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THE NAMEA EXPERIENCE

An interim evaluation of the Netherlands' integrated
accounts and indicators for the environment and the economy

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The views expressed in this paper
are those of the authors and do
not necessarily reflect the views
of Statistics Netherlands.

Abstract

The national accounts publication in the Netherlands contains not only
the conventional economic accounts and indicators, but also an
integrated system of environmental and economic accounts, the NAMEA
(National Accounting Matrix including Environmental Accounts). This
NAMEA-system extends the set of core economic aggregates with five
summary environmental indicators. Moreover, the NAMEA is an analytical
framework that is increasingly used for all kinds of analyses and
policy simulations on the interactions between the monetized economy
and the environment.

The paper reports on the present status of the NAMEA-approach, in
the Netherlands and elsewhere, and gives a concise summary of this
approach. Next, it reviews the present applications of this framework
in the Netherlands. Finally, a comparison with the SEEA is made and
various common misunderstandings regarding Green National Income are
set out.

Contents

1. Present status of the NAMEA-approach

Since 1994, the standard national accounts publication in the Netherlands (e.g. CBS, 1995a) contains not only the conventional economic accounts and indicators, but also an integrated system of environmental and economic accounts, the NAMEA (National Accounting Matrix including Environmental Accounts). This NAMEA-system yields consistent estimates for all conventional economic aggregates and as well for five summary environmental indicators. More importantly, this system enables a comparison of the contribution of all economic activities to conventional policy goals (GDP, exports, employment, etc.) with their contribution to major environmental problems (greenhouse effect, ozone layer depletion, acidification, etc.).

The first release of this new system was the subject of an "Economics Focus" in The Economist (1993) and also made it to the front page of the leading Dutch morning paper, under the title 'Importance agriculture outweighed by environmental damage by this sector'. Although this head-line did not do full justice to the nuances in the press release by Statistics Netherlands, it provides an indication of the kind of messages that can be conveyed by the NAMEA. Partly as a consequence of this information, stringent measures to reduce the phosphoros and nitrogen emissions by factory farms have recently been approved by Dutch Parliament. Besides, a recent report by the World Resources Institute signalizes that the summary environmental indicators, combined with information on the relative contribution of each industry, have played a catalyzing role in reaching voluntary agreements between the Dutch government and industry representatives on a significant reduction of toxic emissions (Hammond et al., 1995: 7).

Meanwhile, NAMEA-figures have been included in the government budget speech. They have also been used in a government-commissioned study in which the trade-offs in future sustainable economic development scenarios were made explicit (Verbruggen, 1996). In this study, the NAMEA has served as the basic consistency framework for modelling and

forecasting. It is expected that the results of this study will dominate the next round of discussions on the integration of economy and ecology in the Netherlands. Analogously, the NAMEA has been used in a linear programming model in which a Sustainable National Income for the Netherlands was estimated (De Boer et al., 1994).

Recently, the Commission of the European Communities (1994) released an official communication to the Council of Ministers and the European Parliament, entitled 'Directions for the EU on Environmental Indicators and Green National Accounting: The Integration of Environmental and Economic Information Systems.' In this communication, the Commission proposes to establish "... a European System of Integrated Economic and Environmental Indices. The system - which will resemble the Dutch NAMEA system, but will be developed using a common European System of Environmental Pressure Indices - will be available to Member States and the EU in 2-3 years time. It will need permanent updating."

In a subsequent resolution, a commission of the European Parliament suggested to allocate a substantial budget to this very proposal, in order to avoid delays in its execution. In October 1995, Eurostat and Statistics Netherlands jointly organized a workshop on the NAMEA-concept, focusing on emissions of pollutants and waste by industries and by households. The workshop was attended by all EU Member States, except Austria; most countries sent both a national accountant and an environment statistician. At the end of last year, Eurostat has announced that its aim is to be able to publish in around 12-18 months time NAMEA-type information systems for all or most Member States. For this purpose, Eurostat has already proposed standard classifications of industries, household consumption purposes and pollutants, as well as a common reference year.

Last year's review of country practices (Smith, 1995) noted that Sweden and the United Kingdom have decided to adopt the NAMEA as the organizing framework for their work. In Sweden, such a framework has already become available (National Institute of Economic Research and

Statistics Sweden, 1995) and it was used in a model that assessed the damage from sulphur depositions in Sweden (Ahlroth and Skånberg, 1995).

The recently approved strategic plan of Statistics Netherlands until the year 2000 mentions: "In the past few years, the CBS has worked on an extension [of the national accounts] with other aspects. An environmental module [NAMEA] has been developed, that presents all kinds of environmental phenomena, fully integrated with the description of the economic process. ... This approach, in which the national accounts is supplemented by a statistical description of other areas, will be pursued. The focus will be on the development of a 'SESAME': a 'System of Economic and Social Accounting Matrices and Extensions'. This will provide an integrated description of economic, social and ecological phenomena. Such a consistent overall description will cater for the data needs on behalf of a consistent overall policy in all these fields." (CBS, 1995b: 23)

The next section of this paper gives a concise summary of the NAMEA-approach.[1] Section 3 dwells upon the applications of the NAMEA and elaborates on the recently completed study on sustainable economic development scenarios for the Netherlands until 2030. Section 4 then compares the NAMEA-approach with the SEEA and points to some common misunderstandings concerning monetary valuation methods. The final section contains a summary and some conclusions for statistical policy.

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1. For a more detailed explanation, it is referred to Keuning and De Haan (1996). That paper also contains some results from the recently completed time-series of NAMEAs for the Netherlands, and illustrates the kind of analyses that can be done with such a data framework. Finally, that paper discusses the extension of the NAMEA into a SESAME, a broad information system for economic, social and environmental statistics. Again, this is illustrated with some figures.

2. Concise explanation of the NAMEA

The NAMEA is a statistical information system that combines national (economic) accounts and environmental accounts in a single matrix. Just like the conventional national accounts, this matrix serves a dual purpose: 1. yielding integrated and consistent summary indicators for a quick insight into the main trends, and 2. providing an integrated and consistent analytical framework that is apt to reviewing or designing integrated environmental and economic policies, forecasts, theories etc.

Contrary to Green GDP, the NAMEA is a statistical system, that is, it contains no implicit or explicit modelling assumptions. As a consequence, the NAMEA's environmental accounts and indicators are in physical units. The summary environmental indicators serve a more or less comparable purpose as the unemployment figure. It may be noted that by now nobody seriously proposes to value the 'costs' of unemployment and to 'subtract' this from GDP.

The first, 'pilot' NAMEA was compiled in 1993. Subsequently, the Dutch National Accounts Advisory Committee, a sub-committee of the Central Statistical Committee that fixes the CBS work programme, approved a regular compilation of this framework. Since 1994, the National Accounts Department and the Environment Statistics Department at the CBS jointly compile an annual NAMEA. Just like the supply and use tables, the NAMEA becomes available about two-and-a-half years after the reference year. Each NAMEA is fully consistent with the national accounts for the same year.

Recently, the CBS (1996) has published a consistent time-series of NAMEAs for the years 1986-1992. This CBS-publication also discusses sources and methods at some length; cf. also De Haan, Keuning and Bosch (1993). These NAMEAs cover the depletion of three types of natural resources -crude oil, natural gas and wood - and as well five types of environmental degradation - the greenhouse effect, ozone layer

depletion, acidification, eutrophication, and waste. Each of these problems is monitored with the help of a single summary indicator. All problems concerned have also been identified in the National Environment Policy Plans (Netherlands' Ministry of Housing, Physical Planning and the Environment, 1989 and 1993), as approved by Dutch Parliament. Thus the NAMEA generates consistent summary indicators for those environmental problems that are considered most pressing at the political level. In addition, information has been incorporated on various other environmentally relevant flows: on waste water, on local air pollution, on marl extraction, etc.

