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PRACTICAL IMPLEMENTATION OF SUSTAINABLE URBAN MANAGEMENT TOOLS

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Summary. *The paper discusses how to promote the use of decision support tools for urban sustainable development. The interest in decision support tools based on indicators is increasing among practitioners and researchers. The research has so far focused on indicator types and systems of indicators and goals for urban sustainability whereas less focus has been on the context of implementation and even less on what we can learn from practical experiences about the usefulness of urban sustainable indicator tools.*

This paper explores the practical implementation of urban sustainable management tools. It is generally agreed that in order to make indicators and other sustainability management tools work it is necessary that they are integrated in the relevant urban organisational levels, in a way that creates commitment to the subsequent goals. This includes involvement of organisations, individuals and other urban actors around indicators, goals and actions for sustainable urban development across organizational levels. Hence the key question is how to implement urban sustainable management tools in urban management gaining validity from an expert perspective as well as a lay-man perspective. The paper points to the importance of intermediary actors as bridge-builders between municipal administration, citizens and infrastructure bodies, and their role in anchoring the tool in the local context.

We use the Ecological Modernisation as a frame for understanding the need for tools and the development of intermediary actors. The paper is based on the Danish part of the PETUS-project (Practical Evaluation of Urban Sustainability) and the INTERMEDIARY-project (New intermediary services and the transformation of urban water supply and waste water disposal systems in Europe). Further the paper draws on Danish experiences with urban sustainable management tools. The experiences rank from simple approaches of municipalities publishing indicators or green accounts, to more advanced approaches of urban sustainability integrated in environmental management systems.

1 INTRODUCTION

The number of urban sustainable evaluation tools is multiplying these years. However our screening of 200 tools showed that the majority of the tools are only used once, and by those who developed the tools [1]. At the same time the research primarily focus on indicator types and goals for urban sustainability. Hence there seem to be a lack of focus on the context of implementation and on what we can learn from practical experiences about the usefulness of urban sustainable indicator tools.

In order to create sustainable urban development urban managers have navigate in a complex field and commitment has to be on many levels, at strategic and political level, at tactical level in e.g. management plans and at operational levels in the concrete designs. On top of that there are contested perceptions of sustainable urban management [2,3,4 and many others]. In practice the search for decision support tools are often motivated by the following challenges arising from different decisions levels within sustainable urban management [1]:

- How to assess and prioritize between environmental solutions? The choice needs to be clear and validated so it can be presented to others.
- How to clarify visions and project target and how to relate to best practice? Does the project need conventional or innovative solutions?
- How to involve relevant stakeholders?
- How to document sustainability throughout the lifetime of a building, a facility, or etc.?
- How to evaluate projects and plans? What should be included, how can it be measured and how to measure success?

Indicator tools to evaluate and monitor urban sustainability are obvious responds to the above questions. The search for better tools is well documented by increasing amounts of research literature [eg. 5,6,7] and will not be repeated here. Instead we will explore the challenge of practical implementation and the anchoring among the urban actors. We will focus on the core debate in resent research literature that is the challenge of combining bottom-up with top-down processes in order to gain validity from an expert perspective as well as a lay-man perspective [e.g. 3, 8,9,10]. This paper discusses how to promote the practical use of decision support tools for sustainable urban management, based on an in-depth analysis of 56 tools carried out in the EU-project PETUS (Practical Evaluation Tools for Urban Sustainability) and the research on intermediaries in the EU-project Intermediaries (New Intermediary services and the transformation of urban water supply and waste water disposal systems in Europe). The gap between the available amount of tools and the limited use of tools indicates a mismatch between the tool, the users and the user situation. The INTERMEDIARY-project points to new urban actors who are able to promote tools and bridge different organisational levels [11].

The key question in this paper is then: how to implement sustainable urban management tools in urban management gaining validity from an expert perspective as well as a lay-man perspective and the paper explores the possible roles of the intermediary actors to acts as links

between municipalities, citizens and infrastructure and how they facilitate anchoring the tools in the local context.

The structure of the paper is as follow: The first section presents the paradigm of ecological modernization to explain the current and increasing need for tools and the context of implementation focusing on the development of intermediary actors. The second section presents an overview of sustainable urban management tools and the lessons learned in the PETUS-project on what promotes and hinder the use of tools. This section points to the lack of knowledge about tools, lack of resources to adapt the tool to the specific situation and the lack of stakeholder dialogue. The concept of intermediaries is developed in section three as one strategy to overcome barriers and bridge top-down and bottom-up perspectives when anchoring a tool. The fourth section presents the Danish concept tool, Dogme 2000, as an illustration of a cross-sector policy tool, where intermediaries bridge the municipal level and citizens level. The fifth section concludes on how to promote implementation of sustainable urban management tools.

