iEMSs 2008: International Congress on Environmental Modelling and Software
Integrating Sciences and Information Technology for Environmental Assessment and Decision Making
4th Biennial Meeting of iEMSs, http://www.iemss.org/iemss2008/index.php?n=Main.Proceedings
M. Sànchez-Marrè, J. Béjar, J. Comas, A. Rizzoli and G. Guariso (Eds.)
International Environmental Modelling and Software Society (iEMSs), 2008

From INGIS to NAMOS – operationalisation and contextualisation of sustainability at the local level

Developing and improving sustainability-related indicator systems as decision and support tools in urban theory and practice

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ABSTRACT

Due to its fuzziness the model of sustainable development has to be particularised and contextualised before any positioning with respect to the yardstick of sustainability. Based on a newly put forward conceptualisation of sustainability the realisation of both postulates is shown within the development of a local indicator system for two German cities. Initially, problems of urban development were identified in a bottom-up approach by local stakeholders. These problem areas were contrasted with a set of sustainability rules which had been systematically derived from the basic sustainability norm, stating minimum requirements for sustainable development. At the interface of local problems and sustainability rules indicators had been identified which provide information on whether the city is over time becoming closer to or farther removed from the respective sustainability goals in its problem areas. This paper shows how such sustainability monitoring system can indicate municipal problems and contextualise the sustainability norm into the administrative structures.

Keywords: *sustainability, monitoring; operationalisation; indicators; Leipzig.*

Introduction

Over the last 20 years, the sustainability concept has become a guiding star for political activity all over the world, especially in cities, towns and smaller communities. The spread of the concept of sustainable development has not been thwarted by its extreme vagueness or its current lack of generally binding operationalisation. On the contrary: its conceptual ambiguity has in all likelihood significantly boosted its appeal by enabling stakeholders to focus on their favourite elements within a process of discourse dominated by the struggle for the power of definition.

However, if a local authority has to state its position regarding sustainability or if the basic concept of sustainability is used as a yardstick for political and administrative action, the stakeholders involved will find themselves forced to particularise the global concept of sustainability and place it into their local context. The reference models usually employed could only be used to a limited extent for such a systematic definition taking into account local conditions.

The definition put forward by the Brundtland Commission is too abstract, the popular three-pillar model too vague, and the Agenda 21 adopted at the Rio Summit far too loose to serve as a blueprint for local sustainability. The numerous sustainability indicator systems developed and propagated in Germany mainly designed for the local level reflect a considerable scope for interpretation regarding the operationalisation of the sustainability concept.

Apart from the desideratum that the local situation should be taken into account when a system of sustainability indicators is being developed, the need for more local contextualisation also means that ways need to be found of building on existing local information systems from the angle of sustainability. This approach is being taken at the Helmholtz Centre for Environmental Research – UFZ, which is collaborating with the city councils of Halle and Leipzig to develop and test an integrated sustainability information system (IGNIS). The system is primarily designed with the needs of local government in mind and is to be made accessible to all council departments over their intranet. The aim is to provide sustainability-related support for local political and administrative decisions.

The main questions of the project were: How the sustainability concept could be contextualised to the local level? In which form sustainability monitoring at best contributes to steer municipal development? How sustainability monitoring can be used to link different existing municipal monitoring activities (social, environmental, health, planning)?

The Integrated Sustainability Concept ("HGF Concept")

The development of the new information system's structure and methodology is geared to the Integrated Sustainability Concept recently put forward by the HGF, Helmholtz Association of National Research Centres (Kopfmüller et al. 2001). Starting from an understanding of sustainability whose central ethical postulate is equity, the HGF Concept systematically sets out the sustainability norm as defined by the Brundtland Commission. It has three core elements regarded as constitutive

for sustainability: *equity* (within and between generations), *globality* and *anthropocentricity*. This sets it apart from the two- and three-pillar concepts which have so far dominated both scholarly and political debate on sustainability. The diverse problems of these concepts (normative vagueness, the unsolved integration problem, a tendency towards 'sectoralisation', etc) prompted HGF researchers to derive (initially) three general interrelated aims for sustainable development from the above-mentioned constitutive elements: *securing human existence, preserving the productive potential of society, and maintaining development and action possibilities*.

These general aims were then used to develop an extensive set of 'sustainability rules' along the lines of the ecological management rules that have already been debated for some time. The sustainability rules particularise the targets for various themes and thus make up the normative core of the HGF Concept. Conceived as minimum requirements for sustainable development, they reflect universal principles to which policy directed towards sustainability (be it at the global, national or local level) needs to be geared.

Problem orientation: local problems

This normative approach to the deductive model definition (top-down) is augmented in the HGF Concept by an inductive, problem-based approach to the topic of sustainability (bottom-up). Starting from the current scholarly and social discourse, the main sustainability problems are identified and compared to the sustainability rules. The bottom-up approach, which ultimately regards sustainability as a social construct to be modified in discourse, reduces complexity by acting as a filter for the broad range of themes covered by the sustainability rules. In addition, however, it enables the universal set of rules to be adapted to the conditions of different spatial, temporal and social contexts – since a certain social group will at a given time in connection with a given level of spatial analysis develop its own specific understanding of sustainability and an equally specific definition of problem areas.