Interestingly, an intensive user has recently added a sixth theme, namely the use of space (Verbruggen, 1996). This theme may well be incorporated in future 'official' NAMEAs as well. In principle, the NAMEA can cover all environmental issues that are considered relevant. For a good coverage of purely local problems, a regional breakdown may be required. This may involve the use of e.g. Geographical Information Systems. Such regionalized NAMEAs might then also be used in a comprehensive cost/benefit analysis of large infrastructural projects in the Netherlands.

Because the NAMEA incorporates the complete system of national flow accounts, and because it is closely linked to a Social Accounting Matrix (SAM), it also covers distributional issues.[2] Moreover, it is apt to including environmental problems that have a current, not a capital character (noise, stench, etc.) and to showing the current effects of environmental problems with a stock character (e.g. leakage from chemical waste dumps); refer to Keuning (1993).

In the NAMEA's current account for the rest of the world, trans-border environmental flows are presented. Because of the NAMEA's matrix format, the pollution embodied in commodity trade can also be analyzed, with the help of the matrix inverse. Another feature that serves to

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2. Refer to Chapter XX of the 1993 SNA and to Keuning (1994) for a review of the SAM-approach.

increase the NAMEA's policy relevance is the inclusion of a separate tax account, subdivided by kind of tax. In this account, the incidence of all kinds of taxes and subsidies is revealed. This means that environmental levies are separately identified. In turn, this facilitates model simulations of the consequences of a shift in the fiscal system. Finally, the NAMEA is easily linked to unemployment, and more general to labour market and human capital issues; cf. our paper in session 6 (Keuning and De Haan, 1996).

The natural resources distinguished in the NAMEA are consistent with the balance sheets that are currently developed at Statistics Netherlands (Baris and Pommee, 1996). The estimation of the resource rents is rather complex if the extractor owns the subsoil assets; for, in that case no rent payments are recorded. In such a situation, however, the extractor's profits are often liable to a specific tax, or an extraordinary dividend payment when the extractor is a public corporation. If the rate of this specific tax or dividend payment is the result of prolonged negotiations between the government and the extractor, it can be argued that the eventual rate is such that the extractor is precisely left with a 'normal' rate of return on his investment. As a consequence, the specific tax or dividend receipts can then be equated with the implicit resource rents (cf. also Keuning, 1995: 27). These resource rents can be shown as a sub-category of operating surplus. However, as long as the government has actually treated these receipts as income, this amount should not be subtracted from Net Domestic Product or Net National Income.

In the supply and use tables, that are an integral part of the NAMEA, environmental protection services are explicitly shown. This includes not only purchased services, but also own-account production within the firm. As a consequence, both output and intermediate input are higher in the NAMEA than in the regular national accounts. Of course, value added is not affected. It may also be noted that the NAMEA incorporates the re-absorption of emitted materials into the economic process. This concerns, for example, waste processed in

incineration plants and re-cycling of materials.[3] The implication of incorporating a) cross-border environmental flows and b) the re-absorption of pollutants in the economy, is that the NAMEA is also able to show the deposition of substances in the Netherlands, in addition to their emission.

The NAMEA is included into the regular national accounts publication, emphasizing that environmental accounts should not be presented in isolation, but instead that they are an integral part of a comprehensive national information system. In Chapter I of this national accounts publication and in the first table of the new annual CBS-publication 'The Dutch Economy', the trends in summary economic and environmental indicators from the NAMEA are juxtaposed. These and other applications of the NAMEA are discussed in the next section of this paper.

3. Just because of lacking data, re-cycling is not yet shown in the NAMEAs compiled thus far.

3. Applications of the NAMEA

The NAMEA system can be used for many purposes. First, it serves to generate joint accounts and summary indicators for the environment and the economy. A simultaneous release of economic and environmental aggregate figures has already increased public awareness that economic development cannot be judged from GDP volume change only. For instance, a recent newspaper article reviewed the pilot version of the new CBS publication 'The Dutch Economy' and stated: "This study auspiciously starts with a series of core indicators which includes, apart from the well-known macro-economic figures, statistics that co-determine the measurement of welfare: income inequality, educational level of the population, criminality, life expectancy and environmental pressure. In particular with the series of data on emissions that contribute to the greenhouse effect, ozone layer depletion, acidification, eutrophication and the increase of waste dumps, the CBS provides an important contribution ... ". In general, our readers panel particularly appreciates the section 'Nature and environment' in the pilot publication. The environmental figures in this book have all been derived from the NAMEA.

In the first, pilot NAMEA, the summary indicators for the five major environmental problems were confronted with norms set for these problems for the year 2000 (De Haan, Keuning and Bosch, 1993). These norms had been endorsed by Dutch Parliament. Subsequently, the five theme indicators were aggregated into a single environmental 'core' policy index by using the inverse of the norm as a weight for each theme. This implies that the summary environment index equalled the sum of the distances to the norm. This procedure acknowledges that essentially the gravity of each environmental problem can only be determined as the outcome of a political process. This is in accordance with modern ideas on sustainable development which attach a crucial role to society's attitude toward risks (e.g. Netherlands Scientific Council for Government Policy, 1994). At the same time, however, the NAMEA's themes and the possibility to set norms for these themes

provide the politicians with an instrument to quantify their choices; refer also to Adriaanse (1993).

In the present NAMEAs, however, this aggregation into a single index has been abandoned. The National Accounts Advisory Committee was not in favour of a combination of statistics and policy norms in an official CBS-publication. The aggregation procedure was also criticized by Alfieri and Bartelmus (1995), because it would give equal a-priori significance to each of the themes. Of course, this depends on the way the norms are set. Their criticism does not hold if the government sets stricter norms for more serious problems. In fact, this has actually already happened in the case of the ozone layer depletion. Ideally, norms are set at the level at which the concomitant problem occurs. This implies, for instance, that global norms are formulated for the greenhouse effect, while for acidification a national norm may be more relevant.

In addition to a joint monitoring of economic and environmental trends, the NAMEA serves an analytical purpose. For example, the indirect economic and ecological effects of consumption or exports can be shown. With the help of a Leontief-inverse, it is possible to estimate the pollution generated in all activities that contributed to the realization of one unit of final product; cf. Keuning and De Haan (1996).

As stated above, the NAMEA has been used in a linear programming model that estimated a consistent Green National Income (De Boer, De Haan and Voogd, 1994). In that model, the consequences of reducing pollution levels to the norms set by Dutch Parliament were estimated, in a situation without technological change and without price or substitution effects. In view of those strict assumptions, it did not come as a surprise that the required 'optimal' reduction in economic activity was quite substantial and very unevenly distributed by industry. At present, it is explored whether the realism of this model can be increased by incorporating options for 'technology shifts'.

The most influential use of the NAMEA to date has been as a basic data framework in a study that analyzed sustainable economic development scenarios for the Netherlands until the year 2030 (Verbruggen, 1996). Based on economic forecasts from a long-term economic development scenario without environmental indicators, four scenarios have been simulated with a NAMEA-based linear programming model: 1. 'strong together', 2. 'strong alone', 3. 'sensible sustainability' and 4. 'weak sustainability'. The main differences between these scenarios concern: a) the degree to which substitution among environmental, physical and human capital is allowed (cf. Serageldin and Steer, 1994), and b) the assumptions regarding the direction and the speed of technical progress. The first two scenarios are identical but for the assumption whether or not the rest of the world has a similarly strong preference for sustainability. A remarkable result of this study is that in each of the scenarios, constant price GDP is (a bit) higher in 2030 than at present.

