

Networks as Tools for Sustainable Urban Development

Paper for the international conference: "Innovation, Sustainability and Policy", 23-25 May 2004 in M \ddot{u} nic, Kloster Seeon.

Jesper Ole Jensen, Assistant Professor, Department of Civil Engineering, Technical University of Denmark (DTU). Telephone: (45) 4525 1717. Fax: (45) 4593 4430. Mail: joj@byg.dtu.dk.
Arch .Nicola Tollin, Researcher, Department of Civil Engineering, Technical University of Denmark (DTU).
Mail: nit@byg.dtu.dk

22 April 2004

Abstract

Due to the increasing number of networks related to sustainable development (SUD) the paper focuses on understanding in which way networks can be considered useful tools for sustainable urban development, taking particularly into consideration the networks potential of spreading innovative policies, strategies and actions. There has been little theoretical development on the subject. In practice networks for sustainable development can be seen as combining different theoretical approaches to networks, including governance, urban competition and innovation. To give a picture of the variety of sustainable networks, we present different examples of networks, operating at different geographical scales, from global to local, with different missions (organizational, political, technical), fields (lobbying, learning, branding) and its size.

The potentials and challenges related to sustainable networks will be discussed through a case study of a Danish municipal network on Sustainable Development, Dogme 2000¹. This network has become quite successful in terms of learning and innovation, committing actors, and influencing local policies, to a larger extent than other SUD-networks the municipalities are involved in. By applying the GREMI²-theories of "innovative milieux" (Aydalot, 1986; Camagni, 1991) to the case study, we will suggest some reasons for the benefits achieved by the Dogme-network, compared to other networks. This analysis will point to the existence of an "innovative milieu" on sustainability within the network, and on the political commitment in the network, where all progress is being measured and audited. From this, we find many parallels between the pre-conditions for an industrial innovative milieu, and the pre-conditions for an innovative municipally based network. Based on the analysis, we will discuss the role of networks at different scales: regional, national and local in diffusing innovative virtuous practices and in adapting it to new context.

Introduction

A number of Networks for sustainable urban development have emerged over the last decades. This includes very different types of networks, both of mission and scale: Sector-orientated networks, Agenda-21 networks, Municipal, National, International and Global networks; some formal (city networks and technical networks) and some others informal (particularly at local level to be intended as a form of strengthen the actors synergy). Also, theories on sustainable urban development emphasises the potential of networks and innovations, through cities' mutual learning processes of sustainable innovations (technical as organisational), involving both public and private stakeholders (Hall & Pfeiffer, 2001). By forming such networks, learning from best practices in other cities, and implementing organisational innovations locally, the city administrators can stimulate local sustainable innovative practices, leading to economic, environmental and social benefits. However, both practically and theoretically it is recognised, that there are

¹ The case study has been carried out as a part of the EU-financed PETUS-project (Practical Evaluation Tools for Urban Sustainability), <http://www.petus.eu.com/>, and is based on interviews with officers from the five municipalities. PETUS focuses on tools for SUD, on how tools work in practice, how they influence decision-making processes, and on why some tools are more successful than others.

² Groupe de Recherche Européen sur les Milieux Innovateurs (GREMI). GREMI is a group of European researchers on urban economy, who during the 1980ies and 1990ies studied a number of new urban innovative industrial districts around the world, and from these studies formed a theory of innovative networks and innovative milieu.

problems and barriers related to fully exploit the potentials for networks. It is acknowledged that incentives to export or import innovation in governance are weak, and “isolated islands of innovation” are more the rule than the exception. One reason is that governance innovations are not traded like new technologies in markets driven by competition, and especially in the public sector, there is a lack of incentives for innovation (Hall & Pfeiffer, 2001 p. 198). We often see gaps between cities policies on sustainability, and the actual local sustainable development, where plans and policies are not implemented locally. Or, we see green policies legitimised by a few conspicuous examples on sustainable development, “green islands in a grey ocean” (Elle et al, 2003).

