	13,810	0.31
1980	13,840	0.27
1981	13,880	0.26
1982	13,910	0.24
1983	13,950	0.24
1984	13,980	0.25
1985	14,020	0.25
1990	14,180	0.23
1995	14,280	0.15
2000	14,280	0.11

*) Rounded to 10,000.
**) *Since the previous date in the first column.*

119 In the population projections of the CBS, attempts are made to quantify both the direct and indirect effects of foreign migration on population developments in the Netherlands. The direct effect is the increase or decrease of the population through net immigration or emigration respectively; the indirect effect is the subsequent natural increase or decrease of the group of migrants after their migration.

Because of the strong dependence of foreign migration on economic trends and political developments at the national level, which are difficult to predict, the CBS limited their projections of the direct effect to the years until 1985. In their migration projections, the CBS offers two alternatives. We used, as indicated above, alternative 1, which is based on a situation in which the Netherlands is considered a relatively attractive immigration country. Emigration is relatively low, immigration relatively high, but always within fairly strict limits.

120 During the period of 1976–1985 the Dutch Government will not conciously influence the course of foreign migration, except
i. to slow down the recruitment of foreign workers; and
ii. to limit immigration from Surinam, and to foster remigration to Surinam.

The movement from the so-called recruitment-countries, from which, with the cooperation of the Dutch authorities, foreign workers are drawn (Morocco, Tunesia, Turkey) can be divided into immigration of workers and immigration of relatives to reunite families. This distinction is important because there are limitations on the entry of wives and children of foreign workers. Family reunion is only possible if the head of the family has worked in the Netherlands for at least one year, has prospects for at least another year, and, further, is in possession of a permit to occupy living quarters. It is assumed that this fairly restrictive policy will not change. The CBS, in estimating family reunions, assumes that these take place within 5 years after immigration of the foreign worker. The total family reunion-intensity per immigrated worker is put at 2 persons. In the calculations, account was taken of the effect of re-migration of workers within a 5-year period.

See: 278A

Thus, no consideration is given to possible large migration-movements which would affect our country as a result of political developments, nor to immigration resulting from the expansion of the European Community or to large migrant-waves within the Community for other reasons.

See: 93

According to the projections, immigration of 2000 workers from the recruitment countries is assumed for 1976; through 1985, this level is raised by 100 persons annually. Projections of return emigration to the recruitment countries for the year 1976 through 1985 is based on a constant re-migration pattern. In this regard, a somewhat increasing tendency by the immigrants for permanent settlement in our country is recognized.

121 The number of persons born in Surinam who were living in the Netherlands on 1 january 1976 is estimated at about 100,000. From the moment that Surinam became independent, immigration from that country has been limited by admittance requirements. Family reunion is still possible; in this regard it is assumed that after 1976 this declines rapidly, from 3000 to none in 1985.

Both Dutch and Surinam authorities encourage return migration to Surinam. The extent to which this will be successful is difficult to predict. In the projection, it is assumed that during the period of 1976–1985 about 25% of the total (25,000 persons) will re-migrate.

In addition to migration to and from Surinam and the recruitment countries, there is a number of other groups which can be distinguished, such as Dutch nationals to and from the Dutch Antilles and to specific migration countries. The future course of the migration of these groups was determined on the basis of historical time-series.

122 All these assumptions led to the projections made by the CBS shown in Table 7. As one can see, net immigration declines rapidly to about 15,000 to 20,000 and remains at level until 1985.

The CBS did not risk projecting beyond 1985. For our survey, this means that we put net migration for the years after 1985 at zero.

Table 7. Projection of foreign migration, 1975–1985

Year	Immigration	Emigration	Net immigration
		–x 1000*)–	
1975	128	55	73
1976	84	63	21
1977	78	63	15
1978	79	61	18
1979	75	59	16
1980	73	57	16
1981	72	56	16
1982	72	55	17
1983	73	54	19
1984	74	53	21
1985	74	53	21

*) Rounded figures.

123 To obtain an insight into the consequences of migration for the age-structure of the population of the Netherlands, the calculated totals have been subdivided by age-groups. This was done by the use of an average age distribution. For all migration-flows separately, by sex, based on data for 1971–74, which was held constant for the period 1975–1985. No distinction by marital status was made. The indirect effect was then calculated to 2000, based on the fertility and mortality figures of the migrant population already in the country.

See: 322A, 322B

Table 8 shows the cumalative effect of foreign migration on the size of the Dutch population for a number of years. It is the young age groups (0–19 years and 20–34 years) specifically which are influenced by foreign migration.

These estimates are naturally not so precise as is suggested by the figures which result from a subdivision by age-group.

Table 8. Projected population of the Netherlands, including migration

1 January	age-group	natural progress	Cummulative migration effect from 1975*)	total
		x 1000**)		
1975	0–19	4,646		
	20–34	3,220		
	35–64	4,274		
	65+	1,460		
	total	13,600		
1980	0–19	4,306	70	4,376
	20–34	3,454	55	3,509
	35–64	4,495	23	4,518
	65+	1,589	2	1,591
	total	13,844	150	13,994
1990	0–19	3,512	105	3,617
	20–34	3,555	113	3,668
	35–64	5,308	72	5,380
	65+	1,803	7	1,810
	total	14,178	297	14,475
2000	0–19	3,211	96	3,307
	20–34	3,048	89	3,137
	35–64	6,075	136	6,211
	65+	1,949	13	1,962
	total	14,283	334	14,617

*) Including the indirect migration effect which is figured at 45,000 and 83,000 for the years 1990 and 2000 respectively.
**) Rounded figures throughout.

124 In Table 9 and Figure 2, we show various results again. These display significant changes in the age structure as the number of young people declines and the middle-aged groups increase sharply. We will return to the consequences of these changes later.

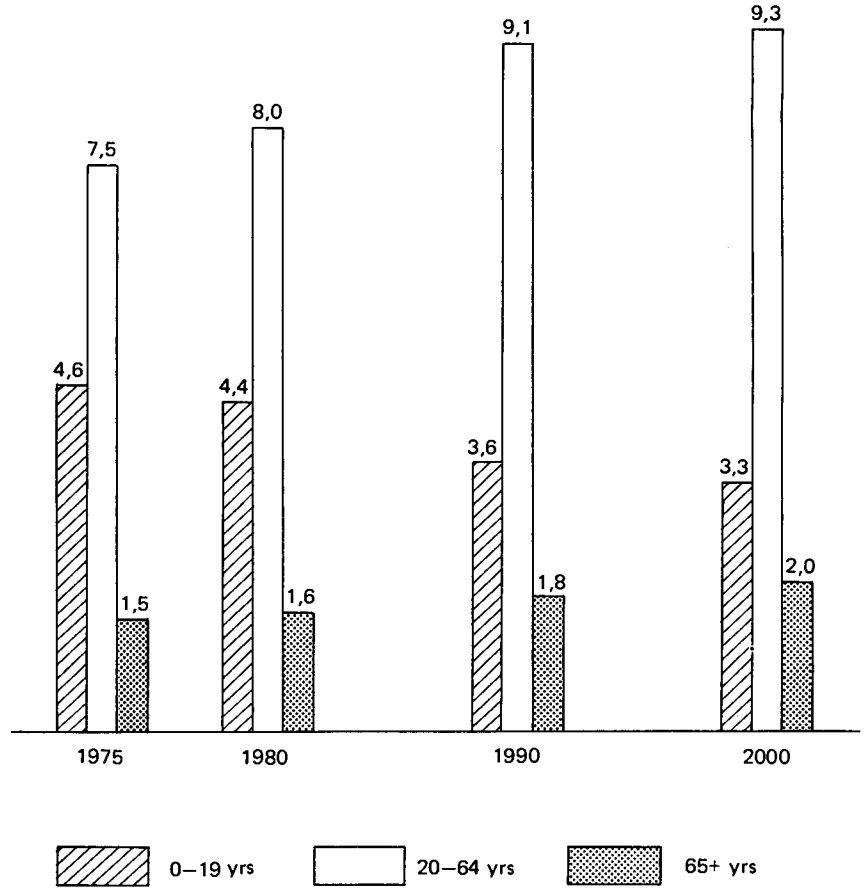
See: 150, 220

Table 9. Selected demographic basic data

	1975	1980	1990	2000
Population (in millions)*	13.6	14.0	14.5	14.6
births per 1000 inhabitants**)	13.1	11.5	11.9	9.9
deaths per 1000 inhabitants**)	8.5	8.9	10.0	11.1

*) CBS, population alternative B.1.
**) CBS, population alternative B (without migration effects).

Figure 2. The age structure of the population (in millions)



3.2. Political and social developments

125 Independently from the preceding projections, we have formulated a few specific forecasts in regard to political and cultural developments. Although it is most difficult to make judgements in this area, we expect three trends from the recent past to continue.

See: 302A, 302B, 305A, 261A and B

126 In the first place, government intervention will increase, particularly in the spheres of economics and land-use, and this will impinge more and more on the lives of the citizens. For example, almost everyone will be affected by tax legislation and administrative regulations for social insurance. Rehabilitation of cities and road construction will also affect many directly. This will lead to conflicts between the government and the citizens.

See: 253

127 In the second place, the government will retreat in other spheres and more personal life-areas than before are considered as private. We point to changes in 'morals' legislation and the broadening of the grounds for draft-exemption, both of which recognize a greater personal freedom.

128 In the third place, in agreement with the preceding, there is a tendency towards societal emancipation of minorities with deviant life-styles and divergent values. The pattern which has dominated public life until now can, with some exaggeration, be stereotyped as middle-class; the profile of the

Average Person shows a man of middle age with an income which is just above modal. This will be replaced gradually by a larger degree of diversity; various groups with divergent life-styles will co-exist, and the key positions in society will be more accessible to the various minorities.

129 All of these developments involve the attitude of the individual towards government and society. The first development reduces automatic acceptance of governmental authority and will lead, in the most favourable case, to the critical attitude that one should have confidence in the government only on rational grounds. The other tendencies will lead – in varying degrees – to a greater freedom of the individual to choose, according to personal insight, from a broader range of behaviour patterns. Thus it will occur more frequently that various groups, each having its own behaviour pattern, will co-exist without subordination of any one group.

See: 140

This assumes a gradual process of emancipation of minority groups. This process cannot, however, prevent a sharper identity- or assimilation-problem from arising for some of these groups. For the time being, the possibility of the continuation of serious difficulties with (parts of) groups such as the South Mollucan community and the Surinamese must be taken into account.

130 The formation of closed groups based on confessional or ideological grounds will rarely occur. We expect the importance of religious creeds as an organizational principle to decline further. People will join groups for other than confessional reasons; ideology or confession will no longer be the over-riding characteristic on the basis of which people organize. There will thus be a greater diversity in the choice of organization which people will join. We expect that the religious or ideological organizational form will be replaced by organizations which recruit their member by appealing to the fulfillment of specific programmatic notions.

See: 228

See: 139

When citizens prefer this organization on one issue and that organization on another, this leads to a steadily sharper competition by groups to obtain the support of public opinion. This will all lead to a situation in which bonds with, or membership of, certain organizations will be less permanent. It will therefore become more difficult for organizations to create a faithful rank and file.

Mr. E. Bloembergen comments as follows:

Here, but also elsewhere in the report, signs of disintegration are continually being pointed out, gathered under the concept of secularization. Elsewhere it is stated that 'large, wide-ranging changes in the value patterns will not take place'. The report nevertheless extrapolates, on the basis of developments in the past, a picture which is historically questionable because it does not recognize the quantative unpredictability of this kind of variable. It is sooner be expected that these developments will not continue in the same course, so that consideration should be given to a spiritual-cultural reaction which will be expressed in part by the return to increasing participation in the confessional/spiritual societal life. This reaction would be reinforced by discontent about increasing governmental intervention.

3.3. Governance and regulation of society

131 The present situation in regard to the governance and organization of the society is characterized by a serious contrast between theory and practice. Actual processes of organization and decision-making are not in agreement with the theoretical models, which provide guidelines, and because of this they are losing their credibility; but until now, other models are lacking.

This summary outline, which will be supported below, forms the basis of our expectations about the future in this area. The coming decades will be dominated by attempts to reduce present tension through the development of new organizational principles. This process, which will not yet be completed in 2000, can be drawn only in rough outline; it is difficult to predict at what pace it will occur and to what extent it will be delayed by the opposition which it will arouse. One can, in any case, expect that the process will not proceed in a straight line but will exhibit ups and downs.

132 For historical reasons, the organizational structure in our country is strongly reminiscent of Weber's bureaucratic model. This means that separate organizations are in large measure independent and self-sufficient, and that there is a clear role distribution among organizations, their subdivisions and individual functionaries. Control within organizations is by a strongly formalized and hierarchical authority structure: personnel have clearly defined tasks and limited responsibility within this hierarchy, clients are treated according to strict rules which do not allow much room for adaptation to individual wishes or needs. The relation among organizations is clearly defined as well; when there is a question of subordination to the government, this is not disputed.

This description is valid for an ideal type, which is never wholly reflected in reality. For some time already there have been developments under way which reduce the actuality of the model even more. We list these here.

a. The role of organizations in societal decision-making is becoming more important. Separate organizations function increasingly less independently of one another but instead operate in mutual consultation, form cooperative alliances or are incorporated into larger, more complex bodies. These complex organizations then also consult with one another. Thus a pattern of large conglomerates, mutually bound by an intricate network of agreements and negotiations is evolving.

b. To a larger degree than before, personnel, clients and other public groups are forming interest groups which try to take part in the decision-making process through consultation or other forms of participation.

c. The increasing importance of consultative organizations and the broader participation of various groups in decision-making means that more and more frequently opposing viewpoints come to light, which the parties cannot resolve even after negotiations. Therefore the government is called upon more often to act a mediator.

d. These developments cause increasing pressure on the bureaucratic model, which steadily loses more and more of its effectiveness. Within the earlier mentioned complex organizations. there will be a search for a more flexible form of governance than is possible by the traditional hierarchical and strongly formalized procedures.

e. In the relationship between and among organizations, the primacy of the government loses its self-evident character, the legitimacy of its actions is disputed in increasing measure and this happens precisely at the time when the range of government intervention is increasing.

The developments indicated in these five points will be further elaborated below. We will first deal with increasing participation and then with developments in business and institutions and in the government.

133 By *participation* we mean the processes by which decision-making in organizations is influenced by third parties affected by those decisions. We expect that participation in this sense will increase strongly and that organs designated within a hierarchical structure to take certain decisions independently will have to allow room for decision-making by a process of negotiation

and consultation. This change will not be equally strong everywhere, but that point will be discussed further on.

In regard to participation, one thinks particularly of individual employees, of clients and of other involved parties, such as residents in the neighbourhood of a factory or parents of children at school. We expect, however, that in this development direct participation by individuals will not be the primary characteristic. In the first place, 'clients' is much broader and includes organizations as well, such as firms which serve as suppliers or customers of a certain enterprise.

Secondly, participation by individuals will not occur directly but through representatives, particularly in strategic decision-making. This role will be filled by internal representative organs or by interest-groups, and sometimes also by the government.

See: 160, 271A and B

Two qualifications are in order in connection with this strongly increased participation. The first refers to the competitive character of this participation which means that many parties with divergent interests will be involved in the decision-making. Secondly, individual clients and employees will be able to exert influence only through representative participation, except for the direct execution of the policy on points which affect them directly.

The picture thus differs strongly from broad, direct participation in the sense of the self-determination of the individual. A development in this last direction is illusory, even though room for personal decisions will increase in the executive area, in part because of technological developments.

134 The anticipated increase in participation will probably not fulfill the expectations which the individual as employee or as client has in regard to this concept. He will acquire more influence on decisions which affect him, but this will involve representation by internal consultative organs or interest-groups, subject to rules and procedures, and limited to participation in negotiations in which others, with other interests, are also taking part. Participation cannot mean that every one gets his own way, and expectations to this effect will be frustrated; to the extent that the individual does obtain a larger degree of shared responsibility, this will apply equally well to decisions with which he does not agree.

135 The organizations we discuss first are business enterprises, public service agencies, welfare organizations, establishments such as hospitals and schools, and also, for example, sports associations. We include the large complexes – the large enterprise, the national organization – as well as their components, more or less independent sub-divisions with a specific function, such as operating companies, divisions of large corporations and regional divisions of national associations or establishments. For these organizations, the trend toward increasing participation has the consequence, that, in increasing measure, organizational inter-twining occurs through which initially independent units are absorbed into a larger, more complex organization.

The trend towards large-scale organizations will continue and will also be reinforced by technical developments in the area of information processing and transmission which make control of larger organizations technically feasible. In this regard, the National Information System of the joint Health Insurance Groups provides an example. The developments towards larger complexes affect the broadening of the actual framework of decision-making, for which various forms can be utilized varying from informal agreements to mergers.

See: 239, 240

Naturally this trend towards more inter-locking may sometimes occur to the detriment of existing organizational structures. For example, in welfare work, the large degree of horizontal cooperation at the ground level and the related tendency towards decentralization undermine the umbrella institutions for the branches of welfare work.

136 Increasing participation further entails provisions for participation by personnel and clients or other public groups within the complex organizations which will arise, all of which are, moreover, rather heterogenous groups. We assume that the possibilities for participation will increase and that the organization will make room for them; in other words, organizations will be permeable, will open themselves to influences from the outside, and will offer appropriate facilities. Beginnings of this can be observed, for example, in the mass media, in health care, in education and in business. In alternative B – eventual zero-growth – this permeability will have an even larger role than when the growth path of case A is followed. We shall see that among the case B developments which differ from those of alternative A is that non-professional services by volunteers and neighbours will occupy a relatively larger place. One thinks for example of help for children, the handicapped, the aged – taking place under the supervision of a professional social worker. We will also see that with the declining economic growth of case B some substitution of services by self-help will take place, with at the same time, communal use of tools and workshops and, in the sphere of recreation, shared use of the equipment of associations. In all these cases the essential prerequisites are open organizations which put their facilities at the disposal of interested outsiders. We also assume that these possibilities will be utilized. Yet actual participation will not come up to expectations which exist in this regard, as we will elucidate below.

See: 157, 160, 227

137 Participation of personnel and public groups in the decision-making of organizations will differ according to the level of decision-making. At one extreme we consider *strategic* policy, which is concerned with setting the goals and tasks of the organizations, the division of labour among the subdivisions – in short, the objectives of the organization itself and the broad lines of its functioning. By passing many intermediate stages, we consider at the other extreme *operational* policy which is involved with the execution of a given task within the framework of a general policy.

See: 271A and B

In regard to strategic decisions, we expect participation of varying intensity (from consultation to decision-making), generally in the form of representative participation. In organizations with many employees – enterprises, firms – participation of personnel is more active than that of public groups such as, for example, consumers. Personnel will normally be represented by specially designated delegates who may or may not be mandated by specific interest-groups; the remaining groups will often have to make do with the government, which will represent their interests in its role as protector of the general interest.

In general, strategic decision-making will be more affected indirectly by the earlier described changes in the structure – the trend towards large, complex organizations – than directly by participation of the groups and individuals concerned. There are several reasons for this. The actual organization is not designed to accomodate changes, and management considers the realization of participation in the decision process as difficult; understandably, since there is a lack of applicable organizational models. This will lead to a great deal of opposition.

In addition, the format of representational participation is not without its shortcomings. The difficulty is to give an effective form to this representation as well from the point of view of the personnel as from the point of view of the other participants in the decision process. If the representativeness of the delegates is in doubt, then their actions, in due time, will lose legitimacy. Opposition to their participation in deciding strategic questions will thereby be even more difficult to overcome.

In operational decision-making, there is – depending on the circumstances which arise in practice – more room for direct participation, for employees as well as other groups, such as customers and clients. Here, too, employees will participate more than the other groups, since we accept that they have a larger measure of concern and a greater community of interests. Still, on this level, possibilities also exist for clients, namely where they are closely involved with the implementation and where they are directly affected by the results, as in the case of patients or pupils, but not of consumers. This holds particularly true for welfare work, where participation often takes a central place. For the rest, the increasing individualization of society and the greater outspokenness of the better trained individual are the primary grounds for this expectation.

See: 130, 152, 198

Mr. E. Bloembergen appends the following:

Maintenance of economic growth, or adjustment to changed circumstances, demands on the one hand initiatives to lay the groundwork for the necessary process of renewal, and, on the other hand, profitable investment possibilities which will make these initiatives feasible.

Increasing participation means a slowing-down of the decision-making process. Moreover, there is the change in property rights and ownership conditions. In the absence of adequate models of control, these three factors will have a negative effect on innovation. Although investments will come largely from the government, the question arises if this can compensate for the negative effects we have mentioned, so that readiness to take risks will support innovation.

Account has to be taken, therefore, of a temporarily growing discrepancy between the need for innovation and adaption on the one hand and the (lack of) stimuli for (creative) entrepreneurship on the other.

138 As long as there are no adequate models of control, increasing participation by public groups and the growing interlocking of separate organizations will slow down the process of decision-making; responsiveness will not be served by this. We expect that adequate models will be lacking for a long time to come.

See: 271A and B

139 As is explained elsewhere, participation by personnel of institutions will be greater than in business, and in business it will be greater than in government services. For groups other than employees, it is difficult to give such an ordering because the occasion for the creation of participatory possibilities is often incidental and is directed to specific concrete elements of policy implementation, whereby participation increases in an irregular manner.

With all the limitations which have been introduced, it can nonetheless be expected that the hierarchical control-model will lose seriously in importance for organizations; it offers, after all, room for participation at only one level, namely at the top. Another, more flexible, control mechanism will have to be found if the separate units are to be given possibilities to participate in the formulation of their own policy. Within large, complex organizations, a tendency towards decentralization will thus arise. With that, though, the need for a linking mechanism becomes apparent, serving to prevent conflicts from arising out of the results of competitive participation in decision-making at different levels. Agreement will not occur automatically, nor is it sufficient for this that each group adopts the same position on each level of the hierarchy where it is represented (and even this is by no means certain); the power positions will not be the same on all levels, and the results of the decision process can thus differ from one hierarchical level to another, even though the same groups have taken part in the process at the various levels.

See: 281A and B

See: 130

140 We wish to pay special attention to the consequences of this development for the government. As we have seen, the increasing representative participation of clients in the (strategic) policy formulation of organizations will lead to a larger degree of government intervention. The government functions here as the representative of all the groups that are not specifically represented ('the common interest') and also as arbiter to decide in case the negotiations between the directly involved parties yield no result. One of the consequences of this is that the government will become involved in many organizations which formerly functioned independently, and that the scope of government intervention thus expands.

See: 305A and B

At the same time, the character of governmental behaviour will change. Directions given from above and unilateral interference will give way more and more to taking part in a process of competitive participation. The government will no longer stand above but among the parties. This change in position will hold true not only for the expansion of government action we have described but also for the more traditional areas. Participation by clients will also take place on the various levels of government activities. Actually this is as true for the government organization as for other organizations, even though there are some subtle differences. We assume that participation of clients will make more rapid advances than that of civil servants, and that within the government organization the hierarchical principle will maintain itself longer than in other organizations. Participation by civil servants is inhibited by the principle of political responsibility.

141 In regard to its own strategic policy, the central government's freedom of decision will be limited to an increasing extent. This freedom of action is already limited by increasing international cooperation with its attendant obligations, especially within the European Community. Moreover, the government, in dealing with its domestic clients, will be able to rely less on authority, becoming more dependent on negotiation and consultation. Thus outside Parliament, ever more various interest groups, more or less formalized, will be incorporated into the decision-making process.

Also in operational policy – up to and including the level of actual policy implementation – the need for participation by clients will be felt and will be responded to as far as possible.

The absence of a linking mechanism between the various levels of the hierarchy will mean that a decision reached after long and laborious negotiation on one level might subsequently not be implemented in practice on other levels.

142 In regard to the territorial structure of the administration, we already see an increasing dependence among municipalities which will lead to various forms of cooperation and to a shift of responsibilities to a higher administrative level, in practice to the provincial level. In those cases implementation of operational policy will remain primarily with the municipality, but the determination of strategic policy will take place increasingly at the provincial or national level.

See: 183, 202

The national government will decentralize the implementation of increasingly more policy measures to the new type of province that is to be established, and thus offer more opportunity for participation by the population. Strategic decisions will stay at the national level. The need for coordination between the various administrative levels will consequently increase. This process can be called an increase in 'complementary administration', indicating that prior consultation will get more emphasis in the relationship between administrative levels.

143 The tendency towards participation will lead to a change in status and activities for the civil servant. He will function less than before as a standard-bearer of Competent Authority above the parties and will have to take his place next to others at the negotiating table. This will contribute to the trend that

See: 304

differences in working conditions vis-à-vis private employees (tenure, pension tied to the cost of living, no right to strike) gradually diminish, either because privileges like the pension become general, or because civil servants for example will be given the right to strike. To the extent that these differences diminish, the hierarchical principle will offer more room for participation of personnel even within the government apparatus. It is doubtful, though, whether this will be realized by 2000.

144 The developments outlined above mean that the manner of governing the societal process will change in character. The possibilities for a deliberate unilateral regulation by the central government will decline, but the increasing participation can be seen as a means of compensating for this in that the quality of the decision-making (in the sense of its acceptability and effectuation) will be improved. This requires, however, that the necessary new forms of procedural organization are introduced in a timely fashion. If the pace of the organizational change is too slow, and if creativity in this area is too limited, the legitimacy of the government's actions will diminish still further. This would lead to a further decline in the ability to control societal processes and to a diminished capacity on the part of the government to decide and to act.

145 The development of participation and control will have consequences for the substantive predictability of the law, and for the relations between government and citizen. The interference of the government in economic and societal matters will increase sharply, and businesses and other organizations, as well as individuals, will be affected more frequently and more directly. As was said earlier, this government interference will take place informally, through agreements, contracts and regulations which, in their application, will allow for a large degree of adaptation in individual cases. If control in essential areas by these means proves impossible, because it is not accepted as legitimate and therefore not complied with, the government will resort to penal sanctions.

See: 126

We take for granted, thus, that limits will be set on the obstruction of governmental control by these developments and that these limits will be imposed by new legislation. In this regard, the continuing interference of the government into social and economic matters will lead to new categories of criminal offences. In regard to organizations, this might apply to violations of environmental protection regulations or, for example, of a merger-code or dismissal procedures; in regard to the individual, this might apply to tax fraud or misuse of social assistance.

146 The described development will give the individual, as consumer, as client, or as employee, more influence than at present in the decisions affecting him, either through representation or through direct participation. Since participation will be competitive, however, he will not always obtain the desired result, nor will the result always be certain. Thus there will be a great legal equality in the sense that everyone will be able to come out for one's own rights and interests more than now. The predictability of the outcome though, will be reduced; there will be fewer set rules than at present; more room will be left to individual initiative, and the results will be uncertain.

See: 251

As a consequence of this development and of the diminished legitimacy of authority, an increase can be expected in the number of violations since one will no longer keep to the letter of the law but will test it against one's own opinion. The diversity now present in opinions about abortion and drug use could spread to other subjects as well. Present developments suggest that this could lead to a decrease in generally valid legal rules which would be replaced by different opinions from group to group.

See: 251

A separate place is occupied by tax-collection and premium-payments and the criminal justice system. These contacts between government and citizen have a one-sided character and participation by the individual therefore seems difficult. Still, one could consider provisional sentences, compensation of the victim, weekend sentences and accomodations with taxes, for example, as symtoms of participation. The need to maintain the justice system and the necessity of tax collection set limits to this development.

3.4. Family

147 What follows relates primarily to the nuclear family, that is, parents and their children. It is unimportant in this regard whether the lasting relationship which unites the parents is or is not sanctioned by marriage. The development which we will outline suggests that there will probably be a shift from marriage to cohabitation. For the argument which follows, this is really not very important; one can, without difficulty, read 'lasting relationship' for marriage and 'breaking of the relationship' for divorce.

148 Very briefly, we expect in alternative A that households and families become smaller, that family ties will be less permanent, that a number of functions which the family has traditionally performed will be taken over by other institutions, that the emancipation of women will continue and that people will become independent at an earlier age. These expectations and their consequences are further elaborated below. As with the related opinion that the birth rate will decline, all this rests primarily on developments starting in the past. In regard to the family, the same result is obtained if it is assumed that a change in the attitude of the recently married has taken place a short time ago which for the time being will not be altered. With the passage of time and the moving up of the generations, this new attitude will slowly become more generally accepted.

See: 124

In alternative B, too, households and families will be smaller and family ties will last for a shorter period, but the transfer of the traditional functions of the family to other institutions will take place more gradually. The continuing emancipation of women will be expressed more than at present in changes in role-specification within the family. This is so because men will assume a different attitude towards work and will be spending more time with the family. In addition we expect that the family will gradually orient itself more towards its immediate neighbourhood.

149 The development whereby the aged are no longer cared for by their children but live independently or in nursing homes is practically completed. As a result, the size of the family is reduced to that of the nuclear family. That we expect a still further reduction of family size is related to changes in the number of children and in the duration of family ties; there will be fewer children, they will leave the parental house at an earlier age and the frequency of divorce will increase. All of this will lead to a smaller household size.

See: 116, 117, 153

150 We expect social consequences from the drastic decline in the number of youths (0–19) from 4.6 million in 1975 to 3.3 million in 2000. We distinguish between the group from 0–12 (children) and the group from 13–19 (adolescents).

See: 123, 124

The decline in the number of children means that there will be fewer contemporaries in the direct neighbourhood. Child-care centers will offer the main opportunities for contact with other children.

See: 161

This is less so in case B. Men and women will be able to alternate in the care

of their children because of part-time jobs, and neighbourhood help will also offer a solution. This will mean a strengthening of the function of the residential environment, because the contacts which the children will have there will be made and maintained at the level of the family.

Naturally it holds true for adolescents as well that there will be fewer contemporaries in the immediate neighbourhood, but because of their independence, they will be better able to find one another in locations where they can pursue their favorite activities. Particularly as a result of the expansion of education, the youth in our society have created their own culture. We expect this to continue, especially because adolescents will continue to attend day schools for longer and in larger numbers.

See: 198

The youth culture, though, will probably be less predominant and will be replaced by the lifestyle of the age group of 30 to 55 years old. This is connected with the decline in the number of adolescents and the increase in the number of middle-aged people. We expect that advertising and the mass media will devote much attention to this older group. The development outlined for case B will be further fostered by the changed position of the family and, through the family, of the immediate environment. Towards the end of the century, the decline in the consumption level will also affect the spending power of the young.

See: 123, 124

See: 296B

151 The care and rearing of children is an important function of the family and it will remain so. This is especially true in case B, where the men, who will be working more part-time, will assume part of the family task. In case A there will be an increased call on professional child care, certainly when the mother resumes a full-time job.

See: 264B

See: 161

The 'parent-period' in the future will not follow marriage directly and it will be shorter since the number of children will be smaller, spacing of children will be better regulated because of birth control techniques and children will become independent earlier and leave the parental house at a younger age.

In both alternatives, married women, partly because of the generally higher educational level, will increasingly want a job outside the home. As was mentioned elsewhere they will set higher demands on these jobs than at present, and they will be less and less willing to give up a career for marriage and motherhood. The family, in other words, will only be a passing phase and no longer the final destination in her life.

See: 261A and B, 262A and B, 265A and B

This pattern, of which the consequences are worked out elsewhere, means that the woman, as a rule, will continue to work after her marriage. When she has children, she will reduce her working to part-time or interrupt it. The best time for this may be earlier or later after marriage; characteristically, this will no longer be directly tied to that event but is something which can be freely selected.

See: 266A and B

In alternative B, the husband will take over part of the family duties and will work part-time, or neighbours will help in the care of the children. There will also be child care centers. Interruption of the woman's career will be temporary, and only for a period of, say, six years in the case of a mother with two children. After this interruption, man and women will alternate in performing the family duties, and both will, under these circumstances, prefer part-time work. When the children are grown up and more or less independent, one of the parents (usually the man) will return to full-time employment.

See: 264B, 157

In case A, when the woman temporarily interrupts her career or goes over to part-time work, she will rely increasingly on professional child-care and, later, on the school, certainly if she resumes full-time employment.

152 We also expect that the attitudes towards marriage and family and the role which these institutions fulfil will continue to change. The nuclear family has

already loosened its ties with the larger family circle, the neighbourhood and the village. Such relationships will not have disappeared entirely – mutual help between parents and children will still be common – but they will no longer be imposed by the prevalent norms. This process of the individualization of the family will be followed by the individualization within the family, particularly in case A. Relations between family members will be less coercive than at present. They will continue to the extent that these relationships serve the direct interests of the persons involved, but they will be subordinated to the personal development of the individual.

In addition to the care and the education of (small) children and affection for the individual, the family will continue to fulfil consumption and recreation functions for its members.

In case A, we expect that this development, which is already under way, will be completed for the marriage generation of 1985; thereafter it will continue to spread through the following marriage cohorts. The described individualization conflicts with the high expectations of the affective function ascribed to marriage and the family. This, in turn, will create new problems and lead to an increased frequency of divorce. Further, this development, with its maintenance of the customary division of roles, puts a very heavy burden on the woman.

See: 153

In alternative B, individualization within the family in the phase during which the children are growing up will manifest itself less strongly. The relationships within the neigbourhood will become more intensive. As a consequence of this, there will be a larger degree of social control than at present, and neigbours will work out communal assistance when mutual help within the family is inadequate. The government will help this by decentralizing existing public assistance facilities, such as district policemen, district nurses and social workers, and by enabling district utilization of centralized services. As the children become independent – at a younger age than at present – the personal growth of the individual family members will once again take first place.

See: 157

Some estimates that illustrate the developments in cases A and B are shown in Table 10.

Table 10. Families, households and singles

	1975	1980	1990	2000
		– millions –		
Population	13.6	14.0	14.5	14.6
Complete families	3.30	3.46	3.76	3.86
Incomplete families	0.18	0.22	0.31	0.36
Total, families	3.48	3.68	4.07	4.22
Other households	0.12	0.15	0.31	0.36
Total, households*)	3.60	3.83	4.26	4.47
Singles**)				
– case A	0.55	0.81	1.14	1.31
– case B	0.55	0.81	0.98	1.00
Total households:				
– case A	4.15	4.64	5.40	5.78
– case B	4.15	4.64	5.24	5.47
average number of persons per households:				
– case A	3.28	3.02	2.69	2.53
– case B	3.28	3.02	2.77	2.67

*) Household: each group of two or more persons who live together in a domestic relationship and join in a common housekeeping.
**) Singles: persons who live alone and occupy a residence of their own.

The estimates of families, households and singles in Table 10 are valid to a large extent for both alternatives. In case B, for financial reasons it will not be possible for many young people to have their own homes. This will influence the number of singles and thereby also the total number of households.

153 There will be a conflict or tension between the large emotional significance of the family in its affective function and the increasing individualization. This will lead to problems, to a need for more assistance and also to a further increase in the number of divorces. As an illustration, we note that, at present, of every thousand existing marriages five are dissolved by divorce and about 16 by the death of a spouse each year. This last figure is temporarily low because there are many young marriages now, and in normal circumstances it would probably be about 22 per thousand. Five divorces per thousand then means that for every 4 marriages-for-life, one divorce will occur. We now assume that the divorce frequency will increase until 1985 to 10 per thousand existing marriages and will thereafter remain constant. The change for an existing marriage to end not by death but through divorce will increase, according to this assumption, from 1 in 5 to 1 in 3.

See: 116

Given the large significance which will continue to be attached to marriage, many of the divorced will remarry; but nevertheless it seems inevitable that more frequent divorce must lead to a larger number of single people of middle age.

154 We expect that there will be a greater tolerance towards divorce, so that the termination of the marriage will take place more and more during the phase of growing children. The number of children who will be confronted with divorce will increase. For the parents, this is a time of tension and conflict; during this period, the children often lack parental love and care. When the divorce is final, this becomes less burdensome; the upbringing by a single parent usually does not lead to big problems, although the visitation regulations are often difficult for the child. Also repeated family formation is difficult for children since they are confronted with several fathers and mothers.

See: 151, 158

In case B, custody of the children will cause more problems than at present, since the father will be more involved in the care and rearing of the children.

155 In spite of the many divorces, marriage will remain the most valued condition of life. There will thus be great need for contact possibilities for singles, who will be numerous in middle age (from 40 to 50 years of age) because of divorce, and also, of course, among the older (particularly widows over 50). This will lead to increasing assistance in this area.

156 Various elements in the described development will lead to a similar kind of individualization occurring in regard to tax-collection and social insurance, in the sense that tax- and premium-collection on the one hand, and income transfers on the other, will be directed more towards the individual than is now the case, and less towards the bread-winner or the family. This will be reinforced within the family because of the work by married woman and the independence this bestows.

Individualization within the family will mean that financial solidarity will be felt to a much smaller extent after the family ties are broken than at present. After the disappearance of parental allowances for students, alimony for divorced spouses will also disappear. This means that the individual will supersede the family as the object of social-economic policy, and that public provisions will take the place of the transfers which now occur because of a prior family connection.

There is another practical consideration in favour of individualization for fiscal and social security. As the content of the relationship gains in importance, its form loses significance, and there will be cohabitation alongside marriage on an increasing scale. In that case it will be difficult to discriminate in fiscal matters between marriages and other relationships.

We thus expect for various reasons that an individualization of taxation and social insurance will occur. In case B this will not happen in the family phase during which there are still growing children, and the criterion will change from marital status to the presence of children of, say, under 16 years.

157 In alternative A, a consequence of the described development will be that the family will be less able to provide mutual assistance than is now the case. This will hold true not only for the case of (small) children but also, for example, for the nursing of the sick, the alteration of clothes or similar chores. There will be more singles, smaller families and more working women, and there will frequently be no one at home during the daytime, so that there will be less opportunity to perform this kind of work. The consequence will be more reliance on services outside the home. This will be true for commercial services – laundries, distributors of pre-cooked meals, cleaning services, tax-consultants – as well as for assistance in case of illness or accident. In these cases, the support of the family and, to a lesser extent, of friends and acquaintances will certainly not disappear entirely, nor will neighbourly help, but there will still be more recourse to social assistance.

See: 289A

See: 184

See: 159 ff.

In case B, the family is more able, in cooperation with the neighbours, to provide help than in case A. Care of small children, nursing of the sick, maintenance activities are examples of areas of possible mutual assistance. The consequence is that there will be less recourse to outside services than in alternative A. Support will come from the family and in stronger measure from friends and acquaintances as well as from neighbours.

158 In case A, the division of roles between men and women within marriage will not change very much. For the time being, the occupation of the husband will determine the status and income of the family, and the wife will carry most of the responsibility for the household and the children. If, in addition, she takes up a job there is a definite danger that she will be overburdened, particularly in the years that the children are young, even if we assume that she will then interrupt her outside career or limit her work to part-time employment for the time being. This heavy burden on married women adds to the tensions mentioned before and increases the need for help and assistance.

In case B there will be an increasing shift in the role distribution between men and women within the marriage, from the marriage generation of 1980 onwards. Family duties will no longer be exclusively the wife's responsibility; men, too, will take their share. This will be possible because, particularly among men, the attitude towards work will change. We expect that changes in the traditional role distribution outside the family – in particular in employment – will lag behind.

3.5. Social services and care

159 As was said, in case A not all mutual help and assistance within the family, or among the family, friends and neighbours will disappear. Still, the conclusion remains that there will be increasing recourse to institutionalized provisions, such as social services, health care and social welfare. In case B, this will be less so because of the increased mutual help and assistance within the family and among neighbours.

See: 157

See: 170

In regard to *social services*, we start from the client-groups towards which the services are directed (children, the aged). *Social welfare* is available to the whole population and is directly accessible; moreover the welfare system is meant for persons with psycho-social problems. Because these provisions are strongly linked to the primary health care services and share many characteristics with them, they shall be treated together under healt care.

See: 133

160 A process of professionalization has been completed in the social services, social welfare and (primary) health care, and such care is now almost entirely in the hands of professional personnel. In connection with the trend towards increasing public participation, we expect the influence of volunteers, from the ranks of clients/patients, to increase markedly in the future. This influence will be felt more in regard to the administration and the nature of the social services than in regard to the actual process of assistance. Such volunteer help is in fact a form of promoting individual and group interests.

See: 136

In case B, more volunteers will be utilized for activities which call for a certain degree of expertise than in case A. The professional social worker will have a two-fold task: help on the basis of specific expertise and supervision of or guidance for volunteers.

See: 203

See: 265A and B

See: 157

161 In regard to child care, the forecast provides for the introduction of a two-year nursery school around the year 1985 for children beginning at age three, which half of the three-year olds and practically all of the four-year olds will attend. The needs of working mothers for child care will depend on the age of the children and the mothers' working hours. In case A, this need will be met in part by family or neighbour assistance, in part by day-care centres. Day-care centres presently are also used by a modest number of non-working mothers. Because of cost considerations and of an increasing number of nursery schools, this will soon end, so that only working mothers will make use of the centres. The percentage of working mothers making use of day-care centres will increase from 5% in 1975 to 40% in 2000.

See: 151, 157

In case B, the needs for child care will be largely taken care of by the parents who will be alternately at home, or by neighbourly help; some use will be made, though, of day-care centres. The percentage of working mothers utilizing the day-care centres will stabilize around the level of 1980. Interest in this form of child care will continue to exist because the parents will not always be able to alternate on the job and neighbours will not always be available when needed.

Working mothers have not used nursery schools for the care of their children during their working hours since these are now only open on specific days during certain hours. Therefore one finds presently in the nursery school primarily – up to 90% – children of non-working mothers. Because of the lack of playmates at home and in the immediate environment, interest will increase sharply until enrollment will reach the level of the kindergartens; even if one of the parents is at home, it will be considered in the interest of the child to have social contact and play opportunities for a few hours a week in the nursery school.

See: 266A and B

In Table 11 we give a few estimates about child care. These are based in part on estimates given elsewhere for the number of working married women. Moreover, it is to be kept in mind that suburbanization necessitates an expension of the facilities. After 1900, this factor works in the the two alternatives in different measure.

Table 11. Facilities for child care

	1975	1980	1990	2000
		— x 1000 —		
Day-care centres, case A				
children	6.0	10.0	18.0	26.0
centres	0.17	0.26	0.46	0.66
professional staff	1.1	1.6	2.8	4.0
Day-care centres, case B				
children	6.0	10.0	10.0	9.0
centres	0.17	0.26	0.26	0.23
professional staff	1.1	1.6	1.6	1.4
nursery schools				
children	97.0	150.0	220.9	204.0
schools (facilities)	2.3	3.3	4.9	4.6
professional staff (half-time)	8.0	11.6	17.1	15.9

See: 157

162 It is estimated that at present 3% of the non-aged households receive family help for up to 240 hours annually. On the basis of the earlier argument, we expect an increase in case A, which will, though, remain limited because of the high costs of this help. In case B there will be a decline in the number of calls made on family help; here, too, high costs will play a role. We assume in both cases that the government will not be willing to furnish an increased contribution to the costs. It will either establish strict regulations or charge a high price from the recipients. This leads to the figures in Table 12.

Table 12. Family help

	1975	1980	1990	2000
Number of non-aged households, millions	3.15	3.35	3.74	3.91
Percentage receiving help				
— case A	3%	3%	4%	5%
— case B	3%	3%	2%	2%
Number of hours, per household, per year	240	240	240	240
Number of man-years of help, thousands				
— case A	18.3	19.3	28.8	37.5
— case B	18.3	19.3	14.4	15.0

See: 123, 124

163 In regard to the care of the elderly, the changing age structure will have a large effect on the over-all picture. We assume that the elderly will be living independently more frequently than at present. Of the aged living independently, about 10% will receive about 240 hours of professional help annually. In addition, there will be a number of service centres at their disposal. The number of aged in residential facilities will increase absolutely but decrease relatively, from 9.5% of the elderly in 1975 to about 8% in 2000. The number of the aged who will be cared for in nursing homes, hospitals, etc. will increase within the group of the elderly from 4% in 1975 to about 5% in 2000, due to the increasing life-expectancy.

Table 13 gives estimates which summarize these considerations.

Table 13. Provisions for the aged

	1975	1980	1990	2000
		– x 1000 –		
Number of aged	1460.0	1591.0	1810.0	1962.0
Care of aged				
– number of clients	125.0	138.0	157.0	171.0
– professional personnel (man-years)	23.0	25.0	29.0	31.0
Service centres for the aged				
– number of centres	0.39	0.42	0.48	0.54
– personnel (man-years)	0.80	0.85	1.00	1.10
Residential facilities				
– number of aged	139.0	46.0	155.0	155.0
– number of homes	1.85	1.95	2.07	2.07
– personnel, man-years	42.6	44.8	47.5	47.5
Number of aged requiring nursing care	59.0	67.0	85.0	96.0

3.6. Health care and social services

164 Judgements about the health of an individual rest on personal, societal and cultural conceptions in addition to objective measurements. Moreover, there are many aspects to health: one can be healthy in one respect and suffer from a malfunction in another. We can therefore never label an individual as healthy or not without further explanation. In regard to health problems which appear in a population, though, it is possible to divide the group up according to predetermined criteria. Each group requires certain kinds of services which we call a *care-system*.

165 If we review the qualitative and quantitative developments of health problems during the last century, the first thing to be noticed is that those diseases which can cause death have shifted to the older age groups. Infant mortality, death from infectious diseases and from deficiency diseases, from operations, parturition and accidents have all declined. In 1970, 78% of female mortality occurred after the 65th year; for men it was 67%; in the age group up to 19 years, the principal cause of death was accidents.

Since 1950 there has been an increase in the number of afflictions which require advanced techniques for diagnosis and/or treatment. This is particularly true for the fatal diseases such as cardio-vascular diseases and cancers. At the same time, there has been increased interest in health care for 'life-diseases'. These do not endanger life but they also do not respond well to treatment by medicines. They are primarily characterized by diminished resilience, which hinders social functioning in various situations. Treatment is partly a medical matter but it should be particularly oriented towards restoring the ability to take part in normal social intercourse. This is the work of social-medical care and out-patient mental health care in combination with social services and the social security system. These health problems are often accompanied by reliance on social insurance benefits. We will include these health problems with those of the handicapped or functionally limited.

See: 260A and B

166 In addition to the sick and the handicapped, we can distinguish four other groups.

The *healthy* need a care-system oriented towards health maintenance and a healthy environment.

The *threatened* are healthy people who are exposed to environmental factors which could cause malfunctions. They need a care-system which is directed to environmental hygiene, mental hygiene and social hygiene. This in turns calls for a systematic monitoring of the environment as well as for supervision

of the application of environmental standards. We call this care-system 'prevention'.

The *high-risk groups* are those which do not yet have complaints but already show deviations of bodily structure or health behavior. The care-system here consists of active investigation, counselling, (advice and information) and periodic examinations, which we gather into the term 'intervention'.

Finally, there are the *help-dependent* who, because of advanced illness, other kinds of malfunctions, congenital defects, or age, are no longer capable of looking after themselves. This care-system consists of nursing and care.

167 The above leads to the following division of health problems and the accompanying care-system:

health problem	care-system
healthy	health maintenance
threatened	prevention
high-risk groups	intervention
sick	therapy
handicapped	resocialization
help-dependent	care and nursing

In the future we expect the shift in the relative frequences of health problems to continue so that the relative significance of the sick will decline and that of the other groups will increase. This will be elaborated below.