2. THE NEED FOR TOOLS AND THE PARADIGM OF ECOLOGICAL MODERNISATION

In this section we present the paradigm of ecological modernisation as a frame for understanding increasing interest in sustainable urban management tools in the recent years. The section further describes the development of intermediary actors a core element in our approach to implementation.

A central question raised by the ecological crisis is whether the institutions that created the environmental problems also are able to solve them [12]. Ecological Modernisation (EM) presents an optimistic view on this: Institutions are able to renew themselves, and to integrate environmental issues in existing policies. Instead of seeing environmental challenges as barriers, they become locomotives for innovation; instead of seeing environmental challenges as anti-modernist and anti-growth, they are seen as a win-win game [13].

Mol & Sonnenfeld mention 3 stages in the development of EM theory. While EM originally developed in the sphere of industrial production focusing on the role of technological innovations and market actors, the second stage gave more attention to institutional and cultural dynamics. The third stage includes studies of ecological transformation of consumption, and some scholars have begun to promote an expansion of the processes of greening to the level of daily practises of households [14,15,16]. Today a consensus are wide spread that participatory processes and stakeholder involvement are important features of sustainable development; however practical strategies need to be developed.

In general the EM approach is oriented towards self-regulation and cooperation and

consultation with those to be regulated [16]. Hence an important feature of EM is about making environmental issues calculable. EM focuses on how substance flows, such as energy and water resources, could be better managed and controlled integrating both technical and social aspects. During the integration of environmental values into the institutions, environment is transformed into manageable entities - e.g. measurable goals, quotas, norms and green taxes also serving marked purposes [3,17]. Moreover, EM implies new institutional arrangements in which the authorities' collaboration with other actors is central, as a contrast to traditional politics, where changes are sought through legal regulation. Boström [16] and others emphasize the environmental organisations that since the 1960s have been very active introducing environmental issues: As opponents to the established system neglecting problems, such as the pollution of the water environment [16, 18], the NGOs contributed to develop the environmental discourse that EM now embodies. Today, the distance between authorities/public institutions and other actors, including green NGO's, has diminished; environmental organizations are generally not seen as opponents to public institutions. Further the lack of confidence to authorities in the late modern society has created a need to develop new institutions to establish the relations between the citizens and the authorities and experts [19]. Hence new intermediary actors are involved in facilitating the participatory strategies [16].

To sum up we focus on the following aspects of EM in relation to urban sustainable development:

- The change of urban management logics and the focus on participatory strategies
- The increased need of new ways to measure and assess the urban sustainability and the development of tools.
- The emergence of intermediary actors and services in urban management to facilitate citizens' participation.

3 THE USE OF SUSTAINABLE URBAN MANAGEMENT TOOLS

This section gives an overview of the sustainable urban management tools and summarises the lessons to learn from the PETUS-project on the usefulness of sustainable urban management tools in.

As part of the PETUS-project researchers has interviewed urban planners and consultants in 8 European countries about their use of sustainability evaluation tools. The methodology has been case studies of "best practice" according to key persons from each country. 56 case studies of practical evaluation tools for urban sustainability have been carried out as part of the project (accessible via www.petus.eu.com). The use of tools reflects four different management situations. Some tools aim at a specific project others on policy level. Some tools aim at a single sector, while others aim at several sectors. In table 1 are examples of tools used in the four different management situations.

	Sector-specific	Cross-sector (holistic)
Project (limited in time and scale)	<p>Sector-specific projects</p> <p><i>Example: Sustainable infrastructure project</i></p> <p><u>Examples of tools:</u></p> <ul style="list-style-type: none"> • Guidelines • Assessments and evaluations • EIA-assessments • Multicriteria Analysis 	<p>Cross-sector projects</p> <p><i>Example: Design and assessment of sustainable buildings</i></p> <p><u>Examples of tools:</u></p> <ul style="list-style-type: none"> • LCA-based assessment tools • Framework tools • Multicriteria analysis
Policy (continuous and covering the whole sector)	<p>Sector-specific policies</p> <p><i>Example: Waste reduction policy</i></p> <p><u>Examples of tools:</u></p> <ul style="list-style-type: none"> • Indicators • Monitoring • Assessments • Cost Benefit Analysis 	<p>Cross-sector policies</p> <p><i>Example: Sustainable Urban Development</i></p> <p><u>Examples of tools:</u></p> <ul style="list-style-type: none"> • Indicators • Monitoring • Audits • Guidelines • SEA • Networks

Table 1: Examples of sustainable urban management tools used at project and policy level, and with the perspective of one or several sectors.