We have little indications whether learning and spreading of innovations in SUD-networks works in practice, and how. Are the good practices from other cities transferred to other cities and implemented – and how efficiently? Does the members develop innovations by participating in the network, sharing experiences, developing common projects etc. – or does the different members “transfer” their innovation and knowledge to the other participants, who try to implement these ideas locally?

Different approaches to networks

In theory and practice, the term “networks” is understood and used in different ways, reflecting different approaches to the term, and that it emerges from different disciplines. The following examples represent some of the understandings in contemporary literature on networks in an urban context (here we exclude theories on technical infrastructure networks):

Networks and Public Management

One perspective on networks comes from the public urban management, and the transformation from “Government to Governance”, giving network management a central role instead of traditional hierarchical leadership. Here (based on Sehested, 2002), one can define a policy network as a cluster or a complex of organisations (public and private) joined together through their interdependencies and interchange of resources (such as money, information, know-how and experience) (Rhodes, 1997). In this understanding, the policy network rules are rooted in confidence and negotiated by the members and giving networks autonomy in relation to government. It has been argued that networks are not purely alternatives to traditional hierarchical public management, but typically operates “in the shadow of the hierarchy” (Scharpf, 1994).

Networks, Globalisation and Competition

Another understanding of “networks” comes from the theories of the “World City Networks”, based on Sassen's concept of *Global Cities*, suggesting a global competition between cities. The constitution of regional and global networks design a new geography and new trans-national urban systems based on a new kind of geography where concept of central and peripheral are determinate by the influence that the city exploits to influence decision making processes, and attracting capital, investors, city users, qualified technicians etc. (Sassen 1991-1994). In relation to these theories, networks of global leader-cities have actually mapped (Taylor et al, 2002), and the innovative characteristics of the “polycentric network cities” emphasised (Batten, 1995).

Networks and innovation

A third perspective on networks comes from theories on innovation. In this paper we focus in the GREMI-theories, based on studies of industrial innovation and the local milieu that the innovations emerge from. Inb these theories, local networks are usually informal, constituted as relational capital between actors, physical proximity, sharing the same beliefs, and working for the same goals. Local networks are seen as an integrated part of the local milieu. The milieu become innovative through the role played by an innovative entrepreneur, activating a process that transforms informal relations to structured and institutional relations (Camagni, 1991; Aydalot, 1986). The theories on emphasizes the regional factor, and along with others (for instance Bradford, 2003) argues for the importance of the local context (or milieu), as a contrast to urban theories arguing that the local is becoming less important in the urban competition. In a broader understanding of urban innovation, the involvement of citizens, enterprises and other local stakeholders in decision-making and participative processes has been emphasized (Castells, 1996; Landry, 2000).

Networks and Sustainable Urban Development

Although there has been a growing number of sustainable urban networks, the concept of sustainable networks itself seems to be little developed in theories on urban development. In practice, however, the ideas of SUD-networks relate to as well governance, competition as innovation. Elements as green urban policies, cleaner urban environment, and a greener city-image are becoming an international competition parameter, and are increasingly becoming important for the survival of the city (Landry, 2000), as well as SUD increasingly is linked with public management, social aspects, empowerment and organisational innovations. Peter Hall and Ulrich Pfeiffer have in *Urban Future 21* described a potential role of sustainable urban networks, with special focus on the transformation of sustainable innovation and knowledge between cities. This includes exchanging ideas in the networks, appointing and awarding best practices, setting up monitoring programmes, comparing best practices and competing on green initiatives (Hall & Pfeiffer, 2001). The authors see sustainable networking as a natural part of current changes in urban management, including privatisation and competition, participation and self-management, transparency and accountability, products and client orientation. The outcome of these trends is less public regulation, more use of PPP (Public-private-Partnerships), and a larger decentralisation with emphasis on local governmental innovation. These tendencies (which also can be seen as tendencies of New Public Management) are not necessarily obstacles for sustainable urban development, but have to be seen as conditions for sustainable urban development. Increasing privatisation might imply advantages as the politicians' administrative burdens are lowered, and they can spend more time and energy on innovative tasks. There are plenty examples on sustainable governmental innovation, combining environmental, social and economic benefits on a local scale – and a number of administrative tools, instruments and techniques that local governments can use: Different forms of eco-auditing, local environmental forums, environmental impact studies, voluntary agreements on waste, energy, water, emissions etc., environmental education and training, and more others (ibid., p. 210). It is, however, also recognised that one barrier is that such organisational innovations spread rather slow, as the public sector generally has little incentives for being innovative.

