



Wadden Sea Forum

11th Meeting

Wilhelmshaven, 26-27 November 2007

Agenda Item: 8
Subject: Sustainability indicators
Document Nr. WSF11-8-2
Date: 15 November 2007
Submitted by: WSF secretariat

Attached is the Manual for the Wadden Sea Region sustainability indicator tool. The tool itself has been distributed as a separate excel file, and will be demonstrated at the meeting.

PROPOSAL: The meeting is invited to take note of the information

Wadden Sea Forum

Development of Wadden Sea Region-specific
Indicators

Manual - using and updating the Excel
indicator tool

COWI A/S

Parallevej 2
DK-2800 Kongens Lyngby
Denmark

Tel +45 45 97 22 11

Fax +45 45 97 22 12

www.cowi.com

Table of Contents

1	Introduction	1
2	Architecture of Excel indicator tool	2
3	Using Excel indicator tool	3
4	Updating Excel indicator tool	6

1 Introduction

This manual is the main document providing guidelines to the Wadden Sea Forum (WSF) in using and updating the WSF Excel indicator tool - produced by COWI A/S, November 2007:

[COWI WSF sustainable-indicator-tool.xls](#)

The manual is concise because the electronic tool is programmed with the purpose of being self-documenting; and so the person(s) at the WSF responsible for using/updating the tool might after sometime only seldom consult the manual. The manual contains three sections:

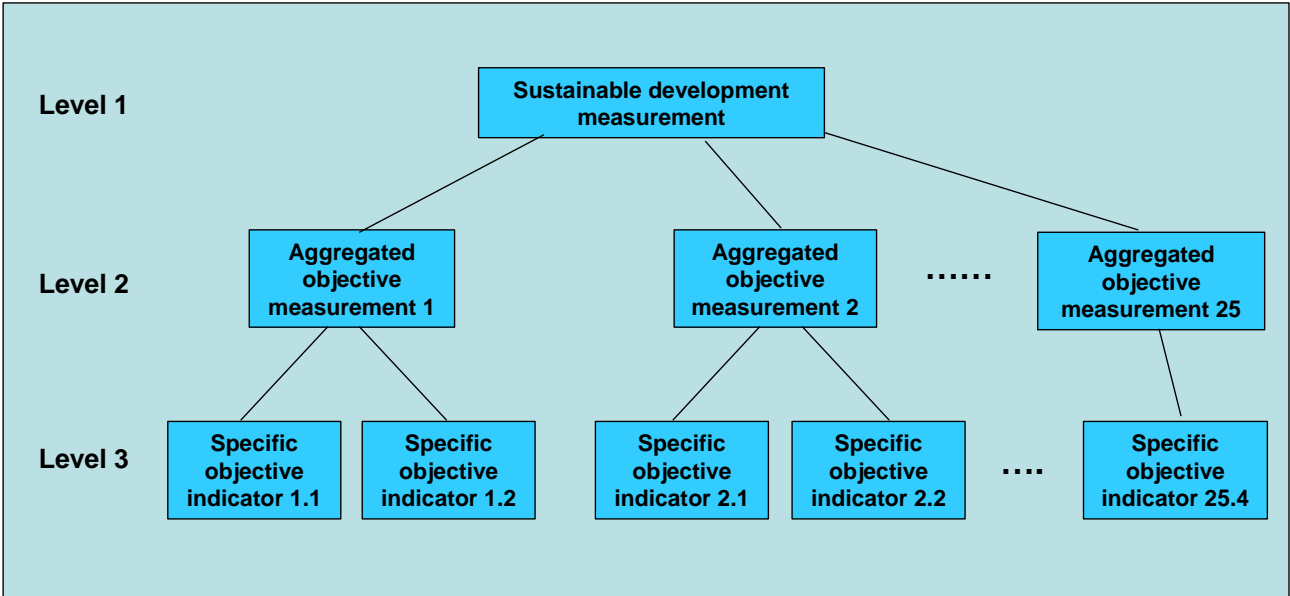
- **Architecture of Excel indicator tool** - presenting how the three-level indicator system is inspired by the WSF objectives presented in "breaking the ice".
- **Using Excel indicator tool** - guiding the WSF in interpreting the indicator values in the process of determining the state of sustainable developments in the Wadden Sea region.
- **Updating Excel indicator tool** - explaining the steps the WSF must take to keep the indicator tool up-to-date.