168 We also expect a continuation of governmental policy further elaborating the care-system created by legislation over the past twenty years. This endeavor will be directed towards more general, long-range planning, the adaptation of licensing systems for institutions and a greater control over costs. This last will lead to a policy deliberately shifting medical care from hospitals and specialists to primary health-care services. This will involve care-systems which are directly accessible to the client without mediation by third parties. In addition to the general practitioner and the district nurse, social-medical services for youth care, industrial health care and geriatrics, out-patient mental health care and the medical services of the social insurance system are in this category. Social welfare organizations and general social work also operate in this direct care system. Numerous councils have an important part in the decision-making and policy formulation in this area. In the near future, these councils will offer opportunities for participation at the central and regional level as well as guaranteeing acces to the process of decision-making.

See: 144

These developments will provoke controversy. On the one hand, there is an increasing need for central control and structuring, more or less imposing certain patterns; on the other, there is an increasing need for free choice and participation on the part of the public. These controversies are to be found in all care-systems. For example, the demand for broad health surveys is coupled with the administration's doubts about their usefulness, and the administration then limits such surveys to whatever is justified in its own opinion.

169 In agreement with the preceeding, the position of the general practitioner will change to provide a clearer distinction between medical and consultative/mediating work. For a long time, the G.P. has been the central figure and has been so recognized in the Government's proposals for the Structure of Health Care of 1974. In this memorandum, the G.P. is primarily a key person who guards the gates of the specialist. We expect that the attitudes in the health care profession will move towards encouraging a greater degree of responsibility on the part of the patient. In connection with this, primary care will have a

consultative/mediating character for referral to social, psychological, spiritual and legal assistance, along with a medical component.

Diverging from existing policy goals, the position of the G.P. will already change in the 1980s. Until then, the G.P. will remain the person to be consulted in the first instance. But, during these years, he will start to share this first responsibility with other helping professions. The consequence of this will be that gradually the general practitioner will return to his original task, namely general medicine.

170 Social welfare, originally operating separately from primary health care services, includes a large number of organizations, from general social work to the institutions which deal with specific complaints (addiction, alcoholism, family and marriage problems).

We expect that it will become a matter of course for the providers of help and assistance to have fairly regular contact with each other on the district level. In this regard, we think particularly of social workers, the general practitioner and the district nurse. This contact can have an informal, voluntary form; it can also be more structured. The minimal form is to know one another and to know the content of the work that the others do. In this way effective reciprocal referral is possible. Cooperation can also consist of more or less regular consultation among the providers of help, with the voluntary nature of the contact still being important. The most intensive form of cooperation is that of the health centre, where everyone works in one building and has daily contact with one another. Because the health centre seems the most suitable to function as a counselling centre, we expect a growth of health centres from the second half of the 1980s, with all the organizational, instrumental and professional problems which arise whenever people try to work in groups. This development will mean that primary assistance will acquire a more consultative character. This, in turn, will mean that it will be ascertained why and for what kind of help the client or patient is asking in consultation with himself. If the patient cannot solve the problems himself, he will call upon the professional social worker.

An initial problem which arises in this connection is that the helping professions, especially the general practitioner, will not be prepared for the changed nature of the task which they will have to perform. This change can, in the best of circumstances, affect personnel training, but there will still be a large degree of adaptation demanded of the existing social services corps.

Thus we can expect, all things considered, that this mutual adjustment of health care and social welfare will take place but only with a great deal of trouble and with much delay. The result will thus lag behind changes in the complaint patterns and will be insufficient to provide adequate assistance under the new conditions.

171 A comparable kind of cooperation will come into being between the general practitioner and the district nurse, on the one hand, and social-medical services and out-patient mental health care on the other. Special forms of coordination will appear but no overt integration will occur. The different problem-orientations will prevent this. Social-medical services, out-patient health care and social services will, however, have a common orientation towards social-medical and social-psychological problems. The question is how cooperation with the counselling centres and with the health survey system will evolve in primary health care. We expect a significant expansion of these activities. This will also affect the organization of curative help and resocialization. Primary health care will thus increase in importance both

qualitatively and quantitatively and will have the following basic functions:
- curative help;
- social-medical help, out-patient mental health care and social welfare;
- counselling centres, wide-scale diagnostic research surveys, dissemination of information.

172 We also expect an increase of non-professional help in three formats:
- direct assistance in case of accidents, cardio-vascular attacks, acute psychological crises. We think in this regard of some sort of first aid training which, in due time, perhaps via the school system, will belong to the knowledge of every citizen.
- assistance to help-dependent, insofar as no professional expertise is required, possibly in co-operation with the local district nurse associations;
- referral functions. In other countries, there are individuals chosen by a population group to act as a trusted intermediary between the public and professional health care services. Sometimes they receive some kind of training. They have the task, among other things, to transmit complaints, to give advice about further counselling,to give information, etc. It is important that they are members of the population group they represent and can therefore interpret its needs and complaints. It is possible that here, too, a relation with the local district nurse associations would come into being.

These individuals will differ from the group of volunteers we already know. In the present case, as already mentioned, in connection with the trend towards increased participation, we expect a movement towards volunteers who are recruited from the circle of patients. A categorical orientation is possible in this regard.

See: 160

173 As said, we expect greater participation by patients/clients in the provision of care in the 1980s. This development will affect health care as it is centred around the general practitioner.

The increase in individual responsibility will enhance the importance and range of the type of care given at the counselling centres. Members of the helping professions will provide advice, but the responsibility for its implementation will rest with the client. This will be true in cases where the client takes the initiative himself (such as seeking advice from counselling centres for infant care, for birth control, for adolescent problems, etc.) as well as for advice given on the grounds of widespread diagnostic surveys. The counselling centre will also play an important role in social and mental health care. The task of the general practitioner will be primarily medical, in co-operation with specialists and district nurses.

Social-medical services as well as services for mental health care are aimed at the social functioning of the individual by means of prevention, intervention and resocialization. Restoration of health by medication or surgery has no part in this care-system.

Here we also expect a gradual reorganization. There are already the beginnings of regional integration of professional services within the social-medical systems and within services for public mental health care. This common concern for social capacity will contribute to the rise of more functional and organizational relationships between social-medical services, services for mental health care, social welfare services and social insurance systems.

See: 142

174 In the field of mental health care, we expect a pervasive change in insight about the psychiatric patient and the function of health care in the sense that it will increasingly be attempted to resocialize the patients and to re-integrate them into society at the appropriate level. As a result of this, we expect a shift to admission for shorter periods with more intensive care within psychiatric hospitals, and a shift from institutional to out-patient and primary health care.

In case B, we expect that this development in the middle of the 1980s will be combined with a call for mental health care in the more traditional sense, due to the cultural changes which will then be taking place, causing capacity shortages which will halt this trend. This will mean increased-costs, which in case B, will again add to the difficulty of providing the required facilities.

See: 257B

175 Health care affects not only the sick, the handicapped and the help-dependent but also the threatened and the high-risk groups. We expect that efforts for these last two groups will increase. There will be, at least temporarily, some discrepancy between the capacity of these care-systems and the demand for them. The care-systems under discussion will require an increasing number of centres for the quantitative investigation of damaging factors in the environment and the search for incipient problems in the population by means of large-scale diagnostic examinations.

The results obtained from these examinations will provide the data necessary for information, prevention and intervention. It would be incorrect, though, to expect that prevention, through environment hygiene, mental hygiene and social hygiene, would be integrated with intervention, counselling and broadly-based health surveys. The health problems differ too much in regard to problem-orientation, to the desired expertise, and the kind of help. Prevention is directed to the environment, intervention is directed to the individual. The two care-systems will certainly, though, exchange and utilize the information collected by each other.

176 Summarizing, we distinguish four kinds of help:
- curative help + institutions;
- social-medical and mental health care;
- investigation, intervention, counselling, information;
- environmental hygiene, systematic early warning research, prevention.

Automatically the question arises here as to how health care as a whole will develop. We expect an increase of contractual status for doctors, physio-therapists, midwives, dentists and pharmacists. We expect as well a quantitative increase in public health services which will be increasingly recognized as public utilities. This does not mean that the government will accept full responsibility for the provision of care in every aspect of the public health services.

This responsibility can be indicated on a declining scale;

– prevention, environmental hygiene, systematic research, inspection: completely the responsibility of the government;

– social-medical services: important government influence;

– investigation, large-scale health surveys, intervention, counselling: organization and control in consultation between the government and health care personnel; actual provision of care: the joint responsibility of the government and the profession;

– primary curative health care, out-patient mental health care and the appropriate institutions: financing and control by the government, provision of care by the profession.

177 Quality control, testing, evaluation, information gathering and information processing will get more attention than at present. We expect that independent institutions will be established for this. Conflict will arise between the demand for freedom of information and the desire to protect the privacy of the individual in regard to much of the data. The solution to this conflict will demand a great deal of consultation and time.

See: 127, 240

178 Some estimates of the range of primary health care can be found in Table 14. As one can see, the number of general practitioners will increase sharply in the first ten years because of the flow of young doctors into the profession,

See: 211

so that the size of the individual practice will decline; we assume, though, that it will not fall below 1800 persons per G.P. The earlier described change in complaint patterns will mean that the number of first consultations will increase by 5% from 1975 to 1985 and that the number of repeat-consultations per first consultations for adults – from 20 to 50 years of age – will increase by 20%. The number of consultations which the G.P. will perform annually will therefore decline over the whole period from 1975 to 2000 by only 20%, which is much less than the decline in the number of patients.

An increasing portion of these consultations will be referrals, but that will be balanced by other consultations, especially repeated contacts, which will take more time than at present. We also take into account the fact that, in addition to the G.P., there will be an increasing number of technicians in primary care, in or outside of the G.P.'s actual practice. We refer here exclusively to paramedical personnel, such as doctor's assistants, physiotherapists (insofar as they work outside the institutions), district nurses, practical nurses and midwives.

179 For more than one reason, the income and the status of the general practitioner will be undermined. We mentioned the surplus of doctors around 1980, the decline in the size of the practice and – to a lesser degree – in the number of consultations, and also the change in role. These developments will cause changes in the position of the general practitioner as it now exists; this will without doubt evoke strong oppostion.

180 Besides the specific health care, social welfare is also a primary help system and these two will (as we have indicated) cooperate more than at present. We point here specifically to general social work which is not directed at specific sectors of the public but is open to anyone, is non-institutional and offers help for social-psychological complaints.

The client will certainly call directly on social welfare more often, but there will also be, as indicated, increasing referrals by the general practitioner. In the 1980s that will change, because the public will choose centres of help other than the G.P. as first contact. The number of personnel in this sector will grow, especially in the second half of the period (especially after 1985). Although a growth in the number of health care professionals is assumed in both alternatives, this growth will be the greater in case A.

In this case, one is more inclined to call upon professional assistance than to rely on family or the immediate environment. This means that in case A, the number of social and medical professionals will be somewhat higher than is indicated in Table 14.

Table 14. Primary care provision (health care, social welfare, dentists)

	1975	1980	1990	2000
Number of general practitioners	4,800	6,000	8,000	8,100
Size of the practice	2,800	2,300	1,800	1,800
Other personnel (paramedical)	8,500	9,200	10,500	11,000
Social workers	7,300	9,000	11,000	12,000
Number of dentists	4,100	5,100	7,500	7,800
Size of practice	3,300	2,700	1,900	1,850
Other dental personnel	4,300	5,500	8,000	8,100

181 The table also contains a few figures regarding dental services. Apart from some growth in the number of dentists, we expect an increase in preventive care in this area. Due to the unchanged structure of dental care, the number of other personnel per dentist will remain practically the same.

182 The development of the complaint pattern leads to expectations that the rise in the referral rate by G.P.s to specialists will come to an end around 1980 and will decline after that. This decline will be due to the fact that the G.P. will return more to his curative function. Referrals will have more often a diagnostic character and therefore the number of repeat-contacts of patient and specialist per referral will also decline.

In the meantime, the progress of medical science, the further advance of specialization and the surplus of graduates above the necessary number of general practitioners will lead to a sharp increase in the number of specialists after 1985. The number of inhabitants per specialist will thus decline and the original increase in referrals is not at all sufficient to compensate for this; on balance, the number of referrals per specialist will decline fairly sharply. A related decline in income is inevitable.

Table 15. Consultants, hospitals, nursing homes

	1975	1980	1990	2000
Consultants				
number	6,650	7,900	9,650	11,400
inhabitants per specialist	2,045	1,770	1,500	1,280
Hospitals				
number of beds	74,000	70,000	65,100	58,500
number per 1000 inhabitants	5.4	5.0	4.5	4.0
Hospital personnel, thousands				
nursing	52.6	51.1	48.2	43.9
paramedical	14.8	15.4	15.6	14.6
other	54.1	51.1	47.5	42.7
Nursing homes				
number of beds			7,200	14,600
personnel, thousands			3.6	7.3

183 In the table, attention is also given to the hospital system. This is primarily determined by government policy, directed towards cost-control, and by a tendency towards administrative decentralization, caused by changes in the areas of policy and organization. This will lead to a differentiation between two types of hospitals, namely:

See: 142

– general and very specialized hospitals with many specialities, wards for intensive care, 800 to 1200 beds and a supra-regional function; in 2000, approximately 15, with about 15,000 beds or one-fourth of the total;

– general hospitals with a regional function for general diagnostic and curative specialist help, 400 to 800 beds, in the year 2000 about 70 in number.

As a result of the shift of emphasis to primary care, we expect a decline in the admission rate and also of the average length of stay, within these two categories, which together will mean a decline in volume of 27% by 2000.

184 Finally the table reflects the expectation that in time a need will arise for general nursing homes or patient-hotels for simple treatment and care, to which the general practitioner will be able to direct patients for admission. These facilities are related to the reduced possibilities for family care in the case of illness which is not of a serious character but which does require some attendance and care, and by the trend, in the interests of cost-control, not to admit patients into hospitals when it is not necessary from the medical viewpoint. These patient-hotels would fulfil much more of a caring than a curative function; the patient can recuperate but gets no more treatment than he would get at home from the general practitioner. Fewer personnel will be required than in a regular hospital.

See: 157

185 We expect an increased demand for mental health care because of developments in the family and society which will lead to a greater frequency of crises for which psychiatric help will be needed. New treatment methods will mean that patients who are at present admitted for short periods will be considered for clinical therapy. The attitude of social workers will be that in the first place an attempt should be made to re-establish the patients in an individually appropriate position in society. There will be increasing concern for the interest of the patient and, where possible, provision will be made for patient participation in the determination of treatment.

The result of this is that the number of admissions will increase (slightly) but that the number of beds will decline because of a fairly strong shift to shorter periods of treatment; and the need for personnel, particularly highly qualified personnel, will increase because of the more intensive nature of this kind of treatment. Because other operating costs will also have risen sharply, the impression given by table 16 that there will be little change is not correct; the underlying changes are quite extensive, and they lead to a significant rise of costs per patient-day.

The developments shown here might be delayed by the need for additional mental health care around the middle of the 1980s, especially in case B.

Table 16. Institutional psychological health care

	1975	1980	1990	2000
Admissions per 1000 inhabitants	0.84	0.86	0.91	0.97
Beds, in thousands	28	29	28	26
Personnel, total	24	25	26	30
Qualified professional staff	1.3	1.9	3.7	7.3

186 Finally we give some attention to nursing homes and other facilities for specific groups who need continuing care: the mentally disturbed aged, the chronically physically ill (also in large part the aged) and the mentally retarded. Some estimates are gathered in Table 17.

Table 17. Nursing homes

	1975	1980	1990	2000
		— x 1000 —		
Beds for chronically ill	27	29	34	35
Mentally disturbed, aged	13	17	25	33
Mentally retarded, all ages	30	30	26	21
Personnel, total, in man-years	63	68	77	80

The growth of the first two categories is related to the increase in the number of the aged and particularly the very old (85 and older). The aged are not cared for only in these nursing homes, moreover; they are found in general hospitals and psychiatric institutions as well. In regard to the care for the mentally handicapped, where only the most serious cases need institutional care, there will be a small shift toward non-institutional care for the same reasons as in the mental health care system.

187 On the basis of the numbers of beds in the various categories, estimates were made for material operating costs and investments in health care as a whole. Here, too, the shift from expensive hospital care to the much less expensive out-patient care will bring some relief in regard to cost in the long

run. Investments will remain high; they will be needed for the replacement of hospitals and the expansion of the number of beds in nursing homes.

Table 18. Material operating costs and investments in health care

	1975	1980	1990	2000
	– volume index, 1975 = 100 –			
Material operating costs	100	99	98	94
Investments	100	100	117	109

See: 140, 141

188 As indicated above, we expect a change in attitudes in the sense that individuals will be less resigned to illness or handicap, will have higher demands for health, and will make more claims to a rewarding existence. This will lead to another kind of complaint pattern and another kind of help, directed towards recovery but, where that does not happen, also towards assistance for the client to realize as active a role in society as possible. In this sense, more effort will be given than at present for the benefit of chronic patients, the handicapped and the psychiatric patient, to lead them to a rewarding existence on their own level of functioning.

189 This concept will be accompanied by a wider acceptance of euthanasia in cases where there is no prospect for restoration of human functioning. We expect in this regard indeed freer discussion than presently but no substantial changes in actual behaviour in the period under consideration. Possible consequences for intensive care wards in hospitals were not taken into account, nor was any effect of euthanasia on the average life-span.

190 Congenital mental retardation is incurable; it is possible, though, in less serious cases to work out an adjusted way of life which makes admission to an institution unnecessary. This demands guidance for out-patient mental health care in the form of social-pedagogic services, day-care centres for mentally retarded children and adults, and foster homes. None of these services is as yet well developed.

The number of mentally retarded who need this care or institutionalization is determined by various factors. The average life expectancy of the mentally retarded will increase significantly and thereby the number who will require care. Changes in attitudes will, at the same time, lead to a strong shift from institutional to out-patient public health care. This will barely affect the older adults who are now in institutions but it will, over time, lead to a gradual shift in future care.

For the small category of the seriously disturbed needing intensive care, who might also be physically handicapped, other considerations pertain. Initially, progress in medical science made it possible to keep a larger number alive. Changed attitudes in medical ethics in regard to the purpose of life are spreading. Of more importance, however, is the increasing possibility to recognize these serious cases early in pregnancy and to avoid them by abortion. This will lead to a decline in the decline in the number of cases.

3.7. Education

191 In June 1975, the Contours Memorandum appeared in which the government set out its view on the development of education in the coming 20 to 25 years. In several respects, we have adopted the vision of education as reflected in the Memorandum. In a few aspects, though, our expectations do not agree with the intended results of the suggested policy and we have deviated from it, namely in regard to the rejection of the proposed integration of kindergarten and primary school, to the replacement of the variety of

secondary schools by the middle school and to participation in higher education. This will be further elucidated in the following paragraphs.

192 The attitude toward education will not undergo any fundamental changes. The transmission of knowledge, skills, rules of behaviour and values are considered important in every highly developed society and an essential role is always given in that process to the educational system. This will remain the case. Changes are to be expected, though, in the manner in which that role is performed.

Of the three traditional tasks of education, namely socialization, transmittal of the culture and preparation for society, socialization is being gradually expanded to include a systematic introduction to social problems in their interrelationships. If this would lead to a tendency towards political influence on the educational system, the most probable result would be a new organization of education on the basis of secular rather than confessional lines of demarcation. It is expected, though, that this will happen only occasionally since such a change would entail very high costs.

See: 130

193 The form which the transmission of the culture now takes in the educational process has attracted all kinds of criticism. Its one-sided intellectualism, its contribution to social inequality in knowledge, power, income and status, and particularly the emphasis on individual achievement, are all under attack. To the extent that participation in secondary education becomes general, this education, with its outsproken theoretical-abstract emphasis, will be less likely to meet the various needs of the pupils. We therefore expect strong pressure for a considerable broadening of the curriculum in secondary education and, to a lesser degree, in higher education as well. This pressure will be even stronger in alternative B due to the changes which will gradually be taking place in the general attitudes towards conservation, towards work and health and towards the allocation of roles between men and women in the family. We expect that education will be the first area where these changes in attitude become evident. Moreover, in the period under discussion, the broadening of the curriculum will be difficult to achieve and will not yet put the less-academic subjects on an equal footing with the intellectual disciplines. The reason for this lies primarily in the expected opposition and the necessary time for preparation. In primary education, the emphasis will continue to lie on the transmission of culture tied to knowledge, next to practice in the accepted basic skills.

See: 158, 172, 173, 257B, 281A, 285B

194 The preparation for society currently provided is also questioned. Such education is accused of directing itself too much towards skills required for employment and, due to this strong orientation towards vocational preparation, of neglecting the other functions of education. The labour market situation, in the meanwhile, has led to the conclusion that the too strong connection between study and vocational choice must be weakened. A long-lasting discrepancy between demand and supply in the labour market for graduates at all levels is expected of itself to lead to a less vocationally-oriented system.

See: 281A

See: 276A and B

Vocational training will continue to be necessary, though, and in some cases this training is so specific that an early linkage of study to career choice is unavoidable. To ward off a permanent disequilibrium between supply and demand for graduates, some kind of regulatory action will be necessary. This will mean a continuing quota system, on social grounds, in the vocationally-specific sectors of higher education*.

*) Except for a limited number of areas (medicine, dentistry, veterinary studies) Dutch universities still practice the traditional policy of free entry for anyone who is qualified by completion credentials from secondary schools.

195 In a more general way, there will continue to be in the future a relation between the duration and level of education on the one hand and subsequent societal activities on the other. Individuals differ strongly from one another in development potential. To the extent that these possibilities are greater, the feeling that education contributes to one's personal development will continue for a longer time. This will subsequently affect the possibilities for later societal participation.

This personal development will, moreover, also have to be reflected in a rising line of advancement in knowledge and abilities. If this line no longer rises, then education will have lost its purpose. Looked at from this angle, the element of achievement will remain a characteristic of education, and tests of educational achievement cannot be done away with.

196 In the future, as now, it will be primarily the young who will attend daytime schooling – and this even more than at present. We expect an increase in educational participation, primarily on the basis of the experience of the last decades.

197 This development will be fostered by changes in the educational system. By about 1985, we expect that a structure of four layers will be in place, which will look as follows:

- kindergarten, from a suitable time during the 4th year to 5 years old;
- 7 years of primary school (5–12 year olds);
- a 5- to 6-year middle school for almost all secondary education;
- higher education.

This structure will stimulate participation in education on the part of young children and adolescents; for girls specifically there should be an obvious effect of the general introduction of the 5- to 6-year middle school. Compared to this change, the extension of school age will have little actual impact on attendance: it affects age groups who, in large majority, are already going to school. We assume that the obligatory school age, which at present starts with the 7th year and ends at the 16th birthday, will be extended by one year at each end.

198 We further expect that, between now and 2000, participation in education after the required age of 17 will practically double for men up to 24 years of age, and for women will increase even more strikingly; they will be catching up. This applies, as mentioned, particularly to secondary education, under the influence of the general introduction of the 5- to 6-year middle school.

In regard to participation in tertiary education, a large difference will remain between the sexes, partly as a consequence of the continuing preference of women for a shorter training period. Educational participation of those 25 and older in the initial educational process will be negligible in the future as a result of the restructuring of higher education.

One thing and another leads to the estimates of Table 19.

Table 19. Participation in education

Age	1975		1980		1990		200	
	m	f	m	f	m	f	m	f
	— percentage participating —							
15	92	89	(100) *)		(100) *)		(100) *)	
16	81	70	(100) *)		(100) *)		(100) *)	
17	62	46	77	63	86	79	90	85
18	47	27	60	42	74	54	80	65
19	36	17	47	25	54	34	60	45
15–19	64	50	77	66	81	71	86	79
20	27	12	36	18	41	30	45	35
21	20	8	28	12	32	21	35	25
22	16	6	20	8	23	13	25	15
23	13	4	16	5	18	7	20	10
24	10	4	12	4	14	4	15	5
20–24	17	7	23	9	26	15	28	18
	— number of pupils x 1000 —							
0– 4	226		169		257		251	
5– 9	1203		1071		824		867	
10–14	1224		1220		852		880	
15–19	669		898		821		698	
20–24	135		191		252		192	

*) Compulsary school age.

199 In the future, adult education in the form of reschooling, remedial education and retraining will also attract an increasing number of people. We are uncertain about what is actually happening now in regard to private training courses, evening classes and correspondence schools, but it is obvious that there will be an increasing need for facilities for those who did not get their fair share of education in their youth.

The school system will, however, remain largely day-time and will not get involved on a large scale in evening and weekend education. For the reschooling mentioned above, there will be some other kind of system, such as the Open School, utilizing television. At present, thinking along these lines is confined primarily to lower vocational education and the lower secondary levels, but expansion into higher levels is certain. We expect that the Open School will come into being; there are no real technical problems, certainly not after the introduction of cable television. Experience from other countries indicates that utilization is limited only by human factors. The Open School will absorb most of the correspondence schools which now provide most of the educational needs of adults.

200 In regard to reschooling in a narrower sense, public discussion until now has been limited primarily to the higher levels, although what is said applies just as well to the lower levels. There are not many signs that much progress will be made in the coming years, even in regard to the higher levels. The institutions for higher day-time education will have no room for activities beyond their present tasks. In addition, cost considerations mean that there will be no strong external pressure for these institutions to provide post-academic education.

To the extent that the solution cannot be found in the business community, educational technology will have to provide the beginnings of a solution, but it does not look as if this would occur within the 20th century.

We thus expect that adult education will only marginally reduce the labour force, as is illustrated in Table 20.

See: 266A and B

Table 20. Claims on the labour volume by adult education

	1975	1980	1990	2000
Day-time adult education, time involved as a percentage of labour volume*)	**	1%	2%	4%
The same in thousands of work-years:				
– men	**	27	66	124
– women	**	7	17	39
– Total	**	34	77	163

*) Working time of the full-time labour-force, who are not unemployed and who are from 25 to 60 years of age.
**) None.

201 Important changes in education which do not yet show even the first beginnings of implementation will not be realized by the end of the century; this much we have learned from earlier changes of any magnitude. Still, the changes will be greater in the coming quarter of a century than in the previous seventy-five years. Considerations of societal relevance, of educational effectiveness and of financial feasibility will make these changes necessary.

The present system of varying educational paths (streams) according to the end result level implies a strong measure of social differentiation. This situation is increasingly being questioned. Solutions in the form of compensatory programs have apparently not been effective. Within the financial constraints, attempts will certainly be made to narrow differences in class size and to introduce new types of schools. Because of these attempts and because of the 'second generation' effect of already existing developments, the problems of the underprivileged groups will lose significance in the future.

202 The need for control of the educational system will increase strongly. The desire to equalize personal development opportunities and the pedagogic need for a clearer and more effective operating system will lead to a more unified educational structure, which can best be governed by regional organs having both a planning function and an educational coordinating task.

See: 142

In a more unified educational system, there will be a pattern of age-group cohort progression rather than, as at present, a subject-matter-year class system. The problems which are now solved by having children repeat a class in primary school could be better dealt with by an average class size of no more than 15 pupils. Because this is not and will not be financially feasible, an attempt will also have to be made in primary education to homogenize achievement groups to a certain extent. Thus, pupils from one group will participate in all subjects as a group. At the secondary level, the groups will be split according to subjects. Because this system works better when the schools are larger, a certain degree of centralization of the school system is an obvious consequence.

203 There will, therefore, be three phases in the future structure: the age-group up to 12 years, the 12 through 16- to 17-years olds, and the oldest, with 24 as a reasonable upper age limit. The first phase starts when the child is ready for the educational process. For many children, this is between the third and fourth birthdays. Further, it is important to mention that the transition from kindergarten to primary school occurs at different ages, corresponding to a different pace of individual development of the child; this is usually some time between the ages of 5 and 7.

According to expectations, there will be a kindergarten for the 3 and the

4-year olds and thereafter the primary school. We expect that both the already existing pressure to allow three-year olds into kindergarten and the recognition of the genuinely differing needs of 3 and 4-year olds will lead to a separate kindergarten for this age group. About half of the three year-olds will attend and practically all the four year-olds. The seven year primary school will start with a two-year transition period.

204 In regard to special education, there will be no major changes. The number of types of facilities will be reduced by approximately half, due to reorganization. Because of the small pupil cohorts and the age-group progression system of the regular school, the number of children in special education will be reduced by 25% to 30%. The system will remain unchanged, though, in purpose and function.

205 According to many, the system of educational streams is ready for fundamental revision. Two models come into consideration in this regard. One is the middle school, with freedom for an internal differentiation in the individual curricula. The other is a dual system, in which there would be both a broadly based general type and a strongly intellectually oriented school type which would provide the principal access to higher education. The choice between the two models is not in the first place a question of educational viability but rather a political-organizational question. The most probable result will be a compromise, by which neither a unified system nor a totally double system will emerge but rather a hybrid. There would then be a middle school, which in principle will cover the whole range of education, but which in practice will be primarily limited to the group which is now in the terminal secondary schools and the vocational-technical training schools. A few of the larger schools of this type will provide a wide spectrum of curricula. In addition to these, there would still be a modernized form of education for the intellectually most challenging alternatives. That would be a six-year lyceum which would have programs at the level of the present university-preparatory schools.

One could easily imagine a further development, in which there would be attempts from the inside for a gradual broadening of the middle school by inclusion of intellectually demanding components. This process would turn out to be so difficult, though, that it would not get off to a good start before the end of the century.

206 For those who will be working in practical occupations, the period of general liberal education will be longer than at present. Within the three to four-year middle school, there will have to be latitude for the choice of strongly practically oriented programs. They will not be, though, vocational in the sense that certain basic techniques required for specific occupations will be taught. There is a real need, though, for such education and it seems obvious that this vocational training will be given after the middle school. In this regard, can imagine an educational period of two or three years, as a rule, as long as this is followed by further on-the-job training.

Naturally, after the middle school, a continuation of middle-level vocational training must be possible. This structure reminds one of an upper school. It is, though, not be expected that a separate upper school would be reality by the end of the century because there will likely not be enough time for that. There will probably be a provisional solution in which the middle school will be followed by a two-year option for technical training or for continuing liberal education that is not centered on specific societal activities. It is conceivable that in a few large middle schools there will be programmes providing access to higher education.

207 We further expect that, even before the middle school is generally available, the lower vocational education will have acquired a longer duration than four years, of which only the last two years would be strictly vocational. This upper structure can easily be attached to the middle school as a follow-on possibility.

Middle level vocation education will perhaps also find a place here and there in the upper structure of such a combined school. The organizational problems of such a structure are not negligible and it therefore looks probable that the middle-level vocational education will still have its present shape towards the end of the century, whereby this kind of education is offered by small, independent units. The duration of the course of middle-level vocational training will in many cases be longer than two years. The four-year type (including an apprenticeship year), is the most usual and this will continue to be the case.

208 With a progression based on age-groups and the creation of homogeneous groups for each subject, an external examination system is appropriate, by which the subjects can be taken separately and testing in each subject can occur on various levels. The pupil will then be able to choose in which subjects he or she wishes to be examined and at what level in each subject. Entrance requirements for the next higher level could possibly be based on the results of these examinations.

209 Given the expected flow of students to university education and higher vocational education and the means available for this, the present structure of two entirely separate systems is too expensive and too inflexible. Far-reaching structural changes are needed to deal with all the difficulties. In the long run, adequate facilities will be available, but only if significant reforms take place. In the medium term, particularly in the years between 1980 and 1990, there will be very serious capacity problems which cannot be solved without entrance limitations within the existing system. This will render long-run solutions more difficult.

If the present system of two rigidly separated educational streams is abandoned, two models can be considered as alternatives: the column and the layer systems. In the column system, within a given area of education, various paths towards different goals exist next to one another. After a short common preparation period, a specific educational stream is chosen, for example research-scientific, practical-professional, or general liberal arts, as well as a level; except for 'switching', the selected stream provides a terminal training. In the layer model, there are a number of training phases of progressively higher levels for every branch. Gradually there will be an increasing differentiation in the final requirements. The training can be rounded off at the end of each phase, but the student can also attempt to qualify for the succeeding phase.

Whichever of the two models is chosen, the initial years of higher education will in any case conform to the educational model used at present in the technical colleges, and not to that of the universities: traditional classroom lecture courses, limited freedom of study for the students, and for most teachers an exclusively educational task and no research activities.

210 Specifically, what do we expect? The integration of the technical colleges and the universities will start with a harmonization of the curricula. We expect the introduction of the column system. Under pressure from the larger influx of students, the wider spread of levels accompanying this and limited funds, as the process gets under way the system, however, will begin to show more

and more characteristics of a layer system. This will be expressed, first, by the introduction of a fairly long preparatory period from which the student may continue to either path and, second, by the change of differences in level into differences in the duration of the course.

The most expensive education, such as medical schools, the top levels of a number of other professional schools and the top research-scientific training, will be concentrated in a small number of institutions. This has consequences for the mobility of the students and the coordination of the training programs.

For most studies, the length of the course will be four years, with more time for medical training, some other professional schools and the research-oriented curricula*).

211 Access to higher education will be more limited than at present. In addition to societal considerations, the expense of the schooling will also contribute to this. The present latitude in regard to the duration of the study, which allows a student to complete a four-year program in five years or even longer, will disappear, except for the last stretch of the longer programs.

The expected changes in the organization of secondary education will necessitate other admission standards for the subsequent stage. In part, there will be general conditions such as a predetermined number of subjects for a diploma of which at least a fixed minimum on the highest level of study, in part specific requirements in respect of the subjects chosen.

212 The described educational changes will lead to larger units. In primary education, this means that the average size of a school will almost double, to just over 300 pupils. In secondary education, the outlined model demands a large variety of programs, even if the lyceum continues to exist. In a middle school, there will have to be between 300 and 400 pupils for every year-class. If 80% of the students go to a middle school and 20% to a lyceum – as in the present division between terminal education and pre-university schooling – then with the present size of a generation, there would have to be 500 to 600 middle schools and almost 200 lycea. Between 1980 and 1990, the size of the school generation will decline to 2/3 of the present figures, and in 2000, 500 schools would be sufficient to meet the needs. In primary education, the increase in scale and the reduction of the birth rate lead to a comparable reduction in the number of schools where that is possible, but not, or only in limited degree, in the rural areas.

213 This reduction of the number of schools conforms to a centralization process which is already under way in secondary education. There will be a great deal of opposition to this increase in scale because it will mean that many smaller communities will have to give up their own secondary educational facilities; and in the larger communities, the present variety of public and private schools, often based on demoninational differences, will be threatened. This development which, with continuing suburbanization, can lead in some places to the introduction of school buses, will take place only gradually and will not be at all completed by the year 2000. One must bear in mind, though, that after 1980 the reduction of the number of schools will no longer be exclusively the result of the increased scale but also of the smaller number of pupils.

214 In higher education we find at present, in addition to universities with about 20,000 students, a large number of schools for higher vocational education

*) At present the system of general liberal arts college education prior to the university is unknown in the Netherlands, and students enroll in a specific university faculty straight from preparatory school or lyceum at the age of 18 and 19. Most studies then take at least five or six years to completion.

with about 250 students. Consolidation and mergers among this latter group will finally lead to a total of 30 to 50 institutions of higher education with 5,000 to 15,000 students each. But this process of concentration will be much more difficult to bring about than at the middle school level and it will not be at all completed by 2000.

215 Educational technology has made important advances, particularly in the development of audio-visual aids to support the teacher. The use of these aids remains limited in practice because they are expensive and because the instructors do not feel at ease with them. Only towards the end of the century will this kind of aid find any wide-spread utilization.

Systems which do not support the teacher but replace him so far appear too expensive and unsatisfactory for the students. The application possibilities of, for example, Computer Assited Instruction (C.A.I.), probably lie particularly outside the regular school, for example in the Open School, if it proves technically feasible to give a large number of people access to the system. For the time being, it must be doubted if cable television and two-way systems will be so far developed in 2000 that C.A.I. could be quite simply brought into the living-room.

216 For an estimate of the necessary funds, we started from present policy goals. In broad lines, this means that the total will show only a modest increase, that priority will be given to primary and secondary education, and that large savings will be possible, in particular in the universities.

For kindergarten and primary school, we expect a real increase of 20% in the funds per pupil by 1990. This increase will serve both to introduce the supporting organization and for the reduction of class size. For secondary education in the same period, we estimate an increase of funds of 10%.

Savings will have to be realized in the universities by the introduction of a new educational model and a different allocation of students over diciplines and levels. In the long run, the University Hospital will be replaced by general hospitals which are affiliated with the medical schools, but this will not be very important before 2000. The growth of university education will, moreover, have to be limited in size by directing the flow of students more and more to the new institutions of higher education. Altogether, for higher education as a whole, personnel per student will decline by 25% by 2000, and exploitation costs, which vary even more strongly between the present university education and the higher vocational training, will decline per student by at least 40%.

It is certain that this adaptation will meet with difficulties. In the universities, a bottleneck threatens during the next ten years because the number of students will increase so quickly that the suggested reforms will not be able to cope with this. The quotas which will then be introduced will further hinder educational reforms. Towards the end of the century, the number of students will decline rather rapidly as a result of demographic changes, so that these difficulties will disappear.

A second problem of the universities is that scientific research will run into difficulties if the funds are reduced because of another distribution of students among institutions and disciplines. (In the Netherlands, traditionally, research is financed from public funds which are allocated on the basis of the number of students.) This effect will continue even after 1990 when the number of students will decline because of population trends. We have therefore raised the budgets for the universities for the later years by a fixed amount.

217 Based on these assumptions and on population trends, the number of personnel and the exploitation costs will slow a fairly steep decline between 1980 and 1990, which will last until 2000. We assume that part of this surplus will be used to make a serious beginning with the Open School or for continuing education for adults.

In order to avoid the suggestion of precision in these very rough estimates, we have brought the results of the assumptions together in Table 21 in some broad totals.

Table 21. Educational expenditure

	1975	1980	1990	2000
Personnel,		— x 1000 man-years —		
Primary education	90	88	83	86
Secondary education	80	96	85	78
Higher (tertiary) education	43	45	42	32
Open School	—	—	5	10
Total	213	229	215	206
		— volume index, 1975 = 100 —		
Exploitation costs, total *)	100	99	88	79
Investments *)				
construction	100	119	125	106
other	100	89	72	65

*) Includes a fixed amount for scientific research at the universities.

218 Table 21 also contains some indicative figures for construction and other investments in education. Here it is assumed that a beginning will be made as rapidly as possible with the construction essential for the earlier mentioned structural changes. This applies to the increase of scale in primary and secondary education, sectors which can claim a certain priority, but for higher education as well.The development of this latter, after all, is a precondition for the savings in university education which the reforms in earlier stages will make possible. We have also then assumed that construction until 1980 in higher education will be sufficient to cope with the increase in students and that, thereafter, by 2000, practically the entire new higher education will be in new or restored buildings. For secondary and primary education, this will not be possible, and presently existing schools will still have to be used for a large number of pupils — about a third of the (diminished) total — by 2000.

The other investments are calculated as a percentage of new construction estimated for various categories; no allowance is made for a strong expansion in utilization of technical aids for education. The investments for university education show a decline which dominate the total amount; there is, however, a smaller decline in the allocation for research than would be consistent with the shift in the number of students.

3.8. Leisure

219 Leisure is the time which the individual can spend according to his or her own desires because he is free from the societal function he has assumed — attending to education, work (including necessary travel time) or home-making and child care. This negative description is in accordance with the fact that the use of leisure can differ a great deal and that there are activities which would be leisure activities for one person and duties for another. Cultural differences are most strongly expressed in the large variety of leisure-time activities. In the past decades, the increase in spending power has brought a large number of

(new) products designed for recreation and relaxation within the reach of the general public. The share of expenditures for recreation in the family budget has risen considerably, and this probably reflects a change in taste; the recent economic recession did not lead to a reduction of purchases of automobiles, caravans or boats; apparently these recreational articles enjoy a high priority.

A second characteristic of the development is an increasing 'privatization' in consumption. Many facilities which were originally utilized in common, such as public transportation, movie-theatres, coffee-houses, have been replaced by provisions within the family, such as family automobiles, television, cocktails at home. In addition, something comparable has appeared within the family in the sense of 'individualization': instead of the family radio, record-player, automobile, library, each individual family member is beginning to have his own. The result is an accumulation of leisure products facilities, none of which are used at all intensively.

See: 152

220 Until now, only a small part of the large differences in leisure behaviour could be explained by characteristics such as education, income, degree of urbanization of the residence, or age, sex and family conditions. This was partly due to self-evident limitations – certain activities are linked to spending power or to age –; it is partly also a question of attitudes about the appropriateness of roles which link certain leisure activities to a specific cultural pattern.

In the future, age and education will be of particular importance, because other characteristics will become less important, and because it will be precisely in these characteristics that the major changes in the composition of the population will occur. This will influence leisure behaviour in a process which will also see a change of cultural patterns.

See: 124

221 We will first indicate why other factors will decline in importance. The higher level of women's education and their larger degree of participation in the work force will lessen the differences between the sexes. The diminished importance of the family in alternative A and the tendency towards individualization carry the implication that the family will lose some of its importance as the focus for leisure activities.

See: 148, 152, 157, 198, 266A and B

In alternative B, the lower degree of individualization within the family in the phase of young children will cause the family to remain important for a while as the focus for leisure activities. This will also apply to the neighbourhood towards which the family will be more oriented. Denominational differences have already lost their meaning in leisure activities to a large extent. Differences between the city and the country have also become less important, and this process will continue, particularly in case A, due to the increasing suburbanization.

See: 130, 152, 157, 320, 321A

222 We expect that differences in leisure behaviour will be linked to the successive life-phases of adults. The family-phase will be shorter than at present, as will the period in which leisure activities will be geared to family circumstances. Still we have here a relatively homogenous group which may set the style. This will be less true for those past the family-phase. Their educational level will be higher than at present, the woman's job will make the family less important as a social framework and the age-group will be large. Attitudes about 'suitable' leisure behaviour will adjust to this, and this will have consequences for the still older groups as well. Greater mobility, greater involvement in leisure-time activities and broader attitudes towards what is suitable will work to the advantage of the aged.

See: 148

See: 324A and B

223 Differences in education lead to differences in leisure behaviour because they are accompanied by differences in income and because they lead to differences in ability and interests. We expect an increase in the level of education, accompanied by a broader spread of leisure activities, even though it

See: 198

will be less than might be expected on the basis of existing differences among the educational levels. For some cultural activities, upbringing is so important that changes take place only after two generations of changed socio-economic status. In addition, some leisure behaviour has strong status aspects. To the extent that such behaviour appears only in a very limited fashion among the highly educated today, it will continue in this way and will not become more general even with a heightened educational level.

224 According to the definition given earlier, the range of leisure varies according to how much time other activities demand. In this respect, the major influence is the duration of the working week and the commuting time. The time-demands of housekeeping and child care turn out in practice to be quite constant and only slightly sensitive to the technical aids now at one's disposal; school hours seem to follow the course of the working hours.

See: 225, 328A and B

225 In regard to working hours, we expect in alternative A that the distribution of increased labour productivity between income and free time will be about what it has been in the past, so that reductions in working time will be equivalent to about 1/5 of the real increase in income.

See: 289A

For case B, the distribution of increased labour productivity between income and free time will be the same as at present until 1980. After 1980, real income increases and labour-time reductions will get equal weight in the distribution of economic growth.

See: 289B

The economic development expected in both cases will lead to changes in the duration of total working time wich are shown in table 22.

Table 22. Working time and free time

	1975	1980	1990	2000
Case A:				
Length of a work-year				
— in hours	1,930	1,871	1,782	1,695
— in workdays	234	231	223	218
Duration of the working week:				
— in hours	41.25	40.50	40.00	38.88
— number of holidays per year	19	22	30	35
		percent growth per year		
working time		— 0.6%	— 0.5%	— 0.5%
free days (holidays)		+ 0.5%	+ 0.6%	+ 0.4%
free hours in work week		+ 0.3%	—	+ 0.2%
Case B:				
Length of a work-year				
— in hours	1,930	1,871	1,674	1,593
— in workdays	234	231	223	222
Duration of the working week:				
— in hours	41.25	40.50	37.50	35.83
— number of holidays per year	19	22	30	31
		percent growth per year		
Working time		— 0.6%	— 1.1%	— 0.5%
free time		+ 0.5%	+ 0.6%	+ 0.1%
free hours in working week		+ 0.3%	— 0.8%	+ 0.4%

In case A, we started with a rise in labour productivity of 3.3/4% annually until 1980 and with 3% annually thereafter. The shortening of the working time absorbs one-sixth of this growth. In addition, it is assumed that the emphasis originally will lie on the reduction of everyone's work-week to 40

hours. This goal will be reached shortly after 1980 and thereafter the number of holidays will increase rapidly. Finally, after 1990 there will be a second round of work-week reductions. In case B, we also begin with an increase of labour productivity of 3.3/4% annually until 1980; but thereafter the percentage will gradually decline. Until 1980, the reduction of working time accounts for a sixth of the growth and thereafter for half. Here, too, it is assumed that the emphasis originally will lie on the reduction of everyone's work-week to 40 hours. This goal will be reached shortly after 1980 and thereafter the number of paid holidays will get more attention. Around 1980, preference will shift again towards a reduction of the work-week.

Table 22 also shows the changes between successive benchmark years expressed as annual percentages. These are relatively small. In the 'free-days' category, the usual number of Saturdays, Sundays and official holidays are included with the paid holidays. The free time in the work-week is reckoned by setting the total of labour time, travel time and leisure per week at 80 hours, taking account of the steady increase in commutation time as a result of the continuing suburbanization. In case B, after 1990, the increase in commutation will be somewhat less rapid because the process of suburbanization will be slowed down.

See: 321A and B, 328A and B

There will also be a reduction in working time because an increasing number of persons will shift to part-time work. In case A, this will be mostly married women who will prefer part-time work in connection with the family-phase; this phenomenon will have no significance for free time. In case B, in addition to married women, there will also be many men who change to part-time work. An important part of the time which will thus become available will be devoted to raising and caring for the children. There will be a little more time for activities outside the home as well, although the phenomenon of part-time work will not have much significance for leisure activities.

See: 265A

See: 264B, 265B

226 We will now look at leisure activities in and around the home, outside the home but in the neighbourhood (as the individual perceives it) and further away. Within this pattern, we will limit ourselves to activities which are important for other areas or which could lead to bottlenecks.

227 Of the activities in and around the home, we will discuss radio-listening, television-viewing, reading and handy-man chores. The first three are practiced by all groups, and that will remain that way; there will be changes, though, in the time spent and in the intensity of the activity.

Much radio use has a low intensity; it accompanies other activities. On the other hand, though, broadcasting achieves intensive contact with certain groups in specific programs. This will increase.

Viewing television forms an important part of the rather monotonous leisure activities of the aged and of people with a low educational level; the medium is of much less importance for the younger people and the better educated, who have a varied repertory of leisure activities, with more frequent creative activities and participation in cultural events. With changes in the age structure and educational level, television might lose some of its significance, were it not that in case A the supply will increase sharply partly as a result of the introduction of cable television, affecting both the number of broadcasting hours a day as well as the number of available channels.

See: 123, 124, 198, 241, 284B

In B, the supply, given the expected economic development, will increase somewhat and there will be a modest introduction of cable networks. We do not expect that this will lead to a change in the nature of the programming but rather to other utilization patterns, since the viewer will begin to use television

during the daytime as the radio is now used, while doing other things at the same time.