A next step might be a further development of this model into a full-fledged general equilibrium model. Such a model may require a NAMEA time-series as its main data base, and will result in an estimated NAMEA for future years. Ideally, such models should also take into account that it may be sub-optimal to chase away polluting industries if this just implies a concomitant increase of imports that are produced by even more polluting production processes elsewhere. This again points to the importance of compiling NAMEAs in a range of countries.

In addition to scenario analyses, NAMEA-based models can be used for calculating e.g. the effects of a shift in the tax base, from labour to energy use, say, on the environmental and economic indicators in the system. Finally, it would be quite interesting to explore the possibility to combine a) the NAMEA's structure, b) preliminary economic figures, and c) scattered, early environmental data, in order to produce much more timely estimates for the aggregate environmental indicators.

4. A comparison between the NAMEA-approach and the SEEA, with special reference to valuation issues

Before the differences between the NAMEA and the System for integrated Environmental and Economic Accounting (SEEA) (United Nations, 1993) are sketched, it should be stressed that both systems have much in common. Apart from their joint origin in the 1993 System of National Accounts (SNA) (United Nations et al., 1993), this concerns, for example, their matrix format, their treatment of environmental protection expenditures and their wish to incorporate social issues as well.

The most important difference between the NAMEA-approach and the SEEA is perhaps that the NAMEA starts from an expansion of the National accounts with the so-called substances accounts, while the SEEA focuses to a large extent on an expansion of the standard asset accounts with accounts for non-produced natural assets. The NAMEA contains a weighted aggregation of substances (resources and residuals) by environmental problem. The SEEA also distinguishes residuals, but without a further aggregation by environmental problem. The NAMEA's link to pressure indicators by type of environmental problem may be useful for two reasons: 1) environmental policies are usually formulated at that level and 2) much more data are available for pressures than for changes in states.

Another difference is that, contrary to the SEEA, the NAMEA-format is ready for use in analytical applications, such as the estimation of the total (direct and indirect) pollution generated by one unit of final demand for each product group (cf. Keuning and De Haan, 1996: Tables 6 and 7), or the pollution embodied in foreign trade. Such calculations can be made on the basis of a closed or an open Leontiev-model. The closed Leontiev-variant is also possible because the NAMEA incorporates income distribution and use accounts. In addition, a linkage to employment and human capital issues is included by a disaggregation of labour incomes in each industry and in each household group, e.g. by sex and by educational level. In turn, these labour

incomes are broken down into employment and average wage rate estimates (Keuning and Timmerman, 1995; Keuning and De Haan, 1996). Above, the expedience of the NAMEA's separate tax account has already been mentioned.

The NAMEA-system does not contain separate entries for eco-value-added, eco-margins, etc, as are found in the SEEA. In fact, a correctly adjusted Net Domestic Product (NDP) can only be the result of an explicit modelling exercise. The essence of this argument is the following. All agree that market prices do not correctly reflect relative scarcities, mainly because of lacking ownership rights for nature. However, **if prices are introduced for an (unsustainable) use of the environment, virtually all prices ánd volumes in the economy may change.**

Every commodity is produced in an unsustainable way or uses inputs (e.g. paper products in services production) that were produced in an unsustainable way. Taking the environment into account thus means that in the reference year all commodities might have become more expensive. Clearly, not all prices would have been affected to the same degree, and in fact the actual price changes would have depended on many factors (e.g. whether or not the rest of the world had introduced these 'true scarcity' prices as well). In turn, these diverging price changes would have set in motion all kinds of substitution processes, so that 'in the end' the economy would have looked completely differently from the one we actually lived in. Probably, the original effect on NDP would have been mitigated.

Moreover, somebody would have <u>received</u> all this money charged on behalf of the environment, and even if it had all been saved and only used for the acquisition of financial assets, this might have lowered interest rates with a concomitant positive influence on investment (in environment-extensive industries). This again would have had an upward effect on Green GDP.

Of course, it is fully legitimate to assign some sort of shadow prices to an unsustainable use of the environment. However, a correct estimation of Eco Domestic Product (EDP) requires more than a reduction of NDP by hypothetical environmental outlays.[4] It implies a re-calculation of NDP, simulating what would have been its size if the economy had been sustainable. Such a model requires realistic assumptions on the (major) economic impacts of introducing shadow prices for (over)exploiting the environment. Hypothetical environmental costs on the one hand and NDP at market prices on the other hand are equally incomparable as kilos of apples and kilos of oranges. Just subtracting the former from the latter yields an incoherent and essentially meaningless result. Moreover, it is quite likely that EDP that is computed by such a simple subtraction procedure substantially underestimates real EDP.

The SEEA holds the quite popular view that "... from the perspective of the role of natural resources in production and income generation, their depletion could be interpreted as a depreciation of fixed assets. In particular, the use of the natural environment, resulting in the degradation of environmental quality, could be interpreted as a depreciation of natural assets analogous to the consumption of fixed capital in the SNA." (United Nations, 1993: para. 276). There are, however, two quite fundamemtal differences between the consumption of fixed capital and the depreciation of natural assets.

First, the consumption of fixed capital is a cost that has actually been taken into account at the micro-level. All companies make a provision for the depreciation of fixed assets and this is subtracted from their receipts before taxes are paid, dividends are decided upon, investment is planned and so on. Subsequently, in the national accounts the computation of this cost item is streamlined. It is unlikely that the prices of products would have been affected significantly if

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4. The 1993 SNA also concludes: "Use of other than market valuation leads to a number of valuation inconsistencies in the SEEA." (United Nations et al., 1993: 21.184).

companies had used exactly the same fixed capital consumption estimates
as the national accounts. However, the situation would have been
completely different if a completely new cost item had been introduced
at the company level: a provision for the depreciation of natural
assets. It stands to reason that the appearance of such a new cost item
would have affected output prices, but even if this had not been the
case, the eventual effect on consumption, saving, investment, NDP, etc.
crucially depends on its incidence among value-added categories and
among institutional (sub)sectors. Summarizing, depletion and
degradation are very real in physical terms, but they have not been
taken into account in anybody's income or saving.

Secondly, the consumption of fixed capital is directly related to
actual investment outlays in the past. At the time this money was
spent, it has not been booked as costs, although it did not yield any
intrinsic utility. Although the national accounts recalculate the fixed
capital consumption costs on the basis of current prices,[5] the link to
past investment expenditures remains. On the contrary, actual outlays
have never been made for environmental assets, and concomitant receipts
do not exist. However, recording costs without receipts is in
contradiction with the basic accounting principles of the transaction
accounts in the system of national accounts. Analogously, investment
outlays and all other expenses for production have been accompanied by
a concomitant decrease in financial assets or increase in liabilities
of the payer. This principle would also be violated if hypothetical
depletion and degradation costs were booked in the production accounts
of the system.