In the following we will look at some practical examples on urban sustainable networks, and explore possible reasons for their ability to spread innovation.

Examples on Sustainable Networks

In practice, networks on urban sustainability have different scale, actors and missions. A categorisation of networks is very difficult but might include temporal aspects (temporary or contingent networks), open or closed, formal or informal networks (Sehested, 2003). The networks typically aim at learning (exchanging of knowledge, experiences, innovation, benchmarking etc., for instance through common projects), lobbying (acting as knowledge-centres and policy formulators) as well as branding (the networks mission giving the participants a green image). Table 1 list some examples on sustainable cities networks on different scales and scopes. The examples includes only formalised networks with a stable organisational form. Therefore the selected examples are different mainly in scale, mission, actors and field. In the table we have suggested differences in missions (Technical, political and organisational) and fields [1) Lobbying 2) learning 3) branding]. The list contains only a very small amount of, assumedly, thousands of networks on sustainability.

Table 1. Practical examples on sustainable urban networks.

Examples (Name)	Scope	Scale	Members	Mission	Field*
International Council for Local Environmental Initiatives (ICLEI)	To achieve tangible improvements towards sustainability.	Global	More than 400 local governments (cities, towns, counties, and their associations)	Organizational Political	1
World federation of United Cities (FMCU-UTO)	International co-operation between local authorities, improvement and perpetuation of our living environment (sustainable development).	Global	1500 local authorities	Political	1
WHO-Healthy Cities Project	To promote comprehensive local strategies for health and sustainable development	Global	1100 cities and towns.	Organizational Political	1
Energie-Cités	To promote sustainable local energy policies	European	about 100 municipalities	Technical	2
Eurocities	To improve the quality of life in European cities and urban areas	European	100 major cities	Political	1
The Association of Cities for Recycling	To introduce ecologically and economically rational waste management.	European	70 local and regional authorities	Technical	2-3
Climate Alliance	protecting the earth's atmosphere and preserve tropical rainforests	European	900 member cities	Organizational Political	1-2
Medcities	strengthen decentralized actions as the best means of promoting awareness of urban environmental problems	Regional (Mediterranean)	26 Mediterranean cities	Political	1-3
Dogma 2000	To promote sustainable urban development	National (Danish)	5 cities (municipalities)	Political Technical	2-3
Green City Denmark	Network aimed at spreading environmental know-how to other countries.	Local (Danish)	250 shareholders, comprising companies, institutions, municipalities etc.	Organizational Technical	2-3
Green Network	Working for sustainability with a focus on environment and social responsibility, including dialogue between enterprises and authorities	Local (Danish)	App. 300 members (enterprises, municipalities etc.)	Political Organizational Technical	2-3
Key2Green	To export knowledge and experiences from Green Network and other networks (a network of networks)	National (Danish)	9 networks, 8 municipalities, 8 enterprises, 3 R&D-institutions	Organizational	2
Network for Sustainable Development	Network for teachers in Copenhagen, focusing on exchanging experiences, sharing knowledge, gathering, and giving inspiration on sustainable issues	Municipal (Danish)	5 networks of school and institutions in Copenhagen interested in sustainability	Organizational	2