Reading a lot correlates with a high educational level and with a high educational level of the parents; apparently upbringing plays its part here. In regard to reading, fiction, which dominated earlier, will lose ground to reading about all kinds of hobbies. With the young people, reading is combined with a variety of other activities; with the older people (over 45), it is often combined with frequent use of radio and television. In the future, this pattern will be less common because the older people will also exhibit more variety in their leisure-time behaviour; they will continue to read but then, as now the case with the younger people, in combination with other activities. Reading is not expensive and it makes no heavy demands on the home or on family circumstances. It will be fostered by the diversification of the available supply — namely with provision of information about all kinds of hobbies — which is already taking place and, which, according to our expectations, will continue. This will mean a shift from general reading materials to publications for specific target-groups. Together with the diminished intensity of television use, this development will mean a larger number of people who will read more frequently.

See: 234, 236

The performance of all kinds of odd jobs in and around the home goes with gardening in the leisure-time pattern of many married men with spacious housing. A further expansion of this pattern can be expected, particularly in case A because of increased home ownership and an increasing interest in homes and furnishings. The further rise in the standard of living, though, will make it improbable that the do-it-yourself activities will spread to specialized jobs; for those, a professional will still be necessary.

See: 296A

In case B, too, the performance of all kinds of jobs in and around the home will be done by an increasing number of married men. We expect this expansion because of declining economic growth, which will invite the substitution of selfhelp for services from third persons, and because of the strengthened function of the neighbourhood, which will lead to a common utilization of tools and workshops, and to mutual assistance.

See: 136, 157

228 Under leisure-time behaviour outside the home within the immediate environment (as the individual perceives it), we consider such things as an evening out, sports and participation in political, social and club activities.

The traditional cultural outing — a visit to a museum, theatre, concert — is associated with income and general liberal education, and the educational level of the parents is also significant. Still, a rise in the educational level will not lead to a further expansion of this pattern because cultural participation of this sort will retain its exclusive character.

The popular evening out is devoted to movies, dancing, clubs etc. The new generation, which aspires to a wide range of activities because its higher level of education, is growing up in the middle of its own elements of style for cultural participation. A broad participation in advanced education will lead to a further expansion of popular culture participation. The character of this cultural participation will have a very capricious course; it can be anticipated for only a few forms. For example, the movie public, which is now primarily under 30, will remain just as large in spite of demographic changes, because the greater variety in the leisure-time behaviour of the middle-aged will lead to their increased attendance at movies. Some slight increase can be expected in visits to cafes and bars, because of the increased number of single people of all ages.

See: 198

See: 152

The practice of sports depends on age, income and background. Income is

important above 30 and particularly above 45 years of age; the educational level determines the number of sports which will be practised. Broadly, the picture is as follows. With a limited income and/or low educational level, one sport is taken seriously, with the emphasis on the element of competition; one stops at a relatively young age. With a higher income or a higher educational level, in contrast, many sports are undertaken for reasons of health or companionship, rather than for competition; one continues longer with this exercise of sports. In the future there will be no substantial increase in the number of young people who engage in sports; there are now already no barriers to participation. Demographic and educational developments will cancel out, and there will be more sports exercised through middle-age. Because of increasing prosperity, in case A, more sports will be available, which means that possibilities will increase to adapt the sport to the age-group. Still the exercise of sports will retain possibilities for the expression of socio-economic status.

See: 123, 124, 198

Because of the course of economic development in alternative B, there will be a change in the tendency to practise more sports. Where expensive equipment is required, the balancing between costs and benefits from the pursuit of that particular sport will lead to a somewhat greater degree of specialization and a tendency towards participation in the 'inexpensive' sports. On the other hand, there will also be a more frequent possibility of renting or sharing equipment with club-members. In this alternative, too, the exercise of sport will retain possibilities for the expression of socio-economic status.

In regard to political, social and club participation, there will be opposing developments which make it difficult to make predictions. Although the number of memberships will remain practically constant, less use will be made of the facilities or privileges granted by membership. There will be, though, political and societal activities which will take place in a less formal context, less on a permanent, more on an ad-hoc basis. We expect that this development will continue for some time. The age-group for which participation is the highest, from 30 to 65, will grow in numbers, and the average educational level will rise as well. In case A, moreover, this participation can offer possibilities for self-fulfillment to people who will not have this opportunity in their work or for whom it will to some extent replace the traditional frameworks of family or confessional groups, for in general we expect an increasing sense of isolation of the individual.

See: 152, 153, 155

In case B, the changed attitude towards work will mean that self-actualizing opportunities outside one's work will increasingly be sought. This will influence political and social participation.

See: 257B

In case A, participation in the traditional clubs and associations will see a resurgence here and there because the youth culture will become more institutionalized, but in general it will decline.

A contrasting development is expected in alternative B. Here, too, the youth culture will become more institutionalized and, in addition, increasing volunteer activities will lead in many cases to the need for legal status which can best be answered by creating formal association. The high priority given to recreation facilities in the expenditure pattern, and the increasing impossibility of private acquisition of equipment, will lead to a greater utilization of equipment within the framework of associations founded for this.

See: 160, 172, 173

See: 296B

229 Acitivities outside the immediate environment are vacations, short sojourns, day-trips and open-air recreation.

At least half the population presently goes on vacation, defined as more than

three consecutive nights spent outside the home. A continuation of the trend would lead to a participation in vacations by 89% in 2000, but we expect the saturation point will be reached at 75%. Growth of holiday traffic will soon be related to a greater frequency rather than to increased participation. A rising level of prosperity, an increasing number of vacation-days and a more active pattern of leisure activities for those over 40 will contribute to this. This may lead to problems since the increased demand for a holiday home of one's own will be difficult to meet and because the holiday traffic by road and air may exceed capacity. Short sojourns – from one to three consecutive nights away from home – are usually weekend-trips. This does not replace vacationing because it primarily involves people who also go on vacation. In more than half the cases one presently stays with family or friends, but this share is smaller for the higher income groups. Not quite 40% of the sojourn recreation takes place in tent, caravan, boat or summer-house, of which three-fourths is personal property. There is no connection between sojourn recreation and the presence of a garden around the home or of recreation facilities in the home environment. There is, though, a correlation with income and, as a result, there will be a large increase in sojourn recreation in case A. This will be particularly true for the weekend trip to one's own accomodation, again keeping in mind the more active leisure acitivity pattern of those over 40. Lack of space for caravans and cabin-boats, and the problems which have already arisen around the second home, will all lead to many difficulties in regard to this development.

See: 225

See: 337A, 338A

The obvious connection between sojourn recreation and income means that, in case B, a large increase in sojourn recreation can be expected in the beginning (of the 1980s), again specifically weekend-trips to one's own vacation accomodation. Thereafter, because of this relation, the growth will stagnate. In fact, because of measures to protect the environment, there will be an earlier halt to the growth of personal vacation accomodation, and thus these recreational activities will also grow less rapidly. The growth will then be coupled increasingly with rental of accomodations. In the longer run, a decline in the time spent outside the home is to be expected.

See: 337B, 338B

In case B, finances will begin to form a hindrance. In addition, measures for environmental protection will not leave even present facilities untouched. And an increasing bond to the home environment will lead to a decreasing need for recreation away from home.

See: 343B
See: 152

In regard to day-trips and open-air recreation, future development will be related to frequency and not participation; everyone takes a day-trip now and then. Sundays are usually used for visits to family and friends and for (spectator) sports. An increase in these excursions does not seem probable. They are mainly communal undertakings of families with small children; if they own a car, in time they go less frequently to visit family and friends and more often to open-air recreation and tourist sites. The decline in attendance at sports events is related to this. With a car of one's own, there is a much larger choice of recreational possibilities, and the choice is made by the whole family. In the future, then, sports events will only attract large numbers when they can be combined with an excursion attractive to the whole family.

An increase in day-trips can be expected because of more vacation-days, an increase in the number of people between 30 and 45, a greater degree of mobility for the middle-aged, the disappearance of barriers making these activities accessible to everyone, and the increasing possession of private cars (alternative A) or an increasing utilization of rented cars (alternative B).

See: 324A and B

230 In some respect the consequences of these developments will be

problematic; because of this, as well as for other reasons, there is cause to expect changes in government policy. Increasing demand for space for recreation and recreation traffic and the policy regarding the media are cases in point; they are discussed elsewhere. One problem, though, which will be discussed here is the subsidy policy for culture and sports.

See: 338A
See: 237

Apart from the Broadcasting Act and the Monument Preservation Act, the government has hardly any legal powers in respect of culture. An effective national culture policy, for example directed towards the promotion of the national language, is impossible for this reason. It would stand in opposition to the promotion of the free exchange of culture and information which presently is one of the foundations of our foreign policy. As mentioned earlier, the continuing process of European unification can lead to problems in this area, which will necessitate a different approach. For the present, in broad lines, culture policy consists of support for existing traditional cultural manifestitations by means of subsidies to institutions which cannot be commercially exploited. In this, the government demonstrates a preference for the traditions of the socially higher classes and attempts to extend these to other population groups by spreading 'culture'. Something similar holds true for sports as well, where the practice of non-competitive sports is fostered but spectator sports as public amusement receive no support.

See: 80

We are anticipating an increasing differentiation in life-styles, with the result that more types of facilities will be commercially unprofitable because the share of each will become smaller. Moreover, the connection between life-style and social class will be weakened and the customary distinction between traditional and popular culture will fade. A call for government support for cultural manifestations thus far not subsidized is therefore to be expected. It can be assumed in alternative A that this will lead to an expansion of government support which will not be at the expense of the presently subsidized categories, since these enjoy strong support from the press and trade unions.

See: 128

In alternative B, the expected economic development will mean that there will be more interest in subsidized activities. The absence of comparable provisions for the pursuits of the lower social groups will then be a problem. We thus expect that the cultural one-sidedness of the present subsidy policy will be abandoned. The absence of pressure groups in this area, though, for the most needy (recipients of national assistance and other pensioners) will mean that an integreated and balanced policy for providing these groups with the means to make full use of their leisure will only come into being in the last decade of this century.

See: 296B

3.9. Communication and information

231 In making information accessible, the mass media and the point-to-point media are important. A mass communication system is characterized by the dissemination of information from one source to many receivers. Point-to-point information concerns a single one-time information transmission. The most important function of the media is the optimal transmission of various kinds of information to changing user-groups. Among other things, information can confirm already secure beliefs, induce flights from reality, provide amusement or contribute to feelings of solidarity. Without deeper examination, though, it is not possible to indicate the future development of these effects.

232 The need for information and information transmission is influenced by various societal and economic factors, as well as by technological develop-

ments. Economic growth will lead to an increased demand for information and communication. This demand is also affected by the relative importance of the various economic sectors: the services sector generates and uses more information than agriculture or industry. We expect the growing importance of the services sector to give a stimulus to an increase of information and of the techniques for information dissemination.

See: 289A and B, 290A and B

See: 198

233 There is also increased consumption of information with the raising of the educational level, quantitatively (in time and money) as well as qualitatively according to the use of information. Particular attention in this respect should be given to women who, in addition to experiencing a larger increase in educational level than men, are also undergoing the influence of increased participation in the labour process. The increase in leisure also leads to a greater need for information directed towards recreational activities, and within the recreation sector the need for specific information will increase because these activities will show a greater diversity and will be intensified. On the other hand, sports and hobbies will be competing with reading, listening and viewing in the allocation of leisure.

See: 266A and B

See: 225

See: 227

234 In general, there will be a shift from general to more specific information. Among other reasons, this is to be expected because, with a further increase in the amount of information, an increased selectivity will develop on the part of the receiver to cope with an abundance of information. This shift from general to specific informational needs will strengthen the position of specialized publications and, within the mass media, will strengthen the regional press and broadcasting stations.

See: 227

The need for more specific information will be fostered by increasing participation. We expect a significant rise in decision-making by negotiation and consultation. Participation presupposes a large measure of accessibility of specific information, for which the constant attention of the media is essential.

See: 133

235 With the arrival of a number of new media, the printing press has not disappeared. There have been adjustments of function, such as from letter to telephone, but the printed word has kept the same importance. Its *relative* share in the information which the consumer receives is, though, drastically reduced, and we expect that this will continue. The reason is that the costing of radio and television is based on political and not economic grounds. Moreover, the marginal costs to the consumer of the utilization of the electronic media are practically zero. This difference will remain.

Dissemination of printed information will change. For newspapers and popular magazines, the accent will shift from subscription to newsstand sales because of the high labour costs of home delivery. This transition will be to the advantage of the largest national and regional newspapers because of their more tightly organized distribution systems. Newspapers with a small circulation will be more difficult to obtain; the specialized publications, which will increase in importance, will be delivered by post.

See: 237

236 In regard to the general interest, popular book, there are a number of recent trends which will continue during the next 25 years. The amount of free time devoted to book reading is stable which means that, with an increase in leisure time, there will be relative decline in reading. The number of new titles has been increasing rapidly from year to year, whereas the number of books sold has not increased. These two tendencies have led to a reduction in the size of the average printing. The big increase in initial costs cannot be covered by a larger printing and is therefore expressed in a rise in price which the reader feels is excessive. Fitting in with this development is the trend that

See: 227

the reader is turning more and more to public libraries for general reading (over half of the borrowers are 16 years and under) and confines his purchases to more specific materials. Towards the end of the century, given the diminished expenditure possibilities in alternative B, more use will be made of the libraries for specific literature as well.

In regard to availability, we see that a limited, fast moving assortment is obtainable in a steadily growing number of outlets. Given the stability of the sales volume, this means that, over time, the traditional book store with a broad assortment, including books with lower circulation rates, will have an increasingly difficult time. In the light of these developments, we have to expect an undermining of the position of those books which do not lend themselves to mass distribution or which cannot count on a clearly defined public of sufficient size that a reasonable price can be attained. A reorganization in regard to the supply of titles will be expected, specifically in the middle sector of books which cannot be distributed in mass or which have no specific readership. Within the framework of a cultural and media policy, the administration will want to protect some categories of books as well as book-dealers, leading to subsidies. In regard to the publishing trade, it can be expected that different shares will emerge for large and small publishers, and that the middle group will suffer. It is not impossible that the national, or even the European, authorities at some point will no longer allow the maintenance of a fixed price for books. This will neither delay nor foster the developments sketched above, while no lower consumer prices should be expected (as has been the case in Sweden). The specialized book (educational, scientific, professional) is in a relatively stronger position. On the basis of developments outlined elsewhere, reflecting the growing need for specialized information, it can be expected that books of this nature will maintain their relative position, possibly augmented by the newer media.

See: 97

One threat to the Dutch book which must be mentioned is the increasing influence of English, and the threat to the survival of our own language in general.

237 The opinion that freedom of expression is best served if the government abstains from interference in this area has been discussed ever since government support to the press became a fact. Corrective measures must oppose the decline of variety resulting from economies of scale. The concern for broad dissemination will, in the longer run, necessitate support for small target groups. These groups are, after all, less attractive for the advertiser who is frequently an important source of income. Such support from public funds, however, will be questioned particularly in alternative B. Thus some loss of diversity of the printed media will be inevitable.

It is also to be expected that government policy in regard to all the media will be further broadened. One basis for this government intervention will be the contribution which the media make to the functioning of a pluralistic democratic society. It is to be expected that more friction will arise between the pluralism which is changing (secularization) and the rigid institutions that dominate the Dutch media world. The financial possibilites allowing the expression of pluralism will not always be available, particularly in alternative B.

See: 130

We do not expect that existing differentiation in listening and viewing behaviour according to age and educational level to be reflected in changes in the structure of broadcasting; the government will continue the existing system*). On the basis of the contrast between the 'neutral' and 'ideological' broadcasting associations, there will be heightened activity by the latter three associations, working together in a loose federation. This would lead to a redistribution: AVRO and TROS on one network, VARA, KRO and NCRV on another. Another possibility is a stronger specialization of the networks: light music, classical music, information, education, each on its own separate wave-length. The most probable outcome in alternative A is a combination of both developments: two general stations, each for one bloc of broadcasting organizations, and additional station(s) for certain interest groups, controlled by the NOS and the combined broadcasting organizations. Further, an educational/instructional station under separate authority as part of the Open School will be established.

See: 199

In alternative B the financial possibilities are inferior to those in alternative A. The most probable outcome is two general stations, each for one bloc of broadcasting organizations and an additional station, controlled by the NOS and the combined broadcasting organizations, for educational/instructional programmes.

238 As a result of increased government intervention, we expect the administration to make more use of the media for its own informational purposes. Particularly in alternative B, the information apparatus of the government will be expanded considerably in personnel and funds. The information will be particularly concerned with the form of human behaviour that is damaging to the environment. In a general sense, the government will pay increasing attention to justifying its policy in the process of competitive participation. The tendency towards expansion of information by the government will be stronger as the degree of legitimacy for governmental authority in society is diminised. This development will doubtless evoke opposition.

See: 133, 140

239 We will now look at technological innovations such as the various systems of image reproduction now being developed. The most important applications are predicted to be in education, in business and in private homes. By the year 1990, many schools will doubtless have their own video apparatus, combined with a simple camera, but its use will remain limited because little attention is given to this during teachers' training. Video will augment but not replace the teacher and the traditional educational material, even in the education via the media which will replace schools in adult education. In the area of business and institutional use, the videocassette will find a more rapid application. The system lends itself to instruction and information about the industry or the institution. Other use possibilities will lie in the area of entertainment (airplanes, hotels, etc.) and in internal dissemination of industrial information.

See: 215

In the private sector, in alternative A, over the next twenty-five years a gradual penetration of the video-disc (pre-recorded programmes) can be expected as well as the self-recorded video-cassette. The video-disc will

*) Ever since the advent of broadcasting, the Netherlands has known a mixed system governing radio and subsequently television as well. There are at present three radio networks and two television channels. All broadcasting transmitters are owned and managed by an independent public agency, but most of the radio and television time is allotted to a number of private associations on the basis of the size of their membership. At present there are five major (and a number of smaller) associations thus engaged in both radio and television, viz. two 'neutral' (TROS and AVRO) and three ideological associations (VARA, socialist; KRO, catholic and NCRV, protestant). In addition there is a public broadcasting authority (NOS).

augment, to a modest degree, the recreational function of the record as well as fulfilling an informative or instructional function. Penetration on a moderate scale of the video-disc will not be without influence on the programme offerings of ordinary television, i.e. nor by cable.

It can be expected that the networks will use new media (discs, cassettes) partly as an extension of their own television programs. This will result in a further blurring of the boundaries between non-profit broadcasting associations and commercial enterprises. In the longer run, there will also be a redistribution within the area of audio-visual information transmission in the private sector, by which television will be established more clearly as a mass medium with a broader range, and the video-disc as a medium with more directed and narrow range. In addition to this, at the same time, the introduction of request television by cable, where the viewer can select a programme and is charged accordingly, would undermine the market for video-discs and cassettes, particularly in the area of entertainment. It is obvious that in the private sector the size of the disposable income is important. The growth of prosperity and the need for specific information for defined professional and interest-groups justify, though, the expectation that a profitable market for video-discs (video-cassettes) will develop, in the longer run with a modest adaptation of request television. Although this will probably be cheaper per hour than the video-discs, the greater freedom of choice and the easy availability of the video-discs will probably give it a temporary advantage. Video-discs and cassettes will augment the magazine and book but will not replace them.

See: 296A

This is also true of the private sector in alternative B. The video-disc is younger than the video-cassette. The latter has only just begun to make a place for itself in the private market. With its introduction, the video-disc will not, or hardly, be considered a competitor to the cassette. Both systems will complement each other for different applications. In the longer run, the introduction of request-television via cable could undermine this market for the video-disc and cassette. On the basis of the expected course of disposable income and the substitutability of video-cassette and request television, we expect that the latter will not arrive before 2000. This is because, for private individuals with specific interests, video-discs and video-cassettes probably offer more freedom of choice than request television. The market for video-discs and cassettes will show a moderate growth in the coming twenty-five years.

See: 296B

240 The most attractive application of facsimile transmission is the tele-newspaper. A broad application of that cannot be expected before the year 2000; there are still too many unsolved technical problems. Moreover, the question arises of the relation between te newspapers and the transmission authority. It also demands a more active attitude on the part of the user than does regular viewing. The use of the facsimile apparatus within industry will gradually increase, especially where mistakes by oral transmission have to be avoided (hospitals, newrooms).

Specialized application of the data-bank and microfilm – especially where transmission via telephone lines is possible – should take place toward the end of the century. For example, one thinks of information about bank balances, medical information and cataloguing of publications. Data-bank and microfilm already replace traditional purveyors of information on the 'specialist' fringe, and they will be further expanded. On technical and economic grounds, increasing pressure for linking the various data systems will make itself felt. This will be a threat to personal privacy.

The demand for data communication facilities will increase annually by about 20%. This makes it essential to establish a special network, a so-called linked

data-net. The use of this net which, according to the policy intentions of the Post Office Administration, will be installed by 1980, will remain limited to business and institutions.

241 In the area of broadcasting, the primary technical innovation will be the increase of the number of channels, either through the introduction of cable-nets (of particular importance for television) or through the increase of the wave-length frequencies (radio). This means, on the one hand, that a larger supply of programmes will be available, and, on the other, that there will be more regional and local programmes. This conforms to our forecast that cultural differences between our country and our neighbours will decrease, but that regionalism will be accentuated.

See: 97

The number of television and radio programmes will markedly increase for various reasons in alternative A, and the number of hours that the television set is turned on will also increase. The increase in the number of viewing hours from the present level of 500 hours per year to ± 2000 hours (the American level) will be accompanied by a change in the nature of the TV's use: as is now the case with radio, television will more often be turned on while viewers are doing other things at the same time. The general introduction of central heating and the accompanying possession of multiple sets per family will foster this development.

In alternative B, the increase in the number of channels for radio and television will be less rapid than in A, given the high costs of investment and the limited economic expansion. The number of viewing hours in B will expand to ± 1500.

In the 1980s, adapters and antennas will come onto the market making it possible to get direct reception of programs via communication satellites. Language barriers and time difference make it unlikely, though, that much use will be made of this.

242 The volume of domestic postal traffic will not change very much. There will be an obvious shift from individual pieces of mail to bundled mail; the relative share of private letters in the total letter traffic will decrease, even though the volume of mail sent by private persons will increase. Postal traffic between individuals has turned out to be sensitive to the spread of the telephone. This effect will diminish as the number of telephone connections reaches its saturation point. About three-quarters of the second class mail is from publishers of magazines, financial institutions and mailorder businesses. Distribution of periodicals by post will be replaced in the future by single-copy sales, for example in the supermarkets, except for very specialized publications with a limited circle of readers.

The share of money-transfers through the postal system will also decline. In the first place, a reduced distribution of statements of accounts will save money; a second possibility is the replacement of the postal service by an automated bank-phone. This possibility is limited in the first instance to the payment traffic between department stores and supermarkets on the one hand and banking institutions on the other *).

Everything taken together, postal traffic will not show much growth and might even decline in volume.

*) In the Dutch banking system payment it is not usually made by cheque but by a direct transfer order from the payee. In this 'giro' system, depositors address transfer orders often in the form of pre-punched cards) to his own bank which then transfers the amount named from his account to that of his creditor. Giro transfer orders by telex and telephone can be readily introduced into this system.

243 At present, 78% of all households are connected to the telephone network – that is, 3.4 million connections. The penetration varies strongly among professional groups: for the self-employed, the percentage is more than 90%, for manual labourers ± 40%. This latter group, though, is now catching up. In alternative A, we expect further growth until the following number of telephone connections per 1000 households is reached in 2000:

See: 337A

private use	950 to 1,050
second home	10
business connections	168 to 200
total	1,130 to 1,260

In alternative B, the number of connections will be somewhat lower, primarily because the number of connections for a second home will be very small. Only a limited number of families will be able to have a second home.

See: 337B

International telephone traffic is at the moment the fastest growing category. This is the result of the strong Dutch orientation towards the outside world; moreover, rate increases have been minimal in this sector, which means an important decline in the relative price. On these grounds, we expect further growth of the private share and, in total, more than a tripling of the international telephone traffic by the year 2000.

A further increase of telecommunications, for the largest part, will certainly still be handled by a further expansion of the existing telephone and telex nets until 1985.

There will also be an expansion of special-number information services and of telephone answering services where the costs of the call are reversed. Further growth, quantitative as well as qualitative, of facilities for conference calls will be realized with existing techniques. The viewphone will remain limited to business applications; its general introduction is not expected before 2000.

Research is now directed towards development of a simpler telex apparatus. If this apparatus could use telephone lines, this would mean large savings in costs and, with that, a significant expansion of its application would be possible. Given the many practical problems, though, this simplified telex will not be introduced before 1990.

Mobile telecommunications with two-way traffic causes increasingly more problems because wavelength capacity is reaching its limits. Within a short time, a start will thus be made to automate the national mobilophone-net, by which more efficient utilization of the radio frequencies will become possible. In the long run, though, it will be necessary to find a better solution. It can be expected that in alternative A, around 1990, a new mobilophone-net will be started which, because of the high investment costs, will be established within a Western European context. In alternative B, no new mobilophone-net will be set up before 2000.

3.10 Crime and the criminal justice system

244 Statements about criminality are usually based on the statistics of the Central Bureau of Statistics. These data reflect investigation, prosecution and trial of criminal behaviour with which the police and justice systems have been involved.

Two comments can be made about these data. The first is only reported criminality is described. From these data one can only derive changes in registered criminality so that one learns perhaps more about changes in public policy in regard to investigation, prosecution and judgment than about changes

in actually committed crimes. These can increase in number, decline or remain the same, regardless of trends in the statistics.

Secondly, the data of the CBS are not corrected for important changes in the age structure of the population. It is well known that young men under 30 are responsible for the major part of the reported crimes. If, for a time, the population pyramid shows a surplus of young men, this has consequences for the criminality figures. A correction of the statistics to include non-reported 'dark number' criminality seems very difficult, although some research in this direction has been done. The conclusion is generally that the distortion is the smallest for the relatively serious offences. A correction for changes in the population structure, in contrast, is easy. If this is done, then it appears that at present there is no increase or only a slight one in the number of convictions for the majority of the registered offences. Without further information it can not be concluded from this that, with a further ageing of the population, registered criminality will decline. It stands to reason that the investigations, prosecution and trial apparatus will be directed to other sectors, or strengthened, as soon as criminality declines in one sector or another.

See: 123, 124

Although the official statistics provide no precise measure of the crimes actually perpetrated, one can nevertheless see them as fairly reliable indicators of judicial policies and changes in them. At the same time they are indirect indicators of public concern and political pressure in regard to criminality.

In what follows, we will confine ourselves to officially reported criminality, and especially to its more serious forms, namely offences which have led to convictions. Misdemeanors and dismissed offences are not considered. For a look at the dismiscal policy, see 246.

245 All forms of reported criminality occur in various degrees despending on the sex, age and social class of the perpetrator. At all times the largest number of the convicted are young men from the lower social classes; this group has a significantly larger share in the criminal statistics than its percentage share of the population would lead one to expect. Since the composition of the population according to sex and social class barely fluctuates, it is sufficient to correct the official figures for age. After this correction, the incidence of most criminal behaviour is found to remain constant or to increase only slightly. During the years 1964–1971, there was actually a decline in violence against persons and in sex offences including rape. Convictions for offences against the public order and public authority, vandalism and offences against property remained more or less constant. Age-specific consideration of convictions, however, shows a clear increase in convictions for offences against public order and public authority and for property offences for the age group from 18 to 20 years.

246 Registered convictions are definitely an under-reporting of actual criminality. Much criminal behaviour is not reported or investigated, and many reports and investigations do not lead to prosecution or conviction. Research into hidden 'dark number' crime does show that its range, at least for fairly serious offences, is relatively limited. It is mostly misdemeanors and less serious offences which conviction statistics do not cover. Criminality which does come under the eyes of the police and the Public Prosecution Office is not included in the conviction statistics for an important part because of the dismissal policy. Until now, the number of cases dismissed by the police or the Public Prosecutor – that is, those cases which do not result in prosecution – has continued to increase. This phenomenon can, to some extent, be explained by the growing tendency towards humanization of the administration of criminal law in the Netherlands since World War II. The increase in dismissals involves primarily offences against the public order and public authority, property offences and vandalism; a practically constant number of convictions (after correction for age) thus indicates an increase in the actual frequency of these offences.

See: 127

247 When dealing with the description and prediction of registered criminality, one should keep two important factors in mind. Legislation and prosecution policy are partly a reflection of opinions which are subject to change. Changes in criminal statistics can thus reflect both actual behaviour and policy. Secondly, one can assume that the total range of registered criminality can vary only within certain limits. It is in all probability true that for the public as well as for the judical authority there are certain lower and upper limits to concern about crime. If the number of offences of a certain category declines, then the reporting of crime will change and the investigation and prosecution policies of the judicial authorities will probably be intensified and/or directed towards other categories.

248 Also responsible for a certain variation in criminal statistics is the threat felt by the public, regardless of whether this feeling rests on facts or should be considered as a (social-psychologically explainable) projection phenomenon.

As the public feels itself more threatened by a (real or imaginary) danger of falling victim to criminal behaviour, so shall there be pressure on the government to intensify criminal law enforcement policy. An increase in the feelings of threat, as seems to be the case in our time, will also promote individual preventive measures, such as burglar alarms and avoidance of dangerous environments. Because of these individual preventive security measures, certain types of criminality remain the same or even decline, while the feeling of threat will stay the same or increase. These comments apply more to amateur delicts, such as street-theft and assault, than to professional burglary and hold-ups. With these latter, the technical improvements of security measures will probably present a challenge rather than a deterrent. As a result of our relatively open borders, the large degree of mobility which characterizes the professional criminal organizations is barely restricted. The fight against the drug traffic already demonstrates that intensified control, in whatever form, leads at most to a few incidental successes; the phenomenon continues to exist. Attention should also be given to the fact that the maintenance of our relatively open borders and the continuing attempt to humanize our penal system will impede the fight against professional criminality. Improved police supervision can lead to a decline of reported criminality while the treat has not lessened.

249 We expect that a gap will continue to exist in opinions about the administration of punishment between judical authorities and large portions of the public. The authorities doubt the usefulness of traditional prison sentences, as witnessed by the establishment of the Commission for Alternative Criminal Law Sanctions. They think actively about a further humanizing of criminal law procedures. In contrast, it seems that a hard approach is popular with the public. Since the public is involved at important moments in criminal law proceedings, the judical authorities will have to think about how a change in attitude can be achieved if they seriously desire alternative sanctions. For example, it is very much the question if anything can be achieved in the area of alternative sanctions as long as traditional distrust continues to exist in regard to ex-convicts. The punishment might be different; the consequences of being punished will not change.

See: 148 ff.

250 Almost all forms of crimes are committed primarily by young men. This will continue, but the participation of women will increase as a result of their on-going emancipation. Looser family ties and the increased independence of adolescent children will mean that the trend towards a steadily more youthful beginning of delinquency to less-than-18-year olds will continue.

See: 79

251 International political relations will continue to give rise to political criminality, also in our country. Regardless of the improved technical security measures which are possible, for example, at air ports, we expect that the public

will not be willing to sacrifice the legal security and privacy which sufficient prevention would demand. This presupposes that political terrorism will not take on such dimensions that these attitudes will change. If political terrorism remains more or less stable at the present level, then the judicial apparatus will institutionalize the emergency command centers which it now has at its disposal.

Also, greater political consiousness of the population and increasing participation will obscure the traditional loyality to authority, which can lead to an increasing public opposition to measures of the government. This civil disobedience will not have a violent form in most cases. It is true that greater political consciousness will lead to a politicizing of the decision-making within the criminal law system whereby the criteria for the maintenance of public order will become more vague.

See: 129, 146

See: 146

We expect a relative increase of ideologically motivated offences relative to ordinary offences. This increase will hold in particular for the age-groups 18–20 and from 21 to 29 years.

We expect that the number of offences against life and persons will decline a bit more; but the seriousness of these offences will increase. An increase in the private possession of weapons will cause this.

252 Crimes against property – robbery, burglary – are the forms of criminality which is most common. This will remain so. In alternative A, we expect a real increase in property crime. The on-going (sub) urbanization and the declining residential character of the central cities will be accompanied by a lessening of social control and this fosters property crimes.

See: 320. 321A and B

Also economic circumstances affect the amount of property criminality. Feelings of relative deprivation are an unfavorable influence. These are not limited to comparisons with others. They can also be related to one's own expectations and aspirations. In case A, neither the economic growth nor the anticipated developments in employment call for further comment in this regard; however, the relative deprivation which is caused by discrepancies between educational training and one's employment opportunities will persist. The developments in this area will lead to an increase in the number of property offences.

See: 284A

See: 276A, 280A

Developments connected with recreation and leisure-time behaviour are important here. Longer absences from the home (more sojouring and vacationing) can lead to an increase in the number of burglaries. This is somewhat countered by the expected which will be a brake on property criminality.

See: 229

See: 248

In alternative B there will be a real increase in property crimes particularly in the beginning of the 1990s; thereafter they will remain more or less the same. The increase we expect rests on the stagnating economic situation which will influence the volume of property crimes. The increase will be stronger to the extent that certain groups think they are more frustrated in their material desires than other groups. Property crime is unfavorably influenced by feelings of relative deprivation and these are not confined to comparison with others but can also relate to one's own expectations and aspirations. It is, though, to be expected that, after a few years of getting accustomed to the new conditions, aspirations will be set somewhat lower, especially in regard to consumption. From this it follows that after a temporary increase in property criminality, there will be a stabilization, possibly even a decline. The relative deprivation which can arise from discrepancies between education and employment will, though, lead to an increase in the number of property crimes.

See: 296B

See: 276B, 280B

Also, in case B, developments related to recreation and leisure-time activities are of importance. In the beginning, an increase in longer absences from the home (sojourns and vacations) will lead to an increase in the number of burglaries. That will be balanced by the anticipated developments of technical security measures which are a brake to property crime. Besides we expect that from 1980 recreation and leisure-time behaviour will be less concentrated in time and in location, which will also lead to a reduction of the number of property offences.

See: 229

See: 127

253 Cultural developments in the area of morality tend towards a larger tolerance for (varieties of) sexual behaviour. This will be accompanied by an increase in criminal law tolerance for the sexual autonomy of the citizen. On this ground, we expect that the number of reported sex crimes will continue to decline.

See: 323A

254 The on-going (sub)urbanization in alternative A will have consequences for the nature and volume of; we expect that, particularly among the young, there will be a steady increase. As a consequence of this, destruction of public facilities will increase. In addition, destruction will not always be reported due to anonimity, so that the number of convictions for vandalism will remain practically the same.

See: 152

In alternative B, increasing social control in the immediate environment of the home will have consequences for the nature and volume of vandalism. We surmise that initially, particularly among the young, there will be an increase. As a result of this, destruction of public facilities will increase, but from the second half of the 1980s, there will be a change and the number of offences will stabilize. In this case, again, many acts of destruction will not be reported because of anonymity.

CHAPTER 4. LABOUR, ECONOMY, SPACE AND ENVIRONMENT IN ALTERNATIVE A

Introduction

255 As explained above, the choice was made early in the project for two alternatives which differed primarily in regard to economic growth after 1980. In A, this growth rate is a steady 3% annually; in B, the growth rate declines gradually until it is practically zero between 1990 and 2000. They are further differentiated by somewhat different expectations about the development of the family, divergent expectations about work and the economy, with obvious consequences of the latter for land-use and the environment. For a large number of areas, the differences between the alternatives are so slight that they did not justify separate treatment; why this is so has already been explained. In regard to work, the economy, land-use and the environment, the differences are large enough to merit a separate chapter for each alternative.

See: 44–48

256 In the interest of an equal presentation of the two cases, the reader can, without difficulty, choose between chapters 4 and 5; each is complete and can be read independently of the other. This means of course that there are many repetitions, even if these refer only to the description of the initial situation or of developments until 1980 which are common to both cases. For the readers' convenience, the paragraphs in both chapters have the same numbering, an italicized number indicating that the whole paragraph in both is exactly same; otherwise an 'A' or a 'B' will follow the number.

4.1. Labour

257A The central position of work in society will barely be affected, if at all. The structure of society reflects the importance of occupational status for one's societal status. Groups which are considered part of the work-force by themselves and by others but which are not actually employed because of illness, invalidity or involuntary unemployment do have much free time but cannot really use this to 'give meaning to life'.

Still, the traditional work ethic will lose some of its significance. The shift in thinking from 'work is a duty' to 'work is the best possibility for self-realization' will continue, because presentday society needs no ideological justification to get the necessary work done. This does not mean that people will be oriented towards work in lesser degree: freed from 'work as a duty', they will give more weight to the possibilities of self-realization through work.

258A Thus there will be a slight shift in the attitude towards work. To the extent that prosperity increases and the educational level rises, the preference will grow for work with a certain amount of autonomy, freedom, variety, responsibility, work which calls for ability, education and interest. At the same time, there will be a decline in the interest which is attached to wages and secondary employment conditions. Opposition to work that is unattractive (that is dirty, unsafe, unhealthy) will increase. The consequences of these changes for the labour market will be discussed later.

259 After finishing initial education and training, most people join the labour

force except for the 1% to 2% who are too handicapped and a (decreasing) portion of women who do not go to work. About 98% of the men enter the work force and leave it with a pension because of age or disability. In addition to participation in education, attention must therefore be given to the course of the national Disability Pension Schemes*).

See: 198

No consideration is given to a lowering of the pensionable age because we did not want to commit future economic resources in advance for this specific purpose.

260A The number of recipients of disability pensions is estimated by projecting sex and age-group percentages on the population figures. These percentages have risen strongly until now because it takes some years before a new social insurance has spread to all those eligible. This increase will diminish, though, in the coming years, and after 1978 the percentages by sex and age-group will remain constant. The growth in the number of eligible persons after that year is due to changes in the population structure. As Table 23A indicates, this effect is substantial.

See: 123, 124

Table 23A. Number of recipients of disability pensions

			1975	1980	1990	2000
				— x 1000 —		
Total			345	475	560	670
of which	men		270	365	415	485
	women		75	110	145	185
	of which	single	20	15	20	25
		married*)	55	95	125	160

*) Includes formerly married women.

261A In regard to women, a distinction must be made between women who are married or who have entered into some kind of lasting relationship, unmarried women, widows and divorced women. These groups differ accordingly to family situation and the care needed for household and children; estimates of the labour force should be made for each of the four groups separately.

In regard to unmarried women, it is expected that their entry into the labour force will increase and after 1985 will be general for those finishing school. In regard to the participation of married women, here, too, an increase is expected. This goes together with their increasing educational level, changes in attitudes towards their role, changes in the function of the family and in the birth-pattern. For widows and divorced women, the age-specific estimates for participation lie between those for married and unmarried women; they more often have children to care for than unmarried women, but there are more factors which stimulate them to seek work than affect married women.

See: 117, 148, 158

262A In Tables 24A and 25A, we give the participation percentages and the labour force figures which follow from paragraph 261A. The labour force includes people who work full-time as well as part-time workers.

*) A general Disability Pension Scheme for wage-earners has been in force for some time as part of social security. It will be supplemented shortly by a similar scheme for the self-employed.

Table 24A. Labour force participation of the population over 14

		1975	1980	1990	2000
			— participation percentages —		
Total		50	49	50	50
of which	men	73	68	69	69
	women	28	29	32	32
of which	single	57	52	54	55
	married	22	25	28	30
	widowed	6	7	7	8
	divorced	36	35	39	38

Table 25A. The estimated labour force

		1975	1980	1990	2000
			— x 1000 —		
Total		5086	5281	5997	6134
of which	men	3629	3658	4065	4136
	women	1457	1623	1932	1998
of which	single	663	662	685	601
	married	720	855	1070	1166
	widowed	34	44	50	63
	divorced	40	62	127	168

263 To pass from the labour force to the potential labour supply, unemployment, part-time work, and reschooling, retraining and remedial schooling have to be considered.

See: 200

Since we expect greater labour mobility and because the adjustment is more difficult when both husband and wife are working, we expect that friction unemployment will increase from 1.5% at present to 2.5% at the end of the century.

264A In regard to part-time work, two groups have to be distinguished: men and unmarried women on the one hand, and women who are or have been married on the other. In regard to the first group, after the extension of the school age to 16-year olds, a partial school obligation was introduced for working 17-year olds for two days a week. Moreover there will be, just as now, about two-thirds of the workers of 65 and over who will do part-time work for an average of half a work-week. There will also be those who work part-time by medical advice. Here, too, the average work duration is half a work-week. After the extension of Disability Pension to the self-employed, this phenomenon will decline in significance and will thereafter remain constant.

See: 197

Finally there is the group who voluntarily works part-time. It is expected that there will be a significant increase in the group of highly educated, well-paid people who prefer a reduction of work-time to a real growth of income, but that part-time work which provides only marginal subsistence will continue to be of little significance. One difficulty in assessing developments is that in both cases the choice for part-time work can be reversed, for example when reaching another family-phase or when recognizing the importance of good pension provisions. Nevertheless, we expect that voluntarily working part-time will become more frequent, involving an average of three-quarters of the normal work-week.

265A Married women, widows and divorced women will work almost exclusively part-time. This phenomenon has already grown rapidly; in 1973, 38% of all employed married women worked part-time for an average of half

a work-week. This preference is related to the family-phase and educational level; and, on the basis of these factors, this 38% should have declined by half in 2000, with a shift towards full-time work. Actually, though, we expect a significant increase in part-time work because of a stronger preference for this. The number of married women who want to do anything but house-keeping and who are therefore satisfied with work which does not reflect their educational level and offers no opportunities for promotion will decline. They are the ones who now fill the majority of the part-time jobs. The willingness of married women to provide a reservoir of relatively arbitrarily available labour will decline.

See: 117

Women will more often join the work force directly after completing school and, to the extent that their educational level rises and the birth of first child is postponed, they will want to keep their jobs or, after a break of a few years for the small children, will want to return to them. They will show a strong preference for part-time work, the duration of which will depend upon the family phase. Because there will be a striving for more fulfilling work, the average part-time working week will increase from 0.5 to 0.7 of the full week.

Table 26A. Part-time work

	1975	1980	1990	2000
Frequency, percentage*)				
men	3.4%	3.7%	5.9%	7.9%
single women	6.7%	8.0%	8.8%	9.3%
married women**)	38.6%	37.7%	42.6%	45.3%
average work-time, fraction of the normal work-week				
men	0.60	0.59	0.64	0.66
single women	0.71	0.75	0.67	0.69
married women**)	0.52	0.53	0.60	0.62

*) Percentage of the number of working persons in the appropriate group who do part-time work.
**) Includes formerly married women.

See: 200

266A By taking account of friction-unemployment, part-time work and reschooling, retraining and remedial schooling, the total labour supply can be determined. This is shown in Table 27A. Naturally the estimates are not as precise as is suggested by the figures that refer to single categories in a detailed breakdown of the total; this precision is only apparent.

This table reflects the maximum labour volume because the figures, as indicated above, are derived entirely from supply considerations. If demand is significantly smaller, this discrepancy will only partly be expressed in the registered unemployment; partly it will result in the reduction of supply, in the sense that married women, for example, who really would like to join the labour force see no chance that this desire will be fulfilled and therefore withdraw from the labour market. It also follows from the method of estimation that the figures include at least part of the employment which is not reflected in the statistics because the people involved do not pay the taxes and Social Security contributions that are due or use loop-holes in the law to avoid payment. Part-time work of married women which is so slight that it requires no tax or premium payments is, for example, included in the figures, but overtime outside the primary employment of a craftsman, in contrast, is not.

Table 27A. Labour volume

	1975	1980	1990	2000
		— x 1000 —		
Active labour force	5,086	5,281	5,997	6,134
of which men	3,629	3,658	4,065	4,136
women	1,457	1,623	1,932	1,998
of which single	663	662	685	601
married*)	794	961	1,247	1,397
Friction unemployment	76	79	120	153
of which men	54	55	81	103
women	22	24	39	50
of which single	10	10	14	15
married*)	12	14	25	35
Part-time employed	467	542	814	990
of which men	121	133	235	318
women	346	409	579	672
of which single	44	52	59	55
married*)	302	357	520	617
Part-time work in work-years	261	307	502	631
of which men	72	79	150	219
women	188	228	352	421
of which single	31	39	40	38
married*)	157	189	312	383
Retraining in work-years	–	34	77	163
of which men	–	27	60	124
women	–	7	17	39
of which single	–	2	5	12
married*)	–	5	12	27
Labour volume in work-years**)	4,804	4,933	5,488	5,459
of which men	3,527	3,522	3,839	3,801
women	1,277	1,411	1,649	1,658
of which single	640	637	647	557
married*)	637	774	1,002	1,101

*) Includes women formerly married.
**) Friction unemployment has been substracted from this figure.

See: 289A

267A Due to the continuing shift of employment from manufacturing to the services sector, the amount of work with a certain degree of freedom, variety and responsibility will increase and the amount of tedious work will decline. The shift is, though, not large enough to meet the changed preferences in regard to the quality of work. Within large organizations firms, institutions, etc. one will also find, even in industry, a shift of work from implementation to the provision of services. This shift within organizations has more important consequences for the structure of work than the earlier mentioned shift between sectors. Even so, unattractive jobs will continue to exist.

268A The significance of technical progress for the abolition of tedious work is limited. New equipment will not be introduced unless that will not involve increased costs or unless compulsory measures are involved. Even in those cases, the change will be gradual and regulations will follow changed attitudes about tedious work only with a time lag. Thus tedious work will not disappear.

269A Pay increases will not adequately nor permanently compensate for unattractive work. Continuing employment of foreign workers on a large scale will not offer a permanent solution either, as will be elaborated below. The solution will thus have to be sought in an improvement in working conditions by another way of structuring the work, so that work satisfaction will increase by means of a redistribution of tasks.

See: 120
See: 278A

270A In due time, such a redistribution of tasks over jobs will be realized, the more so because rapid social change demands a flexible job structure that is at variance with extreme specialization. Rapid and fundamental changes in the social environment of labour organizations will mean that they must be oriented towards a more searching and analyzing attitude in respect of factors which can be of importance for policy. The traditional function of the classical hierarchy will lose importance because of all these changes. The assumption that 'superiors' are more knowledgeable than their 'subordinates' will become less and less tenable. Management will exist as a functional specialization next to, in cooperation with and, in large measure, dependent on other functions on all 'levels'. Because of this, policy will be less oriented towards ensuring uniformity of performance and coordination of divergent tasks than it is at present, and more towards the creation of openings for the development of participatory policy making. The general hierarchy of subordinate relationships will disappear. Work methods will to a large extent be mutually diceded by co-workers, while management will create the conditions to make this possible. This will lead to a tendency towards smaller operational units and to a greater degree of openness and accessibility of the organization at all levels.

See: 139

See: 136, 139

In short, because of the increasing complexity and the requisite greater flexibility, it is essential to give as much autonomy and self-regulation as possible to the person on the job, and to reduce drastically the present degree of specialization. By these means, the process as a whole will remain under control, and productivity in the sense of the relation of results to sacrifices will be safeguarded.

271A It is possible to elaborate somewhat on this theme by distinguishing between business, non-profit organizations and government agencies with regard to the contrast between direct personal influence and indirect participation in policy discussion and formulation on the one hand and in respect of the differences between policy formulation and its implementation on the other.

See: 139

Influence of personnel in the formulation of policy in the service agencies, i.e. non-profit organizations such as welfare agencies, will be greater than in business enterprises, and in enterprises it will be greater than in public offices. The structure of service agencies, with a limited number of hierarchical levels and a relatively egalitarian cooperative form, offers more room for the exertion of influence than does the structure of enterprises of the same size. In regard to public agencies, ministerial responsibility and comparable practices in local administration form a significant barrier against influence of any importance by employees.