2 Architecture of Excel indicator tool

Three-level hierarchy of indicators

Figure 2.1 shows that the principal architecture of the tool is a three-level hierarchy of indicators:

Figure 2.1 Three-level hierarchy of indicators



- **Level 1: Sustainable development measurement** tells us about the overall temperature of sustainable development in the Wadden Sea region via summing up the Level 2 measurements for the social, the economic and the ecological dimensions, respectively.
- **Level 2: Aggregated objective measurements** tell us - on the basis of the Level 3 indicators - about where we are, and if we are progressing towards meeting in the present version 21 different objectives - inspired by the objectives laid down in the WSF report "breaking the ice".
- **Level 3: Specific objective indicators** are specific measures of elements of the progress in achieving the different objectives addressed by the Level 2 measurements. Hence the selection of the indicators is guided by the 21 Level 2 objectives. The Level 3 indicators are calculated on the basis of data that must be collected and entered into the indicator tool to keep it up-to-date.

Sheet name convention in Excel tool

The name convention adopted in the Excel tool for the "sheets"¹ is as follows:

<i>Introduction</i>	Entrance to the tool, and a brief introduction and access to the three levels.
<i>Level 1, 2 and 3</i>	Values of the different measurements and indicators at the Wadden Sea regional level.
<i>1, 2, 3 ... 21</i>	Calculation and presentation of Level 2 values at the Wadden Sea regional level for the different objectives.
<i>1.1, 1.2 ... 21.1</i>	Calculation and presentation of Level 3 indicators values where the number before the dot (.) shows which Level 2 measurement the given Level 3 indicator contributes to. Furthermore they are the only sheets where primary data values are typed in.

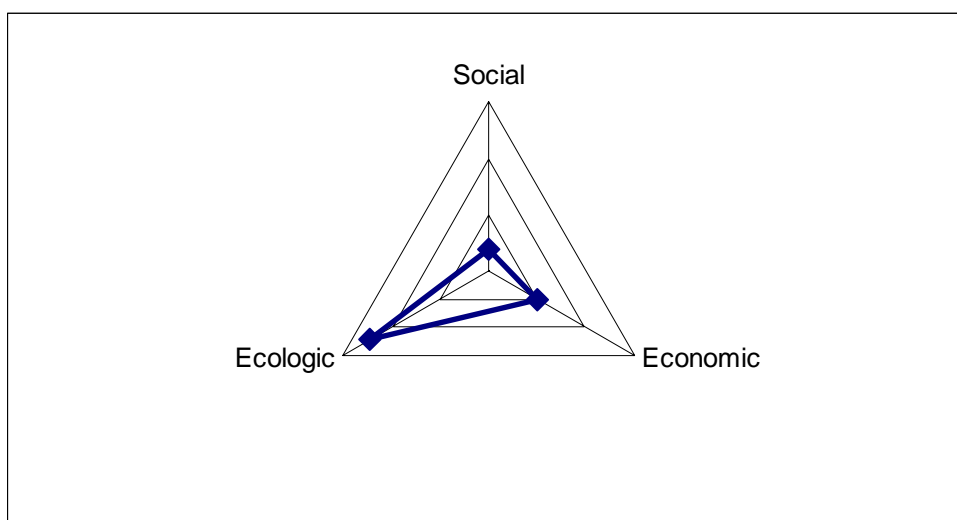
3 Using Excel indicator tool

Level 1

Temperature of social, economic, and ecologic situation

The user is at Level 1 provided with a measure of the temperature of the social, economic, and ecological situation in the Wadden Sea region. More precisely, each of the three dimensions of sustainability is given a score that simply is the sum of the relevant Level 2 scores (see below) - i.e. a positive score of 2 means that there are 2 more positive Level 2 scores than there are negative ones. Figure 3.1 shows the result of taking the temperature in the first version of the Excel indicator tool - i.e. the tool handed over to the WSF by COWI.

Figure 3.1 *Temperature of sustainable development in the Wadden Sea region - from the first version of the Excel indicator tool*



¹ Moves between sheets are where appropriate facilitated via the use of [hyperlinks](#).