Based on a number of comprehensive case studies amongst these different types of cases and tools [1] concludes on general conditions which promotes or hinder implementation of sustainable urban management tools. The analysis identified five different barriers to the use of tools:

- lack of motivation and openness about decision processes
- Little or no knowledge of the tools
- The tools are too complicated and requires too many resources
- Tools lack legitimacy, reliability and transparency
- Data are not available or accessible

To promote implementation of sustainable urban management tools in practice the challenges are to overcome the lack of knowledge about tools, the lack of resources to adapt the tool to the specific situation and the lack of stakeholder dialogue.

Based on the case studies where tools were used there seems to be four main drivers that motivate to use tools:

- Legislation prescribe the use of tools e.g. strategic environmental assessment
- “marked” demand the use of tools and more open decision processes

- providing a clearer statement of the existing problems and possible alternatives
- legitimisation and labelling of projects or policies

Another lesson from case studies where tools were documented successfully, the benefits gained from using tools are:

- Demonstrating more sustainable solutions
- Assessment motivates for improvement
- Legitimisation, documentation and labelling
- New decision procedures involving new actors

The results of the PETUS-project state, in line with Ecological Modernisation, important reasons to implement sustainable urban management tools from an urban management perspective. But in order to motivate the use of tools and to overcome the identified barriers basic challenges arise: How to develop the knowledge and competence to use the tool? How to adapt tools to be implemented in a specific context? How to create commitment at different organisational levels? And finally how to involve local actors in the implementation processes? The next section explores new intermediary actors and how they facilitate implementation processes.

4 Intermediaries acting between municipalities, citizens and infrastructure managers

Development of intermediary actors as an institutional support to implementation of urban management tools might be an answer to the questions raised above. In the INTERMEDIARY-project we analyzed organizations acting between the municipality, the infrastructure managers and the local actors. The organisations are manifold: housing associations, private consultants, NGO's, public private partnerships, Local Agenda 21 centres etc. The screening of more than 200 examples of intermediaries and in-depth studies of intermediaries lead not only to a typology of intermediaries, as presented in [21], but also to an identification of different processes of anchoring a tool in the context. The following categorisation is illustrated with examples from an NGO from Copenhagen [21].

- As bridge-builders the intermediaries communicate and facilitate dialogue between the municipality and the local actors. In Copenhagen the NGO has developed water saving campaigns including indicators in collaboration with the utilities.
- As info-mediaries they provide information typically from the municipality to the citizens and other local actors. The NGO has developed a huge 'water meter' presenting the current water saving status for passers by.
- As advocates they promote urban sustainable development. A specific feature of the NGOs as advocates is their profile as impartial spokesmen of environment and non-commercial.
- As frontrunners they innovate and test sustainable technologies and new social practices such as sustainable urban management tools. When the concept of green accounting

emerged in businesses the NGO explored how this could be applied on an urban scale or in the housing sector.

The case studies document intermediaries play an important role in processes of motivating the use of tools, in processes of using the tool and in processes of communicating results from the use of tool.

5 Dogme 2000: an example of a tool which combines top-down and bottom-up

How can cases from the PETUS and INTERMEDIARY project serve as good examples and as inspiration for others? In this section we present Dogme 2000 as an example of a sustainable urban management tool which is being implemented successfully in a group of Danish municipalities since several years. Dogme 2000 is in our opinion an noticeable tool for sustainable urban management because it represents commitment at strategic and political level and at the same time it stresses the importance of anchoring the processes in a locally.

Dogme 2000 is a municipal network on sustainable urban development, established in 2000 with five members: The municipalities of Albertslund, Copenhagen, Ballerup, Herning and Fredericia. In 2005, the municipalities of Kolding and Malmø also joined Dogme 2000. The network is based on political commitment to the common goals defined, on setting up measurable goals, and on annual audits on the municipality's success. This is formulated in 3 dogmas:

1. All human impacts on the environment must be measured
2. A plan for environmental improvements has to be prepared
3. The Dogme 2000 must be anchored locally

An annual external audit by a certified accountant based on detailed principles is carried out in every member municipality and the results are made public.

For each dogma 3 sub-goals are defined together with a set of ways to measure them (see table 2).

Dogmas	Sub-goals	Indicators
1. All human impacts on the environment have to be measured	1a Green accounts for buildings 1b Sector-measures 1c Total contribution to pollution	Green accounts for municipal and private buildings Waste, district heating, electricity, gas, oil, traffic, groundwater and pesticides Emissions of CO ₂ and NO _x
2. A plan for environmental improvements has to be prepared	2a Agenda 21-plan 2b Environmental goals 2c Specific public goals	Municipal Agenda 21-plan Goals for resource-consumption and environmental impacts Organic food, sustainable construction, sustainable planning, green purchase policy
3. Dogme 2000 must be anchored locally	3a Residential areas 3b Industries 3c Municipal departments	Formation of local Agenda 21's Formalised way of Sustainable Urban Development (e.g. networks) Environmental certification (e.g. EMAS)

Table 2. Overview of the cross-sector policy tool Dogme 2000: dogmas, the sub-goals, and indicators.