See: 137

Where the nature of policy implementation allows it, personnel will take a direct part in deciding about the manner of implementation. They will also be personally consulted in regard to policy goals. Via elected representatives, personnel will be consulted about policy formulation and here and there actually have a say in decisions. Problems, though, will arise in regard to this participatory decision-making to which we will return below. As a result it is improbable that the suggested changes will take place on any significant scale in the short run. It will be the 1990s before these possibilities of solving of the problem of unattractive work will be generally recognized and utilized and before a more intrinsic job satisfaction will also be possible for lower levels of work.

In this alternative, paragraphs 272, 273, 274 are omitted.

See: 289A

275 In broad outline we expect such a development of economic conditions that there will be sufficient employment opportunities to absorb the estimated labour supply in the long run. The discrepancy between labour supply and demand will decline from 274,000 in 1980 to about 150,000 in 2000, including

friction unemployment – by 2000, this will be the only unemployment left. In this connection, four things have to be kept in mind. In the first place, business cycles after 1980 have been ignored, so that unemployment may in fact temporarily deviate from the indicated level. In the second place, the discrepancy is larger than the registered unemployment because the working population is determined on the basis of *willingness* to join the labour force, which makes a difference, specially in regard to married women. In the third place, the discrepancy is expressed in work-years, and because of part-time work, the number of unemployed persons exceeds the number of man-years involved, depending on the distribution of the unemployed by sex, age and marital status. In the fourth place, unemployment during the intervening years will not always be at the same level as in the benchmark years; especially between 1980 and 1990, unemployment will be larger.

276A In the period between 1975 and 1980, the maximum labour volume (i.e. the supply) will increase by 129,000 work-years. The contribution of men will decline somewhat; the share of women will increase sharply, with a shift from unmarried to married women. The number of work-years demanded will increase by 114,000, so that the shortage of jobs of 180,000 in 1975 will increase to 195,000 in 1980. Moreover, there will be friction unemployment of 79,000 persons. The divergence from the unemployment level of 150,000 in 1980 is obvious. In 1980, there will thus be a hidden unemployment of about 125,000 people, primarily married women.

See: 282

Between 1980 and 1990, the supply of labour will increase by 3330,000 work-years, the number of jobs by 295,000; the shortage of jobs will then be 230,000 in 1985. The increase of labour supply will consist for the most part (200,000 work-years) of men, because of a certain stabilization in their educational participation and a smaller increase in the number of the disabled. Only after 1985 will the number of jobs increase faster than the labour supply so that the shortage of jobs will be 30,000 in 1990 and by 2000 will have disappeared; at that time, only friction unemployment will remain.

See: 260A

In addition to a shortage of jobs, there will also be an increasing number of discrepancies between the qualifications of labour demanded and that supplied. Shifts in the prospective supply at various professional levels due to changes in educational participation can be set against the distribution of demand that follows from the expected development of the economy by sectors. In this exercise, we assume that the composition by professional level of the working population per sector will remain constant over time. This assumption is not tenable in the long run, but it can be used until 1985 to indicate which professional groups will be particularly affected by the shortage of openings. We assume also that the relation of career choice to the level of education will remain unchanged, but this is less problematic because this has been the case in the recent past and there are no indications of a change in the near future.

See: 198

See: 289A, 290A

If we look at this situation in 1985, then the first thing which attracts attention is the large surplus of teachers: there will be more than 100,000 too many. In the medical sector, there will be some ten thousand fewer people needed than will be available. There will also be a surplus of about one hundred thousand among the other highly-trained professionals. And finally, one must reckon with a surplus of a few tens of thousands of metal and electro-technical craftsmen and of certain types of construction workers. There will also be some tens of thousands of civil servants who, in the past, would have been promoted to higher functions but who now, bu remaining in the lower positions, will block the entrance of younger people.

There will be, though, shortages of about fifty thousand administrative personnel in both government and commerce. Here it will be a question of positions which are now often occupied by young women for short periods but which, as a result of the increasing educational level, will be more difficult

to fill. Further, there will be shortages of waiters, waitresses, house-keeping and auxiliary nursing staff, cleaners, handlers and packers and related functions; for all of these groups together about one hundred thousand people will be needed. These are the often unattractive jobs for which little interest will exist.

See: 281A

We are hesitant to predict the situation after 1985, since we expect about that time a fundamental change in the structure of work. This will change the specific content of a number of jobs and thus the preferences for these positions. Nevertheless, the career-choice pattern of women with middle or higher educational levels will show so little variation and such a concentration on teaching and health care that it is improbable that the surpluses appearing in these sectors in 1985 will not continue to increase after that.

277A The shift in the attitude towards work in the direction of greater emphasis on self-realization through work means that the lack of a suitable job will become ever harder to bear. It is a question not only of the lack of the job itself but also of social contacts, of the status and liferhythm of labour force participation.

Although research has shown that the experience of being unemployed creates large problems, we expect that developments now and in the near future will make this much worse. The greater weight given to the possibility of self-development through work will reinforce this. The rise in educational level will foster this tendency. The circumstance that large groups of the more highly educated will be faced with unemployment makes it probably that these aspects of the unemployment experience will come to the fore more strongly.

See: 151

Finally, this tendency will increasingly affect married women who, after a temporary absence, for example because of the children, will wish to return to the labour force. However good the social security provisions compensating for the loss of income may be, it has to be feared that the experience of unemployment will bring increasingly bigger problems with it. Because unemployment stigmatizes, it can be expected, from the point of view of those concerned, that the problems will be insufficiently or belatedly recognized and acknowledged. This will generate a call for social assistance.

See: 258A

278A As was earlier established, in addition to a shortage of certain jobs there will also be an increasing number of jobs for which there will be little or no interest. The decreasing significance of the traditional work ethic and the changing attitude towards work will increase opposition to tedious work, which means that the boundaries of what is acceptable will gradually shift.

See: 120

Utilization of foreign workers will offer no lasting solution to this problem. The attitude towards work is not a static datum but alters with changes of one's own and others' work situations. The attitude towards work of a foreign worker upon arrival in our country is perhaps favourable to unattractive work; after assimilation into the labour process, his attitude evolves rather quickly to resemble the dominant attitude here. This, by the way, creates a formidable barrier against a return to the land of origin, so that, even disregarding the social considerations which argue against it, a rapid turnover of foreign workers is ruled out. Our immigration policy reflects this insight, and the approximately 25,000 foreign workers who will be admitted until 1985 illustrate this state of affairs.

See: 269A

279 The solution to the problem of tedious work suggested earlier, namely the introduction of a greater autonomy in the work situation, will not occur before 1985–1990.

See: 132

That the hierarchical-bureaucratic model will lose importance and will evolve in the indicated direction does not mean that any concrete characteristics of one or more new organizational models can already be given; this change will have an experimental nature. Much will depend on the opposition to

organizational changes by present-day management. It can be expected that this development will only then get going if the tendency towards autonomy suggested earlier will make it essential.

280A Internal pressure towards structural changes that favour a more intrinsic orientation towards work will also arise within the organizations. Higher standards of living engender this; in addition, aspirations based on one's educational level cannot be met within the present system. This holds for expectations in regard both to intrinsic aspects and to extrinsic aspects, such as wages. Finally, there will be the additional factor that the change in the population pyramid will lead to an increasing proportion of the middle-aged categories, for whom promotion possibilities will be restricted. At the lower professional levels, therefore, people will no longer be content with tedious work because they cannot expect to be promoted out of it.

See: 296A

See: 123, 124

281A External and internal pressure on the organization of labour and opposition from the side of management make it probable that the change process itself, even after it has begun, will de characterized by a number of problems. There will thus be a demand for a broader education for personnel because the number of functions to be exercised in one job will increase. Employees will have to have the possibility to assume responsibility. Moreover they will have to be able to distinguish between what they would like to do and what they are capable of doing. Learning to recognize and acknowledge one's own limitations, so that one is able to evaluate one's possibilities realistically, is an experimental learning process.

See: 193, 194

It can also be expected that problems will appear within groups of co-workers which have until now been viewed as homogenous. An increase in the number of participants in decision-making and an expansion of that participation will temporarily bring with it an increase in competition within the group. Here, too, there will have to be a learning process leading to a normalization of relationships. Frustrations can be significant and the chance that an elite will develop is present.

See: 137–139

In regard to management, the transition from policy making to the creation of a framework within which such policy making can occur will not only be difficult in itself but will also make heavy demands in regard to insuring the continuity of policy during the transition.

Finally, problems will also arise in regard to the coordination, harmonization and dovetailing of decisions concerning policy and those concerning implementation. There will be some coordination if the manner of implementation is considered during the policy-making process and if operative guideliness are provided for policy execution. A systematic harmonization between policy and implementation will, however, only come into being after a great deal of trouble, when it is learned that, without this linkage, participation in decision-taking is not very effective.

See: 138

4.2 Economic development

282 For the economic development until 1980, we have relied on the 1976 study by the Central Planning Bureau which is based on the policy intentions prevailing at that time. These intentions bear on the limitation of the rise in collective spending according to the so-called 1% norm*), the stimulation of investment and the limitations on the government deficit. If, moreover, there would be some moderation of the wage-cost increase, then, under the

*) This lays down the guideline that the share of the collective sector in national income will rise by not more than one percentage point in each year.

postulated circumstances, an economic growth of 3,8% per annum will lead to a recovery of employment, and unemployment will decline to 150.000 in 1980.

283 In the meantime new estimates were made in June 1977 by the Central Planning Bureau for the Central Economic Commission. This Commission prepared a memorandum regarding projections to 1981. If we compare these with the estimates we have adopted here for this period there are obvious differences. In the later estimates, growth of production is less, there is a stronger rise in real labour costs, and unemployment does not decline to 150,000 in 1980 but rises from its present level to 250,000–275,000 in 1981. The smaller increase in production is the result, among other things, of a further appreciation of the guilder, high wage rise and of a lower estimate of private consumption in relation to disposable income. The volume of production and real labour costs to a large extent determine employment possibilities which, thus, come out lower than before.

An important quantity which directly affects the labour market situation is the labour supply. In our calculations, we assumed a potential working population of about 5 million in 1980–1981. Matching this to the new estimates of employment shows that there will be a shortage of 195,000 jobs and a friction unemployment of 79,000. The difference with the unemployment of 150,000 which would follow from the old figures is 125,000. This is a hidden unemployment, largely of married women. The new estimates of the CPB allow for a higher participation of women in the labour process, specifically married women. This partly explains the rise in unemployment.

See: 266A

See: 276A

The policy of the government will be to avoid this unfavorable development. Already existing policy intentions aim at reducing unemployment in 1981 to 150,000–165,000.

In our project, no account could be taken of these new estimates. Naturally they mean a difference in the initial situation which also affects economic development in later years; the final difference for the whole period of the more than twenty years we survey is, though, slight, and it easily falls within the uncertainty margins attached to our statements. So an adjustment of long-run expectations on the basis of the new information makes little sense. The danger exists, moreover, that a revision would demand so much time that it would not be finished before there would once more be new insights or data available. Thus it would be a process with no end in sight.

284A For the period of 1980 to 2000, alternative A assumes the maintenance of the restored level of employment, continuing growth in labour productivity and continuation of inflation. Other assumptions about economic relationships are, where necessary, subordinated to these fundamentals.

See: 286A

With regard to employment, it is assumed that the unemployment of 150,000 reached in 1980 will remain unchanged until 2000; the hidden unemployment, still considerable in 1980, will disappear in time. About 2000, total unemployment will be equal to the registered labour reserve of 150,000, and this will be equal to the friction unemployment, which will increase from 1½% to 2½%.

See: 266A

We thus assume that the problem of employment – at least in broad lines – will be solved primarily as will appear by the expansion of the number of jobs in the services sector. This is an important assumption. It rests primarily on the expectation that large unemployment rates will not be permanently tolerated and that the improvement in the situation which was initially expected to occur around 1980 will not subsequently be given up. Naturally this assumption implies that a number of conditions will be met; policy in the coming years will

See: 290A

See: 55, 71

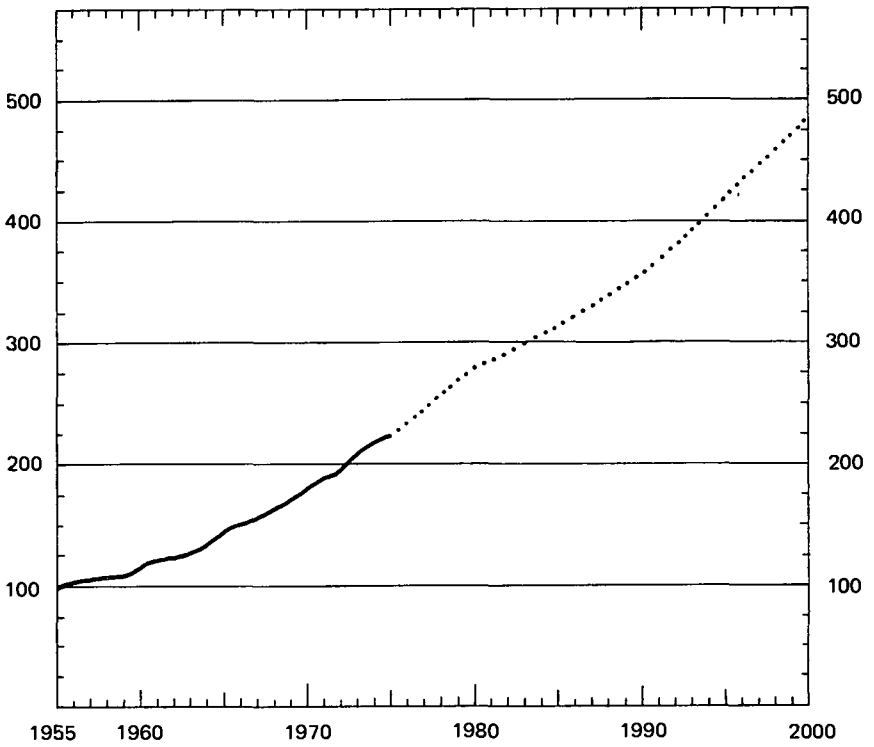
be important in this respect. Originally it was assumed that, with a given combination of policy measures, unemployment would be reduced to 150,000 in 1980; now we know that probably still more will be necessary to achieve that goal. The intention to reduce unemployment to that level has repeatedly been stated by the government – and by many others. Therefore the forecasts adopted here are not entirely without foundation.

See: 55

If this assumption in regard to employment is not realized, there will be a serious bottleneck. In this sense, our methodological dislike of crisis situations has played a (modest) role in the formulation of our expectation. The problematic character of the course of events outlined is thus rightly listed with the bottlenecks.

285A The growth of labour productivity in the private sector (excluding natural gas) was set beforehand at 3% p.a. from 1980 to 2000. This figure reflects the usual definition of productivity, which is limited to the goods and services counted as production. The corrections that would be required to arrive at a proper measure of welfare have not been made. With this reservation, we can establish that 3% is somewhat less than the growth realized in the past – and particularly in the 1960s – as reflected in figure 3A.

Figure 3A. Labour productivity (excl. government); 1955 = 100



We attribute the strong rise of labour productivity in the decades after 1950 to technological development, which usually led to energy-intensive production methods, to the continuing rationalization of the production process, and to structural changes by which branches of industry such as the chemical industry came forward strongly. In regard to this, the increasing international division of labour and the physical location of our country played a role. One can assume that some of these factors, such as technical innovation and rationalization, will continue to be active in the future; others, such as locational advantages and the freeing of foreign trade, in contrast, will not continue to play a role

See: 91, 92

or will do so only in a slight degree. Moreover, the contribution made by inexpensive energy to the rise in productivity will end, and the increasing weight of the services sector will inhibit the total increase in labour productivity. This results in the relatively limited secular rise which we forecast for the far future. *(See footnote by Mr. E. Bloembergen following paragraph 137.)*

286A We also count on a moderate continuation of the past trend of inflation and thus, from 1980, on a rise of the domestic price level of 5% annually. If one continues the past trend consistently, this would lead in the end to very high price rises. We expect, though, that a certain moderation will take place, partly because of a large effort by the government. The growth of labour productivity will continue to differ among sectors and branches of industry and this will evoke price increases; wages in the less productive industrial branches will follow the raises paid in the stronger sectors. Thus there will always be some rise in prices.

See: 80

287A In international economic relations, we distinguish between the countries producing raw materials and the industrialized countries. We assume, in regard to our relations with the raw materials producers, that the import prices we will have to pay will rise more rapidly than the export prices will receive for

See: 84

our goods, so that there will be a continual worsening of the terms of trade. Relations with the other industrialized countries, we assume, will show no important changes and will reflect a steadily continuing process of international specialization. This means that the assumption of continued moderate

See: 95

economic growth in our country actually entails a comparable development in the industrialized countries to which we are related as supplier, buyer or competitor.

288 We generally assume a favorable development in a number of economic problems, such as unemployment. These expectations are based on the assumption that a number of conditions will be satisfied. The first is that the proposed development between 1975 and 1980 is successful. This will set high demands on policy. A second condition is that sufficient jobs will be created in the services sector. This implies that there will be demand for these services as well as willingness to pay, either in the marketplace or from public funds.

More generally, the forecast economic development assumes in this alternative that there will be enough export possibilities – also for services – and that

See: par. 4.4

there will be no insurmountable difficulties in regard to energy and raw materials or in regard to the environmental side-effects of economic growth.

289A Table 28A contains a number of figures about employment, labour productivity and production, with a breakdown into a few large sectors. This division corresponds broadly to the method of estimation. Again, the figures suggest a greater degree of precision than is warranted.

Table 28A. Employment, productivity and production

	1975	1980	199-	2000
		— x 1000 man-years —		
Employment*)				
agriculture	298	259	222	200
industry**)	1229	1185	1150	1080
construction	439	413	400	380
services	2031	2222	2999	3072
government	627	659	687	731
Labour productivity		— % rise per year —		
agriculture		6.6	4.9	3.3
industry**)		7.1	4.2	4.4
construction		2.0	1.8	1.6
services		2.7	2.4	2.4
Production		— billion guilders, 1975 prices —		
agriculture	9.7	11.6	16.0	19.8
industry**)	54.5	73.9	108.6	156.4
construction	13.5	14.4	16.3	18.1
services	80.6	101.0	172.7	224.5
government	28.0	29.5	30.8	32.8
natural gas	7.1	8.0	4.8	1.5
Total	193.4	238.4	349.2	453.1

*) Active working population, including self-employed.
**) Exclusive of natural gas.

See: 336A

Unless otherwise indicated, the estimates per sector rest on the continuation of secular trends. In agriculture there will be, over time, an end to the departure of the small farmer, which will mean a decline in jobs; in construction, production will decline as a result of the saturation of the housing market, and the productivity rise will be slight because of a shift to rehabilitation and improvement of existing housing which are more labour-intensive than new construction.

See: 318A

In regard to the public sector, labour productivity does not have to be estimated since it is by definition constant, according to the accepted conventions of national accounting. For manufacturing and services, finally, it is known that labour productivity in manufacturing rises more rapidly than in the other sectors, and that the number of jobs declines since the demand for goods does not rise so strongly any more. The employment figures for both sectors have then been chosen in such a way that labour productivity in the industrial sector as a whole will rise about 3% annually after 1980 and that the labour supply will be almost entirely absorbed; employment in the services sector has thus been estimated as a residual category.

290A Particularly for the government and services sectors it is useful, by further subdivision, to find out if the estimated development of employment is plausible. We give the figures in Table 29A.

Table 29A. Labour demand in services and government

	1975	1980	1990	2000
		— x 1000 man-years —		
Transportation	307	335	400	405
Wholesale trade	200	205	260	270
Retail trade, crafts	619	640	980	1000
Self-employed	387	447	600	615
Hotels, entertainment	116	126	170	175
Health care and social assistance	244	253	274	279
Social services	90	97	118	129
Other services	68	119	197	199
Total services	2031	2222	2999	3072
Defence (incl. civilian pers.)	134	123	121	121
Other civil servants (national)	108	123	132	145
Municipal, provincial personnel:				
waterschappen*)	150	165	200	240
social insurance	22	23	25	27
education	213	225	209	198
Total government	627	659	687	731

*) 'Waterschappen' are the local administrations in charge of dykes and canals.

See: par. 3.5, 3.6, 3.7, 98ff.,

For a number of entries in this table, the elucidation can be found in the discussion of the appropriate sector. This is true for health care and the social services among the services and for defense and education among government. For the growth of the civil service, we point to the increasing government intervention. The emphasis is on the lower levels of government which is in agreement with the forecast decentralization.

See: 142

291 Growth in the components of the services sector not yet discussed merits a separate elucidation. Particularly between 1980 and 1990, many new jobs are forecast. With that, we assume new growth in the working population which is self-employed in small business. This agrees with the striving for self-determination of one's own working conditions. We also expect, as will be discussed below, that social security will be extended to the self-employed. This will lessen the existing preference for employee status. This development naturally implies a comparable shift in expenditure. We will return to this point.

See: 258A, 302A

See: 296A

292A In regard to the means and expenditures which correspond to these production estimates, our relations with foreign countries will play an important role. As was stated earlier, we assume that there will be no major changes in our relations with the other industrial countries, specifically that the rates of growth will agree and that the mutually competitive relation-ships will not change significantly. In regard to imports, an elasticity of 1.5 is assumed, which means that a 1% increase in domestic production will evoke a 1.5% increase in imports. In the long run, we assume that there will be continuing international specialization. This process will occur on the basis of relative cost advantages which follow from locational advantages, and which are reinforced by technological developments. Because of this, price rises in international trade lag behind those on the domestic scene, which will further foster international trade and (international) specialization.

See: 94, 95

See: 84

In the meantime, consideration has to be given to the deterioration of the terms of trade between the industrial countries and the suppliers of raw materials, and to the influence of a doubling of the real energy price which will apply to a strongly increasing net import of primary energy. Under these circumstances, a satisfactory balance of payments can only be attained if exports increase strongly. The growth percentages are given in Table 30A.

See: 91

Table 30A. Forecast development of exports

	1975–1980	1980–1990	1990–2000
	— annual growth percentages —		
Goods*)			
production volume	5.6	3.3	3.2
export volume	7.9	5.8	4.8
Services			
employment	1.8	3.0	0.2
production volume	4.6	5.5	2.7
export volume	5.8	5.2	4.1

*) Products of agriculture, industry, natural gas.

In addition to the export of goods, the export of services will also rise strongly. In the estimate of production and jobs in this sector, we have left room for a significant growth of the self-employed in small business, but this will not contribute much to exports. There will be heavy pressure on the other service branches to orient themselves more and more towards other countries, which is obvious from the growth percentages for this sector as a whole.

293A We return to Table 28A and observe that a large growth in production is forecast. From 1975 to 2000, this will average 3.5% annually, and for manufacturing even 4.3%, so that for the whole period, total production will more than double and in manufacturing it will triple. This has consequences for land-use, environmental pollution, and the use of raw materials, especially energy.

See: 310A, 334A, 336A, 344, 369A

294A We now direct our attention to the composition of expenditures, and in particular to what remains for private consumption. How much this will be depends primarily on the claims made for other purposes. In addition to exports, already discussed above, there will be the claims of industrial investments, costs of environmental protection and government expenditures.

The forecast development of the first two categories is shown in Table 31A.

Table 31A. Forecast growth of a few expenditures

	1975–1980	1980–1990	1990–2000
	— annual growth percentage, volume —		
Investments in capital goods	+ 4.2	+ 4.5	+ 3.8
ditto, incl. inventories	+ 9.0	+ 4.3	+ 3.6
Housing	+ 0.4	− 1.1	− 2.2
Environmental provisions	+ 6.1	+ 3.8	+ 1.2

See: 289A

The growth of (gross) investments is of course related to the expected growth of employment in manufacturing industry, and it shows a similar course. For future years, moreover, in agreement with the economic growth, a steady net expansion of inventories is expected; before 1980 that will lead to a very large increase in comparison to 1975; in that base year inventories were in fact reduced, so that inventory investment was negative.

See: 318A

In regard to housing, the effect of saturation on the housing market and of the end of the housing shortage can noticed.

See: 366A

The entry 'environmental provisions' includes running costs, net investments and replacement investments, estimated from the base year 1973 on the assumption that, specifically in the period until 1985, a large effort will be

undertaken in this area. These costs, somewhat adapted to the course of production, will be absorbed into the production process, and we should have used a model to estimate the effect of this on price and volume of production of various goods. In fact, though, we have applied a simpler correction which means that, for later years, additional costs relative to 1975 were subtracted from what will be available for private consumptions.

295A In regard to government expenditures – costs of personnel, material consumption and investments taken together – it is expected that there will be a continuous, secular increase of about 0.6% annually in volume. This entry only applies to part of the government expenditures; no transfer payments are included. This estimate says nothing as yet about the tax burden or the claims of the public sector on national income; we will return to this subject shortly.

See: 298 ff.

The principal determinant of these government expenditures is the size of the civil service; this determines the wages and salaries and also to a large extent material consumption. Together these are more than 80% of the total entry. Public investments which form the rest grow just as evenly in volume over the whole period, at 0.8% annually, from 1980 to 1990 somewhat more rapidly, in contrast to the period 1975–1980 which shows a slight decline. This entry will have to suffice for a number of infrastructure projects. Actually, at this point, we should give a summary review of the projects which would come into consideration after the large works now in progress, such as the flood-control system in the Oosterschelde and the creation of Flevoland, are completed. An overall financial assessment is only possible, though, if one also brings the less spectacular projects such as road construction and provisions in urban planning or harbor improvement into the picture. That would take us too far afield. We leave it, then, by ascertaining that, for the period to about 1985, sufficient plans are being executed or are in an advanced stage of preparation, and that the first known large project – the second airport – will come into consideration only much later, if ever. In this respect, from about 1085, there is room for such plans as the establishment of an island in the North Sea.

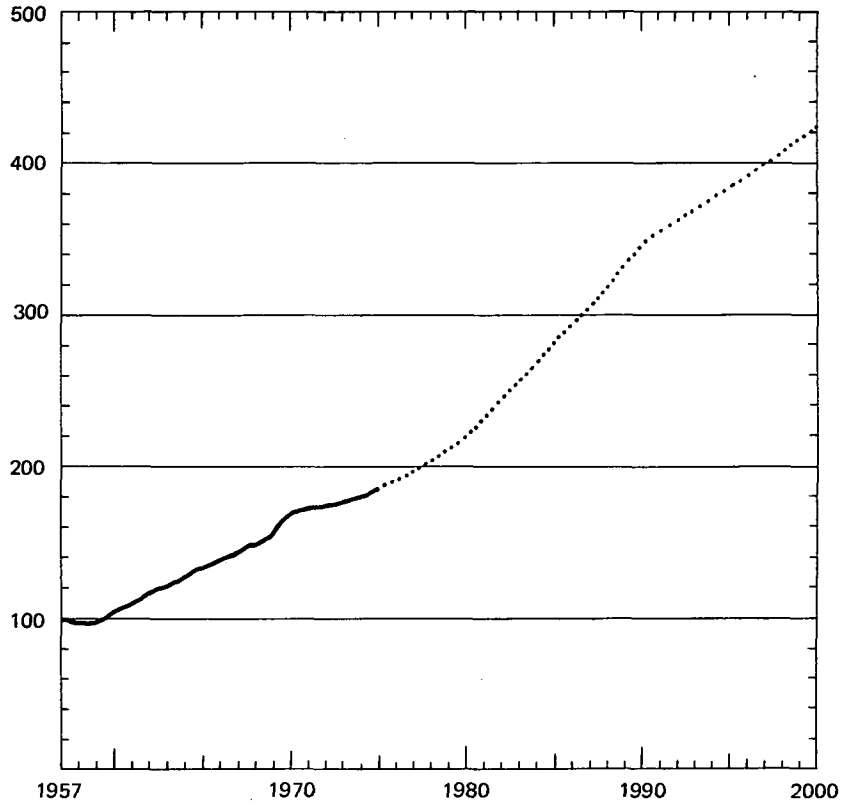
See: 327A

296A After allowing for these expenditures, private consumption remains. Expressed in a per capita volume, this is an important indicator of the material well-being of the population, including both goods and services. Over the whole period from 1975 to 2000, it will show an average growth of 3.2% annually, but this will occur particularly between 1980 and 1990, as figure 4A shows. For a further judgement, we give a division into goods and services in Table 32A.

Table 32A. Consumption volume per capita

	1975–1980	1980–1990	1990–2000
	– annual growth percentage –		
Total	3.2%	4.5%	2.0%
Goods	2.4%	2.7%	1.0%
Services	4.0%	5.6%	2.5%

Figure 4A. Consumption per capita 1957 = 100



As one can see, consumption will increase appreciably until 1980 under the influence of the expected economic recovery. From 1980 to 1990, the expected pace of growth will be still more rapid. This is related to the strong increase in the labour supply which is expected to be absorbed primarily in the services sector. In agreement with this, growth of consumption in this period will be primarily directed to the services.

For the other periods as well, the table indicates that the mix of consumption expenditures will change because services will grow faster than goods. This agrees with the increase in total expenditure; it stands to reason that an increasing proportion will be going to services, and an income elasticity of 1.2 is not excessively high. On the other hand, the average price rise of 5% will not apply equally to both categories. It applies, though, to wages, which affect services more than goods since the rise in productivity in the services sector is lower than in manufacturing. The result is that services as a rule rise in price somewhat more markedly than goods. The services share in the value of consumption in current prices rises, therefore, more rapidly than the volume share shown in Table 32A; at the same time, doubts arise whether this shift, which is reflected in Table 33A, can be realized without government intervention. As can be seen from the Table, the expansion of services will not take place in the sectors which traditionally are strongly controlled by the government. The declining share of the latter in total consumption reflects the effective cost control in health care which is expected.

See: 168

Table 33A. Consumer expenditure on services

	1975	1980	1990	2000
	— share of total consumption expenditure*) —			
Expenditure on services	54.9%	59.2%	65.6%	69.8%
of which health care and social services	16.8%	15.2%	11.4%	11.4%

*) At current prices.

297 For much of the consumption of services, the sums involved are in large measure determined by the government. An example is health care, which, after housing, is probably the largest single entry in services consumption. Part of this is included under social insurances but for the rest, even payments to general practitioners, dentists and private health insurance will only formally be handled in the marketplace; the consumer can hardly influence these entries, and the government will play an important role in the determination of rates. In other areas, such as art and culture, it appears that services to consumers will be possible only by the grace of government intervention, in this case by subsidy. In both these examples, the price rise of services relative to goods will also be a result of the different productivity growth rates.

If one goes back to Table 29A, then it appears that the expected growth of jobs in services lies exactly in those sectors which are less susceptible to government intervention. Therefore a bottleneck in this area is in the offing.

298 Thus far, no attention has been paid to the manner of financing the various categories of expenditures. We want to do this now and thereby gain some insight into the share of the collective sector in the national income. In the broad view, which is appropriate here, we do not distinguish between the government and the social insurances but we do differentiate between certain expenditures which belong directly to the collective sector and transfers between households.

From these entries, the collective claim on the gross national product can be determined. This procedure ignores many further distinctions which would be appropriate on the basis of the present arrangement of our insurance system and it can serve only as a first approximation.

299 How we proceeded appears from the figures given in Table 34 for 1975. The figures are only rough estimates to which not too much significance can be attached. As one sees, the first entry includes all government activity and the necessary purchase of goods and services, as well as the costs of health care and of social assistance. Together these are the collective expenditures: the citizen has to pay for these in the form of taxes, health insurance premiums or doctors' bills*) — all amounts over which he has little influence but for which he gets a direct return in the form of government services and health care. The second entry is other government payments, such as development assistance and support of threatened industries, subsidies to institutions, housing construction, etc.

The third entry is transfers to the non-active population groups, such as the aged, the unemployed, the disabled and, in part, recipients of national assistance. The indicated amount is the net income of these groups, i.e. the payments and pensions which they receive, less any premium and taxes they pay which we treat as a kind of repayment to the other groups of society.

*) About two thirds of the population is subject to compulsory health insurance which covers all medical treatment at a moderate premium. Among the higher income groups, who cannot partake of this insurance, it is customary to take out private insurance against hospital costs and consultants' fees but not for general practitioners' fees.

Table 34. The collective sector in 1975

	— million guilders —		
Gros national product, current prices		203.3	
Government: wages and salaries	27.8		
material consumption	9.6		
investments	7.8		
Health care	17.1		
Social assistance	2.8		
A. Collective expenditures		65.1	(32.0%)
B. Other government payments		9.5	(4.7%)
C. Transfers to non-active groups		33.3	(16.4%)
Remainder for the active working population		95.4	
of which transfers within this group		15.5	

After subtracting the first three entries, the share of gross national income which goes to the active working population remains. As is shown at the bottom of the table, quite substantial transfers are made within that group by premium charges and transfers such as family allowances and illness benefits*).

300 The estimates of the collective sector in table 34 differ from the customary definition in that all costs of health care are included and not only those sums which are paid by the government or by compulsory insurance schemes. The estimates differ also from the premium and tax burden of an individual such as, for example, the average employee. On the one hand, not only are direct taxes taken into account but almost all government payments, regardless of their financing; on the other hand, transfers within the active population resulting from social legislation are ignored. The individual nevertheless experiences the premium payment as a burden even though he might himself receive, e.g., illness benefits.

301 We thus approach the share of the collective sector in the national income from the national totals and not from the corresponding burden which taxes and premium payments impose on the income of the individual. Naturally there is a strong connection between these two approaches, and a large collective claim will always lead eventually to a decrease in the amount of consumer expenditures by individual recipients of primary income from marketplace activities.

In the approach we have adopted, the distinction between taxes and premiums is ignored, as is the distinction between direct and indirect taxes. We assume a shift in this regard between *1980* and *1990*; the burden of indirect taxation will then double. Since it is not possible to increase our price level because of the somewhat coincidental circumstance that our country adjusts its fiscal arrangements to our European partners, the rise of nominal wage rates in these years will have to remain limited in spite of the increase in indirect taxes. This will be possible because (except for a general rise in the tax burden)

*) The structure of the Dutch Social System is quite complex. Some schemes are administered directly by the State and paid for out of taxes, as in the case of basic relief or national assistance, but the majority belong to the realm of social insurance. This comprises a great number of separate funds and compulsory insurance schemes, established by law and to some extent controlled by the government but administered by separate authorities with varying degrees of autonomy. A major distinction must be made between *national* insurance schemes, which cover the entire population (like the old age pension), and *workers'* insurances, which are restricted to wage-earners and employees. The examples quoted in the text are family allowances (as distinct from family tax relief), paid to all workers and certain categories of self-employed out of family allowance funds, and illness benefits which are a form of compulsory insurance of wage-earners and employees against loss of income in case of illness. Both schemes are financed by compulsory premiums paid by employees and employers.

compensation in disposable income will take place by lowering direct taxes, or, in this case, by raising them less than would otherwise have happened.

302A In substance, our estimates for the future are based on the consideration that government intervention will increase still further in many areas, and that there will be an increasing tendency to extend social insurance to a national insurance system. Thus we expect transition to a general health insurance already in the beginning of the period under review, which will do away with the present distinction between compulsory insurance of employees and private insurance of the self-employed. As indicated earlier, this change in the institutional framework will not make much difference to the individual since even now he can exert only very little influence on the sums he has to pay for health care whether he is compulsorily insured or not.

See: 126, 140

See: 299

In the area of the social insurance which bring about income transfers – such as the social insurance schemes for the disabled and the unemployed – the extension of an employees' insurance system to a general, national insurance system means much more; it is a basic change which will make itself fully felt only in the course of time. This change means, namely, that a number of transfers which now take place directly between or even within families will be taken over by the collective sector just as the distribution of income over the duration of the life of the individual, which is now arranged by savings or by private insurance.

See: 156

Our expectation on this point rests precisely on the indicated consequences of the change. The beginning of the transformation of direct transfers into a collective insurance system can be found in the plans for general students' grants independent of the parental income, and in the pleas to bring divorce alimony into a social insurance system. These tendencies are consistent with a greater independence of the individual and a diminishing significance of family and household ties.

See: 152, 156

303 Continuing inflation also plays a role in the substitution of social insurances for pension arrangements and private old-age provisions. It is, after all, almost impossible for the individual to shift his income over periods longer than a few years.

Other than the privately owned home, which retains its value in use over time. there are no investments or forms of insurance which can give inflation-free security. The only system which can provide that is a system based on the simultaneous redistribution of income among various categories. Even now – outside the social security system – this is in a certain sense the case, namely by transfers between family members and, of more importance, by supplements to previously established industrial pensions at the cost of present profits. These means cannot, however, offer a genuine long-run solution. We therefore expect, in time, the introduction of a general pension scheme and of more extensive generalized provisions for widows and orphans in addition to the general health insurance. This will replace industrial pension arrangements and individual life insurance.

This is indeed a basic change, which will certainly meet with opposition. In regard to the industrial framework, there can be a mixed form, certainly during the initial stage; it is certain that the transition from commercial insurance companies to a public authority will not occur as easily as is suggested above. In the broad picture presented here, we in fact ignore these organizational questions.

We also assume that these changes will be accepted by the public, not only in the sense that there will be a majority for the necessary legislative measures but also in the sense that the premium charge will be accepted and that the

transition from private to public insurances will not lead to avoidance of premium payments on any important scale.

Insofar as will be necessary, new laws and stricter sanctions will compel compliance.

304 Keeping in mind this reservation, the expected development will still mean that a number of transfers now in the private sector will be brought over into the public sector, even though the extended social insurance will in part replace the relief scheme that is now operated by the government as a financial provision of the last resort and paid for out of taxes. Moreover, the institutional investor will disappear in due time (or be taken up into the social insurance system) so that the public sector will fulfil a larger role also in other areas. In particular, the government will increasingly take part in the financing of housing construction and investments; this is in accordance with the tendency towards an increasing direct and selective (government) intervention in these areas.

See: 305A

For the working population, this development in the direction of general insurance has other consequences. The difference in position between civil servants and private employees will diminish when everyone has similar pension rights; at present civil servants are exceptionally well situated in this respect, since they receive a pension related to their last salary that is annually adjusted to the current wage rate. Among employees of private enterprises, differences will also become smaller, and labour mobility among industries will be fostered, just as the mobility between government and industry. Finally, the difference in social security between employees and the self-employed will eventually disappear. We expect that this, added to the desire to determine one's own circumstances oneself, will diminish the preference for wage-labour and lead to a resurgence of the self-employed practice of one's craft on the retail level.

See: 143

See: 258A

305A We now present, in Table 35A, an estimate of the future course of the collective burden as it was measured for 1975 in Table 34. Collective expenditures (entry A) grow slightly, because government expenditures do not increase very much and in health care and education a rather strongly imposed moderation, based on control of costs, is assumed. Other government payments (entry B), in contrast, increase sharply because we assume that in 1980, 1990 and 2000, respectively 20%, 40% and 60% of the investments in fixed assets will be financed by the government. As one sees, these tendencies even out, and the sum of entries A and B as a percentage of the gross national product is practically constant.

See: 168, 216

Table 35A. Burden of the collective sector

	1975	1980	1990	2000
	— percentage of national product*) —			
A. Collective expenditures	32.0%	28.6%	23.7%	24.4%
B. Other government payments	4.7%	7.0%	11.7%	12.4%
C. Transfers to non-actives	16.4%	19.7%	21.7%	23.9%
Total	53.1%	55.3%	57.1%	60.5%
Ratio of non-active to active				
— number of persons	0.48	0.58	0.63	0.67
— average per capita income	0.73	0.75	0.80	0.90

*) At current prices.

306A For the estimates of the transfers to non-active persons, we have used the two ratios which are given in the table. We first determined the relation

between the number of persons who make up a household in which at least one active member of the working population is present as breadwinner, and the others. The first group can provide their own support from the primary income of the breadwinner. The second group, single as well as united in a household, is dependent on transferred income.

The relative size of the two groups varies as a result of the changes in employment (the unemployed receive transfers), in the age structure (the aged receive transfers), and in the shape of the household (children who live by themselves rely on transfers until they start to work). As a result of the last two factors in particular, the relative number of recipients of transfer income will increase sharply from 1975 to 2000. In Table 35A, this is reflected in the ratio which indicates how many people are dependent on transfer income for each person who lives on the primary income of a breadwinner in the same household, including the breadwinners themselves.

A second ratio indicates what amount per capita is paid out via the collective sector relative to the amount that remains per capita in the households of breadwinners. This figure is dependent on (i) the measure in which transfers take place via the collective sector or occur directly, and (ii) the relation between the level of transfer payments and the disposable income that remains in the primary sector. The figure of 0.73 for the latter ratio for 1975 is perhaps higher than one would expect, but remember that we are talking about disposable income, that pensions from private sources are included in the transfers and that, finally, we are comparing income per capita and not per household. A further rise of this ratio is to be expected with continuing economic growth and an increase of the older generations.

307A In general, transfers to non-active persons will show a significant rise; the total collective burden, as here defined, will rise accordingly from 53% now to almost 60% in the year 2000. Of course, the result will be much higher if public expenditure – government expenditure on material consumption, investment and health care – would rise more steeply than is expected here and would not lag so far behind gross national product.

Energy

308A Domestic energy consumption is estimated per sector with reference to the growth of production, population and traffic, on the basis of the following assumptions:

– energy consumption in manufacturing and construction will increase proportionately to production; the course of production in the chemical industry and oil refining is treated separately;

– in agriculture, energy consumption will increase more rapidly than in manufacturing;

– energy use in the services sector (heating, electricity) will increase slightly more rapidly than the number of jobs;

– private energy consumption (heating, applicances) will rise faster than the population;

– energy consumption in traffic and transportation will remain behind the rise in transport effort.

309A These assumptions make some allowance for the price rise of energy in the world market, which will be transmitted to the domestic market, but not for a strong conservation policy of the government. Only in regard to traffic are policy measures assumed which will influence the volume of consumption in this sector. Volume and composition of energy use in this sector are of particular importance for air pollution, which is the reason for the measures. Further elaboration of these estimates is given in the paragraphs on air pollution.

See: 91

See: 358A, 360

See: 289A

310A A further subdivision of industrial production can be found in table 36A.

Table 36A. Production of a few branches of industry

	1975	1985	2000
	– volume index, 1975 = 100 –		
Chemical industry	100	255.3	393.5
Refineries	100	173.1	302.1
Other manufacturing	100	158.0	275.7

See: 328A
See: 88

The earlier assumptions and the estimates given elsewhere for traffic lead to estimates of total domestic consumption in Table 37A. On the basis of estimates of future world production and domestic production, the share of the various energy sources in total domestic consumption have been estimated as well. This further break-down is of particular importance in regard to air pollution.

See: 356 ff.

Table 37A. Total domestic energy consumption

	1975	1980	1985	1990	2000
			– x 10^{16} joules –		
Industry, agriculture, services, households:	199.6	277.2	328.4	373.8	484.2
Traffic and transportation	34.8	42.1	49.8	56.1	70.1
Total	234.4	319.3	378.2	429.9	554.3
Coal	4	6	13	16	18
Petroleum	38	41	48	46	44
– of which traffic and transportation	15	14	13	13	12
– other uses	23	27	35	33	29
Natural gas	57	52	36	33	6
Uranium	1	1	3	5	3
Solar energy	–	–	–	–	–

311A When detailing consumption, estimates of domestic production are taken into account. This consists, of course, primarily of natural gas. A relatively limited contribution of nuclear reactors and alternative energy sources – in this case, solar energy – is added. Strictly speaking, energy generation from uranium does not belong in this table since the raw material is imported; nevertheless, the entry is found in Table 38A under the heading of domestic production.

Table 38A. Domestic production (and generation) of primary energy

	1975	1980	1990	2000
		– x 10^{16} joules –		
Natural gas	228	323	205	64
Petroleum	6	6	–	–
Nuclear energy	4	4	23	32
Alternative sources	–	3	7	17
Total	298	336	235	119

These estimates are in physical units. We present no more than a strongly aggregated picture, in which little attention is given to the distinction among

the various energy sources; this aspect was discounted in the underlying calculations.

312A The course of domestic production of primary energy will be determined largely by the decline of natural gas production after 1980.

In regard to nuclear energy, it is assumed that the installed capacity of the nuclear power stations, which is now 500 MWe will increase to 3500 MWe in 1990 and to 5000 MWe in 2000. This development is controversial and uncertain. If it does not occur, then some people fear that the future supply of energy will be in danger. As a contribution to total domestic consumption, the share of nuclear energy will actually be limited until 2000; it will reach only 6% in that year. The importance of nuclear reactors in this respect lies primarily in the contribution they will make after 2000. This contribution, though, would be uncertain if an earlier beginning were not made with this form of energy generation.

313A The objections to the establishment of nuclear power plants pertain to their potential danger, the strict security measures which will also be necessary outside the reactors themselves, the dangers connected with the storage of radioactive wastes, and the fear that the production of nuclear weapons will be facilitated. These objections are tied not so much to the relatively modest development until the year 2000 as to continuation along the adopted path after that year. Again, these unfavourable aspects will make themselves felt in full force only in time.

To summarize, one can state that the decisions in this regard taken before 2000 will have far-reaching effects after that. Our limited futures survey is not directly concerned with them; they would deserve a separate study, extending to the year 2050 at least.

314A We can now make a comparison of domestic energy production and generation on the one hand and consumption on the other. This is done on Table 39A. Actually, nuclear energy should not be treated as is done here, since the fissionable material is imported; as remarked elsewhere, no supply difficulties are expected.

See: 89

Table 39A. Consumption and domestic generation of primary energy

	1975	1980	1990	2000
		– x 10^{16} joules –		
Total domestic consumption	234	319	430	554
Domestic production	298	336	235	113
Import balance	–64	–17	195	441
World use (x 10^{20} joules)	2.5	3.1	4.4	6.1
Share of the Netherlands in world consumption	0.94%	1%	0.98%	0.91%

As can be seen, after 1980 our country will change from a net exporter of energy into an importer very quickly. Indeed, although the present pattern already rests on a huge exchange of exported gas for imported petroleum, the expected development after 1980 will demand a drastic adaptation of domestic consumption to imported fuels. The share of coal in the worl production of energy will slowly increase to the detriment of natural gas and petroleum. The Netherlands will have to adjust to these changes and this will lead to transportation difficulties and other transition problems. After the year 2000, these problems will become more serious.

See: 88

From the last lines of the table, it appears that domestic consumption will

stay about the same relative to world production. This reflects the expectation that production on a world scale will continue to increase until 2000, and that the depletion of the oil and gas reserved will only come into view after that time.

4.3. Land use

315 Our space can be analyzed according to a number of possible uses. Housing, traffic and transportation, industrial production and recreation all lay claim to the available space; land use does not stand alone but is the result of a large number of societal phenomena. What follows will reflect their influences on land utilization and on the quality of space.

Housing

316A Our view of the future in the area of the residential environment rests on two major assumptions. The first is that the housing supply, in regard to volume, composition and location, will follow the presently discernible preferences of the public. As will appear, this leads to no difficulties in the physical construction capacity. We assume the financial problems will be solved by the continuing government involvement in this area*). The second basic assumption is that government intervention in this area will continue as it is at present. This means that the government will take responsibility for a large share of the housing construction, namely public housing, and that urban renewal and housing rehabilitation will take place with government support.