Positive, neutral and negative Level 2 scores	<p>Level 2</p> <p>Level 2 measures are based on a scoring system. A positive, neutral or negative score is given for each of the 21 objectives - i.e. whether the status or trend is positive, neutral or negative with respect to the given objective. Since there will be differences in the most recent year of availability for the different Level 3 indicators - due to differences in dates of release of the data used for calculating the indicators, the Level 2 (and Level 1) measurements are kept undated with respect to a specific year, but are given the timing such as "present" state of sustainable development.</p>
Positive, neutral and negative Level 3 scores	<p>While the original units of measurements for the Level 3 indicators differ between indicators - e.g. %, pp, number etc. - they are at Level 2 also transformed into positive, neutral and negative Level 3 scores - which then are combined to provide the respective Level 2 scores. The method is exemplified in Figure 3.2. It illustrates how the Level 2 demography score is established on the basis of five Level 3 indicators. Note that it might not be possible to calculate all Level 2 measurements in such "mechanical" way as shown in Figure 3.2. However, in any case the respective method used is explained in the given Level 2 sheet in the Excel indicator tool.</p>

Figure 3.2 1. Demography scores

Level 2 measurements	Formula						Score
	1.1 $ value \geq 0.4 \Rightarrow -1; 0.4 > value \geq 0.2 \Rightarrow 0; \text{else } 1$						-1 negative
	1.2 $ value \geq 0.4 \Rightarrow -1; 0.4 > value \geq 0.2 \Rightarrow 0; \text{else } 1$						-1 negative
	1.3 $value \geq -0.2 \Rightarrow -1; 0.2 > value \geq -0.2 \Rightarrow 0; \text{else } 1$						0 neutral
	1.4 $value < 0 \Rightarrow -1; 0.2 > value \geq 0 \Rightarrow 0; \text{else } 1$						-1 negative
	1 $\text{sum}(1.1:1.4) < 0 \Rightarrow -1; \text{sum}(1.1:1.4) > 0 \Rightarrow 1; \text{else } 0$						-1 negative
Level 3 indicator values		2003	2004	2005	2006	2007	
	<u>1.1</u> Relative share of young persons (15-24 years)	0.9	0.9	1.0	1.1		
	<u>1.2</u> Relative share of old persons (65+ years)	0.3	0.3	0.4	0.4		
	<u>1.3</u> Relative population growth		0.2	0.1	0.0		
	<u>1.4</u> Population growth		0.2	0.1	-0.1		

Different units of measurement - at detailed geographical level	<p>Level 3</p> <p>As just mentioned above the units of measurements for the Level 3 indicators differ between indicators - e.g. %, pp, number etc. Hence the user has access to quite specific indicator values, often at a detailed geographical level (see example in Figure 3.3) - that can help the interpretation of the higher level measurements as well as being used for other analyses.</p>
---	--

It must in this context be emphasised that the only geographical unit used at Level 2 and Level 1 is the Wadden Sea region as a whole. The focus on Level 3 is therefore to provide Wadden Sea region indicator values; and for some indicators there will not be detailed Municipal, Kreis or Province values. This is the case where it is not necessary, possible or appropriate to address this detailed geographical level.

Hence the Level 3 indicators will differ with respect to the feasibility of getting at the bottom of analysing the reasons for the Wadden Sea region-level indicator values. However, this is actually inherent in using an indicators approach - i.e. the values of indicators indicate a development that we not necessary fully can explain.

