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Sustainable Development Indicators in Germany and Linkages to Stiglitz/Sen

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Sustainable Development Indicators in Germany and Linkages to Stiglitz/Sen¹

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1. The German Indicator Report on Sustainable Development

Background

The German government has adopted a **National Strategy on Sustainable Development** for Germany in 2002, formulating guiding principles for sustainable development, specific goals for all relevant political fields, management instruments and rules. An integral part of the national strategy is a set of indicators with target values. To monitor the sustainable development every two years, an indicator report is published by the German Federal Statistical Office². Every four years the government releases a progress report on the national sustainability strategy³. Based on the indicator report an assessment of the past years is given and the strategy on how to progress in the future is adapted. To stress the importance of sustainable development and to bring forward its integration into all policy departments, the Federal Chancellery itself is responsible for the issue of sustainable development.

The selection of indicators

In Germany the **sustainability indicators** for the national strategy have been chosen in a longer process by the various governmental departments (ministries), advised by their special institutions (e.g. the Federal Environment Agency) and others. The selection has been arranged – in contrast to the often used three pillars model of sustainability – according to four main policy areas which show a vision of sustainability and serve as a thematic framework. These are intergenerational equity, quality of life, social cohesion and international responsibility. Moreover,

¹ Report by the Commission on the Measurement for Economic Performance and Social Progress, chaired by Joseph E. Stiglitz, Amartya Sen, Jean-Paul Fitoussi, here briefly referred to as Stiglitz/Sen report.

² <http://www.destatis.de> (see at the english website, → indicators → sustainable development indicators → indicator report 2010) /Indikatorenbericht2010,property=file.pdf (D 2010/E2008)

³ The latest: Progress Report 2008 on the national sustainable development strategy http://www.bundesregierung.de/nn_208962/Content/EN/StatistischeSeiten/Schwerpunkte/Nachhaltigkeit/nachhaltigkeit-2006-07-27-die-nationale-nachhaltigkeitsstrategie.html

selected core areas and area specific political goals (currently, issues like climate and energy, sustainable economy of resources, demographic change) show the focus for political activities. Indicators and related quantitative targets are formulated as to represent these goals and to act as monitoring system.

To foster the wide spread of the sustainability issue in all parts of the society, each progress report goes along with a consultation of the public. This allows all interested groups and every citizen to participate in the selection of the main subjects of the national strategy and of the indicators. However, in principle the goal is to introduce only small changes of the indicator set because sustainable development is a long term policy which relies on continuity. In the end, deciding about policy areas, selecting indicators and determining target values is a task of politicians.

The task of the German Federal Statistical Office – Destatis

Since 2006, **Destatis** has been entrusted by the German government with producing the indicator report. The responsibility of Destatis for indicators and monitoring was mentioned by the policy as very important for the **credibility** and **transparency** of the whole process of the national sustainability policy. Official statistics assures **neutrality**, **high quality data**, **methodological competence** as well as **continuity**. Every two years since 2006 Destatis has released an **Indicator Report on Sustainable Development** (the latest for 2010) as a handy pocket book in a print version as well as via internet publication. The indicator report is a politically independent publication in the statistical office's own responsibility. The task includes also the **monitoring** of progress or deficits of the sustainability strategy. Furthermore Destatis provides professional advice to the political board dealing with sustainability in respect of the further development and the design of indicators.

The German Indicator Report on Sustainable Development

The indicator report is structured along four guiding lines for sustainability policy and 21 policy issues. All in all it contains a set of currently 35 single indicators. The report strictly reserves limited space for each indicator to remain clearly arranged. For each indicator one graph with time series is presented, sometimes together with supplementary information. The descriptive text includes the general background of the indicator and its definition, describes its development over time, the target

value/target year and the indicator's success or failure. An important part of the indicator report is to provide background information on the reasons which determine the direction and the speed of the development of an indicator. This improves the possibilities of influencing the development. Particularly, where an indicator is derived from an accounting system (like Environmental-Economic Accounting or National Accounts) it is possible to analyse the causes of an indicator's development. On this database even analyses of linkages between economic and environmental developments are possible, e.g. the very important consideration of global environmental aspects regarding imports and exports of goods. Further item of the description are international comparisons. (See in the Annex: presentation of indicator 1b "Raw material productivity" as an example from the Indicator Report 2010.)