317A Assumptions about government policy in regard to land-use regulation are less unambiguous. In regard to a number of issues, it is assumed that government policy will not be able to steer the development in the desired direction. This will be particularly true in regard to urban development. This assumption reflects the fact that insufficient knowledge exists about the way societal processes that determine spatial development can be effectively influenced. Some improvement has admittedly occured in this regard in the last years, but we have not incorporated this into our view of the future. As a result, the spatial problems that will occur stand out clearly. In some areas, however, it is assumed that the government will indeed be able to influence developments and will do so. This applies, for example, to development in the area of sojourn-recreation (places for caravans and tents) and of water sports. Contributing to the effectiveness of governmental regulations in this area is the circumstance that the limits of the capacity are visible and fairly generally recognized.

See: 337A

318A The demand for housing was estimated by starting from percentages of population groups, according to age and marital status, who wish to have a home of their own. In this regard, an increase in the desire for independent living among young people and among the aged is assumed. If, in addition, a 2.5% vacancy rate is assumed, the demand for housing can be derived. If we assume that this demand will be satisfied, then the housing supply will increase from 4.3 million units in 1975 to 5.9 million in 2000.

See: 152

From this growth of the housing stock, the need for construction can be determined. Consideration is also given to replacement and housing improvement. Because of demolition, change of use, and consolidation of older residences, an increasing number of dwellings will be withdrawn from the housing supply. According to present standards, of the present housing supply

*) Since world war II, an important part of new housing construction has been financed directly or indirectly from public funds.

of 4.3 million units, 650,000 are in bad condition and 350,000 are beyond repair; in the future these numbers will increase because ever higher demands will be set, particularly in regard to the size and comfort of the dwelling. Housing improvement and housing replacement in urban renewal districts have a long lead-time and are expensive. The pace at which these activities can take place is therefore limited. In the estimates, which reflect a limited growth of housing improvement and replacement, it is assumed that about half of the housing replacement will occur in urban renewal districts, and of that, half again in the four largest cities.

These considerations lead to the estimates of Table 40A.

Table 40A. Housing construction

	1975/80	1980/90	1990/2000
	— annual average —		
New construction in connection with increased demand	93.000	76.000	39.000
Replacement construction	25.000	29.500	33.000
Total	118.000	105.000	72.000
Basic housing rehabilitation	22.000	24.000	25.500

319A 68% of the present housing supply consists of single-family houses and 32% are residences in multiple-family dwellings. Particularly after 1960, much of the new construction was high-rise apartment building. The preference of the public, though, is strongly in favor of single-family dwellings. The societal phenomenon of individualization expresses itself in the desire of households for large, comfortable single-family houses. We expect that rising prosperity will increase the demand for space for leisure time activities and for study. The number of households with this desire will not increase greatly, though; the category of demand in the housing market which is growing most rapidly consists of single persons, primarily the young and the aged. They will have no objections to living in apartments.

See: 152

See: 296A

320 In regard to location, the same distinction can be made. Households in general show a preference for living in a quiet environment but not too far from the basic facilities (primarily schools and shopping centers). Together with insufficient construction in the large cities, this has led to a movement out of the large cities to smaller centers in the outlying regions, and from the western part of the country to Utrecht, Gelderland and Noord-Brabant. In the cities, the remaining groups — the young, the aged and the single-person households — are overrepresented, just as are households which cannot move out because of their financial position. The connection between the depopulation of the cities and suburbanization is obvious.

In addition, this depopulation is also stimulated by the considerable inroads on the housing supply by deterioration, renewal, road construction, office building, etc. Such processes are cumulative: the deterioration of housing is accompanied by the deterioration of the neighbourhoods, schools become underutilized, the range of other provisions in the district contracts. One of the most important functions of the city — the residential function — is undermined.

321A We assume that this process will continue into the future. In time, the difference in the composition of the populations of the large cities and of the newer residential nuclei now occurring will be strongly accentuated.

The movement out of the large cities will first be oriented to outlying locations but later also towards places farther away. Consistent with this,

expansion of the housing supply will occur largely outside the cities. This will lead to the development reflected in Tables 41A and 42A: noticeable is the strong growth of the medium-sized nuclei of 16,000 to 64,000 inhabitants.

Table 41A. Frequency distribution of residential centers, 1975–2000

	1975	1980	1990	2000
	— number of nuclei —			
Size of nucleus:				
1,500– 4,000	266	215	165	145
4,000– 16,000	372	370	362	335
16,000– 64,000	162	130	173	204
64,000–256,000	22	23	22	20
more than 256,000	4	3	3	3
Total	826	741	725	707

Table 42A. Population distribution in the residential centers, by size

	1975	1980	1990	2000
	— percentage of population —			
Size of nucleus:				
less than 1,500	15.4	13.9	12.2	10.3
1,500– 4,000	5.3	4.3	3.2	2.8
4,000– 16,000	20.2	21.2	20.1	19.9
16,000– 64,000	22.1	25.8	33.3	39.8
64,000–256,000	18.5	19.4	18.0	15.5
more than 256,000	18.5	14.9	13.2	11.7
Total	100.0	100.0	100.0	100.0

322A The same tendencies will also lead to the internal migration reflected in Table 43A. The provinces Noord- en Zuid-Holland have an emigration surplus; the migrants settle primarily in Gelderland, Utrecht and the new polders. Foreign immigration is directed primarily to Noord- en Zuid-Holland.

See: 123

Table 43A. Population by province

	Population 1975	2000	cummulative migration 1975–2000 internal	foreign
	— x 1000 —			
Groningen	536	564	12.2	3
Friesland	554	563	– 16.2	3
Drenthe	401	462	37.4	3
Overijssel	977	1,060	– 33.3	20
Gelderland	1,621	1,917	137.8	28
Utrecht	858	975	56.4	22
Noord-Holland	2,285	2,104	– 239.3	80
Zuid-Holland	3,025	2,810	– 407.9	109
Zeeland	327	396	60.8	4
Noord-Brabant	1,941	2,506	304.4	44
Limburg	1,044	1,134	– 1.9	17
New polders	30	126	89.6	1
Nederland	13,600	14,617		

See: 342A

323A This means that around 2000, 19% (6,300 sq. km) of our land will be set aside for urban purposes in contrast to 9% at present. This includes all the built-up areas with designated small-scale recreational areas, land-reserves for future construction and trade and industrial land around the residential or built-up areas. This increase is caused by:

- an increase in the number of households;
- a reduction of housing density in urban renewal areas;
- a lower average number of dwellings per hectare in new construction, in comparison with the existing housing stock;
- an increase of space needed for traffic, parking, stores, parks and other facilities.

Traffic and transportation

324A Employment opportunities and facilities such as hospitals, schools and stores cannot entirely follow the movement of the population to the small nuclei. Mobility thus will increase because people will have to travel over greater distances.

See: 296A

We assume that, with the continuing growth of income and a continuing preference for private transportation, the number of automobiles will further increase until there will be 420 cars for every 1000 inhabitants in 2000, or 6.1 million in total. This will not yet be at the point of saturation in the sense that every adult who can get a driver's licence will have a car, even though there will be many households with more than one car. In addition, the number of motorcycles, primarily for recreational use, will increase very much. The automobile, already dominant, by 2000 will have practically a monopoly position in transportation in our country.

Table 44A. The automobile system

	1962	1972	1975	1980	1990	2000
cars per 1000 inhabs.	61	200	250	300	375	420
number of cars (mill.)	0.73	2.7	3.4	4.2	5.4	6.1
annual kms per auto (x 1000)	17.3	16.4	16.0	15.5	14.9	14.3
average occupancy (persons)	1.55	1.74	1.73	1.73	1.72	1.72
average speed (km/h)	48	50	50	50	50	50
person-kms (bills.)	19.6	77.0	94.0	113.0	138.0	150.0

325A In 1962, slow transportation modes – (motorized) bicycles, pedestrians – still occupied three-quarters of all time used for movement. This is now reduced to about half and with further growth of automobile use it will recede even further, which will lead to a serious reduction in the amount of physical exercise for the average traveller. By 2000, it is expected that there will be less movement by foot and a smaller number of bicycles. The recent growth in the number of mopeds will not continue, because the automobile will dominate the traffic system.

326A Utilization of public transportation in 1975 was 8% above that of 1962; since, during this time, population increased by 14%, use declined per capita by 5%. Railroads remained about the same in regard to volume of transportation, municipal and regional public transportation declined noticeably, and group-, tour-, and unscheduled transportation (the 'chartered bus') rose significantly. We assume that this development will continue with the growth of the automobile fleet until an absolute minimum is reached: the use of public transportation per capita will decline another 10% to 15%, the

total number of person-kilometers will stay the same, but in regular services (railroads, local and regional transportation), this will decline from 13.8 billion person/km in 1975 to 12.1 billion in 2000. It is improbable that quality improvement of public transportation will stem this tide, unless measures are taken to limit the possession of automobiles and to curb their utilization. There are inadequate budgetary allocations for quality improvement (especially greater frequency) and quality deterioration threatens regional transportation. Nevertheless we expect that the government will continue to support public transport because of its societal necessity.

Large-scale construction of new railroads will not occur, nor will new automatic transport systems with small units be developed because of the expensive investments in the infrastructure required and the difficulties of fitting such systems into the present cities. There will be, though, a steady improvement of existing techniques such as bus-taxi and shared taxis, and these will to some extent replace the insufficiently utilized regular services. For this to occur, there will first have to be a number of subsidized demonstration projects. Altogether, this means that the government contribution to the deficits of regular services will increase quite sharply. We assume, namely, that the rates will keep in step with the general price level, based on a continuation of present policy. Wages will follow the wage developments; productivity improvement in this sector is limited, and the share of wages is high. In current prices total costs will increase from 2.43 billion guilders in 1975 to 10 billion in 2000, and the government contribution will rise from 1.33 billion or 55% to 6.3 billion or 63% of the total costs.

See: 305A

327A Until a short time ago, the growth of air transportation was spectacular. The principal reasons on the supply side were technological innovation combined with cost reductions, the birth of commercialized tour-operations in the countries of departure and of massive tourist accomodations in the vacation countries of destination and, on the demand side, the rise of incomes and the acceptance of flying and of foreign vacations. Recently the growth of air transportation, particularly to vacation destinations, has slowed; this is because of the recession and the price increases for air-tours, partly caused by the tripling of the fuel costs since 1972. We expect that the price of energy will rise still more and that a more rapid saturation of mass air tourism to some destinations will appear than has been expected until now. This will happen, on the one hand, because of the limited absorption capacity of the destination countries; on the other, the demand for air-vacations will also show an upper limit. One thing and another leads to a minimum estimate of 33 million passenger movements in the year 2000, 4.4 times the number in 1975. Since Schiphol, our sole international airport, given a continuing increase in the size of airplanes, can handle up to 40 million passenger movements annually, a second national airport will not be necessary before the end of the century. Whether this will remain the case after that cannot yet be judged; we stop there. In case, though, changes are to occur in this regard, space will have to be set aside for this much earlier.

See: 91

328A Table 45A presents a summary.

Table 45A. Mobility

	1975	1980	1990	2000
Totals:				
trips (bill.)	18.8	19.3	20.2	21.0
person-kms (bill.)	147	167	210	248
time spent (bill. hrs)	5.2	5.2	5.5	5.7
Averages (for persons 6 years and older):				
trips per person	1,600	1,600	1,600	1,600
distance per person (1000 kms)	12.2	13.4	15.9	18.2
time spent per person (hrs)	430	430	430	430
distance per trip (kms)	7.6	8.4	9.9	11.4
speed (km/hr)	28	31	37	42

As one sees, no increases are anticipated in the number of trips nor in the time spent travelling per person. The length of the average trip, the per capita travelled distance and the speed will rise by almost 60% to 2000, thus rising less rapidly than in recent years. This is the result of the growing share in the modal split of the automobile and airplane at the expense of public transport and especially of the slower transportation modes. Thus, in 2000, more than 20% of the person-kilometers would move through the air, in contrast to 4% now. Because of this, the share of the automobile will decline slightly to 60%, that of the (motorized) bicycle and pedestrian will decline from 18% to 7% and that of public transportation from 14% to 8%. These figures reflect the public's tendency to exchange energy resources for a continuing enlargement of their action-radius provided that travel time does not increase. This naturally has consequences for the use of space and energy. Further estimates of the volume and composition of fuel consumption, also of importance for air pollution, will be found further on.

See: 310A, 332A, 333A

See: 359A

329A The chance of getting killed, maimed or wounded in traffic is the oldest side effect of mobility. Measured by the number of person/kilometers per victim, the bus, streetcar, subway and train are the safest. During the 1960s, safety for automobile drivers and air passengers improved; for motorized bicycle users, pedestrians, and particularly for cyclists and motorcyclists, it decreased due to the increase in the automobile fleet. Unprotected slow traffic is relatively and absolutely the most unsafe.

The government has recently had an active policy to improve the safety of cardrivers and motorized bicycle riders, which led to a decline in the total number of fatal accidents by about 30%; also the number of bicyclist and pedestrian fatalities declined sharply. We suggest that those measures have by this time had all the effect they are going to have, and that a further decline will come only from new measures, such as safety requirements for automobile construction, low-speed zones in built-up areas, road improvement and construction of new roads and bicycle paths. Further, it is probable that the trend towards less rapid growth in the number of fatalities relative to the expansion of the automobile fleet will continue. The total number of fatalities in 2000 could decline by about 17% in comparison to 1975 and thus be 8% less than in 1962. With this, we assume a proportional number of wounded (as a rule, 25 times the number of fatalities) and handicapped (now about 54,400, with a slight decline to 45,000 in 2000). The improvement in traffic safety reflected in these figures will set high demands on central government policy. This will apply to international agreements about automobile construction and also to stimulation and subsidizing of local authorities in order to promote the introduction of zones with severe traffic restrictions in existing residential areas.

Table 46A. Traffic fatalities

	1962	1972	1975	1980	1990	2000
automobile	520	1350	968	875	800	765
motorcycle	149	93	101	115	157	190
moped	412	574	334	318	287	260
bicycle	422	558	456	457	458	460
pedestrians	485	588	396	336	214	150
train (average)		20	20	19	18	16
bus, subway, streetcar (ave.)		6	6	6	6	6
airplane (theoretical average)	7	10	12	16	28	40
other traffic participants	86	97	60	60	60	60
Total	2106	3299	2351	2202	2028	1947
Traffic deaths per 1 mill. inhabitants	177	246	173	159	143	133

See: 289A, 396A

330A The volume of freight transport depends primarily on the volume and nature of production and consumption; because of shifts in the kind of goods, the transported weight does not keep step with the growth of the production volume even though continuing specialization of labour and economies of scale in themselves lead to more transportation demand. Based on these considerations, the expectations about domestic production and foreign trade lead to the estimates given in Table 47A.

Table 47A. Goods transport (mill. ton)

	1975	1980	1990	2000
		– million tons –		
Domestic*)	413	460	535	610
International	256	332	490	650
Total	669	792	1025	1260

*) exclusive of pipelines, but inclusive marine import and export

331A The distribution over the various transportation modes is to a large extent determined by the nature of the goods – bulk transport versus general cargo – and by the location of sender and consignee in regard to waterways or rail connections. Costs and speed also play a role. As shown in Table 48A, we expect that between 1975 and 2000 there will be no large changes in the distribution according to transportation technique, only a shift from road transport to the canal system. This is related to a relative rise in costs of road traffic, caused by improvement in the labour conditions of drivers; this is significant only in regard to bulk transport. We have taken no account of any effect of the rise of energy prises; even with a doubling of this price, energy forms a rather small cost factor.

See: 91

Table 48A. Goods transport by mode of transportation

	1975	2000
Domestic road transportation:		
– road	78%	73%
– waterways	20%	25%
– rail	2%	2%
International transportation:		
– road	23%	18%
– waterways	65%	69%
– rail	3.5%	3%
– pipeline	8.5%	10%

For both domestic and international transportation together, this leads to the estimates in Table 49A.

Table 49A. Transport by modes

	1975	1980	1990	2000
		— million tons —		
Road	386	430	499	462
Waterway	247	312	451	602
Rail	15	20	26	31
Pipeline*)	21	30	49	65
Total	669	792	1025	1260

*) international only

332A Within the framework of the indicated developments in traffic and transportation, for the year 2000 we estimate that the length of the primary road net outside the built-up areas will be ±7700 kms, of which about half with two lanes and half with more than two lanes. This will entail a more rapid pace of road construction than has recently been the case. Including ramps, cloverleaf crossings, etc., the direct space requirements of the primary road network will be 400 square kilometers. Some of the secondary and tertiary roads will be widened; by 2000, we assume that a number of these roads will have become primary roads and that half of the remaining roads will be widened (additional requirement of 130 square km).

See: 342A

In regard to railroads, things will remain about the same except for incidental expansion of the network, such as the Amsterdam-Lelystad line, as well as the completion of projects presently under construction (such as the Schiphol line and the Zoetermeer line).

333A In regard to the spatial effects of roadbuilding, these are not only a matter of the road surface itself but also of the consequences roads have for adjoining areas; their usefulness for other purposes is severely reduced because of noise, pollution of air, water and soil, violation of the ecosystem and fragmentation of the landscape. This involves zones alongside roads and railroads and around airports, their extent being dependent on the size of the effects and on the nature of the intended land use. The closer the infrastructure, the greater the chance that effects will overlap: right next to an expressway, there is noise pollution, air pollution, and lead poisoning of vegetation and possible disruption of ecosystems. At a distance of 4 kilometers, there is still disturbance by noise in quiet areas and horizon pollution. Whether this leads to loss of function depends on the land-use: for housing, work, recreation or as a nature park. If one sets the distance at which a primary road has disturbing effects at 500 meters — 250 meters on either side — then 3900 square kilometers, or almost 10% of the area of our country, will be affected by the primary road net in 2000.

See: 342A

Space demands for production

334A In regard to space needs for production, a few major points will have to suffice.

— In the neighbourhood of ports, most space is used by industries connected to harbour activities. In 1975, the gross space demand, including that set aside for industry and harbour administration, was 110 square kms. On the basis of economic developments, in 2000 about 215 square kms will be required. The total space use might be greater if we take account of bufferzones set up for reasons of environmental protection. This would add about 50%. Space for expansion of the harbour industrial areas will have to be found near the

seaports of Zeeland and Groningen. Some dispersion of activities to these ports is already taking place.

— In big cities, the number of industrial jobs has been declining for some time. Recently the services sector is also stagnating. A steadily larger part of industry is being located elsewhere, in the periphery or outside the city region altogether. If it stays in the urban agglomeration, this is because of connections to the market — the need for good contacts with the centers of decision-making. Lack of space appears to be the major reason why industries are moving out of the city. Certain industries, with storage and distribution functions, are located in accessible places where delivery of goods is easier. The result of this development is a broad dispersal of industry and services. Still, some concentration of business services which need each other will continue to exist in the big cities, especially basic services employment.

See: 321A

See: 321A, 322A

— Facilities such as stores, schools, health centers follow residence. There is an obvious tendency to establish shopping complexes in places which are easily accessible for automobiles (super-markets). The level of services in the small centers, important for scattered housing, will be further affected because the economic base will become too limited.

335A It is thus expected that the use of land for economic activities will increase significantly. In industry, a higher level of production will call for more space per worker, and the space needs per employee are rising in the services sector as well. Figures which would make possible a reliable estimate of the space needs for production are, alas, not available. If we start from the average of 0.24 hectare per million guilders gross production in 1975 prices, which is valid as an average for the industrial then between 1975 and 2000 we arrive at an additional demand for space of 600 square kms. This figure, though, goes back to data from 1961 and is therefore certainly too low; moreover, it does not anticipate further growth of space needs. We thus anticipate in fact an additional space demand of 1000 square kms.

See: 289A

See: 342A

See: 289A

336A Agricultural production will double. Given the decline in farm labour, productivity will have to increase sharply. This can be attained only with continuing growth of scale per enterprise and processing unit and an increasing specialization. Mechanization and an increasing use of artificial fertilizer, insecticides and enriched cattle feed will be needed to increase labour productivity, particularly in farming and dairy farming.

The principal production factor, land, has been decreasing for several years, primarily because of the demands of urban development (for 96%). We expect that in the future this decline in the amount of agricultural land will continue. During the period from 1975 to 2000, this will mean a decrease of 3465 square kms, an average of 13,860 hectares annually.

See: 342A

In addition to the withdrawal of land for other purposes, the government will also impose local limitations on the use of farm land. We assume, namely, a policy by which, with the creation of national parks, farming methods will be adjusted to the demands of nature- and countryside protection. In 2000, about 10% of the farm land could fall under such a utilization limitation. This implies an active and effective government policy in this respect.

See: 377A

Recreation

337A At present, about 10% of all adults possess a second 'roof' (trailer/camper, cabin-boat, second home). If sojourn recreation develops unhindered according to the preferences of the public, then this will be 13% in 1985 and 15% in 2000. The expected increase in income and in the number of vacation days, both by about 3% annually, would foster this growth. It is very much an open question, though, whether the space will be available; this will depend on government policy.

See: 229

See: 225, 296A

The increase in the number of trailers/campers has recently been increasingly absorbed by parking them with farmers outside the official camping businesses. The 1975 draft Camping Bill aims at stemming this development; stipulations of this law would cause a rise in price at existing camp sites and make it difficult to establish new ones. The pressure to establish new sites will be great; whether or not they come into being will depend on land-use policy. We assume that the number of places will increase 20% by 1980 but not at all after that. This means that the rise in the number of caravans will soon have to be drastically curtailed due to lack of sites; for a (small) part, permanent sites abroad will supplement domestic possibilities.

We expect growing opposition to the second home in those localities where the social structure is threatened by this development. Any increase in second homes will than take place primarily in domestic 'recreation parks'. In time, one will also look abroad for this kind of facility.

In regard to water sports, some expansion is still possible outside the heavily urbanized western part of the country. Keeping environmental and nature values in mind, one arrives at an absorption capacity of around 200,000 boats (not all of them cabin boats) or 40% to 50% more than at present. This upper limit will be reached in a few years, certainly if the limitations on trailers and second homes lead to a shift towards boats. We assume that the government by 1985 will already have taken measures to prevent the exceeding of this limit.

Table 50A. Sojourn recreation

	1975	1980	1990	2000
		– x 1000 –		
caravans	300	340	370	380
bungalows/vacation homes	40	50	80	110
second houses	20	30	40	50
cabin boats	40	50	55	60
Total	400	470	545	740
demand	400	485	645	740
short-fall	–	15	100	140

338A In 1975, the number of sites for tents and caravans was 260,000, of which 160,000 were permanently allocated. Of these 72,000 were designated for permanent trailers. Until 1980, the number of sites can be increased by 20%. After 1980, a limited growth of the number of caravans will be dealt with by making less room available for tents, which agrees with the trend. Given a density of 25–50 units per hectare in camp sites and of 15 units per hectare for vacation homes, Table 51A reflects future space demands.

See: 342A

Table 51A. Space demands for trailers and vacation homes

	1975	1980	1990	2000
		– in km² –		
caravans and tents, camp sites	65	80	80	80
bungalows and vacation homes	25	35	55	75

Remaining space demands

339A In the national structure scheme for drinking and industrial water supply, calculations were made of our future water needs. In this plan, drinking and industrial water needs were estimated to be 4000 million cubic meters for

See: 123, 124, 289A

the year 2000. In our alternative A, taking account of the latest population figures and a moderate economic growth, water needs will come to 3700 million cubic meters in 2000, in contrast to 1700 million cubic meters in 1971.

Throughout the country, the limits of the amount of ground water which can be pumped are steadily being approached, These limits are set by the technically available supply and by considerations of conserving nature, countryside and agriculture. At this time, the technically available amount is 1.9 billion cubic meters. In 1975, a total of 1.06 billion cubic meters of fresh water was pumped for water works and industries. Of this, 655 million cubic meters were for the waterworks. These were given permission to withdraw a maximum of 791 million cubic meters of ground water (as of June 1977). The submitted licenses for direct use by industry total 400 million cubic meters.

In increasing measure, recourse will have to be had to surface water and storage formation by reservoir areas and filtration areas. The water for this will come primarily from the Rhine River and its tributaries and from the IJsselmeer. The necessary accumulation depends on the quality of the water, the chance of calamities, the duration of passing calamitous pollution of the rivers concerned, and, naturally, on the hydrologic control of the rivers. If the chloride content of the Rhine can be reduced from 300 kg/sec to 200 kg/sec, then construction of ±150 km^2 of reservoir areas or of 250 km^2 filtration areas will be necessary until the year 2000. If the chloride content is higher, then a larger storage area will be needed. To give some idea of the magnitudes involved, all beaches, dunes and sandy areas totaled 400 km^2 in 1975. In the river Maas, although salinity is not important, the low volume of discharge would mean that storage basins and filtration areas will be necessary for storage purposes. In total, we estimate that, by 2000, a surface area of 200 km^2 will be used as storage basins, or 330 km^2 for filtration areas.

See: 342A

340 The powerful expansion of production in the past 25 years, accompanied by a shorter product life, has also produced an increasing stream of solid wastes. In the past, not much was done other than to dump the waste at some distance from the built-up areas; in 1973, the greatest proportion of the waste was deposited without any regulation in more than 550 dumps. Of the 13.4 million tons, 6.1 million originated from industry, 3.6 million from construction, 2.4 million from households and the rest from agriculture and the services.

There are four possible ways of dealing responsibly with solid waste:
- regulated dumping;
- composting;
- incineration;
- recycling.

341A In the future, there will be an end to unregulated dumping and more waste will be treated. We expect that, from now until 2000, the amount of solid waste will increase slightly more than proportionately to the growth of the gross national product. In the year 2000, 30 million tons of material waste will be disposed of as follows:

See: 289A

- unregulated dumping: none
- controlled dumping: 15 millions tons
- incineration: 10 million tons, with 2.5 million tons of residue
- composting: 5 million tons, with 3.4 million tons of residue.

After the wastes have first been compacted, they can be deposited to an average height of 5 meters. Thus, in 2000, 6 km^2 will be needed to store the solid waste of that year. If we include the storage of past waste, the permanent space requirement is naturally larger. If waste land-fills are included in regional

land-use plans, and if good waste management will enable such land to be used for other purposes after about 15 years, then the total surface which would be needed in 2000 for the storage of solid waste is estimated at 75 km^2.

See: 342A

Land use, summary

342A In Table 52A we summarize the various changes in the space requirements which have been discussed above.

Table 52A. Land use, 1975–2000

	1975	change	2000
		– kms^2 –	
Built-up areas*)	3,000	+ 3,300	6,300
of which industry and commerce		1,000	
Traffic outside built-up area**)	720	+ 330	1,050
of which expansion of primary road network		200	
widening of existing roads		130	
Woods and countryside	4,800	– 500	4,300
Farming land	25,190	–3,465	21,725
Remaining areas	100	+ 335	435
of which waste land-fill area		45	
recreation area		65	
water storage basins (max.)		200	
water treatment plants		25	
Water and beach***)	7,350		7,350
Total	41,160		41,160

*) This includes accompanying small-scale recreation facilities, industrial areas and reserve construction space.
**) roads, railroads and airports
***) includes a small strip of the North Sea and the largest part of the Waddenzee and the IJsselmeer. This does not include the reclamation of the Markerwaard (570 km^2).

This table shows that, following a general trend, in the 25 years until 2000 farm land will decrease by 3450 km^2 and nature reserves by 500 km^2. In comparison, from 1960 to 1975 the decrease was respectively 664 km^2 (including the reclamation of 364 km^2) and 77 km^2.

Moreover, it is true that certain activities entail selective limitations for land use in adjoining areas. Table 53A indicates which surfaces will be affected by the expansion of such use limitations between 1975 and 2000.

Table 53A. Areas with use limitations, 1975–2000

Caused by	surface in km^2	nature of limitation
harbour industry	100	cultivation
primary road network	3.900	cultivation
second national airport (reserved)	500	cultivation
nature and countryside protection	2.100	certain forms of agricultural activities

343A In summary, a picture emerges of a sharp increase of land utilization for urban use, recreation and infrastructure. Although a number of functions of the space can be combined, there will be an increasing competition among functions. On the one hand, clean air, clean water and protection of nature are at stake, on the other, functions which reflect the preferences of the public. Thus the home-culture is characterized by a strong individualization, much interest in one-family dwellings and for living in smaller centers. This suburban-

See: 152

ization means that a spatial separation will take place between certain groups of the population. Thus it will be the young households in the middle and upper income groups which will be able to buy houses and live in the smaller centers. The urban population is obviously ageing and the number of single persons is increasing sharply. The indicated increase of mobility due to the automobile fosters suburbanization. At the same time, there is an accompanying decline of the expansion possibilities of growth centers and of the vitality of the large cities and their centers. Crudely put, without the automobile, there would be no movement to the countryside, once one is there, the second car is essential. A saturated automobile culture would have, eventually, only one urban model: Los Angeles – diffuse construction over a very large area (in our country, the size of the urbanized western part or of the Brabant city-chain), without any obvious centers or open spaces. A strong expansion of the infrastructure will then take place.

The spatial distribution of employment will occur according to two patterns. One will be a concentration of highly skilled work in the four large cities (around the harbours and the international airport), the other exactly the reverse – an extensive sprawl. Shortage of space appears to be the primary motive for the removal of industry from the city, in addition to congestion and the lack of parking spaces. Responding to the population movements or to the new labour market in the residential areas are not cited as reasons.

Although a dispersal of jobs will occur – from large cities to regional industrial parks – there will be an increase in commutation as well as in actual travel time. One source of social tension will appear: suburban sprawl over large distances from the municipal centers of activity will frustrate the striving for emancipation by some members of the household (isolation of the aged and the married women because public transportation facilities will lag behind demand).

See: 152

With the increase of leisure time, recreation will grow significantly. Extensive suburbanization will lead to the opening of the major part of our country for recreation. Primarily sojourn recreation – caravans, second homes – outside the residential centers will increase until the limits are reached rather quickly.

See: 225

It is obvious that the countryside and the natural environment will not remain untouched. Urbanization, construction of the infrastructure and the parcelling out of land will increasingly affect the quality of the countryside and the natural environment.

See: 377A

4.4 Environment

344 In judging the effect of human activities on the environment, we distinguish: i) environmental-hygienic aspects (water, air and soil) and ii) spatial aspects (infrastructure and intensification of land utilization).

345 *Water pollution* is discussed, in regard to discharge and purification of biodegradable materials, in *349ff.* It seems that drainage from dwellings without sewers, together with the so-called effluent of sewage treatment plants for households and industries, will remain within acceptable limits. A problem which is not further elaborated is caused by phosphates, particularly, in residential waste water.

These accumulate in the bottom mud of the water channels and form a permanent source of eutrophy (excessive presence of nutrients). Moreover, the Dutch surface water is burdened with phosphates from the rivers crossing the borders, especially the Rhine, whose water ends up in most parts of the Netherlands. Eutrophy causes impoverishment of flora and fauna in the water. It is not likely that all sewage treatment plants will be improved by an advanced waste

treatment, which gets rid of the phosphates, before the year 2000. It is disturbing that, in addition to phosphates, there are more and more materials in the water which are difficult to break-down, the more so because steadily more use will have to be made of surface water for the provision of drinking water.

The administration's policy is now directed to a curtailment or even termination of the discharge of heavy metals into the water. If complete purification at the source is not possible, this might mean the termination of some industrial activities. If this latter is not feasible, then continuing accumulation of these materials is inevitable.

As a result of international treaties and (in the Netherlands) the Chemical Waste Act, we expect that no more deliberate dumping of (used) oil will occur. An important environmental problem will continue to be the possibility of accidents during the pumping, transport and loading and unloading of oil, especially because of the scale on which these activities will take place.

346A In *356ff*, we estimate the expected air pollution due to the combustion of fossil fuels in industry and transport. The future volume of emissions from these sources will be determined by

– the nature and amount of energy consumption, taking into account the (technical) possibilities for energy conservation;

– emission control measures in the broadest sense.

The expected volume of the so-called process-emissions (that is, all the air polluting discharges not caused by the burning of fossil fuels) is included in the emission figures on the basis of a global estimate.

If no measures are taken, the amount of air pollution will most probably result in significant violations of the standards. Therefore a stringent application of emission control measures stands to reason. Even then we expect:

– a rising emission of hydrocarbons and nitrogen-oxides. These will increase the chance of (photo) chemical reactions, which, we expect, will lead to a rise in the ozone concentrations (which are already often above American standards);

– an increase of the emission of sulphur dioxide, which is contrary to the policy goal of limiting this to the level of 1970 at the most. This could result in the exceeding of standards and a rise of (background) concentrations to a dangerous level;

– violations of standards for nitrogen oxides and particulates are not excluded.

See: 310A, 313A

347A The assumed increase in *energy consumption* and the concomitant use of nuclear energy will bring various dangers in their wake. The growth of total consumption will lead to an increase in heat emissions, resulting in the warming up of the surface water and thereby in an increasing chance, among other things, of botulism. Nuclear energy has a number of specific drawbacks, such as the (small) chance of a large accident, radiactive pollution by the use of fissionable material, the storage of waste materials, the danger of theft and the dangers to personal freedom that may be connected to prospective security measures. These dangers will be felt in full force – just like the advantages of nuclear energy – only after 2000.

It was not possible to study the problem of chemical wastes, but, given the present problems and the expected growth of the chemical industry, one must reckon with serious difficulties in the future.

348A In *370ff*, we set out our expectations about increasing pressure on nature and the countryside by pollution on the one hand and by the intensification of agriculture, the increase of recreation and the expansion of the infrastructure on the other. The perspective is an impoverishment of the agricultural landscape and a loss of diversity of the natural environment, in

See: 336A, 337A, 342A

spite of the establishment of the National Parks and National Landscape Parks (see below).

Water pollution by biodegradable materials

349 Biodegradable organic material appears in household waste water and in waste water from industry and cattle farms. It affects the oxygen content and has thereby a deleterious effect on various functions of the surface water. There are, broadly speaking, two methods of fighting this kind of pollution:

– purification by oxydating-biological waste water treatment plants;
– prevention or limitation of pollution by restructuring the production process.

The treatment of waste water takes place in purification plants, either under public control or under control of private business. The second type of pollution control covers many measures. Some examples are the use of 'cleaner' equipment, or of less polluting raw materials, the application of other production processes or the recycling of worthwhile materials from waste water. Such restructuring measures are restricted to industry.

See: 124, 124, 289A

Estimates of future emissions requiring purification were based on population growth and the expected increase in the production of goods and services.

Because pollution differs greatly according to industrial branch and only four sectors are distinguished in this survey, it is assumed that production within these sectors retains the same relative composition as in the base year 1972.

350 Pollution by households is set at one 'inhabitant-equivalent' per capita. This is the amount of biodegradable organic material which requires as much oxygen for its decomposition as the waste water of one inhabitant. (For this, we adopt a chemical oxygen consumption of 135 grammes per 24 hours.)

351 The number of inhabitant-equivalents produced by industry is less easy to determine. The gross emission of industries without anti-pollution measures serves as a starting point for the calculation. This is then reduced by the part which can be eliminated by restructuring measures. For this, we used the figures for 1980 from the Indicative Long-term Program of the Ministry of Traffic and Public Works. We assume that restructuring measures per unit of production volume will be applied to their fullest extent, so that after 1980 no further reduction of pollution will take place on this account.

352A The discharges of biodegradable materials can be reduced not only by adaptation of the production process but also by purification. In regard to purification measures, we assume that in 1985 the pollution of the surface water will have been reduced to an acceptable level and that, after that year, measures will be taken so that the emissions into the surface water will remain at the same level.

The portion of household waste water to be purified is calculated from the gross emission, subtracting emissions from dwellings not connected to the sewer system. At present, this is the case for 13% of all dwellings; this percentage will be reduced to 10% in 1980 and in the period after that to 8%.

In these calculations, we do not include the amount of sewage which comes into the surface water through over-flows; this can be prevented. It is not known how many inhabitant-equivalents are discharged from this source. The costs involved in purification and anti-pollution measures cannot be estimated separately.

Table 54A. Waste water

	1972	1980	1990	2000
	— million inhabitant equivalents —			
Households:				
— gross emission	13.3	14.0	14.5	14.6
— no sewer connection	1.7	1.4	1.2	1.2
— to be purified	11.6	12.6	13.3	13.4
Industries:				
— gross emission	40.6	65.0	89.8	129.3
— reduction by anti-pollution measures	9.8	37.7	52.1	75.0
— to be purified	30.8	27.3*)	37.7	54.3
Total to be purified	42.4	39.9	51.0	67.7

*) In the Indicative Long-term Program, 12 to 16.5 million is indicated here. It is not clear whether this difference can be attributed to the difference in the projected production volume of that year alone.

353A As basis for calculations of the purification capacity required, it is assumed that from 1985 all of the waste water will be treated in a biological facility. We also assume an average over-capacity of 10%.

Table 55A. Capacity of sewage treatment plants

	1972	1980	1990	2000
	— million inhabitant equivalents —			
Households	4.8	10	14.6	14.7
Industries	3.7	12.8	41.5	59.7
Total	8.5*)	22.8**)	56.1	74.4

*) According to Government Institute for Sewage and Waste Water Treatment.
**) According to the Indicative Long-Term Program.

After 1985, the emission of waste water will be approximately 5 million inhabitant equivalents, namely 1.2 million from households without sewer connections and 3.8 million in the effluent from purification plants. This total approaches the maximum estimate of the absorption capacity of the surface water. To limit the emission of unpurified waste water to 5 million inhabitant equivalents, the average efficiency of the purification facilities will have to rise from 90% to over 94%.

354 An additional problem is the removal of the residual sludge. Until recently, one could use this redisue in agriculture or for public gardens, sports fields, etc. To the extent that more sewage treatment plants are built, there will be more slugde. Only a portion can be used productively. More modern methods will have to be applied to treat the sludge (mechanical dehydration).

355A The space needs for the oxidating-biological waste water treatment are strongly dependent on the depth of the aeration chambers and on the manner of sludge treatment. To the extent that the capacity of the facilities increases, the necessary land surface per inhabitant-equivalent declines quite rapidly because of the use of deeper aeration chambers and mechanical sludge dehydration. We assumed an average space demand of 0.55 m^2 per inhabitant-equivalent for publicly-owned facilities and of 0.3 m^2 per inhabitant-equivalent for purification plants under control of private industry.

The limitation of water pollution by anti-pollution measures demands much

less space. Process adaption usually require no extra space at all. The abatement of water pollution from biodegradable organic material, on the basis of the preceeding data, will require a land surface of about 11 km^2 in 1980. In 1990, the required area is 27 km^2, and in 2000, about 35 km^2.

See: 342A

Air pollution

356 Energy consumption and the concomitant emissions from mobile combustion engines are determined by developments in the areas of mobility, goods transport and recreation. Mobile combustion engines are used in traffic and transportation (road traffic, rail traffic, shipping and aviation), agricultural machines and a residual group (internal transportation in factories, etc.). Fuel consumption and emissions are dependent on the nature of the engine and the type of fuel as well as on the required performance. In this regard, the following is assumed:

See: 328A, 331A, 337A, 338A

— the expected technological developments (engines, fuels and vehicles) are to a large extent autonomous, independent of the policy followed in the Netherlands. The reason is that these developments will occur primarily abroad under the influence, for example, of stringent environmental legislation in the U.S.A., Japan and Sweden. The European Economic Community goals for 1980 and later in regard to exhaust emissions and sulphur- and lead-content of fuels will become legally enforced standards. Towards the end of the century, those standards will be applied here (for CO, HC, NOx) which are anticipated after 1980 in the U.S.A. and Japan.

357 To determine future energy consumption, it was posited which fuels in which type of combustion engines will be important until 2000. Changes and adjustments of power sources will take place gradually. For the most part they will be the sum of a number of small improvements. After 1980, some significant advances can be expected with the introduction of the CVCC(Compound Vortex Controlled Combustion) motor, the Stirling engine, the gas turbine and electric traction, the application of which, however, will be limited. For the rest, the conventional otto engine and the diesel engine will continue to dominate the picture.

In regard to domestic shipping and the railroads, after 1990 steam-turbines fired with pulverized coal will be introduced. In the remaining categories of mobile combustion engines, the expectation is that the now familiar hydrocarbon fuels will continue to be used; the most important exception will be petrol, which will be blended with lower alcohols up to 15%. This expectation is based on the following considerations:

— the fuels will have to be suitable for the engines;

— they should be liquid, volatile at normal temperatures and under limited pressure, with a large degree of energy intensity, capable of being stored, distributed and transported in the existing fuel infrastructure without too many safety risks;

— the fuel storage in the mobile engine itself should be simple and safe, and guarantee an adequate action radius.

358A In the calculation of the fuel consumption for road transport, a decline of specific consumption is assumed because of the reduction of rolling resistance, smaller and better engines and transmissions (commercial vehicles will be somewhat heavier on the average because of the introduction of gas turbines), improvement of the aerodynamics and the shift from petrol engines to other types with a higher efficiency. This contrasts somewhat with the trend towards heavier automobiles to meet safety requirements. The total decline of specific fuel consumption for otto engines will be about 10%–15% in 2000 for private and delivery vehicles, and up to 10% for commercial vehicles. In 1970, the consumption of regular petrol made up 18% of the total. In 1975, this had

declined to 12%, although by that time 40% of the private and delivery vehicles and most mopeds could operate on regular petrol. It is estimated that in 1985, 65% of the petrol-vehicle mileage will be suitable for regular petrol, which, according to the 'Lead Regulation', may contain a maximum of 0.4 g/l lead. The 35% premium petrol which will then still be needed will reach the octane requirement of at least 98 by the addition of methanol. In 2000, the entire automobile fleet will be able to use lead-free gasoline/methanol. It is assumed that the anti-knock requirements can then be attained, among other ways, by the addition of methanol.

The calculated energy consumption is appreciably lower than what would follow from a simple extrapolation of past trends. The savings will be attained by:

- more economical petrol engines;
- a shift from petrol engines to engines with a higher efficiency; such as diesel, Stirling and gas turbine;
- vehicle improvement;
- reduced annual mileage per vehicle;
- smaller engines for private and delivery vehicles;
- technical traffic regulations.

See: 310A

359A A summary of the fuel consumption by mobile combustion engines is presented in Table 56A.

Table 56A. Domestic fuel consumption by mobile combustion engines

	1970	1975	1980	1985	1990	2000
			— million kgs —			
Petrol (excl. methanol)	3035	3500	3798	3640	3538	2802
of which: regular	540	429	1711	2478	2832	2802
premium	2495	3071	2087	1162	706	–
Methanol	–	–	–	146	202	338
Gasoil	2220	2744	3535	4760	5760	7638
of which: automobile use	1260	1750	2275	3200	3853	5468
other use	960	994	1280	1560	1907	2170
L.P.G.	69	245	379	570	675	855
Aircraft gasoline	14	8	5	2	1	–
Jet fuel	692	842	1200	1600	2000	3400
Coal	–	–	–	–	–	520
Total $x10^{16}$ joules	27.9	34.0	41.0	48.6	54.9	68.7
Percentage of total domestic energy consumption	15	14.5	12.8	12.8	12.8	12.4

*) Including use in gasturbines and Stirling engines.

360 The analysis of emissions from mobile combustion is limited to carbon monoxide (CO), hydrocarbons (HC), nitrogen-oxides (NOx), aerosoles (TSP, totally suspended particulate matter) (including soot), lead and sulphur-dioxide. In regard to carbon monoxide and sulphur dioxide, the emissions of road traffic in 1975 were about the same as in 1970. Hydrocarbons were reduced, lead, nitrogen-oxides and aerosoles increased.

The measures which have already been taken to reduce carbon monoxide, and hydrocarbons generally, caused an increase of nitrogen-oxide emissions. The increased number of diesels has meant increased NOx as well as increased particulates emission. The increase in the emission of lead is connected to the growing use of premium petrol. In spite of the hefty increase in the use of (automobile) gasoil, the SO^2 emission has not increased because of the implementation of the 'Sulphur Regulation'. The earlier assumptions about the introduction of standards are important; these are shown in table 57.

Table 57. Standards for emissions from private automobiles (based on vehicle weight of 1000–2500 kg)

	Max. discharge via exhaust			Max. HC-discharge	
	HC	CO	NOx	crank-case	tank+ carburator
	– g/km –			– g/day –	
1985	1.1	14	2	0	10
1990	0.5	7	1	0	6
2000	0.3	4	0.5	0	0

361A In calculating exhaust emissions, we considered the following:

– the announced standards affect only private and delivery vehicles weighing no more than 3500 kgs, with gasoline engines, in city traffic;

– the average emission factor of the automobile fleet will be higher because series models may emit 20%–30% more, and older automobiles do not comply with the standards;

– the emissions are dependent on the use; for the same distance travelled they are lower outside urban areas than in city traffic;

– there are as yet no emission standards for commercial vehicles, buses, motorcycles and motorized bicycles;

– the vehicle fleet is shifting from petrol engines to less polluting engines such as the LPG and diesel. Also, in the 1980s, the very clean Stirling engine and electric traction will be introduced (by 2000, 10–15% of the total);

– in spite of all the conceivable improvements, by 2000 the petrol engines of private and commercial vehicles will not be able to satisfy the proposed standards for CO, HC and NOx. The cleansing of the petrol engine will occur primarily through the utilization of engines with controlled combustion (such as the CVCC engine of Honda). It is assumed that in 1985, 10% of the petrol private and delivery vehicles will be equipped with such engines and by 2000, 100%. Extensive application of difficult and expensive after-treatment of exhaust gases is unlikely. The solution which is anticipated in Western Europe, in contrast to the United States, is the development of a cleaner combustion process in the engine itself. This we consider feasible because legislative regulations will follow the lead of technological possibilities.

Table 58A. Emissions from fuel combustion in mobile engines

	1975	1985	2000
		– mln. kg –	
Carbon monoxide	1410	1000	300
Hydrocarbons	171	126	79
Nitrogen oxide	181	235	206
Aerosoles	15	18	24
Sulphur dioxide	30	46	73
Lead	2.8	1.3	0

– According to expectations, there will be a significant decline in the emission of carbon monoxide. The share of road traffic in the total CO-emission will decline from 95% to 75% but will remain high; the share of inland shipping and air traffic will increase.

– Emission of hydrocarbons will be halved. The decline is primarily in road traffic. Inland shipping will continue to have a high level of emissions.

– Emission of nitrogen oxides is primarily caused by road traffic and inland shipping. In 2000, the total emission will be about back to the level of 1975. In shipping, the emission rate will continue to rise. The sharp decline of emissions by private vehicles will be to some extent cancelled by the increase from commercial vehicles.

— In regard to aerosole emissions, almost all categories will increase. Exceptions to this are private vehicles and mopeds.

— Legislation will provide that in the future only lead-free gasoline will be used. The demand for an anti-knock characteristic will be met by a rise in the aromatics content and/or the addition of up to 15% methanol.

— The doubling of the emission of sulphur dioxide is an obvious exception to the course of the other emissions. This will be caused primarily by road traffic and inland shipping.

See: 310A

See: 289A

362A The use of fossil fuels in furnaces for domestic heating and industrial combustion is an important part of the total energy consumption. This consumption was calculated earlier on the basis of the developments of the population and the economy. It causes emissions which are estimated on the assumption that all presently operational technical measures (flue-gas purification, desulphurization of fuels, etc.) will be applied. The results of this calculation are given in Table 59A.

Table 59A. Emissions from furnaces

	1975	1985	2000
		— million kgs —	
Carbon monoxide	32	70	100
Nitrogen oxides	176	350	550
Sulphur dioxide	338	990	1420
Aerosoles	24	85	140
Hydrocarbons	9	15	21

363A In addition to emissions from furnaces and those from traffic and transportation, there is a third category, process emissions. These consist primarily of the emissions from chemical and other production processes but also of emissions from transshipment, evaporation of stored liquids, etc. A precise calculation of these is not possible; to complete the picture it suffices to estimate, in broad lines, a total proportionate to the production volume. The sum of all emissions is given in Table 60A.