Consequently, the local contextualisation of the sustainability model takes place at the interface of norm-orientated top-down and problem-orientated bottom-up approaches. The model becomes further operationalised as indicators are identified which reflect the changes to the sustainability problems with reference to the corresponding rules (Fig. 1).

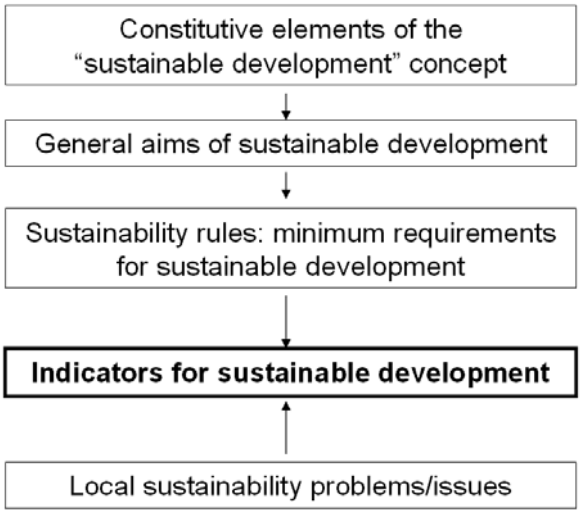

Fig. 1: Diagram illustrating how the top-down and bottom-up approaches are linked in the Integrated Sustainability Concept.

Figure 2 illustrates how the indicator process was carried out: the identification of indicators took place at the interface between rules and problems. The indicators allow to contextualise the concept of sustainability on the local level and to link it with local problems. In most of the cases there were chosen a set of indicators for every so-called rule-problem-complex. Using respective data sets it allows a quantitative measurement of sustainability (Fig.2).

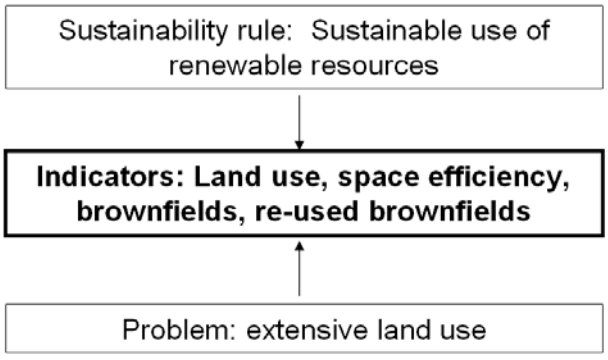

Fig. 2: Example illustrating the choice of indicators.

Although the HGF Concept was originally developed for the national level, all three aspects – the normative definition of the model, the contextualisation strategy implicitly contained, and the identification of indicators as the main element –

make the HGF Concept appear suitable for the operationalisation of sustainability at other structural levels, too. Therefore, the set of sustainability rules was adopted almost unchanged as a conceptual basis for the development of the local indicator system.

The indicators were identified in four stages, we started with assessments by local stakeholders of the current and future problems of the cities of Halle and Leipzig (‘problem orientation’). After introducing the sustainability rules of the HGF Concept as the target or yardstick (‘norm orientation’), rules and problem areas were interconnected (‘contextualisation’). Indicators were then determined for the resulting thematic complexes, which simultaneously led to the further particularisation of the issues covered by the rules and problem areas (‘operationalisation’).

Contextualisation: local problems in the light of sustainable development

Linking up the bottom-up and top-down approaches enabled the local problems of Halle and Leipzig to be compared with the rules of the Integrated Sustainability Concept, i.e. with aims derived from the sustainability model. In order to build the conceptual bridge between the local problems and aims, indicators now had to be identified which over the course of time could provide information about whether the local authority is becoming closer to or farther removed from the sustainability goals in its problem areas. Such indicators are required for both the continuous observation of the problem areas and the systematic controlling of political measures in this sphere. However, the relatively high degree of abstraction of the thematic complexes from sustainability rules and local problems necessitated further content circumscription. Hence the identification of indicators involved not just determining characteristic values for the measurement of sustainability in the area concerned but also the further operationalisation and particularisation of the model under the given local conditions. Therefore, this step can ultimately also be regarded as a discursive process moulded by both the participating scholars and the local authority stakeholders.

The selection process resulted in two extensive systems of indicators, each of which is designed to reflect locally specific, problem-orientated operationalisation of sustainability for the cities of Halle and Leipzig. Containing a total of 111 indicators for Halle and 105 for Leipzig, the two systems showed high congruence

(about 90%). As some indicators were selected for a number of different rule-problem complexes, the total numbers of indicators rose to 161 (Halle) and 155 (Leipzig).