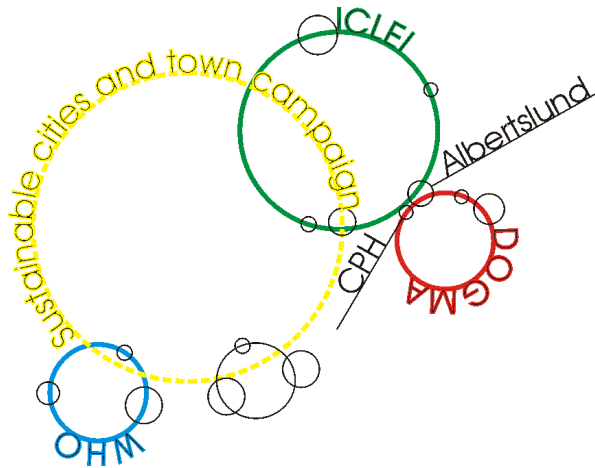
*: [1] Lobbying 2) learning 3) branding]

From the list we can start to assume differences related to the scales, missions, actors and learning. For the technical oriented networks, oriented towards one technical subject or sector (for instance energy, water etc.), large-scale communication and learning is supposedly easier, as the technical subjects and innovations to a larger extent are transferable and independent of the context, as well as the members often are homogenous. One example is the Association of Cities and Regions for Recycling (ACRR), which is an international network of experts involved in urban waste management. The network's aim is to exchange information's and experiences, increase the visibility of innovative experiences and to promote communication, information and public awareness. At the same time the network play an active role in discussions and decisions at the regional level cooperating with the Environment Directorate-General of the European Commission.

In other networks the emphasis is not on learning, but on gaining influence on political decisions through the network. Medcities operates to improve the environment and awareness on sustainable development issues; it operates mainly at a policy level both in relation to the network members and to the international institutions. At the local level Medcities supports the policy making into the municipalities also giving a technical and financial support; at the global level, representing the network members, it influences the formation of a policy for the Mediterranean Region within the international institutions and the regional policy makers. Furthermore it triggers new partnership between towns bypassing governmental intermediation.

When networks focus on urban sustainability in a holistic approach, and includes different sectors, cross-sector problems, political issues and others, learning and transferability of innovations becomes more difficult the larger the scale of the network, due to different political cultures and different contexts. Therefore the focus of such global and European networks is to a larger extent to make urban sustainability visible as a political issue, influencing other bodies, servicing members by collecting knowledge and contacts, and branding the participating cities as sustainable.

One example is WHO – Healthy Cities Network. It is a source of expertise, legitimacy and continuous learning, assuming that the city has a first plan role in developing health and sustainable development policies. The network shapes policies and strategies for the improvement of the urban health and exercises a pressure on the national governments that should follow the network coordinating and capacity-building role. Also, the WHO networks focus on joining forces with other international organizations and agencies to meet urban health challenges and on strengthening inter-regional cooperation and influence on health issues first and on sustainable development in general. This gives the network a mixed function of learning and political influence on decision making.



A similar example is ICLEI, who also has a similar double function on influencing regional decision-making on environmental issues, and to structure a learning process. On the local level, ICLEI's aim is to support local governments to achieve an accelerated implementation of Local Agenda 21; this activity it is carried out by networking, training, publication and particularly through campaigns and programs. ICLEI also has a strong policy making activity, exercising an influence role in regional decision making through its active cooperation with European Commission and Parliament, and UN institutions based in Europe.

On a local scale, we find several examples on networks including different types of actors, primarily enterprises and local authorities (municipalities and counties). In Denmark, Green City Denmark and Green Network were established in 1994 as an answer to the National competition of becoming the Green City Denmark, "Denmark's environ-industrial window to the rest of the world". The Green Network became second in the competition, but decided to continue their cooperation, which has been successfully, and for instance includes the development of a diploma for environmental management. The "Partnership for Environment and Enterprises", later named Key2Green, has been developed to spread the knowledge and experiences from the Green Network (and other successful networks) to other parts of the country, as a way to improve the dialogue between local authorities and enterprises, and make the partnership a pivot point of a learning process. It is initiated and financially supported by the Danish government, and reflects the tendency of establishing formalised "networks of networks" as a way to incorporate and strengthen policies. Several networks have been established with initiative from EU or national governments.