Table 60A. Total air pollution emissions

	1975	1985	2000
		— million kgs —	
Carbon monoxides	1640	1410	900
Nitrogen oxides	380	630	810
Sulphur dioxide	410	1110	1610
Aerosoles	210	330	480
Hydrocarbons	420	510	700
Lead	2.8	1.3	0.0

364A Important for public health and the environment are the atmospheric *concentrations of pollutants at 'living level'.* The magnitude of concentration over an entire year is in principle dependent on all emissions within large distances; in practice, these are primarily those of the Netherlands itself and the border areas in Germany and Belgium.

If the pattern does not change much and developments in the border areas keep about in step with those in the Netherlands, the magnitudes of concentration will be approximately proportional to domestic emissions. Under these circumstances, the following violations of the concentration standards can be expected:

– sulphur-dioxide (upper limit = 250 microgram/m^3; limit for daily average, not to be exceeded more than 7 times per annum);

– ozone (upper limit = 160 microgram/m^3: American limit for hourly average, no exceeding of limit allowable).

Ozone is not emitted as such but originates in the atmosphere from nitrogen oxides and hydrocarbons. In addition, concentrations of nitrogen-oxides themselves and of the aerosoles can be high, but it cannot be determined whether they will exceed permitted standards or not.

It is obvious that the violations of standards for sulphur-dioxides and ozone will be significant. For sulphur-dioxide, this could be somewhat lessened by adjustment of the location and height of the chimneys, but significant violations will continue to occur. It is therefore essential to limit the emissions themselves. This can happen by conversion to other fuels, by fuel conservation and by cleansing. Since the amount and kind of fuel are based on other considerations, the only possibility is the application of a higher level of purification than has been thus far taken into account in the emission calculations. In regard to furnaces, this means techniques to reduce aerosoles (in the emission estimates, it was taken for granted that these had already been applied), far-reaching desulphurization processes and techniques to limit nitrogen-oxides. The reduction of emissions by maximum application of these measures is given in Table 61A.

Table 61A. Reduction of emissions from furnaces through additional purification measures

	1985	2000
	– million kgs –	
aerosoles	14 (+ 170)*)	30 (+ 340)*)
Nitrogen-oxides	210	340
Sulphur-dioxide	630	950

*) In the earlier emission calculations, the amounts in parentheses were already subtracted.

365A In regard to mobile combustion engines, we assumed a combination of changes of fuel, fuel conservation and emission control regulations. With the emission calculations, it was assumed that these measures had already been taken; the emission reduction was already subtracted. In regard to process emissions, in the absence of hard data the reduction is estimated. Table 62A indicates which emissions will remain after application of all these measures.

Table 62A. Residual emissions after maximum application of purification measures

	1985	2000
	– million kgs –	
Carbon monixide	1410	900
Nitrogen-oxides	400	440
Sulphur-dioxide	450	590
Aerosoles	240	330
Hydrocarbons	460	550
Lead	1.3	0.0

366A We have also calculated the cost of air pollution abatement (the indicated purification measures as well as the measures which were discounted in the emission calculations). This has been done for mobile combustion engines (traffic, etc.) and for furnaces, but it was not possible for process emissions. The results of such calculations can be no more then rough estimates; these are given in Table 63A.

Table 63A. Estimates of costs for emission reductions (exclusive of process emissions)

	1985	2000
	— million guilders, 1975 prices —	
Investments:		
furnaces	2200–5200	3700– 8600
traffic etc.	1600–3200	5200–10400
Total	3800–8400	8900–19000
Annual charges:		
furnaces	1100–2800	1800– 4400
traffic etc.	280– 470	530– 1100
Total	1300–3300	2300– 5500

367A If one assumes that, in the border regions, emissions will be reduced approximately in the same proportion as within the Netherlands, one can, in a manner similar to that used in 364A, make a rough estimate of the concentrations at the living level which would exist in the year 2000.

The sulphur-dioxide concentration, given the same height, location, etc. of the emission sources, would be about one and a half times the value for 1975. That means that in large areas of the Netherlands, the concentration will lie at about the standard norm; even with other locations of the emission sources, violations of standards would probably occur in a few places.

The ozone concentrations, which are now already higher than the standard, will increase still more because the emission of both nitrogen-oxides and of hydrocarbons will be higher than in 1975.

In addition, there is the possibility of locally excessive concentrations of nitrogen-oxides and aerosoles.

368A *Radioactivity* is a potential health and environmental problem. The most important hazards are:

— nuclear power stations present a small chance for a large catastrophe; with our population density, there is an insufficient number of safe locations in our country according to American standards.

— the enrichment of fissionable material for these reactors causes radioactive pollution of air and water and brings the risk of accidents.

— the use of the very lethal plutonium in many different places (power stations, enrichment plants) brings the risk of radioactive contamination and of theft for the manufacture of a nuclear weapon.

— the necessarily very long-lasting storage of highly radioactive wastes is potentially very dangerous.

— finally, all this may lead to strict security measures which can threaten personal liberty.

In part, these dangers will only materialize in the long run and, as with the advantages of nuclear energy, will only start to appear in full measure after 2000.

369A Almost all fuel use leads eventually to the generation of heat. Heat can be particularly damaging to the environment insofar as the surface water is warmed. The total amount of heat which could be discharged into the surface water is indicated by order of magnitude in table 64A.

Table 64A. Heat transfer to surface water (rough estimate)

1975	1985	2000
	– $x10^{16}$ joules –	
70	110	180

In the past, the warming of the surface water has been one of the causes of botulism. The strongly increased discharge of heat into the surface water will quite likely enhance the probability of botulism in the future.

Countryside and natural environment

370A Little is yet known about the effect of air pollution on the natural environment. Research has been done primarily about the effects on plants, specifically agricultural crops. It appears that various types of plants react differently to air pollution; thus annual meadow grass is sensitive to smog, and gladioli to hydrogen fluoride. The sensitivity of the lichens which grow on trees has been known even longer; the specific behaviour of this organism has been studied according to type for various kinds of pollution. Recently the existence of these lichens in the Netherlands has been examined again and many of the earlier common species have entirely disappeared or have become very rare. Other ecosystems are also influenced by air pollution. In the neighbourhood of sources of SO^2, the water flora is severely impoverished but even at greater distances the influences are noticeable. In Sweden many lakes have been acidified by air pollution from West Germany and the Netherlands, and the lichens are beginning to die out. In our own country, certain eutrophic symptoms in the already seriously reduced nutrient-poor fens and moors are connected with the sulphur content of rain.

See: 363A, 365A

Given the expected increase in air pollution, this development will continue even more forecefully.

See: 349 ff.

371 Damage to the natural environment, caused by water pollution, attracts most notice if it occurs suddenly, for example by massive fish deaths. There is, though, a gradual effect as well: the more sensitive plant and animal species are pushed out by the less sensitive (A kind of Gresham's Law of Survival). As a result of the increase in the concentration of plant nutrients (the so-called euthrophy), caused by detergents and the decompositions of discharged organic material, species which are at home in nutrient-poor environments have become rare. Also in naturally nutrient-rich waters, because of overdosing of nutrients, shifts have taken place in the mix of the species, so that even well-developed ecosystems, belonging to this type of water, have become rather rare. In conditions of very serious eutrophy, the explosive growth of a certain kind of algae can occur; some of these algae are poisonous. When the algae die and decay, serious shortages of oxygen can occur. In addition to a surplus of plant nutrients, other factors can also change the mix of species, namely organic materials (phenols, polychlorbiphenyls and many others) and heavy metals (lead, mercury and cadmium) which do not decompose rapidly. Often these materials accumulate in the food chains, so that animal species at the end of these chains, like seals and terns, experience the unfavorable consequences first. Undermining of the ecosystem in and next to the water by eutrophy and accumulation will, it is expected, continue to increase in the future. In regard to oxygen shortages in the water resulting from the discharge of biodegradable organic matter, causing massive fish deaths, it is expected that this problem will be solved at the national level by present policy. Locally, though, shortages will

See: 369A

continue to appear and the oxygen shortages caused by the death of algae as a result of the on-going eutrophization will continue to increase. The chance of an explosive development of the bacteria which cause botulism will increase sharply as a result of the warming of the surface water by the increased discharge of coolants. This will be true not only for the bacteria strain which has caused massive bird deaths in the last years (in 1976, 60,000 birds died because of this) but also in other strains which can be fatal to humans.

372 For hundreds of years, the Netherlands have had no natural areas any more in the sense of an ecosystem that has not been influenced by man. Until about 1900, there was an agricultural countryside which, due to continuity of land use, reinforcement of the biological gradients (i.e. transitions, for example, from nutrient-rich to nutrient-poor, dry to wet, etc.) and leaving intact the more or less connected areas outside the cities, provided for a large number of species and ecosystems.

This countryside can be called semi-natural; the flora and fauna have settled there spontaneously. Since 1900, though, the open area has been increasingly reduced and fragmented by the expansion of the cities and by road construction while, moreover, the favourable influence of agricultural practices on the diversity of the countryside has been abolished by increased intensification.

With the concentration of more intensive agriculture on certain lands, other areas have become superfluous from the agrarian point of view, and these were left uncultivated. These constitute the open or wilderness areas which we now call nature reserves. In this way the distinction between nature reserves and cultivated land arose.

373A The area of the nature reserves was subsequently rapidly reduced because of cultivation while their management, which had formerly been an agrarian necessity, was neglected. This meant a break in the continuity which was a condition for the maintenance of a richly varied countryside. The natural and scenic value of the cultivated lands is steadily being undermined by an increase in scale, intensity and uniformity of agricultural practices and by the removal of hedges, ponds and fences. In the cultivated countryside, the number of plant and animal species has declined sharply. The nature reserves, because of their isolated locations, appear to offer inadequate survival opportunities for some plants and animals; the number of endangered species in all of the Netherlands is increasing. It is expected that this development will continue.

See: 342A

See: 321A, 337A

See: 332A

374A From the estimates of land use in Table 52A, it can be seen that the expansion of the built-up areas, industrial areas and roads will reduce the area of the nature reserves even further. The figures do not reflect the effect of increasing suburbanization and the expansion of recreation and bungalow parks on the adjoining nature reserves, nor the fact that the pressure of recreational needs on these reserves will increase sharply and that they will finally experience the consequences of criss-crossing by highways, pipelines and hightension wires. Measures for the regulation of the water supply, such as the lowering of the water table, infiltration and artificial rain can also influence the circumstances in a nature reserve. The outcome of one thing and another is that, within a steadily smaller nature reserve, the number of plant and animal species will decline.

375A More attention is to be given to the protection of the nature reserves by creating National Parks. These are connected areas of at least 1000 hectares, consisting of natural terrain, water and forests with a particular plant and animal life. Twenty such areas, together 780 km^2, are being considered; we assume that these plans will be realized. We expect, though, that not all of the ecosystems which are present in these areas can be preserved. After all, a number of activities will continue to take place within these parks (for example,

water supply and recreation). Also, use as military maneuver grounds or for commercial lumbering will conflict with optimal nature management. Moreover some parks will be unfavourably affected by their location in the middle of a steadily deteriorating agricultural area.

See: 289A, 336A

376A The area of cultivated land — agricultural area — will decline because of urbanization, road construction and the needs of the water management system. In addition, the cultivated countryside will experience the consequences of the increase of scale and specialization of agricultural methods, steadily increasing use of artificial fertilizers and pesticides, mechanization which demands large areas of uninterrupted terrain, interventions in the water management system, and intensive husbandry and poultry farming. By the filling in of ditches and drainage trenches, the canalization of streams, the clearing of woods and removal of wood fences, the diversity of the landscape will diminish; because of the high nitrogen use and because of a water management system which is largely oriented towards mechanization, the species variety of plants (and animals) will decline. In the beginning of the century one could find several hundreds of plant species in our grassland. The number at present is about one hundred; it is to be expected that in the near future, there will be only a few tens of species left.

No estimate can be made of the number of endangered animal species; doubtless it is a multiple of the number of endangered plant species because with every plant which disappears, a number of insect and other animals are also threatened. This is occurring not only in the Netherlands; the same species are disappearing elsewhere for the same reasons.

See: 289A

377A With the anticipated growth in agricultural productivity, this development will continue unabated. The intention exists, though, to reserve some areas by the creation of the National Countryside Parks and by the measures proposed in the governmental Memorandum on the relations between agriculture and the preservation of nature and landscape. The proposed National Countryside Parks are defined as areas of at least 10,000 hectares, which will consist of natural terrain, water and woods (±20%) and of the cultivated land and settlements (±80%), representing a richness of natural and scenic qualities and of cultural-historical values, and forming an unified entity. The establishment of 17 such parks, with a total area of about 3000 km^2, is envisaged in order to maintain and develop the specific and differentiated character of these areas. This will have to be realized by measures regarding urbanization, road construction and industrialization, and, for the cultivated parts, by the application of management and maintenance agreements. These regulatory agreements between the Administration and farmers will orient agricultural activities towards the preservation of nature in about 30% of the parks, and in some 10%, the preservation of nature and landscape will have first priority (so-called reserves). On the remaining cultivated land (±40%), agriculture will develop without restrictions, with maintenance agreements for certain elements in the landscape (windbreaks, pollard willow trees). For management as well as maintenance, the voluntary cooperation of the farmer will be required. Management and maintenance agreements can also be made outside the countryside parks. Altogether, such management agreements and the reserves will cover about 2000 km^2.

We expect that the desired goal will not be attained, in the first place for the same reasons as the National Parks proposal will fail. In the second place, experience in Southwest Drenthe and South Limburg shows that much less than the intended 30% of the cultivated land gets top priority through management and maintenance agreements for the preservation of nature and landscape. In the third place, the costs of the management agreements will grow steadily because the development of agriculture elsewhere will go on as usual,

so that the income differences to be bridged will increase. Since government compensation is limited to a maximum amount, developments elsewhere will be a stimulus for an increase in scale of the farms covered by the proposed measures.

378A On the basis of the above considerations we expect that with a continuing growth of productivity:

– the damage to the natural environment by air and water pollution will continue to increase;

– the nature reserves, in spite of protective measures, will continue to deteriorate; and

– the cultivated land which will not fall under the working of the proposed agreements (about 90% of the farm land) will show a total impoverishment in respect of natural and scenic values.

CHAPTER 5. LABOUR, ECONOMY, SPACE AND ENVIRONMENT IN ALTERNATIVE B

Introduction

255 As explained above, the choice was made early in the project for two alternatives which differed primarily in regard to economic growth after 1980. In A, this growth rate is a steady 3% annually; in B, the growth rate declines gradually until it is practically zero between 1990 and 2000. They are further differentiated by somewhat different expectations about the development of the family, divergent expectations about work and the economy, with obvious consequences of the latter for land-use and the environment.

For a large number of areas, the differences between the alternatives are so slight that they did not justify separate treatment; why this is so has already been explained. In regard to work, the economy, land-use and the environment, the differences are large enough to merit a separate chapter for each alternative.

See: 44–48

256 In the interest of an equal presentation of the two cases, the reader can, without any difficulty, choose between chapters 4 and 5; each is complete and can be read independently of the other. This means of course that there are many repetitions, even if these refer only to the description of the initial situation or of developments until 1980 which are common to both cases. For the readers convenience, the paragraphs in both chapters have the same numbering, an italicized number indicating that the whole paragraph in both is exactly same; otherwise an 'A' or a 'B' will follow the number.

5.1. Labour

257B The central place which labour occupies in society will be impaired in the course of the 1980's. The smaller degree of concern for work, shown by the younger people today in comparison to older and middle-aged people, will become more general. This does not mean a refusal or repugnance in regard to work; the necessity to work will not be denied but work will no longer be seen as the predominant possibility for self-realization. One's position in the labour structure will in time no longer determine one's societal position as strongly as it does now.

The shift in attention from work to the family, the neighbourhood and volunteer work will lead to a greater diversity in the labour structure. Normative elements of the labour structure will find less justification within that structure itself than is now the case. At all levels of labour, work will be seen more as a means, less as a goal.

See: 151, 152, 160

Professor Dr. S. Wiegersma cannot agree with the position that work will no longer be considered as the primary possibility for self-realization in the 1980's. In the alternative under discussion, a change in the attitude towards work is assumed which manifests itself, for example, in a striving for shorter work-hours per day, and a shorter work-week; longer vacations, later entry into the force or, as the case may be, earlier retirement.

Until now, it has not been apparent that such a change in the attitude towards work would necessarily mean that the significance of work as a possibility for self-realization would decline. Attention should be given to the finding that identification with the job and the work experience as a basis for self-development is correlated positively with the level of education and work. It is expected that the average educational level will continue to rise. Even

though there will be opportunity for self-development in other areas because of more leisure, the striving for self-development in one's work will still retain its central significance.

258B This change in the attitude of the individual towards work can already be observed here and there. It is linked to the shift in emphasis to the services sector and, within industry, to the shift to the provision of services. In regard to the employee, this will lead to more concern for his immediate wishes in regard to working conditions rather than the concern for his career prospects which he has demanded in the past.

See: 289B

259 After finishing initial education and training, most people join the labour force except for the 1% to 2% who are too handicapped and a (decreasing) portion of women who do not go to work. About 98% of the men enter the work force and leave it with a pension because of age or disability. In addition to participation in education, attention must therefore be given to the course of the national Disability Pension Schemes*). No consideration is given to a lowering of the pensionable age because we did not want to commit future economic resources in advance for this specific purpose.

See: 198

260B The number of recipients of disability pensions is estimated by projecting sex and age-group percentages on the population figures. These percentages have risen strongly until now because it takes some years before a new social insurance has spread to all those eligible. This increase will diminish, though, in the coming years, and after 1978 the percentages by sex and age-group will remain constant. The growth in the number of eligible persons after that year is due to changes in the population structure. As Table 23B indicates, this effect is substantial.

See: 123, 124

Table 23B. Number of recipients of disability pensions

			1975	1980	1990	2000
				— x 1000 —		
Total			345	475	560	670
of which	men		270	365	415	485
	women		75	110	145	185
	of which	single	20	15	20	25
		married*)	55	95	125	160

*) Married = presently or formerly married.

261B In regard to women, a distinction must be made between women who are married or who have entered into some kind of lasting relationship, unmarried women, widows and divorced women. These groups differ accordingly to family situation and the care needed for household and children; estimates of the labour force should be made for each of the four groups separately.

In regard to unmarried women, it is expected that their entry into the labour force will increase and after 1985 will be general for those finishing school. In regard to the participation of married women, here, too, an increase is expected. This goes together with their increasing educational level, changes in attitudes towards their role, changes in the function of the family and in the birth-pattern. For widows and divorced women, the age-specific estimates for participation lie between those for married and unmarried women; they more often have children to care for than unmarried women, but there are more factors which stimulate them to seek work than affect married women.

See: 117, 148, 158

*) A general Disability Pension Scheme for wage-earners has been in force for some time as part of social security. It will be supplemented shortly by a similar scheme for the self-employed.

For women in general, the shift in the attitude towards work will manifest itself later than for men. The concentration on full-time work by women will increase significantly, and this increase will in important measure be caused by a desire for self-realization through full-time work. This will be especially true for women who presently do not work full-time or for women who have jobs which lie below their educational level. The broad change will follow that experienced by the men, but it will occur later.

262B In Tables 24B and 25B, we give the participation percentages and the labour forces figures which follow from paragraph 261A. The labour force includes people who work full-time as well as part-time workers.

Table 24B. Labour force participation of the population over 14

		1975	1980	1990	2000
			— percentages —		
Total		50	49	50	50
of which	men	73	68	69	69
	women	28	29	31	31
of which	single	57	52	54	55
	married	22	25	28	28
	widowed	6	7	7	7
	divorced	36	35	39	38

Table 25B. The estimated labour force

		1975	1980	1990	2000
			— x 1000 —		
Total		5086	5281	5942	6039
of which	men	3629	3658	4065	4136
	women	1457	1623	1877	1903
of which	single	663	662	685	601
	married	720	855	1047	1075
	widowed	34	44	47	59
	divorced	40	62	127	168

263 To pass from the labour force to the potential labour supply, unemployment, part-time work, and reschooling, retraining and remedial schooling have to be considered.

See: 200

Since we expect greater labour mobility and because the adjustment is more difficult when both husband and wife are working, we expect that friction unemployment will increase from 1.5% at present to 2.5% at the end of the century.

264B In regard to part-time work, two groups have to be distinguished: men and unmarried women on the one hand, and women who are or have been married on the other. In regard to the first group, after the extension of obligatory school attendance to 16-year olds, a partial school obligation was introduced for working 17-year olds for two days a week. Moreover there will be, just as now, about two-thirds of the workers of 65 and over who will do part-time work for an average of half a work-week. There will also be those who work part-time by medical advice. Here, too, the average work duration is half a work-week. After the extension of Disability Pensions to the self-employed, this phenomenon will decline in significance and will thereafter remain constant.

See: 197

Finally there is the group who voluntarily works part-time. It is expected that the pattern by which highly educated groups with a good income prefer a reduction in working time to a further growth of income will increase in

importance and will gradually evolve to a voluntary reduction of income in exchange for more leisure. In these cases, though, the decline in family income will often be offset by the wife's earnings. In contrast, part-time work which provides a marginal subsistence will continue to be of little significance. One difficulty in assessing developments is that in both cases, the choice of part-time work can be reversed, for example when reaching another family-phase or when recognizing the importance of good pension provisions. Nevertheless, we expect that voluntarily working part-time will become more frequent, involving an average of three-quarters of the normal work-week.

265B Married women, widows and divorced women will work almost exclusively part-time. This phenomenon has already grown rapidly; in 1973, 38% of all employed married women worked part-time for an average of half a work-week. This preference is related to the family-phase and educational level; and, on the basis of these factors, this 38% should have declined by half in 2000, with a shift towards full-time work. Actually, though, we expect a significant increase in part-time work because of a stronger preference for this.

The number of married women who want to do anything but house-keeping and who are therefore satisfied with work which does not reflect their educational level and offers no opportunities for promotion will decline. They are the ones who now fill the majority of the part-time jobs. The willingness of married women to provide a reservoir of relatively arbitrarily available labour will decline.

See: 117

Women will more often join the work force directly after completing school and, to the extent that their educational level rises and the birth of first child is postponed, they will want to keep their jobs or, after a break of a few years for the small children, will want to return to them. They will show a strong preference for part-time work, the duration of which will depend upon the family phase. Because there will be a striving for more fulfilling work, the average part-time working week will increase from 0.5 to 0.7 of the full week.

Table 26B gives a summary of data about part-time work.

Table 26B. Part-time work

	1975	1980	1990	2000
Frequency, percentage*)				
men	3.4%	3.7%	13.7%	22.7%
single women	6.7%	8.0%	14.4%	20.5%
married women**)	38.6%	37.7%	51.0%	50.7%
average work-time, fraction of the normal work-week:				
men	0.60	0.59	0.64	0.63
single women	0.71	0.75	0.70	0.68
married women**)	0.52	0.53	0.60	0.63

*) Percentage of the number of working persons in the appropriate group who do part-time work.
**) Includes formerly married.

266B By taking account of friction-unemployment, part-time work and the reschooling, retraining and remedial schooling, the total labour supply can be determined. This is shown in Table 27A. Naturally the estimates are not as precise as is suggested by the figures that refer to single categories in a detailed breakdown of the total; this precision is only apparent.

See: 200

This table reflects the maximum labour volume because the figures, as indicated above, are derived entirely from supply considerations. If demand is significantly smaller, this discrepancy will only partly be expressed in the

registered unemployment; partly it will result in the reduction of supply, in the sense that married women, for example, who really would like to join the labour force see no chance that this desire be fulfilled and, therefore, withdraw from the labour market. It also follows from the method of estimation that the figures include at least part of the employment which is not reflected in the statistics because the people involved do not pay the taxes and Social Security contributions that are due or use loop-holes in the law to avoid payment. Part-time work of married women which is so slight that it requires no tax or premium payments is, for example, included in the figures, but overtime outside the primary employment of a craftsman, in contrast, is not.

Table 27B. Labour volume

	1975	1980	1990	2000
		– x 1000 –		
Active labour force	5086	5281	5942	6039
of which men	3629	3658	4066	4136
women	1457	1623	1877	1903
of which single	663	662	685	601
married*)	794	961	1192	1302
Friction unemployment	76	79	119	151
of which men	54	55	81	103
women	22	24	38	48
of which single	10	10	14	15
married*)	12	14	24	33
Part-time employed	467	542	1250	1848
of which men	121	133	557	938
women	346	409	692	910
of which single	44	52	97	120
married*)	302	357	596	790
Part-time work in work-years	261	307	826	1786
of which men	72	79	401	591
women	188	228	425	595
of which single	31	39	66	82
married*)	157	189	357	514
Retraining in work-years	–	34	70	133
of which men	–	27	55	105
women	–	7	15	28
of which single	–	2	5	11
married*)	–	5	10	17
Labour volume in work-years**)	4804	4932	5330	5094
of which men	3527	3522	773	581
women	1277	1411	557	513
of which single	640	63	37	37
married*)	637	774	920	976

*) Includes formerly married women.
**) Friction unemployment has been subtracted from this figure.

In the present alternative, 267, 268 and 269 are omitted.

270B Rapid and fundamental changes in the social environment of labour organizations will mean that they must be oriented towards a more searching and analyzing attitude in respect of factors which can be of importance for policy. The traditional function of the classical hierarchy will lose importance because of all these changes. The assumption that 'superiors' are more knowledgeable than their 'subordinates' will become less and less tenable. Management will exist as a functional specialization next to, in cooperation with and, in large measure, dependent on other functions on all 'levels'. Because of this, policy will be less oriented towards ensuring uniformity of performance and coordination of divergent tasks than it is at present, and more

See: 139

towards the creation of openings for the development of participatory policy making. The general hierarchy of subordinate relationships will disappear. Work methods will to a large extent be mutually decided by co-workers, while management will create the conditions to make this possible. This will lead to a tendency towards smaller operational units and to a greater degree of openness and accessibility of the organization at all levels.

See: 136, 139

In short, because of the increasing complexity and the requisite greater flexibility, it is essential to give as much autonomy and self-regulation as possible to the person on the job and to reduce drastically the present degree of specialization. By these means, the process as a whole will remain under control, and productivity in the sense of the relation of results to sacrifices will be safeguarded.

271B It is possible to elaborate somewhat on this theme by differentiating between business, non-profit organizations and government agencies with regard to the contrast between direct personal influence and indirect participation in policy discussion and formulation on the one hand and in respect of the differences between policy formulation and its implementation on the other.

See: 139

Influence of personnel in the formulation of policy in the service agencies, i.e. non-profit organizations such as welfare agencies, will be greater than in business enterprises, and in enterprises it will be greater than in public offices. The structure of service agencies, with a limited number of hierarchical levels and a relatively egalitarian cooperative form, offers more room for the exertion of influence than does the structure of enterprises of the same size. In regard to public agencies, ministerial responsibility and comparable practices in local administration form a significant barrier against influence of any importance by employees.

See: 137

Where the nature of policy implementation allows it, personnel will take a direct part in deciding about the manner of implementation. They will also be personally consulted in regard to policy goals. Via elected representatives, personnel will be consulted about policy formulation and here and there actually have a say in decisions. Problems, though, will arise in regard to this participatory decision-making to which we will return below. As a result it is improbable that the suggested changes will take place on any significant scale in the short run – say before 1985.

272B This other organizational format will be introduced to ensure the control of the enterprise. For the worker, this will mean a larger degree of autonomy and a changing distribution of the unattractive aspects of the work. Such a re-division of dirty, heavy, unsafe, unhealthy and monotonous work will be necessary to meet the increasing opposition to that kind of work. Because of the continuing shift of employment from manufacturing to services, indeed, the amount of work with a certain freedom, variety and responsibility will increase and the amount of work with the indicated unattractiveness will decrease. The shift, though, will not be large enough to meet the changing preferences in regard to the quality of work. Inside organizations – business, institutions, etc.– there will be a similar shift, namely from mere execution to provision of services, in particular within manufacturing. This shift within organizations has larger consequences for the organization of work than the earlier mentioned shift between sectors. Even with all of this, though, unpleasant work will not disappear.

273B The significance of technical progress for the abolition of disagreeable work is also limited. New pieces of equipment will only then be introduced if that is not hindered by cost-considerations, unless legally enforceable prescriptions are applied. Even in that case, the introduction will occur gradually, and the regulations will follow the changing attitudes towards what is disagreeable

only with delay. Unpleasant work will not disappear in this manner either.

Even though the attitude in regard to work will become more practical than now, still the unpleasant jobs cannot in the long run be adequately compensated with increased income. Nor will the continued large-scale employment of foreign workers offer a solution, for reasons given below. The solution will therefore be sought in the improvement of the labour conditions by another organization of work such that worksatisfaction will increase through a re-allocation of tasks.

See: 120, 278B

274B The greater autonomy of the employee also affects the organization and work methods of the work-place. The greater diversity in the labour structure and the stronger orientation toward other aspects of life will be expressed in this. Although the results of this process will be very modest, it can be expected to result in a network of relatively loosely linked systems with a large degree of autonomy for the components. From the point of view of management of the total organization, this will set heavy demands on the way in which the linkage among the various components is regulated.

See: 289B

275 In broad outline we expect such a development of economic conditions that there will be sufficient employment opportunities to absorb the estimated labour supply in the long run. The discrepancy between labour supply and demand will decline from 274,000 in 1980 to about 150,000 in 2000, including friction unemployment – by 2000, this will be the only unemployment left.

In this connection, four things have to be kept in mind. In the first place, business cycles after 1980 have been ignored, so that unemployment may in fact temporarely deviate from the indicated level. In the second place, the discrepancy is larger than the registered unemployment because the working population is determined on the basis of *willingness* to join the labour force, which makes a difference, specially in regard to married women. In the third place, the discrepancy is expressed in work-years, and because of part-time work, the number of unemployed persons exceeds the number of man-years involved, depending on the distribution of the unemployed by sex, age and marital status. In the fourth place, unemployment during the intervening years will not always be at the same level as in the benchmark years; especially between 1980 and 1990, unemployment will be larger.

276B In the period between 1975 and 1980, the maximum labour volume (i.e. the supply) will increase by 129,000 work-years. The contribution of men will decline somewhat; the share of women will increase sharply, with a shift from unmarried to married women. The number of work-years demanded will increase by 114,000, so that the shortage of jobs of 180,000 in 1975 will increase to 195,000 in 1980. Moreover, there will be friction unemployment of 79,000 persons. The divergence from the unemployment level of 150,000 in 1980 is obvious. In 1980, there will thus be a hidden unemployment of about 125,000 people, primarily married women.

See: 282

Between 1980 and 1985, the labour supply will increase by 230,000 man-years, the number of jobs by 270,000; the shortage of jobs in 1985 will then be 155,000. Only after 1985 will the number of jobs increase so much more rapidly than labour supply that the shortage of jobs will disappear; in 1990, only friction unemployment will remain.

In addition to a shortage of jobs, there will also be an increasing number of discrepancies between the qualifications of labour demanded and that supplied. Shifts in the prospective supply at various professional levels due to changes in educational participation can be set against the distribution of demand that follows from the expected development of the economy by sectors. In this exercise we assume that the composition by professional level of the working population per sector will remain constant over time. This assumption is not tenable in the long run, but it can be used until 1985 to indicate which profes-

See: 198

See: 289B, 290B

sional groups will be particularly affected by the shortage of openings. We assume also that the relation of career choice to the level of education will remain unchanged, but this is less problematic because this has been the case in the recent past and there are no indications of a change in the near future.

If we look at the results for 1985, then the first thing which attracts attention is the large surplus of teachers: there will be more than 100,000 too many. In the medical sector, there will be some ten thousand fewer people needed than will be available. There will also be a surplus of about one hundred thousand among the other highly-trained professionals. And finally, one must reckon with a surplus of a few tens of thousands of metal and electro-technical craftsmen and of certain types of construction workers. There will also be some tens of thousands of civil servants who, in the past, would have been promoted to higher functions but who now, by remaining in the lower positions, will block the entrance of younger people.

There will be, though, shortages of about fifty thousand administrative personnel in both government and commerce. Here it will be a question of positions which are now often occupied by young women for short periods but which, as a result of the increasing educational level, will be more difficult to fill. Further, there will be shortages of waiters, waitresses, house-keeping and auxiliary nursing staff, cleaners, handlers and packers and related functions; for all of these groups together several hundred thousands will be needed. These are the often unattractive jobs for which little interest will exist.

See: 281B

We are hesitant to predict the situation after 1985, since we expect about that time a fundamental change in the structure of work. This will change the specific content of a number of jobs and thus the preferences for these positions. Moreover the more pragmatic attitude towards work will mean that less weight will be given to the possible discrepancies between aspirations and qualifications on one hand and the job specification on the other. But this element will still continue to play a large role in job-preference.

In spite of all changes that will take place in the 1980's, the career-choice pattern of women with middle or higher educational levels will show so little variation and such a concentration on teaching and health care that it is improbable that the surpluses appearing in these sectors in 1985 will not continue to increase after that.

277B The shift in the attitude towards work in the direction of a more pragmatic approach will ultimately lead to the situation in which the lack of an appropriate job is less of a problem than now. The greater weight which will be given to the self-realization possibilities outside work, and the stronger bonds within the home environment will mean that increasingly adequate alternatives for a suitable job will come into being.

See: 152, 227, 228

Nonetheless, the lack of a suitable job will be felt painfully during the period under discussion. In the first place, the shift in the attitude towards work will first be accepted at the higher educational levels and will reinforce the present tendency to give greater weight to self-realization in work, and this tendency will still be filtering down to the lower educational levels. For the less well educated, moreover, the expected development of income provides a more direct cause for this shift than for the more highly educated.

In the second place, the possibilities for self-development in leisure activities are greater for the more highly educated than for the less well educated. This is related not only to the possibilities which exist because of education and background but also to government policies which are biased towards subsidizing facilities that are used by the highly educated. Given the expected course of income, this element will weigh more heavily, due to the increasing interest in subsidized activities.

In short, the experience of the lack of an appropriate job will remain difficult for large groups, and the differences in insight in regard to the attitude towards work and in regard to changes in income patterns will be a source

See: 296B

of social tension during the period in which there will be a shortage of jobs.

See: 258B

278B As was earlier established, in addition to a shortage of certain jobs there will continue to be a number of jobs for which there will be little or no interest. The decreasing significance of the traditional work ethic will increase opposition to tedious work, which means that the boundaries of what is acceptable will gradually shift.

See: 120

Utilization of foreign workers will offer no lasting solution to this problem. The attitude towards work is not a static datum but alters with changes of one's own and others' work situations. The attitude towards work of a foreign worker upon arrival in our country is perhaps favourable to unattractive work; after assimilation into the labour process, his attitude evolves rather quickly to resemble the dominant attitude here. This, by the way, creates a formidable barrier against a return to the land of origin, so that, even disregarding the social considerations which argue against it, a rapid turn-over of foreign workers is ruled out. Our immegration policy reflects this insight, and the approximately 25,000 foreign workers who will be admitted until 1985 illustrate this state of affairs.

See: 272B

279 The solution to the problem of tedious work suggested earlier, namely the introduction of a greater autonomy in the work situation, will not occur before 1985–1990.

See: 132

That the hierarchical-bureaucratic model will lose importance and will evolve in the indicated direction does not mean that any concrete characteristics of one or more new organizational models can already be given; this change will have an experimental nature. Much will depend on the opposition to organizational changes by present-day management. It can be expected that this development will only then get going if the tendency towards autonomy suggested earlier will make it essential.

280B Internal pressure towards structural changes that favour a more intrinsic orientation towards work will also arise within the organizations. It can also be expected that problems will appear within groups of co-workers which have until now been viewed as homogeneous. The greater diversity is attitude towards work and the greater divergence in private goals will give rise to difficulties and frustrations in the adaptation of the work to the wishes of the workers. Here, too, a learning process will have to lead to a normalization of the relationships. The chance for the emergence of an elite is large. Problems will also arise around the division of tasks among those who will be working part-time. This concerns the division of the task within the operational unit as well as the adjustment of the activities between the units. In regard to management, the transition from actual policy formulation to the creation of a framework within which that formulation can take place will not only be difficult as such, but the assurance of continuity during the transition will also present a serious challenge to management. Specially, where the goals of the organization will diverge significantly between the various levels of the organization, problems will arise around the establishment of an adequate alignment of the activities of the various units. Aspirations based on one's educational level cannot be met within the present system. This holds for expectations in regard both to intrinsic aspects and to extrinsic aspects, such as wages. Finally, there will be the additional factor that the change in the population pyramid will lead to an increasing proportion of the middle-aged categories, for whom promotion possibilities will be restricted. At the lower professional levels, therefore, people will no longer be content with tedious work because they cannot expect to be promoted out of it.

See: 198

See: 123, 124

281B External and internal pressure on the organization of labour and opposition from the side of management make it probable that the change

See: 193, 194

process itself, even after it has begun, will be characterized by a number of problems. There will thus be a demand for a broader education for personnel because the number of functions to be exercised in one job will increase. Employees will have to have the possibility to assume responsibility. Moreover they will have to be able to distinguish between what they would like to do and what they are capable of doing. Learning to recognize and acknowledge one's own limitations, so that one is able to evaluate one's possibilities realistically, is an experimental learning process.

Finally, problems will also arise in regard to the coordination, harmonization and dovetailing of decisions concerning policy and those concerning implementation. There will be some coordination if the manner of implementation is considered during the policy-making process and if operative guidelines are provided for policy execution. A systematic harmonization between policy and implementation will, however, only come into being after a great deal of trouble, when it is learned that, without this linkage, participation in decision-taking is not very effective.

See: 138

5.2. Economic development

282 For the economic development until 1980, we have relied on the 1976 study by the Central Planning Bureau which is based on the policy intentions prevailing at that time. These intentions bear on the limitation of the rise in collective spending according to the so-called 1% norm*), the stimulation of investment and the limitations on the government deficit.

If, moreover, there would be some moderation of the wage-cost increase, then, under the postulated circumstances, an economic growth of 3,8% per annum will lead to a recovery of employment, and unemployment will decline to 150.000 in 1980.

283 In the meantime, new estimates were made in June 1977 by the Central Planning Bureau for the Central Economic Commission. This Commission prepared a memorandum regarding projections to 1981. If we compare these with the estimates we have adopted here for this period, there are obvious differences. In the later estimates, growth of production is less, there is a stronger rise in real labour costs, and unemployment does not decline to 150,000 in 1980 but rises from its present level to 250,000–275,00 in 1981. The smaller increase in production is the result, among other things, of a further appreciation of the guilder, high wage rises and of a lower estimate of private consumption and real labour costs to a large extent determine employment possibilities which, thus, come out lower than before.

An important quantity which directly affects the labour market situation is the labour supply. In our calculations, we assumed a potential working population of about 5 million in 1980–1981. Matching this to the new estimates of employment shows that there will be a shortage of 195,00 jobs and a friction unemployment of 79,000. The difference with the unemployment of 150,000 which would follow from the old figures is 125,000. This is a hidden unemployment (largely) of married women. The new estimates of the CPB allow for a higher participation of women in the labour process, specifically married women. This partly explains the rise in unemployment.

See: 266B

See: 276B

The policy of the government will be to avoid this unfavorable development. Already existing policy intentions aim that reducing unemployment in 1981 to 150,000–165,000.

*) This lays down the guideline that the share of the collective sector in national income will rise by not more than one percentage point in each year.

In our project, no account could be taken of these new estimates. Naturally they mean a difference in the initial situation which also affects economic development in the later years; the final difference for the whole period of the more than twenty years we survey is, though, slight, and it easily falls within the uncertainty margins attached to our statements. So an adjustment of long-run expectations on the basis of the new information makes little sense. The danger exists, moreover, that a revision would demand so much time that it would not be finished before there would once more be new insights or data available. Thus it would be a process with no end in sight.

284B For the period of 1980 to 2000, alternative B assumes the maintenance of the restored level of employment, a gradual decline of the growth in labour productivity to an average of 0.07% per annum in 1990–2000, and continuation of inflation. Other assumptions about economic relationships are, where necessary, subordinated to these fundamentals.

See: 286B

With regard to employment, it is assumed that the unemployment of 150,000 reached in 1980 will remain unchanged until 2000; the hidden unemployment, still considerable in 1980, will disappear in time. About 2000, total unemployment will be equal to the registered labour reserve of 150,000, and this will be equal to the friction unemployment, which will increase from 1½% to 2½%.

See: 266B

We thus assume that the problem of employment – at least in broad lines – will be solved primarily, as will appear, by the expansion of the number of jobs in the services sector. This is an important assumption. It rests primarily on the expectation that large unemployment rates will not be permanently tolerated and that the improvement in the situation which was initially expected to occur around 1980 will not subsequently be given up. Naturally this assumption implies that a number of conditions will be met; policy in the coming years will be important in this respect.

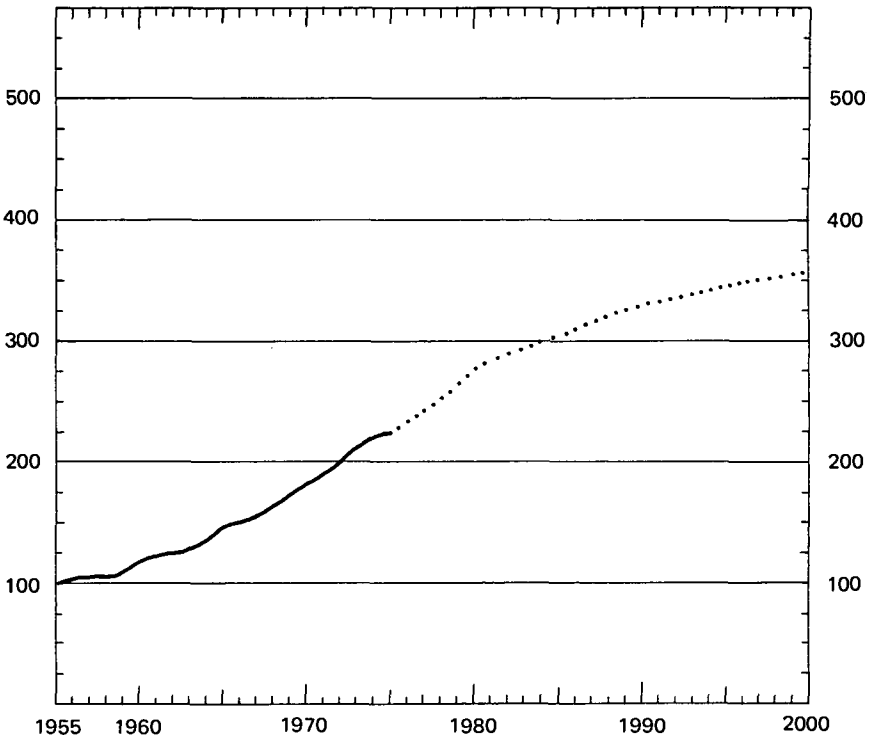
See: 290B

See: 55, 71

Originally it was assumed that, with a given combination of policy measures, unemployment would be reduced to 150,000 in 1980; now we know that probably still more will be necessary to achieve that goal. The intention to reduce unemployment to that level has repeatedly been stated by the government – and by many others. Therefore the forecasts adopted here are not entirely without foundation. If this assumption in regard to employment is not realized, there will be a serious bottleneck. In this sense, our methodological dislike of crisis situations has played a (modest) role in the formulation of our expectation. The problematic character of the course of events outlined is thus rightly listed with the bottlenecks.

285B The gradual decline of the growth of labour productivity in the private sector (excluding natural gas) to practically zero in 2000 was also established beforehand. This development refers to productivity in its usual definition, which is limited to goods and services counted as production. The corrections that would be required to arrive at a proper measure of welfare have not been made. The decline until 2000 means a drastic change in comparison to the growth realized in the past – and particularly in the 1960s – as reflected in figure 3B.

Figure 3B. Labour productivity (excl. government); 1955 = 100



We attribute the strong rise of labour productivity in the decades after 1950 to technological development, which usually led to energy-intensive production methods, to the continuing rationalization of the production process, and to structural changes by which branches of industry such as the chemical industry came forward strongly. In regard to this, the increasing international division of labour and the physical location of our country played a role. One can assume that some of these factors, such as technical innovation and rationalization, will continue to be active in the future; others, such as locational advantages and the freeing of foreign trade, in contrast, will not continue to play a role or will do so only in a slight degree.

The decline of the growth of labour productivity rests on the expectation that the physical limits to further economic growth will make themselves felt through a shortage of space and deterioriation of the environment. The concern for the environment will become so strongly predominant that the government, supported by the opinion of broad sections of the population, will take the necessary measures to deflect production processes as well as sectoral development towards a conservationist course.

See: 342B and par. 4.4

A second assumption which affects our description of the economic development is that after 1980 the results of a changes attitude to work will materialize. The increase in part-time work, particularly after 1990, will reduce the total supply of labour in work-years. *(See footnote by Mr. E. Bloembergen after 137.)*

See: 257B, 264B, 265B

286B We also count on a moderate continuation of the past trend of inflation and thus, from 1980, on a rise of the domestic price level of almost 6% annually. If one continues the past trend consistently, this would lead in the end to very high price rises. We expect, though, that a certain moderation will take place, partly because of a large effort by the government. The growth of labour productivity will continue to differ among sectors and branches of industry

and this will evoke price increases; wages in the less productive industrial branches will follow the raises paid in the stronger sectors. Thus there will always be some rise in the prices.

See: 80

287B In international economic relations, we distinguish between the countries producing raw materials and the industrialized countries. We assume, in regard to our relations with the raw materials producers, that the import prices we will have to pay will rise more rapidly than the export prices we will receive for our goods, so that there will be a continual worsening of the terms of trade.

See: 84

Relations with the other industrialized countries, we assume, will show no important changes and will reflect a steadily continuing process of international specialization. This means that the assumption of a declining economic growth in our country actually entails a comparable development in the industrialized countries to which we are related as supplier, buyer or competitor.

See: 95

288 We generally assume a favorable development in a number of economic problems, such as unemployment. These expectations are based on the assumption that a number of conditions will be satisfied. The first is that the proposed development between 1975 and 1980 is successful. This will set high demands on policy. A second condition is that sufficient jobs will be created in the services sector. This implies that there will be demand for these services as well as willingness to pay, either in the marketplace or from public funds.

More generally, the forecast economic development assumes in this alternative that there will be enough export possibilities – also for services – and that there will be no insurmountable difficulties in regard to energy and raw materials or in regard to the environmental side-effects of economic growth.

See: par. 4.4

289B Table 289A contains a number of figures about employment, labour productivity and production, with a breakdown into a few large sectors. This division corresponds broadly to the method of estimation. Again, the figures suggest a greater degree of precision than is warranted.

Table 28B. Employment, productivity and production

	1975	1980	1990	2000
		– x 1000 man-years –		
Employment*)				
agriculture	298	259	59	72
industry**)	1229	1185	61	1138
construction	439	413	417	425
services	2031	2222	2804	2526
government	627	659	687	731
Labour productivity:		– % rise per year –		
agriculture		6.6	2.4	1.2
industry**)		7.1	3.0	1.3
construction		2.0	1.2	0.3
services		2.7	1.4	0.5
Production		– billion guilders, 1975 prices –		
agriculture	9.7	11.6	14.4	12.5
industry**)	54.5	73.9	97.5	108.2
construction	13.5	14.4	16.0	16.8
services	80.6	101.0	146.4	139.1
government	28.0	29.5	30.7	32.5
natural gas	7.1	8.0	4.8	1.5
Total	193.4	238.4	309.8	310.6

*) Active working population, including self-employed.
**) Exclusive of natural gas.