Most of the German sustainability indicators are combined with target values and target years. Both attributes constitute the informative evidence of the indicators and their impact on the political perception. As label for the status of each indicator four different "weather symbols" are used similar to the relevant monitoring report of the EU⁴. This **evaluation** of the status is neither a political assessment nor a forecast but just the result of a simple forward calculation of the past years with regard to the given targets. The rather simple rules for the statistical calculation of the indicators' status as a basis for the classification by symbols are introduced in the report. Similar to evaluations given by other national offices (e.g. the MONET system of the Federal Statistical Office of Switzerland by three traffic lights), the trend of past years is used as a basis to assign valuating symbols. Beyond that the existence of targets for the German indicators extends the possibilities of carrying out the evaluation (see figure 1).

Figure 1: Four weather symbols represent the status of the indicators

⁴ Measuring Progress towards a more sustainable Europe – 2009 monitoring report of the EU sustainable development strategy.



The target value of the indicator has been achieved or the remaining 'distance' would be covered by the target year (deviation less than 5%).



The indicator is developing in the right direction, but if the annual trend continues unaltered there will still be a gap of between 5 and 20% which will need to be covered to reach the target value in the target year.



The indicator is developing in the right direction, but if the average annual trend continues unaltered there will still be a gap of more than 20% which will need to be covered to reach the target value in the target year.



The indicator has developed in the wrong direction and if the average annual trend continues unaltered the distance to be covered to reach the goal would become even greater.

Accounting System and Sustainable Development Indicators

The report includes several indicators embedded in Environmental-Economic Accounting and National Accounts. Examples are productivity indicators for resources (energy, raw material), greenhouse gas emissions, land use and others. Not all indicators which are part of the set can be derived from accounting systems, but in the long run it would be helpful to supplement indicators from accounting systems as far as possible. Environmental-Economic Accounting and National Accounts together are a comprehensive and consistent data framework. Indicators which are embedded in such a comprehensive accounting framework make it possible to analyse not only the development of single indicators but also interrelations between indicators and even policy areas. That is very helpful because a sustainable development policy has to foster simultaneously different goals for the economic, social and environmental development.

2. What are the linkages between the German Indicator Report on Sustainable Development and the recommendations of Stiglitz/Sen?

The recommendations of Stiglitz/Sen

The Stiglitz-Sen-Fitoussi Report on the Measurement of Economic Performance and Social Progress encompasses three main chapters:

1. Classical GDP issues
2. Quality of Life
3. Sustainable Development and Environment

The first two chapters deal with the measurement of current well-being. In contrast, the third part is more oriented towards future conditions. Only the third chapter is

subject of this paper. Here the guiding principle is that at least the current level of well-being should be maintained for future periods or future generations. To bring it closer to concrete terms, Stiglitz/Sen propose the “capital approach” as a theoretical basis. This means that different types of capital like economic, social, human and environmental capital should be preserved for future generations. But Stiglitz/Sen also point out that the difficulties in measuring various kinds of capital are not solved yet. That holds especially for natural capital and for the monetary valuation of natural, and also social capital. Considering the substantial constraints in implementing the capital approach, Stiglitz/Sen draw pragmatic conclusions. They recommend measuring sustainable development and environment with two sets of indicators – so-called dashboards. The Stiglitz/Sen report encompasses altogether 12 recommendations, two of which concern sustainable development and the environment:

Recommendation 11: Sustainability assessment requires a well identified dashboard of indicators. The distinctive feature of components of this dashboard should be that they are interpretable as variations of some underlying “stocks”. A monetary index of sustainability has its place in such a dashboard but, under the current state of the art, it should remain essentially focused on economic aspects of sustainability (Stiglitz/Sen, page 17).