The main idea is that the three dogmas include the entire municipality's activities and environmental impacts; therefore it is the municipality's entire progress according to the Dogme 2000s that has to be evaluated. This concept has several advantages: The political commitment motivates for a serious effort to improve on the three dogmas. It also legitimises the environmental departments' demands to other departments. This gives the Dogme 2000 a potentially strong role internally, integrating sustainable issues in the municipality's different policies. This is also strongly supported by the annual audit, where the auditors' interviews 20-60 persons in the municipal administration (including the involved politicians) about their contribution to Dogme 2000 and the initiatives included in Dogme 2000. Hence the municipality is able to compare this audit with last years audit, and with other municipalities' audits. Due to the innovative concept and the progress shown in practice, Dogme 2000 is gradually becoming nationally and internationally recognised, and has been internationally awarded twice.

In some of the participating municipalities, Dogme 2000 is used as a coordinating tool for

the various sustainable policies in the municipality. Horizontally, Dogme 2000 has a function as a forum for exchanging experiences, knowledge, innovations etc. between the participants. Also, it has the potential of making common environmental actions within the Dogme network more visible and known to other stakeholders in the municipality, and thereby enforcing Dogme 2000 as the common concept for sustainable urban management. Vertically the Dogme 2000 focuses on anchoring the strategy on all municipal levels, which has been a core challenge to create commitment within in the municipality as organisation (including not only the technical and environmental departments, but also the social department and the culture department, the schools, day care institutions, care homes etc). The experience is that within the municipal organisation the main reason for commitment to implementation of the dogmas at in all municipal activities, is the commitment on the highest political level [22].

Much effort is also made to ensure local anchoring in residential areas and local industries and several examples of intermediary organisations is identified in the case studies of Dogme 2000. In Albertslund, where the Dogme 2000 originally was conceptualised by the Technical Director, a strategy of sustainable urban management has been developed since 1992, when the first green account for the city was published. In the municipal of Albertslund environmental progress has primarily been driven by organizational innovations such as the 'user group' – an intermediary roundtable forum constituted by representatives from all the urban districts. Here prices, indicators, campaigns etc. are discussed and agreement between the municipal and the citizens are reached. Hence the representatives take responsibility for anchoring the policy locally. Further the municipal for more than 10 years have financed a local Agenda Centre working as an info-media and frontrunner promoting citizens participation and local environmental projects among the citizens.

In the municipality of Copenhagen a similar strategy has been developed to bridge top-down and bottom-up in sustainable urban management. So far seven local Agenda Centres have been established to anchor sustainable urban management among local municipal institutions such as schools, SMEs and citizens. These have been developed as public-private partnerships on a local level. An evaluation of the first 3 centres shows that the centres to a large degree work as independent organisations. Further it points to the fact that they not only promote urban management top-down but also bottom-up supporting local knowledge, ideas and critique [23].

6 CONCLUSION

Ecological modernization point to a shift in the logic of urban management and the focus on stakeholder participation, and the increasing need for new management tools as well as the emergence of new intermediary actors and services to facilitate citizen's participation. As stated in the introduction, the key question in this paper is: how to implement sustainable urban management tools in urban management gaining validity from an expert perspective as well as a lay-man perspective.

Our analysis of the use of sustainable urban management tools show that there is a large amount of tools targeting either at project or policy level, and either with a single sector focus or a cross-sector focus, but the tools are not widely used. When the tools were used it was driven by: legislation, marked demand, a search for clarity and openness in decision processes and legitimisation and labelling of projects or policies. However there are practical barriers that hinder the implementation of sustainable urban management tools. The barriers are lack of knowledge about tools, lack of resources to adapt the tool to the specific situation and lack of stakeholder dialogue.

We point to intermediaries as a possibility for anchoring tools in the context, and ensure the needed match between tool, user and user situation. Intermediaries can facilitate dialogue between stakeholders, provide information and advocate urban sustainability solutions and act as front runners for innovations in sustainable urban management.

The example of the cross-sector-policy tool Dogme 2000, illustrates the use of a tool which focus on processes of creating commitment among all relevant stakeholders from the municipal organization as well as outside. The case of Dogme 2000 shows examples of how intermediaries are used to facilitate the implementation process. In Albertslund a “user-group” is developed to facilitate the dialogue between the municipality and users of municipal infrastructure services. In Copenhagen Local agenda 21 centres are used to bridge top-down and bottom-up perspectives of sustainable urban management.

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