All this does not imply, though, that there is no possibility
whatsoever to record depletion and degradation within a coherent
national accounting system. On the contrary, these phenomena should be
properly reflected in the balance sheets, via an entry in the 'other

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5. In fact, even this practice may lead to (slightly) misleading results if in reality all
   relevant economic decisions at the micro-level were based on fixed capital consumption
   estimates that used the 'historic costs' method.

changes in assets' account. In turn, the balancing item on the balance sheet, total net worth of the nation, is probably a less insufficient welfare indicator than GDP. However, on the balance sheet, both a possible price rise of the remaining stock and additions to the proven reserves should also be taken into account. This purely monetary treatment of the environment may not do full justice to its importance. For that reason, it is perhaps useful to design as well one or a few separate, physical environmental indicators. Again, a parallel can be drawn with unemployment. This is also considered a more serious problem than is reflected by the loss of output that coincides with it. For that reason, it is captured by a separate indicator, with a policy weight that often surpasses that of GDP.

Such non-monetary summary indicators can be derived from the NAMEA-framework. In this respect, Alfieri and Bartelmus [1995] view the standardization of theme unit scales as an as yet unresolved issue in the NAMEA. The aggregate indicators in a single-year NAMEA may indeed not be very appealing. However, this problem vanishes when the contribution of each industry to environmental and economic indicators is compared, or when the rates of change in environmental and economic indicators from successive NAMEAs are juxtaposed.

5. Summary and conclusions

It cannot be stressed enough that GDP (volume change) is at most a partial indicator to measure welfare (change). That, though, does not alter the fact that National Income or GDP figures have an important role to play. For instance, it is fully legitimate to use National Income as a tax base for the contribution to international organizations (European Union!). For, Member States transfer money to these international organizations, not environmental functions or labour time. Clearly, (Net) National Income is still the best indicator for the financial strength of a country. Similarly, all kinds of quotes - e.g. the government deficit - should be expressed relative to actual NNI. Again, only the financial parameters count in these cases. The government does neither spend nor tax unpaid housekeeping services or environmental functions.

It may be quite interesting to try to simulate how large National Income would have been if all aspects of welfare had actually been monetized. Clearly, such a 'genuine' welfare index can only result from a properly specified model and anyhow requires a large number of fairly heroic assumptions. On the other hand, an Eco-Domestic Product that results from just subtracting hypothetical environmental costs from actual NDP appears highly dubious. In fact, such an Eco-Domestic Product may be (much) too low.

It is increasingly realized that a simple subtraction of hypothetical environmental outlays from actual NDP does indeed not yield meaningful results. For instance, Hueting et al. (1995: 218-223) mention a large number of (modelling) assumptions that are needed for the calculation of such a figure. It is equally arguable, though, to start from a rather different set of assumptions. For instance, Hueting and his co-authors use the so-called strong sustainability concept, whereas elsewhere in the same book (Serageldin et al., 1995: 103-104) four different sustainability profiles have been sketched. Another crucial assumption of the Hueting-model is that utility functions,

production functions, and so on are such that "... the percentage
decrease in production is the same in each and every sector". Clearly,
a 'cheaper' solution might be to make assumptions which lead to a
drastic reduction in only the most polluting industries.

All this has recently led to the following policy concensus within
Statistics Netherlands on the preferred outcome of its EDP-project: It
is misleading to provide the general public with a single EDP-estimate.
Instead, several plausible 'assumption bundles' should all be tested.
This will yield a range of EDP estimates, each of which cannot be
rejected a priori. It is expected that in the first instance this range
will be fairly wide. In turn, this may provoke a discussion among
users, both on the model specification and on the assumptions regarding
the exogenous variables (e.g. the sustainability concept that is
selected). That might then help to narrow down the confidence interval
at a next stage. In any case, the usefulness of an EDP-range is
restricted to a signalling function. Furthermore, all EDP-simulations
will make use of the NAMEA as the underlying data base, in order to
ensure consistency.[6] Besides, the NAMEA is an expedient basic data
framework for analyzing the implications (effects on employment,
inflation, government deficit, balance of payments, income distribution
and so on) of actual policy measures that are intended to remedy the
unsustainable situation.

Meanwhile, our users are best served if GDP is also supplemented by
proper balance sheet estimates and by a NAMEA-type framework that
supplements the macro-economic aggregates with a limited number of
environmental (and social) core indicators. It is our experience to
date that the media and the public at large are able and willing to
cope with such an extension of the standard list of core indicators. In
addition, the NAMEA is increasingly used in policy analyses. On the
other hand, its compilation requires quite modest resources once the

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6. Simulating the costs of environmental problems that are not yet covered by the NAMEA (e.g. use
   of space) will of course be based on other sources.

national accounts and the relevant environmental statistics have become available.

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United Nations, Eurostat, International Monetary Fund, Organization for Economic Cooperation and Development, and World Bank, System of National Accounts 1993, Series F, No. 2, Rev. 4, United Nations, New York, etc., 1993.

Statistics Netherlands
National Accounts Occasional Papers

NA/01 Flexibility in the system of National Accounts, Van Eck, R., C.N.
Gorter and H.K. van Tuinen (1983).
This paper sets out some of the main ideas of what gradually developed
into the Dutch view on the fourth revision of the SNA. In particular it
focuses on the validity and even desirability of the inclusion of a
number of carefully chosen alternative definitions in the "Blue Book",
and the organization of a flexible system starting from a core that is
easier to understand than the 1968 SNA.

**NA/02 The unobserved economy and the National Accounts in the Netherlands, a
sensitivity analysis,** Broesterhuizen, G.A.A.M. (1983).
This paper studies the influence of fraud on macro-economic statistics,
especially GDP. The term "fraud" is used as meaning unreporting or un-
derreporting income (e.g. to the tax authorities). The conclusion of
the analysis of growth figures is that a bias in the growth of GDP of
more than 0.5% is very unlikely.

**NA/03 Secondary activities and the National Accounts: Aspects of the Dutch
measurement practice and its effects on the unofficial economy**, Van
Eck, R. (1985).
In the process of estimating national product and other variables in
the National Accounts a number of methods is used to obtain initial
estimates for each economic activity. These methods are described and
for each method various possibilities for distortion are considered.

NA/04 Comparability of input-output tables in time, Al, P.G. and G.A.A.M.
Broesterhuizen (1985).
It is argued that the comparability in time of statistics, and input-
output tables in particular, can be filled in in various ways. The way
in which it is filled depends on the structure and object of the sta-
tistics concerned. In this respect it is important to differentiate be-
tween coordinated input-output tables, in which groups of units (indus-
tries) are divided into rows and columns, and analytical input-output
tables, in which the rows and columns refer to homogeneous activities.

NA/05 The use of chain indices for deflating the National Accounts, Al,
P.G., B.M. Balk, S. de Boer and G.P. den Bakker (1985).
This paper is devoted to the problem of deflating National Accounts and
input-output tables. This problem is approached from the theoretical as
well as from the practical side. Although the theoretical argument
favors the use of chained Vartia-I indices, the current practice of
compilating National Accounts restricts to using chained Paasche and
Laspeyres indices. Various possible objections to the use of chained
indices are discussed and rejected.

NA/06 Revision of the system of National Accounts: the case for flexibility,
Van Bochove, C.A. and H.K. van Tuinen (1985).
It is argued that the structure of the SNA should be made more flexi-
ble. This can be achieved by means of a system of a general purpose
core supplemented with special modules. This core is a fully fledged,
detailed system of National Accounts with a greater institutional
content than the present SNA and a more elaborate description of the
economy at the meso-level. The modules are more analytic and reflect
special purposes and specific theoretical views.

**NA/07 Integration of input-output tables and sector accounts; a possible
solution**, Van den Bos, C. (1985).
The establishment-enterprise problem is tackled by taking the institu-
tional sectors to which the establishments belong into account during
the construction of input-output tables. The extra burden on the con-
struction of input-output tables resulting from this approach is exa-
mined for the Dutch situation. An adapted sectoring of institutional
units is proposed for the construction of input-output tables.