Technical implementation

The indicator systems compiled are an important milestone on the road to integrated sustainability reporting for the cities of Halle and Leipzig. Once the indicators have been underpinned with data and integrated into an interactive web application, the two cities are to be equipped with a user-friendly, web-based georeferenced sustainability information system (IGNIS) allowing sustainability data to be accessed by all departments (Figure 3).

Such an information system can in principle fulfil a whole string of functions. It can for example be used as an information and communication medium on the local role of sustainability which is geared to the different needs of the addressees consulting it (e.g. local politicians, local authority personnel, the general public, Local Agenda 21 officers) and the aims in mind (e.g. reporting, transparency, education and training, comparison with other towns and cities).

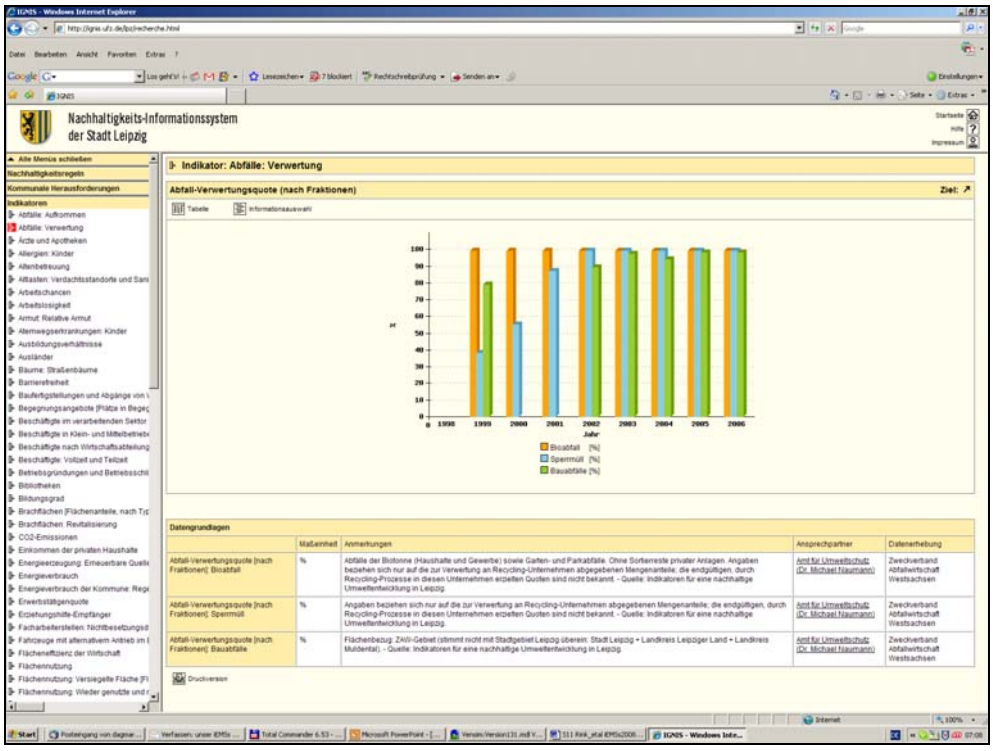

Fig. 3: IGNIS – local sustainability information system website.

In addition, the information system could acquire a guidance function by supporting local politicians and authorities in the early identification and analysis of problem areas, the definition of aims and the selection of suitable measures. And if the information system is used to check the success and effectiveness of certain development measures, it could also have an appraisal and verification function. In this particular case, the main consideration is probably to keep local government and authorities (and possibly also the general public) abreast of the implementation of local sustainability (i.e. sustainability monitoring). Whether this will lead to additional usage within local decision and control processes as described by means of the guidance and verification function (sustainability controlling) will mainly depend on how the stakeholders involved take to the information system.

The procedure chosen for the development of the indicator system has already proved successful. In particular, the systematic definition of the global sustainability norm and its incorporation into the local context have turned out to be especially helpful tools both for the selection of indicators for sustainable development at the local level and for the acceptance of the sustainability model among the stakeholders involved. Both monitoring systems were integrated into the municipal bargaining. By means of annual sustainability reports via the councillors the urban development shall steered towards sustainable direction.

Outlook

NAMOS is a specification of IGNIS and elaborates the sustainability concept to the specific problems of so-called “shrinking cities". Using the example of the city of Leipzig, we develop a monitoring system that aims to measure the sustainability of the shrinkage. By shrinkage we mean a multidimensional process in which economic and demographic decline join to physical decay.

Up to now, we identified a pool of indicators, formulated problems relevant to the shrinking process and related these to the rules of the sustainability concept of the Helmholtz society. The methodological concept is based on the IGNIS system and applies the latter to the phenomenon of shrinkage and will use an enhanced Geo-Information System for visualization.

The monitoring system NAMOS will provide a data base for urban modelling projects. Furthermore we plan an independent analysis that extensively evaluates the shrinking process following the rules of the HGF Concept. Besides we will also analyse processes of social change and relate them to urban social-science concepts such as segregation, reurbanisation and gentrification.

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