Unless otherwise indicated, the estimates per sector rest on the continuation of trends until 1980 and, thereafter, on the introduction of stronger environmental safeguards and on a changed attitude towards work.

In agriculture, there will be an end to the departure of the small farmer. In time, employment will increase because of the introduction of conservationist methods of farming. In construction, production will decline as a result of the saturation of the housing market, and the productivity rise will be slight because of a major shift to rehabilitation and improvement of existing housing which are more labour intensive than new construction.

See: 336B

See: 318B

In regard to the public sector, labour productivity does not have to be estimated since it is by definition constant, according to the accepted conventions of national accounting. For manufacturing and services, finally, it is known that labour productivity in manufacturing rises more rapidly than in the other sectors, and that the number of jobs declines since the demand for goods does not rise so strongly any more. The employment figures for both sectors have then been chosen in such a way that labour productivity in the industrial sector as a whole will slowly decline after 1980 and that the labour supply will be almost entirely absorbed; employment in the services sector has thus been estimated as a residual category.

290B Particularly for the government and services sectors it is useful, by further subdivision, to find out if the estimated development of employment is plausible. We give the figures in Table 29B.

Table 29B. Labour demand in services and government

	1975	1980	1990	2000
		— x 1000 man-years —		
Transportation	307	335	365	340
Wholesale trade	200	205	235	207
Retail trade, crafts	619	640	930	810
Self-employed	387	447	550	515
Hotels, entertainment	116	126	170	175
Health care and social assistance	244	253	272	277
Social services	90	97	102	104
Other services	68	119	180	137
Total services	2031	2222	2804	2526
Defense (incl. civilian pers.)	134	123	121	121
Other civil servants (national)	108	123	132	145
Municipal, provincial personnel:				
waterschappen*)	150	165	200	240
social insurance	22	23	25	27
education	213	225	209	198
Total government	627	659	687	731

*) 'Waterschappen' are the local administrations in charge of dykes and canals.

For a number of entries in this table, the elucidation can be found in the discussion of the appropriate sector. This is true for health care and the social services among the services and for defense and education among government. For the growth of the civil service, we point to the increasing government intervention. The emphasis is on the lower levels of government which is in agreement with the forecast decentralization.

See: par. 3.5, 3.6 and 3.7
See: 98, 142

291 Growth in the components of the services sector not yet discussed merits a separate elucidation. Particularly between 1980 and 1990, many new jobs are

forecast. With that, we assume new growth in the working population which is self-employed in small business. This agrees with the striving for self-determination of one's own working conditions. We also expect, as will be discussed below, that social security will be extended to the self-employed. This will lessen the existing preference for employee status. This development naturally implies a comparable shift in expenditure. We will return to this point.

See: 258B, 296B, 302B

292B In regard to the means and expenditures which correspond to these production estimates, our relations with foreign countries will play an important role. As was stated earlier, we assume that there will be no major changes in our relations with the other industrial countries, specifically that the rates of growth will agree and that the mutually competitive relationship will not change significantly. In regard to imports, an elasticity of 1.5 is assumed, which means that a 1% increase in domestic production will evoke a 1.5% increase in imports. In the long run, we assume that there will be continuing international specialization. This process will occur on the basis of relative cost advantages which follow from locational advantages, and which are reinforced by technological developments. Because of this, price rises in international trade lag behind those on the domestic scence, which will further foster international trade and (international) specialization.

See: 94, 95

In the meantime, consideration has to be given to the deterioration of the terms of trade between the industrial countries and the suppliers of raw materials, and to the influence of a doubling of the real energy price which will apply to a strongly increasing net-import of primary energy. Under these circumstances, a satisfactory balance of payments can only be attained if exports increase strongly. The growth percentages are given in Table 30B.

See: 84

See: 91

Table 30B. Forecast development of exports

	1975–1980	1980–1990	1990–2000
		– annual growth percentage –	
Goods*)			
production volume	5.6	2.2	0.5
export volume	7.9	5.0	0.7
Services			
employment	1.8	2.4	1.1
production volume	4.6	3.8	0.5
export volume	5.8	5.2	1.9

*) Products of agriculture, industry, natural gas.

In addition to the export of goods, exports of services, too, will increase faster than production over the period 1975–1990. After 1990 the production of goods still continues to increase slightly, but the production of services declines and their exports decrease even faster. In the estimate of production and jobs in this sector, we have left room for a significant growth of the self-employed in small business, but this will not contribute much to exports. There will be heavy pressure on the other service branches to orient themselves more and more towards other countries, which is obvious from the growth percentages for this sector as a whole.

293B We return to Table 28B and note that production in the period of 1975–2000 will have increased by a factor of 1.6. In this regard, one has to keep in mind that this production growth is realized almost exclusively during the period of 1975 to 1990. In the 1980s, production growth is obviously less than

See: 310B, 334B, 336B, 344, 369B

in the earlier years; after 1990, there is a decline in production in the agricultural and services sectors. This has consequences for land use, for environmental pollution and for the use of raw materials, especially energy.

294B We now direct our attention to the composition of expenditures, and in particular to what remains for private consumption. How much this will be depends primarily on the claims made for other purposes. In addition to exports, already discussed above, there will be the claims of industrial investments, costs of environmental protection and government expenditures.

The forecast development of the first two categories is shown in Table 31B.

Table 31B. Forecast growth of a few expenditures

	1975–1980	1980–1990	1990–2000
	— average growth percentage of volume per annum —		
investments in capital goods	+ 4.2	+ 3.3	+ 0.4
ditto, incl. inventories	+ 9.0	+ 3.1	+ 0.4
housing	+ 0.4	−1.1	−2.2
environmental provisions	+ 6.1	+ 1.2	0

See: 289B

The growth of (gross) investments is of course related to the expected development of employment. For the period 1990–2000 this means that there will only be a very limited growth of investments.

For the future a limited expansion of inventories is envisaged; 1980 still shows a considerable increase in comparison to 1975, but this is so merely because, in that year, base inventories were in fact reduced, so that inventory investment was negative. In regard to housing, the effect of saturation on the housing market and of the final termination of the housing shortage can be noticed.

See: 318B

See: 366B

The entry 'environmental provisions' includes running costs, net investments and replacement investments, estimated from the base year 1973 on the assumption that, specifically in the period until 1985, a large effort will be undertaken in this area. These costs, somewhat adapted to the course of production, will be absorbed into the production process, and we should have used a model to estimate the effect of this on price and volume of production of various goods. In fact, though, we have applied a simpler correction which means that for later years, additional costs relative to 1975 were subtracted from what will be available for private consumption. We proceed from the assumption that after 1990 the capital stock for environmental protection will not be expanded further. The environmental costs for 1990 and 2000 refer therefore to exploitation costs and replacement investments alone.

295B In regard to government expenditures — costs of personnel, material consumption and investments taken together — it is expected that there will be a continuous, secular increase of about 0.5% annually in volume. This entry only applies to part of the government expenditures; no transfer payments are included. This estimate says nothing as yet about the tax burden or the claims of the public sector on national income; we will return to this subject shortly.

See: 298 ff.

The principal determinant of these government expenditures is the size of the civil service; this determines the wages and salaries and also to a large extent material consumption. Together these are more than 80% of the total entry. Public investments which form the rest will show a moderate growth over the period 1980–1995; in contrast, both 1975–1980 and 1990–2000 will show a slight decline. This entry will have to suffice for a number of infrastructure projects. Actually, at this point, we should give a schematic review of the projects which would come into consideration after the large works now in progress, such as the flood-control system in the Oosterschelde and the creation of Flevoland, are completed. An overall financial assessment is only possible,

though, if one also brings the less spectacular projects such as road construction and provisions in urban planning or harbor improvement into the picture. That would take us too far afield. We leave it, then, by ascertaining that, for the period to about 1985, sufficient plans are being executed or are in an advanced stage of preparation.

296B After allowing for these expenditures, private consumption remains. Expressed in a per capita volume, this is an important indicator of the material well-being of the population, including both goods and services. Over the whole period from 1975 to 2000, it will show an average growth of 1.7% annually, but this will occur particularly between 1980 and 1990, as figure 4B shows. For a further judgement, we give a division into goods and services in Table 32B.

Figure 4B. Consumption per capita 1957 = 100

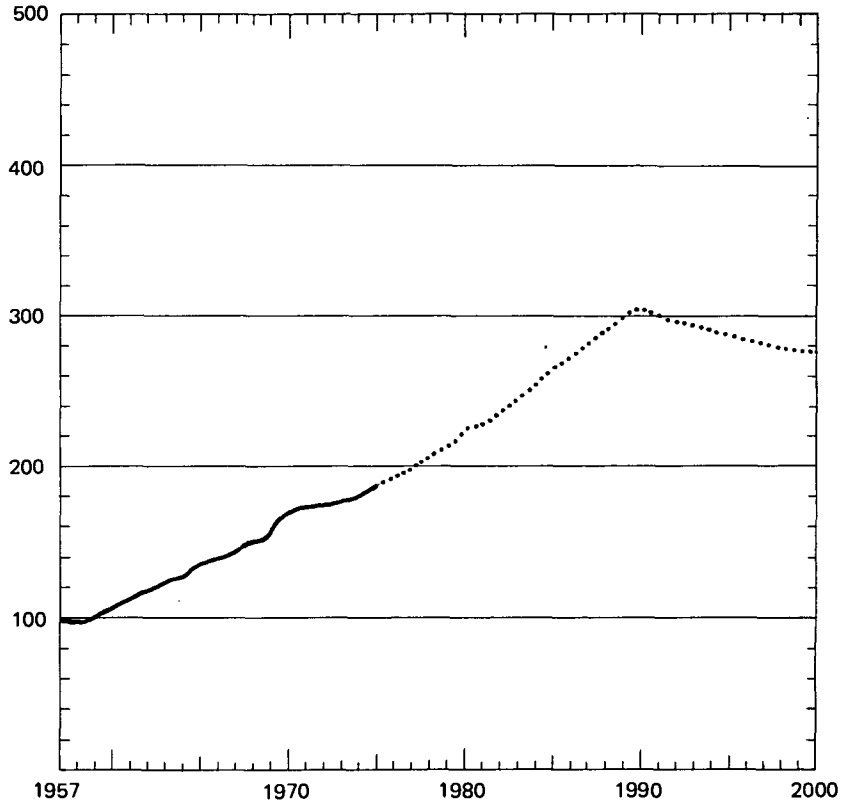


Table 32B. Consumption volume per capita

	1975–1980	1980–1990	1990–2000
	– annual growth percentage –		
Total	3.2%	3.1%	–0.9%
Goods	2.4%	2.6%	–0.5%
Services	4.0%	3.5%	–1.2%

As one can see, consumption will increase appreciably until 1980 under the influence of the expected economic recovery. From 1980 to 1990, the expected pace of growth will be somewhat reduced. From 1990 to 2000, per capita consumption of both goods and services declines; in this period a decline of

employment and of production is expected in the service sector. The table also illustrates that until 1990 services consumption grows faster thans consumption of goods. This shift is however not spectacular. It occurs largely in the years 1975–1980; after 1990 the trend is reversed, and by 2000 the share of services in total consumption is back at the old level of 1975.

An overall price for consumer expenditure of almost 6% per annum is expected. This price rise does not apply equally to both categories. It is however reflected in wages, which affect services more than goods since the rise in productivity in the services sector is lower than in manufacturing. The result is that services as a rule rise in price somewhat more markedly than goods. The services share in the value of consumption in current prices rises, therefore, more rapidly than the volume share shown in Table 32B; at the same time, doubts arise whether this shift, which is reflected in Table 33B, can be realized without government intervention. As can be seen from the table, the expansion of services will not take place in the sectors which traditionally are strongly controlled by the government. The declining share of the latter in total consumption reflects the effective cost control in health care which is expected. By 2000 the share of health care and social welfare services in the total of consumer expenditure has again somewhat increased.

See: 168

Table 33B. Consumer expenditure on services

	1975	1980	1990	2000
	— percentage of total consumption*) —			
Expenditure on services	54.9%	59.2%	60.6%	55.6%
of which health care and social services	16.8%	15.2%	11.5%	12.4%

*) Current prices.

297 For much of the consumption of services, the sums involved are in large measure determined by the government. An example is health care, which, after housing, is probably the largest single entry in services consumption. Part of this is included under social insurances but for the rest, even payments to general practitioners, dentists and private sickness insurance will only formally be handled in the marketplace; the consumer can influence these entries only very slightly, and the government will play an important role in the determination of rates. In other areas, such as art and culture, it appears that services to consumers will be possible only by the grace of government intervention, in this case by subsidy. In both these examples, the price rise of services relative to goods will also be a result of the different productivity growth rates.

If one goes back to Table 19B, then it appears that the expected growth of jobs in services lies exactly in those sectors which are less susceptible to government intervention. Therefore a bottleneck in this area is in the offing.

298 Thus far, no attention has been paid to the manner of financing the various categories of expenditures. We want to do this now and thereby gain some insight into the share of the collective sector in the national income. In the broad view, which is appropriate here, we do not distinguish between the government and the social insurances but we do differentiate between certain expenditures which belong directly to the collective sector and transfers between households.

From these entries, the collective claim on the gross national product can be determined. This procedure ignores many further distinctions which would be appropriate on the basis of the present arrangement of our insurance system and it can serve only as a first approximation.

299 How we proceeded appears from the figures given in Table 34 for 1975. The figures are only rough estimates to which not too much significance can be attached. As one sees, the first entry includes all government activity and the necessary purchase of goods and services, as well as the costs of health care and of social assistance. Together these are the collective expenditures: the citizen has to pay for these in the form of taxes, health insurance premiums or doctors' bills*) – all amounts over which he has little influence but for which he gets a direct return in the form of government services and health care. The second entry is other government payments, such as development assistance and support of threatened industries, subsidies to institutions, housing construction, etc.

The third entry is transfers to the non-active population groups, such as the aged, the unemployed, the disabled and, in part, recipients of national assistance. The indicated amount is the net income of these groups, i.e. the payments and pensions which they receive, less any premium and taxes they pay which we treat as a sort of repayment to the other groups of society.

Table 34. The collective sector in 1975 (million guilders)

Gross national product, current prices		203.3	
Government: wages and salaries	27.8		
material consumption	9.6		
investments	7.8		
health care	17.1		
social assistance	2.8		
A. Collective expenditures		65.1	(32.0%)
B. Other government payments		9.5	(4.7%)
C. Transfers to non-active groups		33.3	(16.4%)
Remainder for the active working population		95.4	
of which: transfers within this group		15.5	

After subtracting the first three entries, the share of gross national income which goes to the active working population remains. As is shown at the bottom of the table, quite substantial transfers are made within that group by premium charges and transfers such as family allowances and illness benefits**).

300 The estimates of the collective sector in table 34 differ from the customary definition in that all costs of health care are included and not only those sums which are paid by the government or by compulsory insurance schemes. The estimates differ also from the premium and tax burden of an individual such as, for example, the average employee. On the one hand, not only are direct taxes taken into account but almost all government payments, regardless of their financing; on the other hand, transfers within the active population resulting

*) About two thirds of the population is subject to compulsory health insurance which covers all medical treatment at a moderate premium. Among the higher income groups, who cannot partake of this insurance, it is customary to take out private insurance against hospital costs and consultants' fees but not for general practitioners' fees.

**) The structure of the Dutch Social System is quite complex. Some schemes are administered directly by the State and paid for out of taxes, as in the case of basic relief or national assistance, but the majority belong to the realm of social insurance. This comprises a great number of separate funds and compulsory insurance schemes, established by law and to some extent controlled by the government but administered by separate authorities with varying degrees of autonomy. A major distinction must be made between *national* insurance schemes, which cover the entire population (like the old age pension), and *workers'* insurances, which are restricted to wage-earners and employees. The examples quoted in the text are family allowances (as distinct from family tax relief), paid to all workers and certain categories of self-employed out of family allowance funds, and illness benefits which are a form of compulsory insurance of wage-earners and employees against loss of income in case of illness. Both schemes are financed by compulsory premiums paid by employees and employers.

from social legislation are ignored. The individual nevertheless experiences the premium payment as a burden even though he might himself receive, e.g., illness benefits.

301 We thus approach the share of the collective sector in the national income from the national totals and not from the corresponding burden which taxes and premium payments impose on the income of the individual. Naturally there is a strong connection between these two approaches, and a large collective claim will always lead eventually to a decrease in the amount of consumer expenditures by individual recipients of primary income from marketplace activities. In the approach we have adopted, the distinction between taxes and premiums is ignored, as is the distinction between direct and indirect taxes. We assume a shift in this regard between 1980 and 1990; the burden of indirect taxation will then double. Since it is not possible to increase our price level because of the somewhat coincidental circumstance that our country adjusts its fiscal arrangements to our European partners, the rise of nominal wage rates in these years will have to remain limited in spite of the increase in indirect taxes. This will be possible because (except for a general rise in the tax burden) compensation in disposable income will take place by lowering direct taxes, or, in this case, by raising them less than would otherwise have happened.

302B In substance, our estimates for the future are based on the consideration that government intervention will increase still further in many areas, and that there will be an increasing tendency to extend social insurance to a national insurance system. Thus we expect a transition to a general health insurance already in the beginning of the period under review, which will do away with the present distinction between compulsory insurance of employees and private insurance of the self-employed. As indicated earlier, this change in the institutuional framework will not make much difference to the individual since even now he can exert only very little influence on the sums he has to pay for health care whether he is compulsorily insured or not. In the area of the social insurances which bring about income transfers – such as the social insurance schemes for the disabled and the unemployed – the extension of an employees' insurance system to a general, national insurance system means much more; it is a basic change which will make itself fully felt only in the course of time. This change means, namely, that a number of transfers which now take place directly between or even within families will be taken over by the collective sector just as the distribution of income over the duration of the life of the individual, which is now arranged by savings or by private insurance.

See: 126, 140

See: 299

See: 156

Our expectation on this point rests precisely on the indicated consequences of the change. The beginning of the transformation of direct transfers into a collective insurance system can be found in the plans for general students' grants independent of the parental income, and in the pleas to bring divorce alimony into a social insurance system. These tendencies are consistent with a greater independence of the individual.

See: 152

303 Continuing inflation also plays a role in the substitution of social insurances for pension arrangements and private old-age provisions. It is, after all, almost impossible for the individual to shift his income over periods longer than a few years.

Other than the privately owned home, which retains its value in use over time, there are no investments or forms of insurance which can give inflation-free security. The only system which can provide that is a system based on the simultaneous redistribution of income among various categories. Even now – outside the social security system – this is in a certain sense the case, namely by transfers between family members and, of more importance, by supplements to previously established industrial pensions at the cost of present profits. These

means cannot, however, offer a genuine long-run solution. We therefore expect, in time, the introduction of a general pension scheme and of more extensive generalized provisions for widows and orphans in addition to the general health insurance. This will replace industrial pension arrangements and individual life insurance.

This is indeed a basic change, which will certainly meet with opposition. In regard to the industrial framework, there can be a mixed form, certainly during the initial stage; it is certain that the transition from commercial insurance companies to a public authority will not occur as easily as is suggested above. In the broad picture presented here, we in fact ignore these organizational questions.

We also assume that these changes will be accepted by the public, not only in the sense that there will be a majority for the necessary legislative measures but also in the sense that the premium change will be accepted and that the transition from private to public insurances will not lead to avoidance of premium payments on any important scale.

Insofar as will be necessary, new laws and stricter sanctions will compel compliance.

304 Keeping in mind this reservation, the excepted development will still mean that a number of transfers now in the private sector will be brought over into the public sector, even though the extended social insurance will in part replace the relief scheme that is now operated by the government as financial provision of the last resort and paid for out of taxes. Moreover, the institutional investor will disappear in due time (or be taken up into the social insurance system) so that the public sector will fulfill a larger role also in other areas. In particular, the government will increasingly take part in the financing of housing construction and investments; this is in accordance with the tendency towards an increasing direct and selective (government) intervention in these areas.

See: 305B

For the working population, this development in the direction of general insurance has other consequences. The difference in position between civil servants and private employees will diminish when everyone has similar pension rights; at present civil servants are exceptionally well situated in this respect, since they receive a pension related to their last salary that is annually adjusted to the current wage rate. Among employees of private enterprises, differences will also become smaller, and labour mobility among industries will be fostered, just as the mobility between government and industry. Finally, the difference in social security between employees and the self-employed will eventually disappear. We expect that this, added to the desire to determine one's own circumstances oneself, will diminish the preference for wage-labour and lead to a resurgence of the self-employed practice of one's craft on the retail level.

See: 143

See: 258B

305B We now present, in Table 35B, an estimate of the future course of the collective burden, as it was measured for 1975 in Table 34. Collective expenditures (entry A) grow slightly, because government expenditures do not increase very much and in health care and education a rather strongly imposed moderation, based on control of costs, is assumed. Other government payments (entry B), in contrast, increase sharply because we assume that in 1980, 1990 and 2000, respectively 20%, 40% and 60% of the investments in fixed assets will be financed by the government. As one sees, these tendencies even out, and the sum of entries A and B as a percentage of the gross national product is practically constant.

See: 168, 216

Table 35B. Burden of the collective sector

	1975	1980	1990	2000
		– percentage of national product*) –		
A. Collective expenditures	32.0%	28.6%	24.1%	26.1%
B. Other government payments	4.7%	7.0%	8.4%	10.6%
C. Transfers to non-actives	16.4%	19.7%	23.5%	26.4%
Total	53.1%	55.3%	56.0%	63.1%
Ratio of non-active:				
• active number of persons	0.48	0.59	0.67	0.79
• average per capita income	0.73	0.75	0.80	0.90

*) At current prices.

306B For the estimates of the transfers to non-active persons, we have used the two ratios which are given in the table. We first determined the relation between the number of persons who make up a household, in which at least one active member of the working population is present as breadwinner, and the others. The first group can provide their own support from the primary income of the breadwinner. The second group, single as well as united in a household, is dependent on transferred income. The relative size of the two groups varies as a result of the changes in employment (the unemployed receive transfers), in the age structure (the aged receive transfers), and in the shape of the household (children who live by themselves rely on transfers until they start to work). As a result of the last two factors in particular, the relative number of recipients of transfer income will increase sharply from 1975 to 2000. In Table 35A, this is reflected in the ratio which indicates how many people are dependent on transfer income for each person who lives on the primary income of a breadwinner in the same household, including the breadwinners themselves.

A second ratio indicates what amount per capita is paid out via the collective sector relative to the amount that remains per capita in the households of breadwinners. This figure is dependent on (i) the measure in which transfers take place yia the collective sector or occur directly, and (ii) the relation between the level of transfer payments and the disposable income that remains in the primary sector. The figure of 0.73 for the latter ratio for 1975 is perhaps higher than one would expect, but remember that we are talking about disposable income, that pensions from private sources are included in the transfers and that, finally, we are comparing income per capita and not per household. Even if economic growth declines, a further rise of this ratio is to be expected because of the increase of the older generations.

307B In general, transfers to non-active persons will show a significant rise; the total collective burden, as here defined, will rise accordingly from 53% now to 63% in the year 2000. Of course, the result will be much higher if public expenditure – government expenditure on material consumption, investment and health care – would rise more steeply than is expected here and would not lag so far behind gross national product.

Energy

308B Domestic energy consumption is estimated per sector with reference to the growth of production, population and traffic, on the basis of the following assumptions:

– energy consumption in manufacturing and construction will increase somewhat more slowly than production; the course of production in the chemical industry and oil refining is treated separately;

– in agriculture, energy consumption will increase proporionately to production;
– energy use in the services sector (heating, electricity) will increase more slowly than the number of jobs;
– private energy consumption (heating, applicances) will rise slightly faster than the population;
– energy consumption in traffic and transportation will remain behind the rise in transport effort.

309B These assumptions reflect the effect of a deliberate government policy directed towards energy saving, which leads to improved insulation of dwellings and other building, to savings in industrial production and to savings in transport. On the other side of the ledger there will be a wider penetration of central heating and of electrical appliances.

See: 358B, 360

The volumes and composition of energy use are of particular importance for air pollution, and this is the reason for the expected policy measures. A further elaboration of the estimates concerned is given below in the paragraphs devoted to air pollution.

See: 289B

310B A further subdivision of industrial production can be found in table 36A.

Table 36B. Production of a few branches of industry

	1975	1985	2000
	- volume index, 1975 = 100 –		
Chemical industry	100	215	274
Refineries	100	163	208
Other industry	100	148	188

See: 328B

See: 88

The earlier assumptions and the estimates given elsewhere for traffic lead to estimates of total domestic consumption in Table 37B. On the basis of estimates of future world production and domestic production, the share of the various energy sources in total domestic consumption have been estimated as well. This further break-down is of particular importance in regard to air pollution.

See: 356 ff.

Table 37B. Total domestic energy consumption

	1975	1980	1985	1990	2000
			– x 10^{16} joules –		
Industry, agriculture, services, households	199.6	255.5	279.8	303.9	314.9
Traffic and transportation	34.8	41.3	43.3	44.4	40.2
Total	234.4	296.8	323.1	348.3	355.1
			– percentage of total –		
Coal	4	6	13	16	18
Petroleum	38	41	48	46	44
Of which traffic and transportation	15	14	13	13	12
Other uses	23	36	36	35	32
Natural gas	57	41	36	34	29
Uranium	1	1	1	1	1
Solar energy	–	–	1	1	3

311B When detailing consumption, estimates of domestic production are taken into account. This consists, of course, primarily of natural gas. A relatively limited contribution of nuclear reactors and alternative energy sources – in this case, solar energy – is added. Strictly speaking, energy generation from

uranium does not belong in this table since the raw material is imported; nevertheless, the entry is found in Table 38B under the heading of domestic production. We warn that the composition by energy source of domestic consumption can diverge quite substantially from home production because of imports and exports. This holds in particular for natural gas which is exported in the earlier years and will be imported later on.

Table 38B. Domestic production (and generation) of primary energy.

	1975	1980	1990	2000
		– x 10^{16} joules –		
Natural gas	288	323	205	64
Petroleum	6	6	–	–
Nuclear energy	4	4	4	4
Alternative sources	–	–	5	13
Total	298	333	214	81

These estimates are in physical units. We present no more than a strongly aggregated picture, in which little attention is given to the distinction among the various energy sources; this aspect was discounted in the underlying calculations.

312B The course of domestic production of primary energy will be determined largely by the decline of natural gas production after 1980.

In regard to nuclear energy, it is assumed that the installed capacity of nuclear power stations will remain at its present level until the year 2000.

313B The objections to the establishment of nuclear power plants pertain to their potential danger, the strict security measures which will also be necessary outside the reactors themselves, the dangers connected with the storage of radioactive wastes, and the fear that the production of nuclear weapons will be facilitated. These risks are of course smaller for the present installed capacity of about 500 MWe than for a capacity of 5000 MWe, but they are still not entirely absent.

314B We can now make a comparison of domestic energy production and generation on the one hand and consumption on the other. This is done on Table 39B. Actually, nuclear energy should not be treated as is done here, since the fissionable material is imported; as remarked elsewhere, no supply difficulties are expected.

Table 39B. Consumption and domestic generation of primary energy

	1975	1980	1990	2000
		– x10^{16} joules –		
Total domestic consumption	234	297	348	355
Domestic production/generation	298	333	214	181
Import balance	–64	–36	134	274
World use (x 10^{20} joules)	2,5	3,1	4,4	6,1
Share of the Netherlands in world consumption	0.94%	0.96%	0.79%	0.59%

As can be seen, after 1980 our country will change from a net exporter of energy into an importer very quickly. Indeed, although the present pattern already rests on a huge exchange of exported gas for imported petroleum, the expected development after 1980 will demand a drastic adaptation of domestic

See: 88

consumption to imported fuels. The share of coal in the world production of energy will slowly increase to the detriment of natural gas and petroleum. The Netherlands will have to adjust to these changes and this will lead to transportation difficulties and other transition problems. After the year 2000, these problems will become more serious.

5.3. Land use

315 Our space can be analyzed according to a number of possible uses. Housing, traffic and transportation, industrial production and recreation all lay claim to the available space; land use does not stand alone but is the result of a large number of societal phenomena. What follows will reflect their influences on land utilization and on the quality of space.

Housing

316B Our view of the future in the area of the residential environment rests on two major assumptions. The first is that the housing supply, in regard to volume, composition and location, will follow the presently discernible preferences of the public. Towards the end of the century, however, financial considerations and land use regulations take in the interest of the environment will set limits to the realization of these wishes. The second basic assumption is that government intervention in this area will continue as it is at present. This means that the government will take responsibility for a large share of the housing construction, namely public housing, and that urban renewal and housing rehabilitation will take place with government support*).

See: 285B

317B Government policy in respect of land use will be more stringent and more effective than it has been over the 15 years. Particularly after 1980 active measures will be taken in urban development, in recreation and in the infrastructure in the interest of nature conservation and the environment.

318B The demand for housing was estimated by starting from percentages of population groups, according to age and marital status, who wish to have a home of their own. In this regard, an increase in the desire for independent living among young people and among the aged is assumed, although its extent will be limited by financial considerations. If, in addition, a 2.5% vacancy rate is assumed, the demand for housing can be derived. If we assume that this demand will be satisfied, then the housing stock will increase from 4.3 million units in 1975 to 5.6 million in 2000.

See: 152

From this growth of the housing stock, the need for construction determined. Consideration is also given to replacement and housing improvement. Because of demolition, change of use, and consolidation of older residences, an increasing number of dwellings will be withdrawn from the housing supply. According to present standards, of the present housing supply of 4.3 million units, 650,000 are in bad condition and 350,000 are beyond repair; in the future these numbers will increase because ever higher demands will be set, particularly in regard to the size and comfort of the dwelling. Housing improvement and housing replacement in urban renewal districts have a long lead-time and are expensive. The pace at which these activities can take place is therefore limited. In the estimates, which reflect a limited growth of housing improvement and replacement, it is assumed that about half of the housing replacement will occur in urban renewal districts, and of that, half again in the four largest cities.

These considerations lead to the estimates of Table 40B.

*) Since world war II an important part of new housing construction has been financed directly or indirectly from public funds.

Table 40B. Housing construction

	75/80	80/90	90/2000
		— annual average —	
New construction in connection with increaesd demand	93.000	76.000	39.000
Replacement construction	25.000	29.500	33.000
Total	118.000	105.500	72.000
Basic housing rehabilitation	22.000	24.000	25.000

319B 68% of the present housing stock consists of single-family houses and 32% are residences in multiple-family dwellings. Particularly after 1960, much of the new construction was high-rise apartment building. The preference of the public, though, is strongly in favor of one-family dwellings. The societal phenomenon of individualization expresses itself in the desire of households for large, comfortable one-family houses.

See: 152

We expect that rising prosperity will increase the demand for space for leisure time activities and for study. The number of households with this desire will not increase greatly, though; the category of demand in the housing market which is growing most rapidly consists of single persons, primarily the young and the aged. They will have no objections to living in apartments.

320 In regard to location, the same distinction can be made. Households in general show a preference for living in a quiet environment but not too far from the basic facilities (primarily schools and shopping centers). Together with insufficient construction in the large cities, this has led to a movement out of the large cities to smaller centers in the outlying regions, and from the western part of the country to Utrecht, Gelderland and North-Brabant. In the cities, the remaining groups — the young, the aged and the single-person households — are over-represented, just as are households which cannot move out because of their financial position. The connection between the depopulation of the cities and suburbanization is obvious.

In addition, this depopulation is also stimulated by the considerable inroads on the housing supply by deterioration, renewal, road construction, office building, etc. Such processes are cumulative: the deterioration of housing is accompanied by the deterioration of the neighbourhoods, schools become under-utilized, the range of other provisions in the district contracts. One of the most important functions of the city — the residential function — is undermined.

321B We assume that in the future this process will gradually come to a halt, because of the wish to preserve the environment which would otherwise be endangered. The turning point occurs between 1980 and 1990. Until then the movement out of the large cities will first be directed to the outlying locations, but later also towards places farther away. This last development will be the first to be stopped by zoning regulations aimed at the preservation of nature and of the country landscape. As a result of these measures the share of the large cities will decline less rapidly than at present, and the share of nuclei of medium size (between 16.000 and 64.000 inhabitants) will increase.

See: 285B

Tables 41B and 42B reflect these tendencies.

Table 41B. Frequency distribution of residential nuclei, 1975–2000

Year	1975	1980	1990	2000
		— number of nuclei —		
Size of nucleus				
1,500– 4,000	266	215	165	145
4,000– 16,000	372	370	350	315
16,000– 64,000	162	130	150	170
64,000–256,000	22	23	25	25
more than 256,000	4	3	4	5
Total	826	741	694	660

Table 42B. Population distribution in the residential centers, by size

Year	1975	1980	1990	2000
		— percentage of total population —		
Size of center				
less than 1,500	15.4	13.9	12.2	10.3
1,500– 4,000	5.3	4.3	3.2	2.8
4,000– 16,000	20.2	21.2	19.6	17.4
16,000– 64,000	22.1	25.8	29.2	32.0
64,000–256,000	18.5	19.4	20.4	20.4
more than 256,000	18.5	14.9	15.4	17.0
Total	100.0	100.0	100.0	100.0

322B The slowing down of suburbanization and the relative strengthening of medium-sized and larger cities will also affect internal migration. The present movement from the two western provinces to Gelderland and Noord-Brabant will slow down, which leads to the net migration pattern shown in table 43B. Foreign immigration is directed primarily to North and South Holland, the two most westerly provinces of the country.

See: 123

Table 43B. Population by province

	Population 1975	2000	cummulative migration, 1975–2000 internal	foreign
		— x 1000 —		
Groningen	536	564	12.2	3
Friesland	554	563	– 16.2	3
Drenthe	401	462	37.4	3
Overijssel	977	1,060	– 33.3	20
Gelderland	1,621	1,828	49.0	28
Utrecht	858	975	56.4	22
Noord-Holland	2,285	2,204	–139.0	80
Zuid-Holland	3,025	2,995	–223.0	109
Zeeland	327	396	60.8	4
Noord-Brabant	1,941	2,336	134.0	44
Limburg	1,044	1,134	– 1.9	17
Zuidelijke IJsselmeerpolders	30	100	64.0	1
Nederland	13,600	14,617		

323B This means that around 2000, 15% (4,900 sq. km) of our land will be set aside for urban purposes in contrast to 9% at present. This includes all the built-up areas with designated small-scale recreational areas, land-reserves

See: 342B

for future construction and trade and industrial land around the residential or built-up areas. This increase is caused by:

- an increase in the number of households;
- a reduction of housing density in urban renewal areas;
- a lower average number of dwellings per hectare in new construction, in comparison with the existing housing stock;
- an increase of space needed for traffic, parking, stores, parks and other facilities.

Traffic and transportation

See: 321B

324B Until 1990, suburbanization will continue to increase, although at a slower pace after 1980. Because employment and facilities such as stores, schools and hospitals will follow the exodus of the population to the smaller centers only partially, the distances to be travelled will increase. The automobile fleet and the mobility by car will rise, public transportation will remain constant, and the slow traffic will diminish. After 1980 this will change. The growth of income will diminish, as will the favourable cost differentials due to economies of scale for the automobile as well as for the other industrial products. Moreover, on the basis of considerations of environment and safety, demands will be made which will make the automobile more expensive. In addition, the government will utilize levies to combat disadvantageous side effects, to limit the growth of ownership and of use of automobiles or even to push back the automobile system.

See: 296B

Although many think that the latter development will be better for society as a whole, the car will still be preferred for many types of travel. The number of licensed drivers will therefore continue to increase.

The most obvious way to make use of a car without owning one is to rent it without a driver. We therefore expect that the car-rental system will gradually expand until, at the end of the century, rental cars will be available as a matter of course within walking or bicycling distance in shopping centers, at gas stations and garages. They will be used primarily for day-trips, visiting, vacations, etc.

The results of our assumptions are given in Table 44B. Person-kilometers by car will increase until 1990 and thereafter decline until 2000, when they will have returned to the 1975 level. This will also be true for the automobile fleet. These figures are based on the consideration that in alternative B, there

Table 44B. The automobile system

	1975	1980	1990	2000
Cars per 1000 inhabitants	250	300	275	200
Number of cars (millions):				
privately owned	3.4	4.2	3.75	2.6
rental	–*)	–	0.25	0.3
total	3.4	4.2	4.0	2.9
Mileage (1000 km per annum)				
private car owner	16	15.5	15	13
car renter	–	–	4.5	3.25
Average occupancy (persons)				
private car	1.73	1.73	1.75	1.75
rented car	–	–	2.6	2.6
Average speed (km/h)	50	50	50	50
Person-kilometers (billions)				
private cars	94	113	98	59
rental cars	–	–	19	27
total	94	113	117	86

*) About 12.000 rental cars available in peak season.

See: 296B

are as many users of cars as in case A, namely 5.4 million in 1990 and 6.1 million in 2000. In 1990, 31% will rent their cars and in 2000, this percentage, because of the stagnation of income growth, will rise to 57%.

Mr. A. Dekker expects another course of car ownership than is shown in table 44B. He expects that the number of cars per 1000 inhabitants will continue to rise a little from 1980 to 1990 and will thereafter begin to decline. This view is supported by following arguments:

– between 1980 and 1990 the volume of per capita consumption will still increase by 3.1% per annum (see table 32B); it begins to decline only after 1990.

– the proportion of the population likely to own a car, viz. the age groups between 20 and 64, will increase between 1980 and 2000.

This divergent view will of course affect the entire discussion of mobility, in particular table 45B

325B In 1963, slow transport modes – (motorized) bicycles, pedestrians – still accounted for three-quarters of all time used in movement. This is now reduced to about half, and by 1990 the share will be still further reduced; after that year it begins to rise again and by 2000 it will be about 56%. There will be 9.6 million bicycles by then, and they will be used more intensively than is now the case. The decline in the number of motorized bicycles is reversed and it increases to 2.2 million. People will go on foot more often than now and for longer distances.

In addition to the reduction of the number of privately owned cars, the introduction on a national scale of residential zones where very low speeds are enforced, even in existing built-up areas, and the establishment of separate bicycle routes through cities will contribute to the increased attraction of 'soft' means of transport.

326B Utilization of public transportation in 1975 was 8% above that of 1962; since, during this time, population increased by 14%, use declined per capita by 5%. Railroads remained about the same in regard to volume of transportation, municipal and regional public transportation declined noticeably, and group-, tour-, and unscheduled transportation (the 'chartered bus') rose significantly.

The total contribution of public transport will decline still further until 1980, but after that year changes will make themselves felt. When the automobile system is past its peak in 1990, the person-kilometers output of line services (rail and bus) will have risen from 13.8 billion in 1975 to 18 billion in 1990. In 2000 this figure will reach 20 billion, or 45% higher than in 1975.

The use of buses for group charters and other non-scheduled transportation will also increase. Altogether public transport mileage per capita will have risen by 25% to 30% relative to present levels. This development will be favoured by the increase in speed and reduction of travelling time on public transport that is brought about by reserving free lanes for public transport and giving it priority over other road users.

Due to lack of funds the construction of automatically guided transportation systems will not take place, nor will new railroads be constructed on a large scale. In the larger cities, no complete subway system will come into being, but the tramway system will be modernized.

Intermediate types of transport, half-way between public and private transport, such as bus-taxis, shared taxis and neighbourhood buses operated by the public will be introduced as the predominance of the private car begins to decline.

See: 296B

327B Until a short time ago, the growth of air transportation was spectacular. The principal reasons on the supply side were technological innovation combined with cost reductions, the birth of commercialized tour-operations in the countries of departure and of massive tourist accomodations in the vacation countries of destination and, on the demand side, the rise of incomes and the acceptance of flying and of foreign vacations. Recently the growth of air transportation, particularly to vacation destinations, has slowed; this is because of the recession and the price increases for air-tours, partly caused by the tripling of the fuel costs since 1972. We expect that the price of energy will rise still more and that a more rapid saturation of mass air tourism to some destinations will appear than has been expected until now. This will happen, on the one hand, because of the limited absorption capacity of the destination countries; on the other the demand for vacations by air will also show an upper limit. This will happen the sooner since the growth of real income that occurred until now will come to an end. Moreover the absorption capacity will be limited in some countries of destination in order to avoid continuing damage to the environment.

Altogether, this view leads to the expectation that the number of air passengers will stabilize at a level of 20 million per annum, or 2.7 times the present number, and that this stable level will have been reached by 2000. Since Schiphol (the sole Dutch international airport) can handle this number, if needs be with a fifth runway (now four), there will be no need for a second international airport until the end of this century. The maximum capacity of Schiphol depends on its runway capacity, or, broadly, on the growth of the total number of passenger movements and the pace of replacement of the present generation of airplanes by larger models. So far it has been generally assumed that this pace would be rapid. With the present expectation of 20 million passengers per year, however, the possibilities of operating 1000 to 1200 seat airplanes at a profit is much reduced since the transport demand by line or destination will fall below earlier forecasts. The need for a fifth runway may then arise. Residential development will take place on the present site of the airport of Rotterdam.

Mr. G. Hupkes adds the following comment:

In the present alternative, in which a heightened awareness of environmental values is assumed, it is also likely that the noise of Schiphol Airport will be experienced as a greater nuisance than it is now, in spite of improvements in this respect of airplane engines. It therefore seems probable that a small second international airport will be opened elsewhere in order to prevent the addition of a fifth runway and the further increase of the noise level in general around Schiphol. The most likely location is Zevenbergen. This is preferable to the other candidate – the Markerwaard – that remained after the analysis of the Report on the location for a second National Airport (1974). Zevenbergen can much more easily assume the function of Rotterdam airport, which will be closed, and it is better located in relation to the centres of population in our country and in Belgium.

Traffic at this new airport would reach approximately the present level of Schiphol.

A railroad link to this new airport is likely to be constructed.

328B Table 45B presents a summary.

Table 45B. Mobility

	1975	1980	1990	2000
Totals:				
– trips (bill.)	18.8	19.3	20.2	21.0
– person-kms (bill.)	147	167	194	179
– time spent (bill. hrs)	5.2	5.2	5.5	5.7
Averages (for persons 6 years and older)				
trips per persons	1,600	1,600	1,600	1,600
distance per person (1000 kms)	12.2	13.3	14.4	13.2
time spent per person (hrs)	430	430	430	430
distance per trip (kms)	7.6	8.4	9.6	8.5
speed (km/hr)	28	31	35	31

The forecast of the number of trips and the total time allotted to travel reflects the general tendency that these variables are constant.

The share of the faster transport systems in the total transport effort (as measured in passenger-kilometers) increases until 1990 and declines thereafter. This is bound up with the decline in the total transport effort in passenger-kilometers. By 2000 the distances travelled, the distance per trip and the average travel speed have all returned to their 1980 levels.

As far as shares in the total passengers/kilometers are concerned, the motorcar will go from 64% to 48% in 2000, slow transport mode and public transport percentages remain approximately the same as now and for Dutchmen the share of air travel will rise from 4% now to 18% in 2000.

See: 310B, 332B, 333B, 359B

These tendencies will of course affect land use and energy consumption, as shown in the detailed estimates of fuel consumption which are given in the paragraphs dealing with air pollution.

329B The chance of getting killed, maimed or wounded in traffic is the oldest side-effect of mobility. Measured by the number of person/kilometers per victim, the bus, streetcar, subway and train are the safest. During the 1960s, safety for automobile drivers and air passengers improved; for motorized bicycle users, pedestrians, and particularly for cyclists and motorcyclist, it decreased due to the increase in the automobile fleet. Unprotected slow traffic is relatively and absolutely the most unsafe.

The government has recently had an active policy to improve the safety of cardrivers and motorized bicycle riders, which led to a decline in the total number of fatal accidents by about 30%; also the number of bicyclist and pedestrian fatalities declined sharply. We suggest that those measures have by this time had all the effect they are going to have, and that a further decline will come only from new measures, such as safety requirements for automobile construction, low-speed zones in built-up areas, road improvement and construction of new roads and bicycle paths. Further, it is probable that the trend towards less rapid growth in the number of fatalities relative to the expansion of the automobile fleet will continue. The total number of fatalities in 2000 could decline by about 17% in comparison to 1975 and thus be 8% less than in 1962. With this, we assume a proportional number of wounded (as a rule, 25 times the number of fatalities) and handicapped (now about 54,400, with a slight decline to 45,000 in 2000).

Table 46B. Traffic fatalities

	1962	1972	1975	1980	1990	2000
– automobile	520	1,350	968	875	625	510
– motorcycle	149	93	101	115	75	95
– moped	412	574	334	318	330	320
– bicycle	422	558	456	457	460	445
– pedestrians	485	588	396	336	195	190
– train (average)		20	20	19	16	18
– bus, subway, streetcar (ave.)		6	6	6	6	7
– airplane (theoretical ave.)	7	10	12	16	20	25
– other traffic participants	86	97	60	60	60	60
Total	2,106	3,299	2,351	2,202	1,787	1,670
Traffic deaths per 1 mill. inhabitants	177	246	173	159	126	114

See: 289B, 296B

330B The volume of freigth transport depends primarily on the volume and nature of production and consumption; because of shifts in the kind of goods, the transported weight does not keep step with the growth of the production volume even though continuing specialization of labour and economies of scale in themselves lead to more transportation demand. Based on these considerations, the expectations about domestic production and foreign trade lead to the estimates given in Table 47B.

Table 47B. Goods transport

	1975	1980	1990	2000
		– million tons –		
Domestic*)	413	460	510	515
International	256	332	465	480
Total	669	792	975	995

*) Exclusive of pipelines, but inclusive marine import and export.

331B The distribution over the various transportation modes is to a large extent determined by the nature of the goods – bulk transport versus general cargo – and by the location of sender and consignee in regard to waterways or rail connections. Costs and speed also play a role. As shown in Table 48B, we expect that between 1975 and 2000 there will be no large changes in the distribution according to transportation technique; only a shift from road transport to the canal system. This is related to a relative rise in costs of road traffic, caused by improvement in the labour conditions of drivers; this is significant only in regard to bulk transport. We have taken no account of any effect of the rise of energy prises; even with a doubling of this price, energy forms a rather small cost factor.

See: 91

Table 48B. Goods transport by mode of transportation

	1975	2000
Domestic road transportation		
road	78%	73%
waterways	20%	24%
rail	2%	3%
International transportation		
road	23%	15%
waterways	65%	70%
rail	3.5%	5%
pipeline	8.5%	10%

For both domestic and international transportation together, this leads to the estimates in Table 49B.

Table 49B. Transport by modes

	1975	1980	1990	2000
		— in million tons —		
Road	386	430	471	448
Waterway	247	312	431	460
Rail	15	20	31	39
Pipeline*)	21	30	42	48
Total	669	792	975	995

*) International only.

See: 342B

332B Within the framework of the indicated developments in traffic and transportation, for the year 2000 we estimate that the length of the primary road net outside the built-up areas will be ±7200 kms, of which about two-thirds with two lanes and one third with more lanes. This is the result of a limited programme of expansion and widening of roads which will largely take place before 1985. The priority accorded to nature and landscape, and the expected development of traffic and transportation after 1990 will curb the expansion of the primary road network. This means that during these later years there will be traffic congestion.

Including ramps, clover-leaf crossings, etc., the direct space requirements of the primary net in 2000 will be 240 square kilometers.