To illuminate some of the problems related to different types of networks, and to the aspects of learning, the following section focus on one of these networks, Dogme 2000, present some experiences from it, and from this discuss the differences to other types of networks.

Dogme 2000: An innovative network?

Dogme 2000 is a Danish network on sustainable urban development, having at the moment five members³. 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 Dogmes:

1. All human impacts on the environment must be measured
2. A plan for environmental improvements (Agenda-21 plan) has to be prepared
3. The Dogme 2000-plan must be anchored locally

If the annual audit reveals that the municipality is not improving its environmental standard, exclusion from the network is possible. For each Dogme there are 3 sub-goals defined, and different ways to measure them (see table 2).

Table 2. The three Dogmes, the sub-goals, and suggested indicators to measure the goals (see also Annex 1). Dogme is a dynamic concept, meaning that measures of goals and sub-goals can be changed along the way, so can the sub-goals themselves, if agreed by the partners.

<i>Dogmas</i>	<i>Sub-goals</i>	<i>Indicators</i>
1. All human impacts on the environment have to be measured	1a Green accounts for buildings 1b Sector-measures 1c Total contribution to pollution	<ul style="list-style-type: none"> • Green accounts for municipal and private buildings • Waste, district heating, electricity, gas, oil, traffic, groundwater and pesticides • emissions of CO₂ and NO_x
2. A plan for environmental improvements has to be prepared	2a Agenda 21-plan 2b Environmental goals 2c Specific public goals	<ul style="list-style-type: none"> • Municipal Agenda 21-plan • Goals for resource-consumption and environmental impacts • Organic food, sustainable construction, sustainable planning, green purchase policy
3. Dogme 2000 should be anchored locally	3a Residential areas 3b Industries 3c Municipal departments	<ul style="list-style-type: none"> • formation of local Agenda 21's • formalised way of SUD • environmental certification

The main characteristic of Dogme 2000 is the political commitment, where the city council signs the Dogme document. The participants commit themselves to have these Dogme's audited each year by a certified accountant. If they do not show progress compared to last years audit, the municipality can be excluded from the network. The main idea is that the three Dogme's 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 Dogme's. 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 auditors⁴ interviews 20-60 persons in the municipal administration (including the involved politicians) about their contribution to Dogme and the initiatives included in Dogme. From this, the municipality can compare this audit with last years audit, and with other municipalities' audits.

Figure 1. Example on a summary of an external Dogme-audit in a municipality. The annual audit includes an assessment that in a simple way summarises the municipality's progress on the 3 Dogme's and the subgoals, categorising the policy on a step from "start phase" to "fully implemented".

³ The members are the municipalities of Copenhagen, Albertslund, Ballerup, Herning and Fredericia.

⁴ Norske Veritas A/S

	Human impacts on the environment must be measured	A plan for environmental improvements (Agenda-21 plan) has to be prepared	SUD must be anchored locally
Fully implemented	1a		
Widespread implementation	1b		
Progressing	1c	2a	3c
Foundation established		2b 2c	3a 3b
Start phase			

In some of the participating municipalities, Dogme is used as a coordinating and collecting 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 as an environmental policy. The network was conceptualised by the Technical Director in Albertslund and initiated in 2000 by the municipality of Albertslund. The municipality of Albertslund has for some years been internationally recognized for environmental and participatory practices for sustainable development. It has taken a strong part in the international debate on sustainable development, participating actively at ICLEI conferences and charts definition⁵, being awarded with the European Sustainable Cities Award in 1996 for its environmental initiatives⁶. The environmental progress in Albertslund has primarily been driven by organizational innovations, allowing an extensive use of environmental concepts and technologies such as green accounting, Agenda 21-plans, local waste sorting, water savings etc. 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 twice⁷.