NA/08 A note on Dutch National Accounting data 1900-1984, Van Bochove, C.A.
(1985).
This note provides a brief survey of Dutch national accounting data for
1900-1984, concentrating on national income. It indicates where these
data can be found and what the major discontinuities are. The note
concludes that estimates of the level of national income may contain
inaccuracies; that its growth rate is measured accurately for the
period since 1948; and that the real income growth rate series for
1900-1984 may contain a systematic bias.

NA/09 The structure of the next SNA: review of the basic options, Van Bochove, C.A. and A.M. Bloem (1985).
There are two basic issues with respect to the structure of the next version of the UN System of National Accounts. The first is its 'size': reviewing this issue, it can be concluded that the next SNA should contain an integrated meso-economic statistical system. It is essential that the next SNA contains an institutional system without the imputations and attributions that pollute the present SNA. This can be achieved by distinguishing, in the central system of the next SNA, a core (the institutional system), a standard module for non-market production and a standard module describing attributed income and consumption of the household sector.

NA/10 Dual sectoring in National Accounts, Al, P.G. (1985).
Following a conceptual explanation of dual sectoring, an outline is given of a statistical system with complete dual sectoring in which the linkages are also defined and worked out. It is shown that the SNA 1968 is incomplete and obscure with respect to the links between the two sub-processes.

NA/11 Backward and forward linkages with an application to the Dutch agro-industrial complex, Harthoorn, R. (1985).
Some industries induce production in other industries. An elegant method is developed for calculating forward and backward linkages avoiding double counting. For 1981 these methods have been applied to determine the influence of Dutch agriculture in the Dutch economy in terms of value added and labour force.

NA/12 Production chains, Harthoorn, R. (1986).
This paper introduces the notion of production chains as a measure of the hierarchy of industries in the production process. Production chains are sequences of transformation of products by successive industries. It is possible to calculate forward transformations as well as backward ones.

NA/13 The simultaneous compilation of current price and deflated input-output tables, De Boer, S. and G.A.A.M. Broesterhuizen (1986).
A few years ago the method of compiling input-output tables underwent in the Netherlands an essential revision. The most significant improvement is that during the entire statistical process, from the processing and analysis of the basic data up to and including the phase of balancing the tables, data in current prices and deflated data are obtained simultaneously and in consistency with each other.

NA/14 A proposal for the synoptic structure of the next SNA, Al, P.G. and C.A. van Bochove (1986).

NA/15 Features of the hidden economy in the Netherlands, Van Eck, R. and B. Kazemier (1986).
This paper presents survey results on the size and structure of the hidden labour market in the Netherlands.

NA/16 Uncovering hidden income distributions: the Dutch approach, Van Bochove, C.A. (1987).

NA/17 Main national accounting series 1900-1986, Van Bochove, C.A. and T.A. Huitker (1987).
The main national accounting series for the Netherlands, 1900-1986, are provided, along with a brief explanation.

NA/18 The Dutch economy, 1921-1939 and 1969-1985. A comparison based on revised macro-economic data for the interwar period, Den Bakker, G.P., T.A. Huitker and C.A. van Bochove (1987).
A set of macro-economic time series for the Netherlands 1921-1939 is presented. The new series differ considerably from the data that had been published before. They are also more comprehensive, more detailed, and conceptually consistent with the modern National Accounts. The macro-economic developments that are shown by the new series are discussed. It turns out that the traditional economic-historical view of the Dutch economy has to be reversed.

NA/19 Constant wealth national income: accounting for war damage with an application to the Netherlands, 1940-1945, Van Bochove, C.A. and W. van Sorge (1987).

NA/20 The micro-meso-macro linkage for business in an SNA-compatible system of economic statistics, Van Bochove, C.A. (1987).

NA/21 Micro-macro link for government, Bloem, A.M. (1987).
This paper describes the way the link between the statistics on government finance and national accounts is provided for in the Dutch government finance statistics.

NA/22 Some extensions of the static open Leontief model, Harthoorn, R.(1987).
The results of input-output analysis are invariant for a transformation of the system of units. Such transformation can be used to derive the Leontief price model, for forecasting input-output tables and for the calculation of cumulative factor costs. Finally the series expansion of the Leontief inverse is used to describe how certain economic processes are spread out over time.

NA/23 Compilation of household sector accounts in the Netherlands National Accounts, Van der Laan, P. (1987).
This paper provides a concise description of the way in which household sector accounts are compiled within the Netherlands National Accounts. Special attention is paid to differences with the recommendations in the United Nations System of National Accounts (SNA).

NA/24 On the adjustment of tables with Lagrange multipliers, Harthoorn, R. and J. van Dalen (1987).
An efficient variant of the Lagrange method is given, which uses no more computer time and central memory then the widely used RAS method. Also some special cases are discussed: the adjustment of row sums and column sums, additional restraints, mutual connections between tables and three dimensional tables.

NA/25 The methodology of the Dutch system of quarterly accounts, Janssen, R.J.A. and S.B. Algera (1988).
In this paper a description is given of the Dutch system of quarterly national accounts. The backbone of the method is the compilation of a quarterly input-output table by integrating short-term economic statistics.

NA/26 Imputations and re-routeings in the National Accounts, Gorter, Cor N. (1988).
Starting out from a definition of 'actual' transactions an inventory of all imputations and re-routeings in the SNA is made. It is discussed which of those should be retained in the core of a flexible system of National Accounts. Conceptual and practical questions of presentation are brought up. Numerical examples are given.

NA/27 Registration of trade in services and market valuation of imports and exports in the National Accounts, Bos, Frits (1988).
The registration of external trade transactions in the main tables of the National Accounts should be based on invoice value; this is not only conceptually very attractive, but also suitable for data collection purposes.

NA/28 The institutional sector classification, Van den Bos, C. (1988).
A background paper on the conceptual side of the grouping of financing units. A limited number of criteria are formulated.

NA/29 The concept of (transactor-)units in the National Accounts and in the basic system of economic statistics, Bloem, Adriaan M. (1989).
Units in legal-administrative reality are often not suitable as statistical units in describing economic processes. Some transformation of legal-administrative units into economic statistical units is needed. This paper examines this transformation and furnishes definitions of economic statistical units. Proper definitions are especially important because of the forthcoming revision of the SNA.

NA/30 Regional income concepts, Bloem, Adriaan M. and Bas De Vet (1989).
In this paper, the conceptual and statistical problems involved in the regionalization of national accounting variables are discussed. Examples are the regionalization of Gross Domestic Product, Gross National Income, Disposable National Income and Total Income of the Population.

NA/31 The use of tendency surveys in extrapolating National Accounts, Oudde-ken, Frank and Gerrit Zijlmans (1989).
This paper discusses the feasibility of the use of tendency survey data in the compilation of very timely Quarterly Accounts. Some preliminary estimates of relations between tendency survey data and regular Quarterly Accounts-indicators are also presented.

NA/32 An economic core system and the socio-economic accounts module for the Netherlands, Gorter, Cor N. and Paul van der Laan (1989).
A discussion of the core and various types of modules in an overall system of economy related statistics. Special attention is paid to the Dutch Socio-economic Accounts. Tables and figures for the Netherlands are added.

NA/33 A systems view on concepts of income in the National Accounts, Bos, Frits (1989).
In this paper, concepts of income are explicitly linked to the purposes of use and to actual circumstances. Main choices in defining income are presented in a general system. The National Accounts is a multi-purpose framework. It should therefore contain several concepts of income, e.g. differing with respect to the production boundary. Furthermore, concepts of national income do not necessarily constitute an aggregation of income at a micro-level.