For the environment a further indicator set is recommended, rooted in the capital approach. Ideally the indicators should be combined with target values to indicate the need for action:

Recommendation 12: The environmental aspects of sustainability deserve a separate follow up based on a well-chosen set of physical indicators. In particular there is a need for a clear indicator of our proximity to dangerous levels of environmental damage (such as associated with climate change or the depletion of fishing stocks), (Stiglitz/Sen, page 17).

Stiglitz/Sen do not recommend a concrete set of indicators but rather emphasize the need for further discussion and research.

Do these recommendations fit to the German Indicator Report?

The German Indicator Report on Sustainable Development is in many aspects quite close to those recommendations: The indicator report encompasses a set of

manageable indicators with indicators targets, these are directly linked to political goals. So the German indicator set is a scoreboard to monitor Sustainable Development and it indicates success or failure of a desired development and given targets. But the selection of the indicators is not based on the idea of the capital approach. Some indicators fit into this concept, sometimes in a more or less broad and pragmatic sense, and others do not. The starting point of the German Indicator Report was a different vision of Sustainable Development that includes also the welfare of the present generation in a common sustainability indicator set.

Some thoughts on the Capital Approach

In theory the capital approach calculates national wealth as a function of the sum of different kinds of capital like economic, natural, human and social capital. The capital approach implies that all kinds of capital have to be valued in monetary units and that they can substitute one another. To reach sustainability the sum of all assets must not decline and can be passed on to the next generation. From a pure theoretical point of view this is a sound framework to report on Sustainable Development. However there are some critical aspects also highlighted by Stiglitz/Sen:

The assumption that different forms of capital can substitute one another is limited. For example it is possible to substitute fossil fuels partly by solar energy and other renewable energies, but a destroyed environment cannot be substituted by more economic capital. This assumption does not fit to the notion of sustainability. A further critical point is monetary valuation. For important parts of natural capital (as well as for social capital) a reliable valuation method is not available. There are no market prices or relative utilities of an intact climate compared with clean water, economic or social aspects. And there is no reliable valuation method at the moment that could be used under the code of practice of official statistics. Accordingly Stiglitz/Sen conclude that monetary valuation of natural capital cannot deliver the needed results under the current state of the art.

Actually, even the measurement of natural capital in physical units is in some parts extremely ambitious. How should we measure the capital stock of an intact climate? Nevertheless, the capital approach could serve as a guiding principle to select and structure indicators for Sustainable Development whenever it makes sense. However

the experiences from the work on the German Sustainable Development Indicators suggest that there are some more aspects that need to be included.

Conclusions

A reporting system on Sustainable Development needs a common notion of Sustainable Development. Of course it is helpful to have a guiding theoretical concept like the capital approach, but the pure concept has to be adapted to theoretical and practical constraints. Also a thematic framework agreed on by important users could give the necessary structure and starting point for reporting.

The aim of official statistics is to provide objective information on important societal, economic and environmental issues. This is crucial for fact-based politics. Therefore the different indicators should describe important political or societal sustainability goals. If there are sustainable development goals like in the EU 2020 strategy, on energy productivity, the proportion of renewable energy or reduction targets for greenhouse gases, then they should be a component of an indicator set. Implicitly this means that the vision of sustainability has to be similar on the user and the producer side. In Germany politicians have determined the sustainability goals, indicators and indicator targets. The task of Destatis is to give professional advice for the selection of indicators, in respect to methods, meaningfulness of indicators and data quality. As process requirements of politicians and other users also are confronted and adapted to the reporting requirements of Official Statistics concerning neutrality, high quality of data as well as continuity. Therefore good cooperation between politics and Statistical Offices is necessary. Furthermore Destatis is in charge of monitoring and reporting of the indicator set on Sustainable Development, which includes an evaluation on the distance to the indicator target. From our experience this split of work is a good approach that is in line with the strengths and tasks of Official Statistics.