Understanding Dogme in terms of networks and innovative milieu

Using the GREMI perspective on innovative milieu and networks, we can see Dogme 2000 as an example on a network on SUD, emerged from an innovative milieu in Albertslund. According to the GREMI-theories, the milieu is innovative when able to open to external network connection, where collect information and exchange experiences, opening to the diversity and internalizing it. The networks, under this point of view, can be seen as a flow of resources, both material and immaterial, that are exchanged between the participants. By transforming innovations to different situations and needs, in a process of adaptation, new innovations emerge ("adaptive innovation", Perrin, 1991). In this way, the innovation networks drive the innovation through space and time, and different sectors (public as private). The innovation in a milieu can be considered as a process of integration, which also establish and foster the transformation of the local territorial system, for instance buildings, infrastructure and natural environment (Maillat 1993).

The municipality of Albertslund sees the Dogme network as their "environmental foreign policy", and a way to spread and develop innovations on sustainability (officer, Albertslund). The parallels to the innovative milieus described by the GREMI-theories might explain some reasons for the apparent success of Dogme, in terms of learning, transferring innovations, and using networks as a tool for SUD. Some of the characteristics of Dogme, which can be paralleled to the GREMI-theories include:

- The existence of an innovative milieu within the network (Albertslund municipality)
- The commitment and anchoring of the network
- Learning in the network

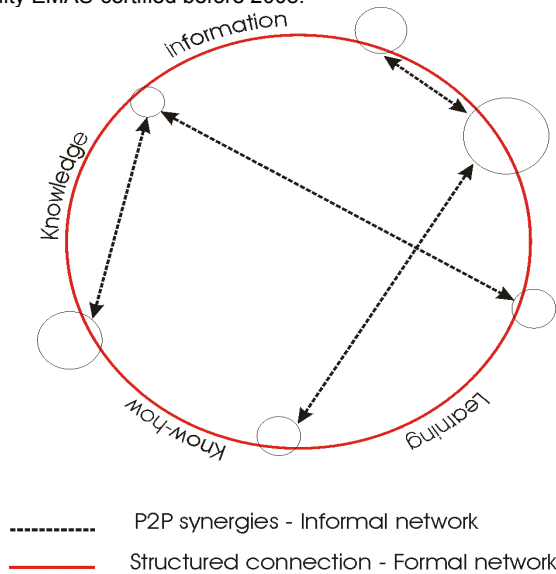
⁵ DISCUS (Developing Institutional and Social Capacity for urban Sustainability), <http://www.iclei.org/europe/DISCUS/cities.htm>

⁶ Jesper Holm (1999), Roskilde University, Denmark. *LA21 and Political Modernization: Toward a new Environmental Rationality in Denmark?* Located d. 09.11.03 at: <http://www.prosus.uio.no/English/research/suscom/firstreport/denmark/>

⁷ Latest in 2003 from "Les Eco Maires", in the category "European Cities"

Albertslund as an innovative milieu on sustainability⁸

From the GREMI-perspective we could see the initiators of Dogme 2000, the municipality of Albertslund, as an innovative milieu that has initiated the Dogme-network. Albertslund has in the last decades gained a reputation as the leading green municipality in Denmark, through a number of organizational innovations and environmental initiatives. The municipality is settled 15 km west of Copenhagen and has almost 30,000 residents. It was developed in the late '60 and '70, as a sub-urban area with a residential part planned under a strong *zoning* urban scheme, and with a majority of public housing (61%). There was a widespread application of dense-low neighborhoods design and co-housing-style self-governance, particularly in the public housing sector. This attracted a high percentage of people concerned about environment and human living conditions, and often willing to find an alternative way of growth. Consequently, it was a loose network of community activists who initiated the first urban ecology projects in Albertslund during the 1980s, gradually drawing interest and support from the local authorities and other stakeholders of the public (Scheurer, 2001). Amongst many other things, Albertslund has been renowned for being the first Danish municipality to publish green accounts on several scales, to have Agenda-plans for many neighbourhoods⁹, to establish ambitious and flexible waste-sorting systems (in some neighbourhoods sorted in up to 42 fractions), to include the ecological space in the Agenda-plans, and, as one of the latest initiatives, aims to have the whole municipality EMAS-certified before 2008.