NA/34 How to treat borrowing and leasing in the next SNA, Keuning, Steven J. (1990).
The use of services related to borrowing money, leasing capital goods, and renting land should not be considered as intermediate inputs into specific production processes. It is argued that the way of recording the use of financial services in the present SNA should remain largely intact.

NA/35 A summary description of sources and methods used in compiling the final estimates of Dutch National Income 1986, Gorter, Cor N. and others (1990).
Translation of the inventory report submitted to the GNP Management Committee of the European Communities.

NA/36 The registration of processing in supply and use tables and input-output tables, Bloem, Adriaan M., Sake De Boer and Pieter Wind (1993).
The registration of processing is discussed primarily with regard to its effects on input-output-type tables and input-output quotes. Links between National Accounts and basic statistics, user demands and international guidelines are examined. Net recording is in general to be preferred. An exception has to be made when processing amounts to a complete production process, e.g. oil refineries in the Netherlands.

NA/37 A proposal for a SAM which fits into the next System of National Accounts, Keuning, Steven J. (1990).
This paper shows that all flow accounts which may become part of the next System of National Accounts can be embedded easily in a Social Accounting Matrix (SAM). In fact, for many purposes a SAM format may be preferred to the traditional T-accounts for the institutional sectors, since it allows for more flexibility in selecting relevant classifications and valuation principles.

NA/38 Net versus gross National Income, Bos, Frits (1990).
In practice, gross figures of Domestic Product, National Product and National Income are most often preferred to net figures. In this paper, this practice is challenged. Conceptual issues and the reliability of capital consumption estimates are discussed.

NA/39 Concealed interest income of households in the Netherlands; 1977, 1979 and 1981, Kazemier, Brugt (1990).
The major problem in estimating the size of hidden income is that total income, reported plus unreported, is unknown. However, this is not the case with total interest income of households in the Netherlands. This makes it possible to estimate at least the order of magnitude of this part of hidden income. In this paper it will be shown that in 1977, 1979 and 1981 almost 50% of total interest received by households was concealed.

NA/40 Who came off worst: Structural change of Dutch value added and employ-- ment during the interwar period, Den Bakker, Gert P. and Jan de Gijt (1990).
In this paper new data for the interwar period are presented. The distribution of value added over industries and a break-down of value added into components is given. Employment by industry is estimated as well. Moreover, structural changes during the interwar years and in the more recent past are juxtaposed.

NA/41 The supply of hidden labour in the Netherlands: a model, Kazemier, Brugt and Rob van Eck (1990).
This paper presents a model of the supply of hidden labour in the Netherlands. Model simulations show that the supply of hidden labour is not very sensitive to cyclical fluctuations. A tax exempt of 1500 guilders for second jobs and a higher probability of detection, however, may substantially decrease the magnitude of the hidden labour market.

NA/42 Benefits from productivity growth and the distribution of income, Keuning, Steven J. (1990).
This paper contains a discussion on the measurement of multifactor productivity and sketches a framework for analyzing the relation between productivity changes and changes in the average factor remuneration rate by industry. Subsequently, the effects on the average wage rate by labour category and the household primary income distribution are studied.

NA/43 Valuation principles in supply and use tables and in the sectoral accounts, Keuning, Steven J. (1991).
In many instances, the valuation of transactions in goods and services in the national accounts poses a problem. The main reason is that the price paid by the purchaser deviates from the price received by the producers. The paper discusses these problems and demonstrates that different valuations should be used in the supply and use tables and in the sectoral accounts.

NA/44 The choice of index number formulae and weights in the National Accounts. A sensitivity analysis based on macro-economic data for the interwar period, Bakker, Gert P. den (1991).
The sensitivity of growth estimates to variations in index number formulae and weighting procedures is discussed. The calculations concern the macro-economic variables for the interwar period in the Netherlands. It appears, that the use of different formulae and weights yields large differences in growth rates. Comparisons of Gross Domestic Product growth rates among countries are presently obscured by the use of different deflation methods. There exists an urgent need for standardization of deflation methods at the international level.

NA/45 Volume measurement of government output in the Netherlands; some alternatives, Kazemier, Brugt (1991).
This paper discusses three alternative methods for the measurement of the production volume of government. All methods yield almost similar results: the average annual increase in the last two decades of government labour productivity is about 0.7 percent per full-time worker equivalent. The implementation of either one of these methods would have led to circa 0.1 percentage points higher estimates of economic growth in the Netherlands.

NA/46 An environmental module and the complete system of national accounts, Boo, Abram J. De, Peter R. Bosch, Cor N. Gorter and Steven J. Keuning (1991).
A linkage between environmental data and the National Accounts is often limited to the production accounts. This paper argues that the consequences of economic actions on ecosystems and vice versa should be considered in terms of the complete System of National Accounts (SNA). One should begin with relating volume flows of environmental matter to the standard economic accounts. For this purpose, a so-called National Accounting Matrix including Environmental Accounts (NAMEA) is proposed. This is illustrated with an example.

NA/47 Deregulation and economic statistics: Europe 1992, Bos, Frits (1992).
The consequences of deregulation for economic statistics are discussed
with a view to Europe 1992. In particular, the effects of the introduc-
tion of the Intrastat-system for statistics on international trade are
investigated. It is argued that if the Statistical Offices of the EC-
countries do not respond adequately, Europe 1992 will lead to a dete-
rioration of economic statistics: they will become less reliable, less
cost effective and less balanced.

NA/48 The history of national accounting, Bos, Frits (1992).
At present, the national accounts in most countries are compiled on the
basis of concepts and classifications recommended in the 1968-United
Nations guidelines. In this paper, we trace the historical roots of
these guidelines (e.g. the work by King, Petty, Kuznets, Keynes, Leon-
tief, Frisch, Tinbergen and Stone), compare the subsequent guidelines
and discuss also alternative accounting systems like extended accounts
and SAMs.

NA/49 Quality assessment of macroeconomic figures: The Dutch Quarterly Flash,
Reininga, Ted, Gerrit Zijlmans and Ron Janssen (1992).
Since 1989-IV, the Dutch Central Bureau of Statistics has made prelimi-
nary estimates of quarterly macroeconomic figures at about 8 weeks
after the end of the reference quarter. Since 1991-II, a preliminary or
"Flash" estimate of GDP has been published. The decision to do so was
based on a study comparing the Flash estimates and the regular Quar-
terly Accounts figures, which have a 17-week delay. This paper reports
on a similar study with figures through 1991-III.

**NA/50 Quality improvement of the Dutch Quarterly Flash: A Time Series
Analysis of some Service Industries**, Reininga, Ted and Gerrit Zijlmans
(1992).
The Dutch Quarterly Flash (QF) is, just like the regular Quarterly
Accounts (QA), a fully integrated statistic based on a quarterly
updated input-output table. Not all short term statistics used to
update the QA's IO-table are timely enough to be of use for the QF, so
other sources have to be found or forecasts have to be made. In large
parts of the service industry the latter is the only possibility. This
paper reports on the use of econometric techniques (viz. series decom-
position and ARIMA modelling) to improve the quality of the forecasts
in five parts of the service industry.

NA/51 A Research and Development Module supplementing the National Accounts,
Bos, Frits, Hugo Hollanders and Steven Keuning (1992).
This paper presents a national accounts framework fully tailored to a
description of the role of Research and Development (R&D) in the
national economy. The framework facilitates to draw macro-economic
conclusions from all kinds of data on R&D (also micro-data and quali-
tative information). Figures presented in this way can serve as a data
base for modelling the role of R&D in the national economy.