Annex

Fig. 1: Presentation of Indicator 1b “Raw material productivity” as an example from the Indicator Report 2010 on Sustainable Development in Germany

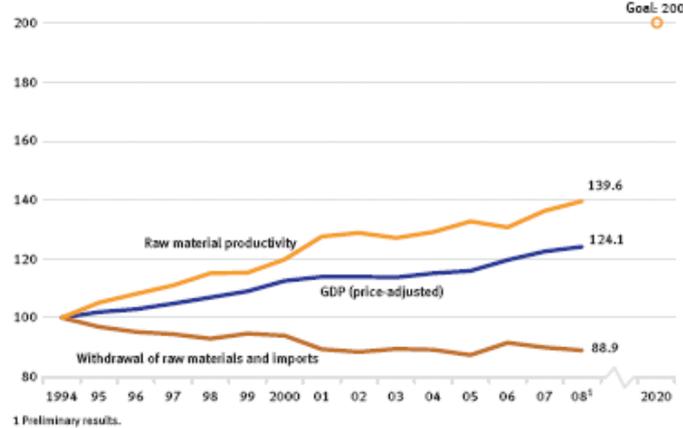
I. Intergeneration equity

Resource Protection

Using resources economically and efficiently



Raw material productivity and economic growth
1994 = 100



1 Preliminary results.

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Federal Statistical Office, Sustainable Development in Germany, Indicator Report 2010

1b Raw material productivity

The use of raw materials is indispensable to economic development. However it also has environmental implications. Moreover, the non-renewable natural resources consumed today will no longer be available to future generations. For this reason resources should be used sparingly. The Federal Government is pursuing the target of doubling raw material productivity by 2020 (based on the rates in the base year of 1994).

Raw material productivity expresses how much gross domestic product (in euros, adjusted for price) is obtained per tonne of abiotic primary material used. Abiotic primary materials are the materials withdrawn domestically — excluding agricultural and forestry products — as well as all imported abiotic materials (raw materials, semi-finished and finished products).

Raw material productivity increased by 39.6% between 1994 and 2008. While use of materials decreased (– 11.1%), the

I. Intergeneration equity

gross domestic product went up by 24.1%. Following a slight decline in productivity from 2005 to 2006, it increased again in 2007 and 2008. In 2008 the use of materials decreased slightly by comparison with the previous year (– 1.2%), while the gross domestic product grew by 1.3%. Although this indicator shows a trend in the right direction, its previous growth rate would not be sufficient to achieve the goal set.

The increase in raw material productivity between 1994 and 2008 is to be attributed chiefly to a structural change towards less resource-intensive industries: these industries have expanded (especially the service sector), while industries with high material consumption, such as the construction industry (which accounts for 44% of total primary material use) or other manufacturing fields, have tended to shrink (see Indicator 10). The use of raw materials for construction decreased by 27% or 215 million tonnes between 1994 and 2008. In contrast the use of ores and their products increased significantly during this

period (by 54% or + 47 million tonnes). The amount of fossil energy sources used has increased only slightly (+ 0.9%) since 1994. The increase in overall productivity mentioned above was caused by this decrease in the use of materials and a rise in the gross domestic product.

An important factor in interpreting the trend in the resource indicator is also that the demand for materials is increasingly covered by imports. Whereas the import of raw materials as well as that of semi-finished and finished products went up by 106 million tonnes (+ 27%) between 1994 and 2008, withdrawal of raw materials in Germany dropped by 273 million tonnes (– 25%) in the same period. Thus, the share of the overall use of primary materials made up by imported goods increased from 26% in 1994 to just over 37% in 2008. Of quantitative importance in this shift are particularly the increased imports of metallic semi-finished and finished products (+ 105%) and the replacement of domestic coal by imported sources of energy.

In order to be able to evaluate the impact of such shifts on raw material productivity, the imported goods were traced back mathematically to the raw materials used abroad to manufacture them (so called raw material equivalents) as part of a study by the Federal Statistical Office. These results also show clearly the global raw material requirements of the German economy. For Germany the studies showed that in the period between 2000 and 2007 the weight of imports in raw material equivalents was about five times the weight of imports actually registered. It was also evident that the advance in productivity with such a calculation would be significantly less than for the results presented above.

Federal Statistical Office, Sustainable Development in Germany, Indicator Report 2010

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