The GREMI-theories points to the local space and community as a competitive factor, decisive for triggering innovative processes. For this reason it is considered as a precondition for the innovation, the creation and the support of social interaction, interpersonal synergies and the local cultural heritage (Ratti 1997). The innovative milieu is defined as a set of relations, active in a limited space, related to a production system, to be intended both soft and hard, economic and social actors, relations that generate a dynamic process of collective learning. Moreover, the importance of committed *entrepreneurs* with informal relations to the

⁸ Part of this study has taken place under the EU-project "Intermediaries", focusing on the role of the emerging intermediaries in the water sector, i.e. new actor groups operating between suppliers and consumers.

⁹ By 2003, 27% of the neighbourhoods, representing 45% of the population, had their own Agenda 21-plan (Dogme-revision, 2003).

¹⁴ In Copenhagen, participating in Dogme has led to the formation of a network ("The Environmental Network of Copenhagen") between the municipality and the local private enterprises

political level and municipal administration has also been demonstrated in the municipality, as a crucial condition for the different initiatives. As underlined in the theory, the ability to turn informal personal networks and synergic relationships to formal and institutional relations is an important precondition for developing an innovative milieu. A central example of this is the “user-group” in Albertslund, which has strongly contributed to the environmental progress in the municipality. The user-group was established in the early 1980ies, as a result of emerging conflicts over heating payment between owners of single-family houses and tenants in multi-storey buildings. These conflicts arose when the district heating system was established. As a way to tackle these conflicts, the municipality established the user-group, with representatives from the 65 neighbourhoods, who were given the permission to settle the prices on heating for the different owner-groups. Over the years the user-group has developed a strong and progressive position in local environmental questions, for instance in relation to differentiation on fees for water, energy and waste to support green initiatives and establishing the local Agenda 21-center (Åberg, 1996). So, actually, this first formal structure on sustainability, has led to the formation of others as well. The relation between the user group and the municipal administration has led to a number of organisational innovations and initiatives on sustainability. This is also due to the power of the group– all the important environmental questions are presented to the user group, and if they agree, no politician dares to oppose their suggestions (Elle, 2001).

In general, the fundament underlined by GREMI for an innovative milieu, are also found to a large degree in Albertslund: Social connections in terms of partnership, consensus building, leadership, collective learning capacity, a set of shared visions for the future development, and participation of actors in the civil society in decision making and action planning. Moreover, we can argue that a precondition for this normative dimension in Albertslund has been the type of citizens moving to Albertslund, accepting and supporting the municipality's rhetoric and practices related to SUD.

Motivations for joining the network

As a result of the development in Albertslund, the municipality conceptualised and initiated the Dogme-2000 network as their “environmental foreign policy”. According to the GREMI-theories, it is natural for an innovative milieu to join a network when the local structures are settled. GREMI points out two main reasons for the actors to join external networks: One is learning, the other is to make their own innovative milieu visible to other, in order to attract resources (financial, intellectual, cultural etc.). The importance of visibility towards others is a very present aspect in Dogme, but also the aim for making Dogme visible internally in the municipality is regarded as important.

Amongst the Dogme participants there were different motivations for joining the network, as well as the network has different functions in the municipality.

- For Albertslund, Dogme is the “foreign-policy” of the municipality's environmental policy. They already have policies on the different Dogme's, but see the Dogme-network as a way of strengthening environmental policies in general, and a way to collaborate with other municipalities (officer, Albertslund)
- For Copenhagen and Ballerup, Dogme functions as an umbrella for the different environmental initiatives and policies in the municipality. For Copenhagen, the political commitment was also a way of making the environmental policy more efficient (officer, Copenhagen)
- For Herning and Fredericia, Dogme is an environmental initiative, parallel to others in the municipality. For Herning it was also a chance to participate in a network with larger municipalities, in contrast to the other networks, where they were always the largest municipality (officer, Herning). Also for the other municipalities, Albertslund and Copenhagen were seen as attractive partners in a network on sustainable development.