**NA/52 The allocation of time in the Netherlands in the context of the SNA; a
module**, Kazemier, Brugt and Jeanet Exel (1992).
This paper presents a module on informal production, supplementing the
National Accounts. Its purpose is to incorporate informal production
into the concepts of the SNA. The relation between formal and informal
production is shown in the framework of a Social Accounting Matrix
(SAM). To avoid a controversial valuation of informal production, the
module constists of two SAMs. One expressed in actual prices with
informal labour valued zero, and one which expresses the embedded
informal labour input measured in terms of hours worked.

**NA/53 National Accounts and the environment: the case for a system's
approach**, Keuning, Steven J. (1992).
The present set of main economic indicators should be extended with one
or a few indicators on the state of the environment. This paper lists
various reasons why a so-called Green Domestic Product is not suitable
for this purpose. Instead, a system's approach should be followed. A
National Accounting Matrix including Environmental Accounts (NAMEA) is
presented and the way to derive one or more separate indicators on the
environment from this information system is outlined.

NA/54 How to treat multi-regional units and the extra-territorial region in the Regional Accounts?, De Vet, Bas (1992).
This paper discusses the regionalization of production and capital formation by multi-regional kind-of-activity units. It also examines the circumstances in which a unit may be said to have a local kind-of-activity unit in the extra-territorial region and what should be attributed to this "region".

NA/55 A historical Social Accounting Matrix for the Netherlands (1938), Den Bakker, Gert P., Jan de Gijt and Steven J. Keuning (1992).
This paper presents a Social Accounting Matrix (SAM) for the Netherlands in 1938, including related, non-monetary tables on demographic characteristics, employment, etc. The distribution of income and expenditure among household subgroups in the 1938 SAM is compared with concomittant data for 1987.

NA/56 Origin and development of the Dutch National Accounts, Den Bakker, Gert P. (1992).
This paper describes the history of national accounting in the Netherlands. After two early estimates in the beginning of the nineteenth century, modern national accounting started in the 1930s on behalf of the Tinbergen model for the Dutch economy. The development spurred up after World War II to provide data to the government for economic planning purposes. In the 1980s, the development was towards a flexible and institutional approach.

NA/57 Compiling Dutch Gross National Product (GNP); summary report on the final estimates after the revision in 1992, Bos, Frits (1992).
This summary report describes the sources and methods used for compiling the final estimate of Dutch Gross National Product after the revision of the Dutch National Accounts in 1992. Attention is focused on the estimation procedures for 1988. A more extensive report is also available (**NA/57_Ext.**).

NA/57_Ext. Compiling Dutch Gross National Product (GNP); full report on the final estimates after the revision in 1992, Bos, Frits and Cor N. Gorter (1993).
This report describes the compilation of the final estimate of Dutch Gross National Product after the revision of the Dutch National Accounts in 1992. Attention is focused on the estimation procedures for 1988. The description covers i.a. data sources, sampling features of the surveys, grossing up procedures, adjustments for underreporting and the integration process.

NA/58 The 1987 revision of the Netherlands' National Accounts, Van den Bos, C and P.G. Al (1994).
The 1987 revision that was completed in 1992 has improved the Dutch National Accounts in three ways. First, new and other data sources have been used, like Production statistics of service industries, the Budget Survey and Statistics on fixed capital formation. Secondly, the integration process has been improved by the use of detailed make- and use-tables instead of more aggregate input-output tables. Thirdly, several changes in bookkeeping conventions have been introduced, like a net instead of a gross registration of processing to order.

NA/59 A National Accounting Matrix for the Netherlands, Keuning, Steven and Jan de Gijt (1992).
Currently, the national accounts typically use two formats for presentation: matrices for the Input-Output tables and T-accounts for the transactions of institutional sectors. This paper demonstrates that presently available national accounts can easily be transformed into a National Accounting Matrix (NAM). This may improve both the transparency and analytic usefulness of the complete set of accounts.

NA/60 Integrated indicators in a National Accounting Matrix including environmental accounts (NAMEA); an application to the Netherlands, De Haan, Mark, Steven Keuning and Peter Bosch (1993).
In this paper, environmental indicators are integrated into a National Accounting Matrix including Environmental Accounts (NAMEA) and are put on a par with the major aggregates in the national accounts, like National Income. The environmental indicators reflect the goals of the environmental policy of the Dutch government. Concrete figures are presented for 1989. The NAMEA is optimally suited as a data base for modelling the interaction between the national economy and the environment.

NA/61 Standard national accounting concepts, economic theory and data compilation issues; on constancy and change in the United Nations-Manuals on national accounting (1947, 1953, 1968 and 1993), Bos, Frits (1993).
In this paper, the four successive guidelines of the United Nations on national accounting are discussed in view of economic theory (Keynesian analysis, welfare, Hicksian income, input-output analysis, etc.) and data compilation issues (e.g. the link with concepts in administrative data sources). The new guidelines of the EC should complement those of the UN and be simpler and more cost-efficient. It should define a balanced set of operational concepts and tables that is attainable for most EC countries within 5 years.

NA/62 Revision of the 1987 Dutch agricultural accounts, Pauli, Peter and Nico van Stokrom (1994).
During the recent revision of the Dutch national accounts, new agricultural accounts have been compiled for the Netherlands. This paper presents the major methodological and practical improvements and results for 1987, the base year for this revision. In addition, this paper demonstrates that a linkage can be established between the E.C. agricultural accounting system and the agricultural part of the standard national accounts.

NA/63 Implementing the revised SNA in the Dutch National Accounts, Bos, Frits (1993).
This paper discusses the implementation of the new United Nations guidelines on national accounting (SNA) in the Netherlands. The changes in basic concepts and classifications in the SNA will be implemented during the forthcoming revision. The changes in scope will be introduced gradually. Important changes scheduled for the near future are the incorporation of balance sheets, an environmental module and a Social Accounting Matrix.

NA/64 Damage and insurance compensations in the SNA, the business accounts and the Dutch national accounts, Baris, Willem (1993).
This paper describes the recording of damages to inventories and produced fixed assets in general, including damages as a result of legal product liability and of the liability for damage to the environment. In this regard, the 1993 System of National Accounts and the practice of business accounting are compared with the Dutch national accounts.

NA/65 Analyzing economic growth: a description of the basic data available for the Netherlands and an application, Van Leeuwen, George, Hendrie van der Hoeven and Gerrit Zijlmans (1994).
This paper describes the STAN project of the OECD and the Dutch national accounts data supplied to the STAN database, which is designed for a structural analysis of the role of technology in economic performance. Following an OECD analysis for other industrial countries, the importance of international trade for a small open economy such as the Netherlands is investigated. The STAN database is also available on floppy disk at the costs of DFL. 25, an can be ordered by returning the order form below (Please mention: STAN floppy disk).

NA/66 Comparability of the sector General Government in the National Accounts, a case study for the Netherlands and Germany, Streppel, Irene and Dick Van Tongeren (1994).
This paper questions the international comparability of data concerning the sector General Government in the National Accounts. Two differences are distinguished: differences due to lack of compliance with international guidelines and institutional differences. Adjustments to National Accounts data are reflected in a separate module which comparises Germany versus The Netherlands. The module shows that total General Government resources as well as uses are substantially higher in the Netherlands.

