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## **Visualising Environmental Indicators of Lower Saxony**

**- Poster presentation at the International Conference on „Visualising and Presenting Indicator Systems“, Neuchatel, Monday 14 March 2005 -**

In Lower Saxony, one of the 16 German ‚Lander‘, environmental indicators have been compiled to play an important roll in the state’s strategy for sustainable development. On behalf of the Ministry for the Environment, the Lower Saxony State Agency for Ecology (NLOE) prepared a set of environmental indicators, including a core set of 17 key indicators (list of indicators see below).

I have been engaged in developing and publishing the environmental indicators from the very beginning, i.e. since 1998 - until last year in the State Agency, today – after the closing of this agency - as an employee of the Ministry for the Environment. The selection of these indicators took place in an interactive process, including the international discussion on environmental and sustainability indicators on the one hand, data availability on the other hand and – of course - political requirements. We also have been very busy with concerted activities of all German ‚Lander‘. With Lower Saxony contributing substantially, a harmonization of main environmental indicators which are now used nationwide has been achieved. Last year, the German Environmental Ministers Conference (UMK) finally agreed to a list of 24 environment-oriented sustainability indicators.

In Lower Saxony, we managed to calculate most of our key indicators and to publish them for the first time in 2002. This is how they were looking like in our status report that year: Corresponding to other indicator sets of that time, we just see some bar graphs and some line graphs, generated by the simple means of Excel calculation software. Some of them with an ascending tendency, others declining – not really making a great visual impact.

Even though we had been very proud of our indicators, and we also got much plaudit and acclamation from a scientific audience and among the German ‚indicator community‘, we had not been able to draw attention to the subject neither from politicians nor in the newspaper’s editorial offices which was really worth mentioning. That’s why we thought about a better presentation of our indicators – part of this being better visualisations. Inspired by information graphs in newspapers and magazines depicting facts in a very clear and interesting way, we had the idea to combine line graphs with individual pictures – multicoloured, of course. So we entrusted a design agency to create a serial of professional illustrations. We didn’t

have much money to spend. (We payed about 2.000 €) That's why we had to provide the photos by ourselves – partly a difficult job.

From the beginning, we have been considering the practical handling of the indicator graphs:

1. First of all It should be possible to update the indicator graphs by ourselves. That's why we used the software 'Pagemaker' which is available in our ministry, whereas the background picture is originally created with 'Corel Draw'.

2. We are working with tree file formats of the graphs:

- Picture files (jpg) for print versions and internet
- Poster files (Pagemaker)
- PDF files e.g. for use in Power Point presentations

That's why we have to update three versions of each indicator - that means to administrate about 50 indicator files.

Concerning the design of the indicator graphs, we tried to achieve great clearness and as much comprehensibility as possible. So we took particular care that the title of each indicator is corresponding to the inclination of the line graph. When the line shows an index for air pollution, the indicator has been named 'Air pollution' and not 'Air quality'! (Unfortunately, many indicators are disregarding this coherency.) That's the reason why our Indicator 'Fish stock in the North Sea' is using a negative scale (degree of falling below minimum populations needed for biological reproduction).

In addition we had to solve a number of problems when illustrating the indicators:

- Some Indicators are abstract, e.g. Energy productivity or Organisations with environmental management schemes – these indicators require symbolic pictures.
- You have to visualise a lot of invisible environmental problems e.g. carbon dioxide emissions, deposition of heavy metals or other immissions, nitrate levels in groundwater – here it is necessary to find associative pictures.
- Some indicators are combined with targets, some are not – some of the targets being timed, some are not – some targets are lying out of scale (eco-farming).
- Some graphs are containing two informations, e.g. Eco-farming (development in Lower Saxony in comparison with the Federal Republic), Municipal waste (also including recycling).

- One indicator (Structural quality of running waters) consists of only one single date, there is no time series available. Here we decided to enrich the information by the means of a more detailed feature.

My experiences with our indicator visualisations are generally positive. When I am showing them in presentations, they generally evoke positive reactions.

But – as a matter of fact - we are still waiting for a bigger response from the general public and greater enthusiasm from politicians. I am convinced that there is still a long way to go until environmental indicators will become really established (like economic indicators, e.g. gross national product). The more we harmonise our key indicators, and the better we visualise them, the more they will win recognition.

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See Indicators in:

[http://www.umwelt.niedersachsen.de/master/C4474650\\_N4472915\\_L20\\_D0\\_I598.html](http://www.umwelt.niedersachsen.de/master/C4474650_N4472915_L20_D0_I598.html)

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## List of Environmental Indicators for Lower Saxony (2004)

The 17 most important Environmental Indicators (Key Indicators)

Indicator	Subject for Protection / Problem Area
<ul style="list-style-type: none"> <li>• Nitrogen Immissions into the North Sea</li> </ul>	Eutrophication
<ul style="list-style-type: none"> <li>• Acid Deposition</li> <li>• Deposition of Heavy Metals</li> </ul>	Acidification Bioaccumulation
<ul style="list-style-type: none"> <li>• Municipal Waste</li> </ul>	Waste Disposal
<ul style="list-style-type: none"> <li>• Priority Areas for Nature Protection</li> <li>• Bird Species in Typical Surroundings</li> </ul>	Biodiversity, Landscape
<ul style="list-style-type: none"> <li>• Nitrate Levels in Groundwater</li> <li>• Structural quality of running waters</li> </ul>	Water Resources, Water Quality
<ul style="list-style-type: none"> <li>• Land Usage</li> </ul>	Soil Quality, Soil Resources
<ul style="list-style-type: none"> <li>• Proportion of Organic Agriculture</li> </ul>	
<ul style="list-style-type: none"> <li>• Air Quality Index</li> </ul>	Air Quality – Protection of Human Health
<ul style="list-style-type: none"> <li>• CO<sub>2</sub>-Emissions</li> </ul>	Air Quality – Protection of the Earth's Atmosphere
<ul style="list-style-type: none"> <li>• Radioactive Waste</li> </ul>	Radioactivity, Radiation Levels
<ul style="list-style-type: none"> <li>• Fish Stocks in the North Sea</li> </ul>	Fisheries Resources
<ul style="list-style-type: none"> <li>• Energy Productivity</li> <li>• Traffic Volume</li> </ul>	Energy and Transport
<ul style="list-style-type: none"> <li>• Organisations with Environmental Management Schemes (EMAS)</li> </ul>	Socio-Economic Indicators