A small part of the roads outside the primary road network will be widened; we assume that until 1985 a number of roads will become primary roads, and that 10% of the remainder will be widened. The additional requirement is 25 km^2.

As for the railroads, even with a considerable increase in transportation we expect only minor additions to the existing network, such as the Amsterdam-Lelystad line and the completion of projects already under construction (Schiphol line and Zoetermeer line). Many small new stations will, however, be opened along the existing railroads.

333B In regard to the spatial effects of roadbuilding, these are not only a matter of the road surface itself but also of the consequences roads have for adjoining areas; their usefulness for other purposes is severely reduced because of noise, pollution of air, water and soil, violation of the ecosystem and fragmentation of the landscape. This involves zones alongside roads and railroads and around airports, their extent being dependent on the size of the effects and on the nature of the intended land use. The closer the infra-structure, the greater the chance that effect will overlap: right next to an expressway, there is noise pollution, air pollution, and lead poisoning of vegetation and possible disruption of ecosystems. At a distance of 4 kilometers, there is still disturbance by noise in quiet areas and horizon pollution.

See: 253B

Whether this leads to loss of function depends on the land-use: for housing, work, recreation or as a nature park. If one sets the distance at which a primary road has disturbing effects at 500 meters — 250 meters on either side — then 3600 square kilometers, or almost 8% of the area of our country, will be affected by the primary road net in 2000.

See: 324B

Space demands for production

334B In regard to space needs for production, a few major points will have to suffice.

— In the neighbourhood of ports, most space is used by industries connected to harbour activities. In 1975, the gross space demand, including that set aside

for industry and harbour administration, was 110 square kms. On the basis of economic developments, in 2000 about 170 square kms will be required. The total space use might be greater if we take account of bufferzones set up for reasons of environmental protection. This would add about 50%. Space for expansion of the harbour industrial areas will have to be found near the seaports of Zeeland and Groningen. Some dispersion of activities to these ports is already taking place.

– In big cities, the number of industrial jobs has been declining for some time. Recently the services sector is also stagnating. A steadily larger part of industry is being located elsewhere, in the municipal periphery or outside the city altogether. If it stays in the urban agglomeration, this is because of connections to the market – the need for good contacts with the centers of decision-making. Lack of space appears to be the major reason why industries are moving out of the city. Certain industries, with storage and distribution functions, are located in accessible places where delivery of goods is easier. The result of this development is a broad dispersal of industry and services. Still, some concentration of business services which need each other will continue to exist in the big cities, especially storage services.

See: 321B

– Facilities such as stores, schools, health centers follow residence. There is an obvious tendency to establish shopping complexes in places which are easily accessible for automobiles (super-markets), but this will be halted by regulations after 1980. The level of services in the small centers, important for scattered housing, will be further affected because the economic base will become too limited.

See: 321B, 322B

335B It is thus expected that the use of land for economic activities will increase significantly. In industry, a higher level of production will call for more space per worker, and the space needs per employee are rising in the services sector as well. Figures which would make possible a reliable estimate of the space needs for production are, alas, not available. If we start from the average of 0.24 hectare per million guilders gross production in 1975 prices, which is valid as an average for the industrial sector, then between 1975 and 2000 we arrive at an additional demand for space of 300 square kms. This figure, though, goes back to data from 1961 and is therefore certainly too low; moreover, it does not anticipate further growth of space needs. We thus anticipate in fact an additional space demand of 400 square kms.

See: 289B

See: 342B

See: 289B

336B Agricultural production will continue to rise until 1990 and decline thereafter. In the years 1975–1980, a continuing increase of scale in agricultural enterprises and units of cultivation and an increasing specialization raise productivity per farmworker considerably. After 1980, the government's concern with protection of the countryside and the natural environment will make itself felt; increase of the scale of production will no longer be possible everywhere, and stringent restrictions will be enforced in respect of mechanization and of the use of fertilizer and pesticides.

See: 377B

The establishment of national parks, national landscape parks and the negotiation of contracts with farmers about acceptable farming methods will give shape to the government's conservation policy. By 2000 about 10% of the cultivated area will be subject to such restrictions on its use.

The principal production factor, land, has been decreasing for several years, primarily because of the demands of urban development (for 97%). We expect that in the future this decline in the amount of agricultural land will continue but at a slower pace. During the period from 1975 to 2000, this will mean a decrease of 2025 square kms, an average of 8000 hectares annually.

See: 342B

337B At present, about 10% of all adults possess a second 'roof' (caravan, cabin-boat, second home). The strong growth of sojourn recreation which has occurred in recent years will continue until 1980. Thereafter, it will increasingly experience limitations imposed by the government in order to protect the landscape and the natural environment. This will also extend to the correction of undesirable conditions already in existence. The decline of disposable income after 1990 will further reduce sojourn recreation. Table 50B illustrates these tendencies.

See: 229

See: 296B

The increase in the number of caravans has recently been increasingly absorbed by parking them with farmers outside the official camping businesses. The 1975 draft Camping Bill aims at stemming this development; stipulations of this law would cause a rise in price at existing camp sites and make it difficult to establish new ones. The pressure to establish new sites will be great. We assume that the number of places will increase 20% by 1980 but not at all after that. This means that the rise in the number of caravans will soon have to be drastically curtailed due to lack of sites; for a (small) part, permanent sites abroad will supplement domestic possibilities.

We expect growing opposition to the vacation home in those localities where the social structure is threatened by this development; moreover the costs of a second home will be hard to bear after 1990. After 1980 the growth in the number of second homes is halted, and we also expect no further expansion of bungalow/vacation homes.

In regard to water sports, some expansion is still possible outside the heavily urbanized western part of the country. Keeping environmental and nature values in mind, one arrives at an absorption capacity of around 200,000 boats (not all of them cabin boats) or 40% to 50% more than at present. This upper limit will be reached in a few years, certainly if the limitations on caravans and second homes lead to a shift towards boats. We assume that the government by 1985 will already have taken measures to prevent the exceeding of this limit.

Table 50B. Sojourn recreation

	1975	1980	1990	2000
		– x 1000 –		
Caravans	300	340	350	350
Bungalows/vacation homes	40	50	50	50
Second houses	20	30	30	20
Cabin boats	40	50	55	50
Total	400	470	485	470

338B In 1975, the number of sites for tents and caravans was 260,000, of which 160,000, were permanently allocated. Of these, 72,000 were designated for permanent caravans. Until 1980, the number of sites can be increased by 20%, but after that it cannot be increased any more. Given a density of 25–30 units per hectare in camp sites and of 15 units per hectare for vacation homes, Table 51B reflects future space demands.

See: 342B

Table 51B. Space demands for caravans and vacation homes

	1975	1980	1990	2000
		– in km² –		
Caravans and tents, camp sites	65	80	80	80
bungalows and vacation homes	25	35	35	35

Remaining space demands

339B In the national structure scheme for drinking and industrial water supply, calculations were made of our future water needs. In this plan, drinking and industrial water needs were estimated to be 4000 million cubic meters for the year 2000. In our alternative B, taking account of the latest population figures and the expected economic development, water needs will come to 2900 million cubic meters in 2000, in contrast to 1700 million cubic meters in 1971. Throughout the country, the limits of the amount of ground water which can be pumped are steadily being approched. These limits are set by the technically available supply and by considerations of conserving nature, countryside and agriculture. At this time, the technically available amount is 1.9 billion cubic meters. In 1975, a total of 1.06 billion cubic meters of fresh water was pumped for water works and industries. Of this, 655 million cubic meters were for the waterworks. These were given permission to withdraw a maximum of 791 million cubic meters of ground water (as of June 1977). The submitted licenses for direct use by industry total 400 million cubic meters.

See: 123, 124, 289B

In increasing measure, recourse will have to be had to surface water and storage formation by reservoir areas and filteration areas. The water for this will come primarily from the Rhine River and its tributaries and from the IJsselmeer. The necessary accumulation depends on the quality of the water, the chance of calamities, the duration of passing calamitous pollution of the rivers concerned, and, naturally, on the hydrologic control of the rivers. If the chloride content of the Rhine can be reduced from 300 kg/sec. to 200 kg/sec. – and that is expected to happen – then construction of ± 75 km^2 of reservoir areas or of 125 km^2 filtration areas will be necessary until the year 2000. If the chloride content is higher, then a larger storage area will be needed. To give some idea of the magnitudes involved, all beaches, dunes and sandy areas totaled 400 km^2 in 1975. In the river Maas, although salinity is not important, the low volume of discharge would mean that storage basins and filtration areas will be necessary for storage purposes. In total, we estimate that, by 2000, a surface area of 100 km^2 will be used as storage basins, or 165 km^2 for filtration areas.

See: 342B

340 The powerful expansion of production in the past 25 years, accompanied by a shorter product life, has also produced an increasing stream of solid wastes. In the past, not much was done other than to dump the waste at some distance from the built-up areas; in 1973, the greatest proportion of the waste was deposited without any regulation in more than 550 dumps. Of the 13.4 million tons, 6.1 million originated from industry, 3.6 million from construction, 2.4 million from households and the rest from agriculture and the services.

There are four possible ways of dealing responsibly with solid waste:

- regulated dumping;
- composting;
- incineration;
- recycling.

341B In the future, there will be an end to unregulated dumping and more waste will be treated. We expect that, from now until 2000, the amount of solid waste will increase less than proportionately to the growth of the gross national product. In the year 2000, 25 million tons of material waste will be disposed of as follows:

See: 289B

- unregulated dumping: none
- controlled dumping: 10 million tons
- incineration: 10 million tons, with 2.5 million tons of residue
- composting: 5 million tons, with 3.5 million tons of residue.

After the wastes have first been compacted, they can be deposited to an average height of 5 meters. Thus, in 2000, 4 km^2 will be needed to store the

solid waste of that year. If we include the storage of past waste, the permanent space requirement is naturally larger. If waste land-fills are included in regional land-use plans, and if good waste management will enable such land to be used for other purposes after about 15 years, then the total surface which would be needed in 2000 for the storage of solid wate is estimated at 60 km^2.

See: 342B

Land use, summary

342B In Table 52B we summarize the various changes in the space requirements which have been discussed above.

Table 52B. Land-use, 1975–2000

	1975	change	2000
		– km^2 –	
Built-up areas*)	3,000	+ 1,900	4,900
of which industry and commerce		400	
Traffic outside built-up area**)	720	+ 65	785
of which: expansion of primary road network		40	
widening of existing roads		25	
Woods and countryside	4,800	– 100	4,700
Farming land	25,190	– 2,025	23,165
Remaining areas	100	+ 160	260
of which: waste land-fill area		30	
recreation area		15	
water storage basins (max.)		100	
water treatment plants		15	
Water and beach***)	7,350		7,350
Total	41,160		41,160

*) This includes accompanying small-scale recreation facilities, industrial areas and reserve construction space.
**) Roads, railroads and airports.
***) Includes a small strip of the North Sea and the largest part of the Waddenzee and the IJsselmeer. This does not include the reclamation of the Markerwaard (570 km^2).

This table shows that, following a general trend, in the 25 years until 2000 farm land will decrease by 2025 km^2 and nature reserves by 100 km^2. In comparison, from 1960 to 1975 the decrease was respectively 664 km^2 (including the reclamation of 364 km^2) and 77 km^2.

Moreover, it is true that certain activities entail selective limitations for land use in adjoining areas. Table 53B indicates which surfaces will be affected by the expansion of such use limitations between 1975 and 2000.

Table 53B. Areas with use limitations, 1975–2000

Caused by	surface, km^2	nature of limitation
harbour industry	80	cultivation
primary road network	3.600	cultivation
nature and countryside protection	2.300	certain forms of agricultural activities

343B In summary, our picture of future land use shows present trends continuing for another 5 or 10 years, and then being halted or in some cases reversed. The priority accorded by the government to the preservation of the

countryside and the natural environment demands a strict and effective land use policy. The results of this policy will become apparent after 1990. Suburbanization will be curbed, the exodus from the larger cities will diminish and it will be directed particularly towards medium-sized centers.

The dispersal of employment will follow two patterns. On the one hand, there will be a concentration of skilled and highly qualified posts in the large cities; on the other, there will be a general diffusion towards the medium sized centers.

The development of mobility is in agreement with these tendencies. The role of the automobile will in due time become less predominant. The reduced growth of income, and the decline of disposable income after 1990, lead to a decline in the number of private cars. This is enhanced by the increased cost of cars due to stricter environmental and safety requirements.

Public transport will increase substantially. Even so, the car will continue to be the preferred mode of transport for a large number of movements. Recourse will, however, increasingly be had to rented cars.

The strong growth of sojourn recreation will come to an end. Government regulations will not permit a further expansion out of concern for nature and for the countryside landscape. The public will have to change to recreation facilities in the immediate vicinity of the cities which will be created by the government.

By establishing national parks, national landscape reserves and national forests, the administration will strive for the preservation of the countryside and the natural environment. A considerable part of the cultivated land will be subject to restrictions on its use.

5.4. Environment

344 In judging the effect of human activities on the environment, we distinguish: i) environmental-hygienic aspects (water, air and land) and ii) spatial aspects (infrastructure and intensification of land utilization).

345 Water pollution is discussed, in regard to discharge and purification of biodegradable materials, in *349ff.* It seems that drainage from dwellings without sewers, together with the so-called effluent of sewage treatment plants for households and industries, will remain within acceptable limits. A problem which is not further elaborated is caused by phosphates, particularly in residential waste water.

These accumulate in the bottom mud of the water channels and form a permanent source of eutrophy (excessive presence of nutrients). Moreover, the Dutch surface water is burdened with phosphates from the rivers crossing the borders, especially the Rhine, whose water ends up in most parts of the Netherlands. Eutrophy causes impoverishment of flora and fauna in the water. It is not likely that all sewage treatment plants will be improved by an advanced waste treatment, which gets rid of the phosphates, before the year 2000. It is disturbing that, in addition to phosphates, there are more and more materials in the water which are difficult to break-down, the more so because steadily more use will have to be made of surface water for the provision of drinking water. The administration's policy is now directed to a curtailment or even termination of the discharge of heavy metals into the water. If complete purification at the source is not possible, this might mean the termination of some industrial activities. If this latter is not feasible, then continuing accumulation of these materials is inevitable. As a result of international treaties and (in the Netherlands) the Chemical Waste Act, we expect that no more deliberate dumping of (used) oil will occur. An important environmental problem will continue to be the possibility of accidents during the pumping, transport and loading and unloading of oil, especially because of the scale on which these activities will take place.

346B In 356ff, we estimate the expected air pollution due to the combustion

of fossil fuels in industry and transport. The future volume of emissions from these sources will be determined by

- the nature and amount of energy consumption, taking into account the (technical) possibilities for energy conservation;
- emission control measures in the broadest sense.

The expected volume of the so-called process-emissions (that is, all the air polluting discharges not caused by the burning of fossil fuels) is included in the emission figures on the basis of a global estimate.

If no measures are taken, the amount of air pollution will most probably result in significant violations of the standards for ozone and sulphurdioxide. Ozone is not itself emitted, but it originates in the atmosphere from reactions between nitrogenoxides and hydrocarbons.

Maximum restriction of sulphurdioxyde emissions are capable of bringing the concentration within the standards. Maximum restriction of nitrogenoxides and hydrocarbon emissions will bring the 1975 level or even a lower concentration within reach. In that case ozone concentrations will be about the same as present levels (which exceed U.S. standards).

See: 310B

347B The assumed increase in *energy consumption* will bring various dangers in its wake. The growth of total consumption will lead to an increase in heat emissions, resulting, in the warming up to the surface water and thereby in an increasing chance, among, other things, of botulism.

The use of nuclear energy, which is limited but not entirely absent from the present alternative, moreover has a number of specific drawbacks, such as the (small) chance of a large accident, radioactive pollution by the use of fissionable material, the storage of waste materials, the danger of theft and the dangers to personal freedom that may be connected to prospective security measures.

It was not possible to study the problem of chemical wastes, but, given the present problems and the expected growth of the chemical industry, one must reckon with serious difficulties in the future.

See: 336B, 337B, 342B

348B In 370Bff, we set out our expectations about increasing pressure on nature and the countryside by pollution on the one hand and by the intensification of agriculture, the increase of recreation and the expansion of the infrastructure on the other. The perspective is an impoverishment of the agricultural landscape and a loss of diversity of the natural environment, in spite of all sorts of government measures that will be taken particularly after 1980 to protect the countryside and the natural environment.

Water pollution by biodegradable materials

349 Biodegradable organic material appears in household waste water and in waste water from industry and cattle farms. It affects the oxygen content and has thereby a deleterious effect on various functions of the surface water. There are. broadly speaking, two methods of fighting this kind of pollution:

- purification oxydating-biological waste water treatment plants;
- prevention or limitation of pollution by restructuring the production process.

The treatment of waste water takes place in purification plants, either under public control or under control of private business. The second type of pollution control covers many measures. Some examples are the use of 'cleaner' machines, or of less polluting raw materials, the application of other production processes or the recycling of worthwhile materials from waste water. Such restructuring measures are restricted to industry. Estimates of future emissions requiring purification were based on population growth and the expected increase in the production of goods and services.

See: 123, 124, 289B

Because pollution differs greatly according to industrial branch and only four sectors are distinguished in this survey, it is assumed that production within these sectors retains the same relative composition as in the base year 1972.

350 Pollution by households is set at one 'inhabitant-equivalent' per capita. This is the amount of biodegradable organic material which requires as much oxygen for its decomposition as the waste water of one inhabitant. (For this, we adopt a chemical oxygen consumption of 135 grammes per 24 hours.)

351 The number of inhabitant-equivalents produced by industry is less easy to determine. The gross emission of industries without anti-pollution measures serves as a starting point for the calculation. This is then reduced by the part which can be eliminated by restructuring measures. For this, we used the figures for 1980 from the Indicative Long-term Program of the Ministry of Traffic and Public Works. We assume that restructuring measures per unit of production volume will be applied to their fullest extent, so that after 1980 no further reduction of pollution will take place on this account.

352B The discharges of biodegradable materials can be reduced not only by adaptation of the production process but also by purification. In regard to purification measures, we assume that in 1985 the pollution of the surface water will have been reduced to an acceptable level and that, after that year, measures will be taken so that the emissions into the surface water will remain at the same level.

The portion of household waste water to be purified is calculated from the gross emission, subtracting emissions from dwellings not connected to the sewer system. At present, this is the case for 13% of all dwellings; this percentage will be reduced to 10% in 1980 and in the period after that to 8%.

In these calculations, we do not include the amount of sewage which comes into the surface water through over-flows; this can be prevented. It is not known how many inhabitant-equivalents are discharged from this source. The costs involved in purification and anti-pollution measures cannot be estimated separately.

Table 54B. Waste water

	1972	1980	1900	2000
		— million inhabitant equivalents —		
Households:				
— gross emission	13.3	15.0	14.5	14.6
— no sewer connection	1.7	1.4	1.2	1.2
— to be purified	11.6	12.6	13.3	13.4
Industries:				
— gross emission	40.6	65.0	85.7	94.3
— reduction by anti-pollution measures	9.8	37.7	49.5	55.0
— to be purified	30.8	27.3*)	36.2	39.3
Total to be purified	42.4	39.9	49.5	52.7

*) In the Indicative Long-term Program, 12 to 16.5 million is indicated here. It is not clear whether this difference can be attributed to the difference in the projected production volume of that year alone.

353B As basis for calculations of the purification capacity required, it is assumed that from 1985 all of the waste water will be treated in a biological facility. We also assume an average over-capacity of 10%.

Table 55B. Capacity of sewage treatment plants

	1972	1980	1990	2000
	— million inhabitants equivalents —			
Households	4,8	10	14,6	14,7
Industries	3,7	12,8	39,8	42,2
Total	8,5*)	22,8**)	54,3	57,9

*) According to Government Institute for Sewage and Waste Water Treatment.
**) According to the Indicative Long-term Programme.

After 1985, the emission of waste water will be approximately 5 million inhabitant equivalent, namely 1.2 million from households without sewer connections and 3.8 million in the effluent from purification plants. This total approaches the maximum estimate of the absorption capacity of the surface water. To limit the emission of unpurified waste water to 5 million inhabitant equivalents, the average efficiency of the purification facilities will have to rise from 90% to 93%.

354 An additional problem is the removal of the residual sludge. Until recently, one could use this residue in agriculture or for public gardens, sports fields, etc. To the extent that more sewage treatment plants are built, there will be more sludge. Only a portion can be used productively. More modern methods will have to be applied to treat the sludge (mechanical dehydration).

355B The space needs for the oxidating-biological waste water treatment are strongly dependent on the depth of the aeration chambers and on the manner of sludge treatment. To the extent that the capacity of the facilities increases, the necessary land surface per inhabitant-equivalent declines quite rapidly because of the use of deeper aeration chambers and mechanical sludge dehydration. We assumed an average space demand of 0.55 m^2 per inhabitant-equivalent for publicly-owned facilities and of 0.3 m^2 per inhabitant-equivalent for purification plants under control of private industry.

The limitation of water pollution by anti-pollution measures demands much less space. Process adaptation usually requires no extra space at all. The abarement of water pollution from bio-degradable organic material, on the basis of the preceeding data, will require a land surface of about 11 km^2 in 1980. In 1990, the required area is 26 km^2, and in 2000, about 27 km^2.

See: 342B

Air pollution

356 Energy consumption and the concomitant emissions from mobile combustion engines are determined by developments in the areas of mobility, goods transport and recreation. Mobile combustion engines are used in traffic and transportation (road traffic, rail traffic, shipping and aviation), agricultural machines and a residual group (internal transportation in factories, etc.). Fuel consumption and emissions are dependent on the nature of the engine and the type of fuel as well as on the required performance. In this regard, the following is assumed:

See: 328B, 331B, 337B, 338B

— the expected technological developments (engines, fuels and vehicles) are to a large extent autonomous, independent of the policy followed in the Netherlands. The reason is that these developments will occur primarily abroad under the influence, for example, of stringent environmental legislation in the U.S.A., Japan and Sweden. The European Economic Community goals for 1980 and later in regard to exhaust emissions and sulphur- and lead-content of fuels will become legally enforced standards.

Towards the end of the century, those standards will be applied here (for CO, HC, NOx) which are anticipated after 1980 in the US and Japan.

357 To determine future energy consumption, it was posited which fuels in which type of combustion engines will be important until 2000. Changes and adjustments of power sources will take place gradually. For the most part they will be the sum of a number of small improvements. After 1980, some significant advances can be expected with the introduction of the CVCC (Compound Vortex Controlled Combustion), the Stirling engine, the gas turbine and electric traction, the application of which, however, will be limited. For the rest, the conventional otto engine and the diesel engine will continue to dominate the picture.

In regard to domestic shipping and the railroads, after 1990 steam-turbines fired with pulverized coal will be introduced. In the remaining categories of mobile combustion engines, the expectation is that the now familiar hydrocarbon fuels will continue to be used; the most important exception will be petrol, which will be blended with lower alcohols up to 15%. This expectation is based on the following considerations:

– the fuels will have to be suitable for the engines;

– they should be liquid, volatile at normal temperatures and under limited pressure, with a large degree of energy intensity, capable of being stored, distributed and transported in the existing fuel infrastructure without too many safety risks;

– the fuel storage in the mobile engine itself should be simple and safe, and guarantee an adequate action radius.

358B In the calculation of the fuel consumption for road transport, a decline of specific consumption is assumed because of the reduction of rolling resistance, smaller and better engines and transmissions (commercial vehicles will be somewhat heavier on the average because of the introduction of gas turbines), improvement of the aerodynamics and the shift from petrol engines to other types with a higher efficiency. This contrasts somewhat with the trend towards heavier automobiles to meet safety requirements. The total decline of specific fuel consumption for otto engines will be about 10%–15% in 2000 for private and delivery vehicles, and up to 10% for commercial vehicles. In 1970, the consumption of regular petrol made up 18% of the total. In 1975, this had declined to 12%, although by that time 40% of the private and delivery vehicles and most mopeds could operate on regular petrol. It is estimated that in 1985, 65% of the petrol-vehicle mileage will be suitable for regular petrol, which, according to the 'Lead Regulation', may contain a maximum of 0.4 g/l lead.

The 35% premium petrol which will then still be needed will reach the octane requirement of at least 98 by the addition of methanol. In 2000, the entire automobile fleet will be able to use lead-free petrol/methanol. It is assumed that the anti-knock requirements can then be attained, among other ways, by the addition of methanol.

The calculated energy consumption is appreciably lower than what would follow from a simple extrapolation of past trends. The savings will be attained by:

– more economical petrol engines;

– a shift from petrol engines to engines with a higher efficiency, such as diesel, Stirling and gas turbine;

– vehicle improvement;

– reduced annual mileage per vehicle;

– smaller engines for private and delivery vehicles;

– technical traffic regulations.

See: 310B

359B A summary of the fuel consumption by mobile combustion engines is presented in Table 56A.

Table 56B. Domestic fuel consumption by mobile combustion engines

	1970	1975	1980	1985	1990	2000
			— million kgs —			
Petrol (excl. methanol)	3035	3500	3798	3240	2968	1578
of which: regular	540	429	1711	2178	2385	1578
premium	2495	3071	2087	1056	583	—
Methanol	—	—	—	130	169	193
Gasoil	2220	2744	3535	4395	4811	4577
of which: automobile use	1260	1750	2275	2825	3021	3057
other use	960	994	1280	1570	1790	1520
L.P.G.	69	245	379	518	534	500
Aircraft petrol	14	8	5	1,5	1	—
Jet-fuel	692	842	1000	1000	1100	1600
Coal	—	—	—	—	—	380
Total $x10^{16}$ joules	27.9	34.0	40.0	42.6	43.0	38.7
Percentage of total domestic energy consumption	15%	14.5%	13.5%	13.0%	12.3%	11.0%

*) Including use in gasturbines and Stirling engines.

360 The analysis of emissions from mobile combustion engines is limited to carbon monoxide (CO), hydrocarbons (HC), nitrogen-oxides (NOx), aerosoles (TSP, totally suspended particulate matter) (including soot), lead and sulphur-dioxide SO^2. In regard to carbon monoxide and sulphur dioxide, the emissions of road traffic in 1975 were about the same as in 1970. Hydrocarbons were reduced, lead, nitrogen-oxides and aerosoles increased.

The measures which have already been taken to reduce the carbon monoxide content, and hydrocarbons generally, caused an increase of nitrogen-oxide emissions. The increased number of diesels has meant increased NOx as well as increased particulates emission. The increase in the emission of lead is connected to the growing use of premium petrol. In spite of the hefty increase in the use of (automobile) gasoil, the SO^2 emission has not increased because of the implementation of the 'sulphur Regulation'. The earlier assumptions about the introduction of standards are important; these are shown in table 57.

Table 57. Standards for emissions from private automobiles (based on vehicle weight of 1000–2500 kg)

	Max. discharge via exhaust			Max. HC-discharge	
	HC	CO	NOx	crank-case	tank + carburator
	g/km			g/day	
1985	1.1	14	2	0	10
1990	0.5	7	1	0	6
2000	0.3	4	0.5	0	0

361B In calculating exhaust emissions, we considered the following:

— the announced standards affect only private and delivery vehicles weighing no more than 3500 kgs, with petrol engines, in city traffic;

— the average emission factor of the automobile fleet will be higher because series models may emit 20%–30% more, and older automobiles do not comply with the standards;

— the emissions are dependent on the use; for the same distance travelled they are lower outside urban areas than in city traffic;

– there are as yet no emission standards for commercial vehicles, buses, motorcycles and motorized bicycles;

– the vehicle fleet is shifting from petrol engines to less polluting engines such as the LPG and diesel. Also, in the 1980s, the very clean Stirling engine and electric traction will be introduced (by 2000, 10–15% of the total);

– in spite of all the conceivable improvements, by 2000 the petrol engines of private and commercial vehicles will not be able to satisfy the proposed standards for CO, HC and NOx. The cleansing of the petrol engine will occur primarily through the utilization of engines with controlled combustion (such as the CVCC engine of Honda). It is assumed that in 1985, 10% of the petrol private and delivery vehicles will be equipped with such engines and by 2000, 100%. Extensive application of difficult and expensive after-treatment of exhaust gases is unlikely. The solution which is anticipated in Western Europe, in contrast to the United States, is the development of a cleaner combustion process in the engine itself. This we consider feasible because legislative regulations will follow the lead to technological possibilities.

Table 58B. Emissions from fuel combustion in mobile engines

	1975	1985	2000
		– mln. kg –	
Carbon monoxide	1410	840	180
Hydrocarbons	171	117	50
Nitrogen oxide	181	215	132
Aerosoles	15	16	14
Sulphur dioxide	30	43	45
Lead	2,8	1,2	0

– According to expectations, there will be a significant decline in the emission of carbon monoxide. The share of road traffic in the total CO-emission will decline from 95% to 75% but will remain high; the share of inland shipping and aviation will increase.

– Emission of hydrocarbons will be reduced by 70%. The decline is primarily in road traffic. Inland shipping will continue to have a high level of emissions.

– Emission of nitrogen-oxides is primarily caused by road traffic and inland shipping. In 2000, the total emission will be about back to the level of 1970. In shipping, the emission rate will continue to rise until 1985. The sharp decline of emissions by private vehicles after 1985 will be to some extent cancelled by the practically constant level from commercial vehicles.

– In regard to aerosoles, the emission will remain constant. A decline of road traffic emission is offset by emissions from inland shipping.

– Legislation will provide that in the future only lead-free petrol will be used. The demand for an anti-knock characteristic will be met by a rise in the aromatics content and/or the addition of up to 15% methanol.

– The increase of the emission of sulphur dioxide by 50% until 1985 is an obvious exception to the course of the other emissions. This will be caused primarily by road traffic and inland shipping. After 1985 the decline of road transport will be offset by the increase of inland shipping.

362B The use of fossil fuels in furnaces for domestic heating and industrial combustion is an important part of the total energy consumption. This consumption was calculated earlier on the basis of the developments of the population and the economy. It causes emissions which are estimated on the assumption that in the burning of coal dustcatchers will be generally used. For all other fuels we assume the same reduction of emissions as at present. The result is given in table 59B.

See: 289B, 310B

Table 59B. Emissions from furnaces

	1975	1985	2000
		— million kgs —	
Carbon monoxide	32	50	70
Nitrogen oxides	176	310	430
Sulphur dioxide	338	870	1010
Aerosoles	24	70	110
Hydrocarbons	9	12	14

363B In addition to emissions from furnaces and those from traffic and transportation, there is a third category, process emissions. These consist primarily of the emissions from chemical and other production processes but also of emissions from transshipment, evaporation of stored liquids, etc. A precise calculation of these is not possible; to complete the picture it suffices to estimate, in broad lines, a total proportionate to the production volume. The sum of all emissions is given in Table 60B.

Table 60B. Total air pollution emissions

	1975	1985	2000
		— million kgs —	
Carbon monoxide	1640	1200	600
Nitrogen oxides	380	560	600
Sulphur dioxide	410	970	1150
Aerosoles	210	300	370
Hydrocarbons	420	470	490
Lead	2.8	1.2	0.0

364B Important for public health and the environment are the atmospheric *concentrations of pollutants at 'living level'.* The magnitude of concentration over an entire year is in principle dependent on all emissions within large distances; in practice, these are primarily those of the Netherlands itself and the border areas in Germany and Belgium.

If the pattern does not change much and developments in the border areas keep about in step with those in the Netherlands, the magnitudes of concentration will be approximately proportional to domestic emissions. Under these circumstances, the following violations of the concentration standards can be expected:

— sulphur-dioxide (upper limit = 250 microgram/m^3 : limit for daily average, not to be exceeded more than 7 times per annum);

— ozone (upper limit = 160 microgram/m^3: American limit for hourly average, no exceeding of limit allowable).

Ozone is not emitted as such but originates in the atmosphere from nitrogen oxides and hydrocarbons. In addition, concentrations of nitrogen-oxides themselves and of the aerosoles can be high, but it cannot be determined whether they will exceed permitted standards or not.

It is obvious that the violations of standards for sulphur-dioxides and ozone will be significant. For sulphure-dioxide, this could be somewhat lessened by adjustment of the location and height of the chimneys, but significant violations will continue to occur. It is therefore essential to limit the emissions themselves. This can happen by conversion to other fuels, by fuel conservation and by cleansing. Since the amount and kind of fuel are based on other considerations, the only possibility is the application of a higher level of purification than has been thus far taken into account in the emission calculations. In regard to furnaces, this means techniques to reduce aerosoles (in the emission estimates, it was taken for granted that these had already been applied), far-reaching

desulphurization processes and techniques to limit nitrogen-oxides. The reduction of emissions by maximum application of these measures is given in Table 61B.

Table 61B. Reduction of emissions from furnaces through additional purification measures

	1985	2000
	— million kgs —	
Aerosoles	14 (+ 140)*)	30 (+ 300)*)
Nitrogen-oxides	210	300
Sulphur-dioxide	570	750

*) In the earlier emission calculations, the amounts in parentheses were already subtracted.

365B In regard to mobile combustion engines, we assumed a combination of changes of fuel, fuel conservation and emission control regulations. With the emission calculations, it was assumed that these measures had already been taken; the emission reduction was already subtracted. In regard to process emissions, in the absence of hard data the reduction is estimated. Table 62B indicates which emissions will remain after application of all these measures.

Table 62B. Residual emissions after maximum application of purification measures

	1985	2000
	— million kgs —	
Carbon monoxide	1200	600
Nitrogen-oxides	340	280
Sulphur-dioxide	370	340
Aerosoles	210	270
Hydrocarbons	420	400
Lead	1.2	0.0

366B We have also calculated the cost of air pollution abatement (the indicated purification measures as well as the measures which were discounted in the emission calculations). This has been done for mobile combustion engines (traffic, etc.) and for furnaces, but it was not possible for process emissions. The results of such calculations can be no more than rough estimates; these are given in Table 63B.

Table 63B. Estimates of costs for emission reductions (exclusive of process emission)

	1985	2000
	— million guilders, 1975 prices —	
Investments:		
furnaces	2,600–5,900	3,400– 7,600
traffic etc.	1,400–2,700	2,900– 5,800
Total	4,000–8,600	6,300–13,400
Annual charges:		
furnaces	1,400–3,100	1,600–3,700
traffic etc.	210– 400	350– 700
Total	1,600–3,500	2,000–4,400

367B If one assumes that, in the border regions, emissions will be reduced by the maximum application of control techniques, approximately in the same proportion as within the Netherlands, one can, in a manner similar to the used in 364B, make a rough estimate of the concentrations at the living level which

would exist in the year 2000. Most emissions would be lower than in 1975, and so would the concentrations. This means that for most substances, violations of the concentration standards are not very likely to occur. Ozone is possibly an exception; its concentration is in 1975 already clearly in excess of the norms.

368B Radioactivity is a potential health and environmental hazard. If the installed capacity of nuclear power stations is expanded, this problem is more pressing than if the present capacity is maintained, as is here assumed. Even in the latter case, however, risks remain.

369B Very nearly all fuel consumption leads eventually to the generation of heat. Heat can be particularly damaging to the environment in so far as surface water is warmed up by being used as coolant. Some indication of the order of magnitude of the amount of heat will be thus discharged is given in table 64B.

Table 64B. Heat transfer to surface water (tough estimate)

1975	1985	2000
	– x 10^{16} joules –	
70	100	120

In the past the warming of surface water has been one of the causes of botulism. The strongly increased discharge of heat will quite likely enhance the probability of botulism in the future.

Countryside and natural environment

370B Little is yet known about the effect of air pollution on the natural environment. Research has been done primarily about the effects on plants, specifically agricultural crops. It appears that various types of plants react differently to air pollution; thus annual meadow grass is sensitive to smog, and gladioli to hydrogen fluoride. The sensitivity of the lichens which grow on trees has been known even longer; the specific behaviour of this organism has been studied according to type for various kinds of pollution. Recently the existence of these lichens in the Netherlands has been examined again and many of the earlier common species have entirely disappeared or have become very rare. Other ecosystems are also influenced by air pollution. In the neighbourhood of sources of SO^2, the water flora is severely impoverished but even at greater distances the influences are noticeable. In Sweden many lakes have been acidified by air pollution from West Germany and the Netherlands, and the lichens are beginning to die out. In our own country, certain eutrophic symptoms in the already seriously reduced nutrient-poor fens and moors are connected with the sulphur content of rain.

See: 363B, 365B

With maximum application of measures to limit air pollution the situation of in 2000 will show a slight improvement on that of 1975.

See: 349 ff.

371 Damage to the natural environment, caused by water pollution, attracts most notice if it occurs suddenly, for example by massive fish deaths. There is, though, a gradual effect as well: the more sensitive plant and animal species are pushed out by the less sensitive (A kind of Gresham's Law of Survival). As a result of the increase in the concentration of plant nutrients (the so-called euthrophy), caused by detergents and the decompositions of discharged organic material, species which are at home in nutrient-poor environments have become rare. Also in naturally nutrient-rich waters, because of overdosing of nutrients, shifts have taken place in the mix of the species, so that even well-developed ecosystems, belonging to this type of water, have become

rather rare. In conditions of very serious euthrophy, the explosive growth of a certain kind of algae can occur; some of these algae are poisonous. When the algae die and decay, serious shortages of oxygen can occur.

In addition to a surplus of plant nutrients, other factors can also change the mix of species, namely organic materials (phenols, polychlorbiphenyls and many others) and heavy metals (lead, mercury and cadmium) which do not decompose rapidly. Often these materials accumulate in the food chains, so that animal species at the end of these chains, like seals and terns, experience the unfavorable consequences first. Undermining of the ecosystem in and next to the water by eutrophy and accumulation will, it is expected, continue to increase in the future. In regard to oxygen shortages in the water resulting from the discharge of biodegradable organic matter, causing massive fish deaths, it is expected that this problem will be solved at the national level by present policy. Locally, though, shortages will continue to appear and the oxygen shortages caused by the death of algae as a result of the on-going eutrophization will continue to increase. The chance of an explosive development of the bacteria which cause botulism will increase sharply as a result of the warming of the surface water by the increased discharge of coolants. This will be true not only for the bacteria strain which has caused massive bird deaths in the last years (in 1976, 60,000 birds died because of this) but also in other strains which can be fatal to humans.

See: 369B

372 For hundreds of years, the Netherlands have had no natural areas any more in the sense of an ecosystem that has not been influenced by man. Until about 1900, there was an agricultural countryside which, due to continuity of land use, reinforcement of the biological gradients (i.e. transitions, for example, from nutrient-rich to nutrient-poor, dry to wet, etc.) and leaving intact the more or less connected areas outside the cities, provided for a large number of species and ecosystems.

This countryside can be called semi-natural; the flora and fauna have settled there spontaneously. Since 1900, though, the open area has been increasingly reduced and fragmented by the expansion of the cities and by road construction while, moreover, the favourable influence of agricultural practices on the diversity of the countryside has been abolished by increased intensification. With the concentration of more intensive agriculture on certain lands, other areas have become superfluous from the agrarian point of view, and these were left uncultivated. These constitute the open or wilderness areas which we now call nature reserves. In this way the distinction between nature reserves and cultivated land arose.

373B The area of the nature reserves was subsequently rapidly reduced because of cultivation while their management, which had formerly been an agrarian necessity, was neglected. This meant a break in the continuity which was a condition for the maintenance of a richly varied countryside. The natural and scenic value of the cultivated lands is steadily being undermined by an increase in scale, intensity and uniformity of agricultural practices and by the removal of hedges, ponds and fences. In the cultivated countryside, the number of plant and animal species has declined sharply. The nature reserves, because of their isolated locations, appear to offer inadequate survival opportunities for some plants and animals; the number of endangered species in all of the Netherlands is increasing. It is expected that this development will continue for some time.

See: 342B

See: 321B, 337B

374B From the estimates of land use in Table 52B, it can be seen that the expansion of the built-up areas, industrial areas and roads will reduce the area of the nature reserves even further. The figures do not reflect the effect of increasing suburbanization and the expansion of recreation and bungalow parks on the adjoining nature reserves, nor the effect of recreation itself.

See: 332B

These pressures on nature reserves will increase until 1990, as will the consequences of criss-crossing by highways, pipelines and hightension wires.

Measures for the regulation of the water supply, such as the lowering of the water table, infiltration and artificial rain can also influence the circumstances in a nature reserve. After 1990, however, a turning point is reached in the sense that these unfavorable developments are curbed by conservationist regulations.

375B More attention is to be given to the protection of the nature reserves by creating National Parks. These are connected areas of at least 1000 hectares, consisting of natural terrain, water and forests with particular plant and animal life. Twenty such areas, together 780 km^2, are being considered; we assume that these plans will be realized. We expect, though, that not all of the ecosystems which are present in these areas can be preserved. After all, a number of activities will continue to take place within these parks (for example, water supply and use as military maneuver grounds). Moreover some parts will be unfavourable affected by their location in the middle of a steadily deteriorating agricultural area.

376B The area of cultivated land will decline because of urban expansion, industrialization and road building (see table 52B). Until 1990, though from 1980 at a slower pace, the cultivated countryside will experience the consequences of the increase of scale and specialization of agricultural methods, steadily increasing use of artificial fertilizers and pesticides, mechanization which demands large areas of uninterrupted terrain, interventions in the water management system, and intensive husbandry and poultry farming. By the filling in of ditches and drainage trenches, the canalization of streams, the clearing of woods and removal of wood fences, the diversity of the landscape will diminish; because of the high nitrogen use and because of a water management system which is largely oriented towards mechanization, the species variety of plants (and animals) will decline. In the beginning of the century one could find several hundreds of plant species in our grassland. The number at present is about one hundred; it is to be expected that in the near future, there will be only a few tens of species left.

See: 289B, 336B

No estimate can be made of the number of endangered animal species; doubtless it is a multiple of the number of endangered plant species, because with every plant which disappears, a number of insect and other animals are also threatened. This is occurring not only in the Netherlands; the same species are disappearing elsewhere for the same reasons.

See: 289B

377B With the anticipated growth in agricultural productivity, this development will continue until 1990, although from 1980 at a lesser pace. Thereafter the governments' conservationist policy will make itself felt: increase of the scale of agriculture will be no longer possible everywhere, and mechanization, the use of fertilizer and of pesticides will be restricted. This policy will be further reflected in the establishment of National Countryside Parks.

The proposed National Countryside Parks are defined as areas of at least 10,000 hectares, which will consist of natural terrain, water and woods (± 20%) and of the cultivated land and settlements (± 80%), representing a richness of natural and scenic qualities and of cultural-historical values, and forming an unified entity. The establishment of 17 such parks, with a total area of about 3000 km^2 is envisaged in order to maintain and develop the specific and differentiated character of these areas. This will have to be realized by measures regarding urbanization, road construction and industrialization, and, for the cultivated parts, by the application of management and maintenance agreements. These regulatory agreements between the Administration and farmers will orient agricultural activities towards the preservation of nature in about 30% of the parks, and in some 10%, the preservation of nature and landscape will have first

priority (so-called reserves). On the remaining cultivated land (±40%), agriculture will develop without restrictions, with maintenance agreements for certain elements in the landscape (windbreaks, pollard willow trees). For management as well as maintenance, the voluntary cooperation of the farmer will be required. Management and maintenance agreements can also be made outside the countryside parks. Altogether, such management agreements and the reserves will cover about 2300 km^2.

We expect that the intended goals will be achieved, at least in those areas that are still intact in 1990. Large funds will however be required for the management agreements because the economic development in agriculture elsewhere continues as before, so that the income differentials that must be met out of public funds increase.

378B In summary we may state that the environment will deteriorate further until 1990 as a result of more intensive agricultural methods, recreation, industrialization, suburbanization, road construction and the like. After 1990, however, the pace slackens, and after 1990 there is a clear turn for the better which may improve conditions relatively to the preceding years. This improvement will however become apparent only after a lapse of time because the natural environment will not react immediately. For the same reason it may be expected that the deterioration of the years before 1990 still has some effect after that year. A return to the present situation is not to be expected; too many irreversible changes will by then have taken place. Moreover it should be borne in mind that the present situation of the environment is unstable; even without further spoliation or economic growth the natural environment will deteriorate. In order to maintain present conditions in the face of a constant pressure from outside a large effort would be necessary. Altogether we do not expect an improvement of the situation in 2000 relatively to 1975.

Appendix 1

List of publications of the Council

I. Rapporten aan de Regering (Reports to the Government) *)

Introductie, taak, plaats en werkwijze (Introduction, responsibilities, position and working methods) (1974)

1. Europese Unie (European Union) (1974)
2. Structuur van de Nederlandse economie (Structure of the Netherlands Economy) (1974)
3. Energiebeleid op langere termijn (Long-term Energy Policy) (1974)
   1 to 3 published in one volume
4. Milieubeleid (Environment Policy) (1974)
5. Bevolkingsprognoses (Population Forecasts) (1974)
6. De organisatie van het openbaar bestuur (The Organization of Public Administration) (1975)
7. Buitenlandse invloeden op Nederland: Internationale migratie (Foreign Influence on the Netherlands: International Migration) (1976)
8. Buitenlandse invloeden op Nederland: Beschikbaarheid van wetenschappelijke en technische kennis (Foreign Influence on the Netherlands: Availability of Scientific and Technical Knowledge) (1976)
9. Commentaar op de Discussienota Sectorraden Wetenschapsbeleid (Comments on the Discussion Paper on Sectoral Councils for Science Policy) (1976)
10. Commentaar op de nota Contouren van een toekomstig onderwijsbestel (Comments on the White Paper on the Contours of the Future Educational System) (1976)
11. Overzicht externe adviesorganen van de centrale overheid (Survey of External Advisory Bodies of the Central Government) (1976)
12. Externe adviesorganen van de centrale overheid, beschrijving, ontwikkelingen, aanbevelingen (External Advisory Bodies of the Central Government: Description, Developments, Recommendations) (1977)
13. 'Maken wij er werk van?' Verkenningen omtrent de verhouding tussen actieven en niet-actieven ('Do we make Work our Business?' An Exploratory Study of the Relations between the Economically Active and Inactive Persons) (1977)
14. Overzicht interne adviesorganen van de centrale overheid (Survey of Internal Advisory Bodies of the Central Government) (1977)
15. De komende vijfentwintig jaar, een toekomstverkenning voor Nederland (The Next Twenty-Five Years: a Survey of Future Developments in the Netherlands) (1977)
16. Over sociale ongelijkheid, een beleidsgerichte probleemverkenning (On Social Inequality: a Policy-oriented Study) (1977)

II. Voorstudies en Achtergronden (Preliminary and Background Studies)

W. A. W. van Walstijn, Kansen op onderwijs, een literatuurstudie over ongelijkheid in het Nederlands onderwijs (Educational Opportunities: A Literature Study on Inequality in the Netherlands Educational System) (1975)

I. J. Schoonenboom and H. M. In 't Veld-Langeveld, De Emancipatie van de vrouw (Women's Emancipation) (1976)

G. R. Mustert, Van dubbeltjes en kwartjes, een literatuurstudie over ongelijkheid in de Nederlandse inkomensverdeling (Dimes and Quarters: a Literature Study on Inequality in the Distribution of Income in the Netherlands) (1976)

J. A. M. van Weezel a.o., De verdeling en de waardering van arbeid (The Distribution and Appreciation of Work) (1976)

A. Ch. M. Rijnen a.o., Adviseren aan de Overheid (Advising the Government) (1977)

J. J. C. Voorhoeve, Internationale Macht en Interne Autonomie (International Power and Internal Autonomy) (1978)

*) The Reports nrs. 13 and 15 have been translated into English.