NA/67 What would Net Domestic Product have been in an environmentally sustainable economy?, Preliminary views and results, De Boer, Bart, Mark de Haan and Monique Voogt (1994).
Sustainable use of the environment is a pattern of use that can last forever, at least in theory. This pattern is likely to render a lower net domestic product than the present economy. The coherence between reductions in pressure on the environment and changes in net domestic product is investigated with the help of a simple multiplier model. This model is based on a National Accounting Matrix including Environmental Accounts (NAMEA).

NA/68 A Social Accounting Matrix for the Netherlands, concepts and results,
Timmerman, Jolanda G. and Peter J.M. van de Ven (1994).
In this paper a Social Accounting Matrix (SAM) for the Netherlands is
presented. Two years are covered: 1988 and 1990. The SAM is an integrated
data framework based on national accounts extended with information on
distribution of income, consumption and wealth among household.
Furthermore, labour income and employment are subdivided into several
labour categories. The tables of the SAMs of both 1988 and 1990 are
available on separate floppy disks at the costs of DFL. 65 each.

**NA/69 Analyzing relative factor inputs of Dutch exports: An application of
the 1990 Social Accounting Matrix for the Netherlands** (forthcoming),
Reininga, Ted (1995).
In this paper the validity of neoclassical trade theory for explaining
Dutch international trade patterns is studied. The analysis is carried
out with the use of a Social Accounting Matrix for The Netherlands.
This study corroborates the outcome of other recent analysis in this
field: classical trade theory offers a better starting-point to
understand Dutch trade patterns than neoclassical trade theory.
Moreover, these recent studies point to the increasing relevance of
insights derived from modern trade theory. The results presented here
seem to support this point of view.

NA/70 SESAME for the evaluation of economic development and social change,
Keuning, Steven J. (1994).
This paper elaborates on the concept of a System of Economic and Social
Accounting Matrices and Extensions, or SESAME for short. The SESAME-
concept serves to meet the criticism that conventional national
accounts take a too limited view at social, environmental and economic
development. SESAME details the monetary accounts and couples non-
monetary information in an integral system approach. SESAME is meant as
a synthesis of national accounts and the social indicators approach.

NA/71 New revision policies for the Dutch National Accounts, Den Bakker,
Gert P., Jan de Gijt and Robert A.M. van Rooijen (1994).
This paper presents the (new) revision policy for the Dutch National
Accounts. In the past, several major revisions of national accounting
data have been carried out in the Netherlands. In the course of time,
the policy has changed several times. Recently, the aim has become to
publish relatively long time-series shortly after the publication of
the revised benchmark year data.

NA/72 Labour force data in a National Accounting framework, Den Bakker,
Gert P. and Jan de Gijt (1994).
This paper deals with the Dutch interwar labour force data. Starting
with census data the estimation of the working and non-working labour
force by industry and by occupational type is described and the results
are discussed. The data have been estimated within the national accounts
framework. It is the first time that labour market figures at a meso-
level have been estimated which are linked to other national accounting
figures.

**NA/73 Integrated estimates of productivity and terms-of-trade changes from
a Social Accounting Matrix at constant prices,** Keuning, Steven J.(1994).
This paper demonstrates that measures of real income change for the total
economy can best be derived from real income changes per subsector. For
this purpose a Social Accounting Matrix (SAM) at constant prices has been
compiled. By breaking down value added at constant prices into constant
price estimates for each primary input category, productivity changes by
industry can be estimated as an integral part of the regular national
accounts compilation. The national total trading gain or loss from a
change in the terms of trade is as well allocated to subsectors, thus
embedding the estimation of this macro-measure into a meso-consistency
framework. These ideas have been applied in a case-study for Indonesia.

**NA/74 Taking the environment into account: The Netherlands NAMEA's for
1989, 1990 and 1991,** De Haan, Mark and Steven Keuning (1995).
The National Accounting Matrix including Environmental Accounts (NAMEA)
contains figures on environmental burdens in relation to economic
developments as reflected in the National accounts. NAMEA's for the
Netherlands in 1989, 1990 and 1991 have now been completed. They include
a more detailed industrial classification and a series of environment
taxes and levies, plus environmental protection expenditures by industry
and households. Further, the depletion of two important mineral
resources in the Netherlands is now incorporated in the NAMEA's.

NA/75 Economic theory and national accounting, Bos, Frits (1995).
This paper describes the relationship between economic theory and national accounting. This relationship is often misunderstood, by economic theorists and national accountants alike. Attention is drawn to the consistency required in a national accounting system, to national accounts figures as a transformation of primary data and to the fundamentally different valuation principles employed in economic theory and national accounting (forward looking and analytic versus backward looking and descriptive). The gap between economic theory and national accounting can only be bridged by satellite accounts, as in these accounts consistency with the overall system and valuation at current exchange value are not strictly required.

NA/76 An information-system for economic, environmental and social statistics, Keuning, Steven J. and Jolanda G. Timmerman (1995).
The 1993 SNA mentions that a SAM can also be extended to deal with environmental issues. This entails the integration of a SAM and a NAMEA into a SAMEA (Social Accounting Matrix including Environmental Accounts), a further extension into the direction of a so-called SESAME (System of Economic and Social Accounting Matrices and Extensions). This paper shows how environmental data and environmental indicators can be integrated into such a system. A Dutch case-study shows the interrelations between e.g. the employment of various types of workers (by sex/educational level) and the environmental problems caused by the activities in which they are employed. Moreover, this pollution is also allocated to the subsectors that receive value added. This enables a comparison with the consumption-based pollution by subsector. The SAMEA yields a framework for an integrated analysis and modelling of social, economic and environmental issues.

NA/77 Material flows, energy use and the structure of the economy, Konijn, Paul J.A., Sake de Boer and Jan van Dalen (1995).
Many environmental problems are connected to production and use of materials and energy. It would therefore be desirable to have an information system that gives consistent, complete and detailed information on material and energy flows. Such a system would even be more useful if it could be connected directly to economic data. This paper presents such a system. Based on the foundation laid by the national accounts the authors construct a system for the analysis of flows of materials and energy through the economy. In this paper the proposed system is illustrated with an application to the flows of iron/steel and energy. An input-output table is presented that describes the production processes in the ferrous metal branch entirely in physical units. Subsequently, steel contents of final products are calculated, and an analysis is made of the consequences of a new technology in the basic steel industry on total energy use in the economy.

NA/78 Calendar effects on quarterly GDP-growth rates, Reininga, Ted K. and Brugt Kazemier (1996).
Since 1986 Statistics Netherlands publishes Quarterly National Accounts. The earliest estimates of quarterly GDP, the so-called flash estimates, are published some seven weeks after the reference quarter. In this paper we examine a new, faster flash estimate, some three to four weeks earlier than its original counterpart. The gain is made by using a simple regression technique and incomplete data. To compensate for the lack of data, information on the number of working-days and shopping-days was added to the regression. It turns out that these calendar-aspects significantly affect GDP-growth: 0.30%-points extra GDP-growth for one extra working-day. One extra shopping-day accounts for about 0.17%-points extra GDP-growth.

NA/79 The NAMEA experience. An interim evaluation of the Netherlands' integrated accounts and indicators for the environment and the economy, Keuning, Steven J. (1996).
The national accounts publication in the Netherlands contains not only the conventional economic accounts and indicators, but also an integrated system of environmental and economic accounts, the NAMEA (National Accounting Matrix including Environmental Accounts). This paper reports on the present status of the NAMEA-approach and gives a concise summary of this approach. It reviews the present applications of this framework in the Netherlands and, finally, a comparison with the SEEA is made and various common misunderstandings regarding Green National Income are set out.

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