Figure 3.3 Example of Level 3 indicator values

1.1 Relative share of young persons (15-24 years)								
Definition	Share of 15-24 years olds in the total population in a Wadden Sea geographical area compared with the relevant national average share - i.e. Danish, German and Dutch national figures, respectively - January 1st.							
Rationale	Provides - together with "3.2: Relative share of old persons (65+ years)" - a measure for assessing the target of a balanced age structure of the population in the Wadden Sea region.							
Formula	1.1 [pp] = ("WS area population - 15-24"/"WS area population") - ("national population - 15-24"/"national population")							
	Weights for regional aggregation:			Population				
Primary data sources	Denmark	Table = BEF1A07	http://www.statistikbanken.dk/statbank5a/default.asp?w=1024					
	Germany	Table =173-21-4	https://www.regionalstatistik.de/genesis/online/logon					
	Netherlands	StatLine	http://www.cbs.nl/en-GB/default.htm?Languageswitch=en					
Indicator values			2003	2004	2005	2006	2007	2008
	WSR	Wadden Sea region	0.9	0.9	1.0	1.1		
	DK	Danish part of WS area	0.4	0.4	0.5	0.5	0.5	
	DK1	Varde	-0.2	-0.2	0.0	-0.1	-0.3	
	DK2	Esbjerg	0.7	0.8	0.9	0.8	0.9	
	DK3	Fanø	-2.1	-1.8	-1.7	-2.1	-3.0	
	DK4	Tønder	0.3	0.3	0.4	0.5	0.3	
	D	German part WS area	-0.9	-0.9	-0.8	-0.7		
	D1	Nordfriesland	-0.9	-0.8	-0.8	-0.7		
	D2	Dithmarschen	-0.9	-0.9	-0.9	-0.8		
	D3	Steinburg	-1.3	-1.3	-1.1	-0.8		
	D4	Pinneberg	-1.8	-1.8	-1.8	-1.7		
	D5	Stade	-0.7	-0.8	-0.7	-0.7		
	D6	Cuxhaven	-1.6	-1.6	-1.6	-1.5		
	D7	Bremerhaven	0.4	0.3	0.3	0.5		
	D8	Wesermarsch	-1.2	-1.2	-1.0	-0.7		
	D9	Wilhelmshaven	-0.3	-0.1	0.2	0.4		
	D10	Friesland	-1.6	-1.5	-1.4	-1.3		
	D11	Wittmund	-0.4	-0.5	-0.5	-0.6		
	D12	Aurich	-0.4	-0.4	-0.3	-0.1		
	D13	Emden	0.5	0.4	0.4	0.6		
	D14	Leer	0.0	0.0	0.1	0.1		
	NL	Dutch part of WS area	3.3	3.3	3.3	3.4		
	NL1	Groningen	4.1	4.1	4.2	4.2		
	NL2	Fryslan	4.6	4.6	4.6	4.7		
	NL3	Kop van Noord-Holland	-0.1	-0.2	-0.2	-0.2		

4 Updating Excel indicator tool

Level 3

Timing of updating

Level 3 is where the principal updating of the Excel indicator tool takes place; and the updating consist primarily in entering new primary data values when they become available from the primary data sources.

However, the many different types of indicators in the tool imply that several different primary data sources are consulted; and so there will be different timings of data releases.

It is therefore recommended that all primary data are updated annually at an agreed date. This date should be set to allow for the elaboration of an annual WSF announcement on the state of state of sustainable development in the Wadden Sea region - say a month later. However, this does not prevent the WSF to make some in between updates of certain indicators, for example in connection with an analysis of selected sustainability developments.

Step 1: Entering primary data

Step 1 in the updating process is Level 3 sheet by Level 3 sheet to gather data from the primary data sources as specified in each sheet. These primary data are entered according to the established procedures:

- Typed-in primary data are written in the **blue** colour.
- The geographical level in focus in the indicator tool is the Wadden Sea region as a whole. Hence, if (aggregated or average) Wadden Sea region-level data are available - they are directly used. In many cases, however, the Wadden Sea region-level data will be calculated on the basis of e.g. data at municipal (Denmark), Kreis (Germany) and Province (Netherlands) level - and so these geography-specific data must be entered.
- In a few cases, the definition of the indicator corresponds to that of the primary data variable. When this is the case, the indicator values are directly typed in - i.e. in the **blue** colour.

Step 2: Updating Level 3 formulae

Having entered new primary data values at a low geographical level, the formulae calculating the indicators at the higher geographical level will need to be updated - or rather extended to cover another year. This is simply done by copying the given formula for the previous year.

The reason - why this updating is not made fully automatic in the indicator tool - is that in some cases the person responsible for updating the tool will need to judge whether the aggregation is suitable. This is the case where the timings of data releases differ between countries. For example, the person will need to decide whether it is suitable to use a "Wadden Sea region-level indicator" for 2006 - if e.g. only data for Denmark and Germany are available for 2006, while the Dutch data series at the same point in time end in 2005.

Step 3: Updating Level 2 and Level 1 formulae	<p>Level 2 and Level 1</p> <p>The last year of availability of the Level 3 indicators - as just discussed above - determine as such the years for which the Level 2 and thus the Level 1 measurements can be established.</p> <p>It is <u>recommended</u> that the Level 2 and Level 1 measurements are kept undated with respect to a specific year - but are given the timing such as "present" state of sustainable development. Hence, the measurements are calculated on the basis of the most recent developments of the Level 3 indicators - independent of which recent years they represent.</p>
Step 4: Dissemination of updated sustainable development measurements	<p>The person(s) at the WSF responsible for updating the tool will finally communicate to the users of the indicators tool that updated values have become available. This will concern a delivery of information to those in the WSF responsible for analysing and presenting the "annual Wadden Sea sustainable development status", as well as dissemination via e.g. the WSF homepage, newspapers or other channels.</p>