In general, the Dogme-municipalities see themselves as having a green profile before they entered the Dogme-network. For three of the municipalities (Albertslund, Ballerup and Herning), this started with participating in the national programme “Green municipalities”, that ran in the mid-1980ies. Participating in Dogme is seen as a way to maintain this green profile (officers in Herning and Ballerup). Parallel to the GREMI-theories, the green image, or the “story-telling” is an important part of the Dogme network.

An important part of this “story-telling” is related to other parts of the municipality – the politicians, the other administrations, the citizens, the enterprises, the staff in the municipal institutions etc. It is crucial for Dogme to become well known in the municipal administration, as a way to anchor the concept as a general policy.

The politicians' needs success-stories to justify that the municipality is spending money and resources at Dogme, and local stakeholders need to be aware of Dogme as a policy followed in Copenhagen (officer, Copenhagen). As the network is extremely aware of this aspect, they have hired a consultant to outline a communication strategy for the network, to maximise the communication of the good stories and message in Dogme.

Commitment and internal anchoring of Dogme

A central aspect about networks is how the actors commit themselves to the common goals defined. The GREMI theories point to the necessity of maintaining a strict link between the network collaboration and the local territorial conditions; if the exchange of knowledge and innovations in the network is not integrated in the local organizations, the networks become regressive. For instance, if the participation in a network was left to a single and less central person in the enterprise, and not really included in the rest of the organization.

The commitment and anchoring is an extremely important element of Dogme. In Dogme, the commitment is formalised as the city council signs the Dogme document, and the annual external audit will point out if the commitment is followed by action. The annual external audit shows how the municipality has performed on the nine points in Dogme 2000 (see figure 1), and on which points there are strengths and weaknesses. According to the officers in the municipalities, it would be very problematic if the audit showed a lack of progress, as the municipality regard themselves as green, and the mayor reads the audit and feels a personal responsibility for the network.

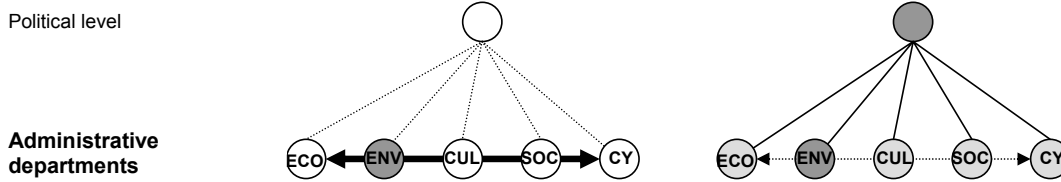
When officers involved in Dogme are asked about the main difference between Dogme and other networks is, they all point to the political commitment in Dogme. Other SUD- networks are based on intentions, but with no actual commitment, no consequences if the intentions are not followed, and no ways to actually measure or document progress. As an officer explains: *"The difference is that Dogme 2000 commits – in the other networks you meet once a year, have a good time, and go home. It is nice that you can exchange experiences with other municipalities, but.....?"* (officer, Copenhagen). Another officer compares networks from her former job in a county. There was a lot of talking about making common projects, but it was difficult to coordinate, and people had little time to work on them, killing the enthusiasm in the long run. *"Many collaborations and initiatives becomes "principal speech and toasts", also the Dogme 2000. The difference is that they cannot run away from Dogme 2000"* (officer, Ballerup). In contrast to other networks, Dogme 2000 is a politically based network; it was conceived politically, established by means of political networks, and of personal contacts between the mayors of the municipalities.

As it turns out, the degree of commitment and engagement from the municipality, is to a large extent due to the internal anchoring of the environmental policy in the municipality. As Landry points out: *"the success of the sustainability-driven creativity will depend on how the battle between environmentalists and free marketers pan out"*. (Landry 2000, p. 136). This battle takes place inside the municipality, at the city council, and between the different departments in the municipality. Therefore, the commitment from the municipality to a SUD-policy often is a matter of the internal anchoring of the SUD-policy. Traditionally, the municipality's SUD-initiatives are anchored in one department (for instance, the Department of Environment and Supply (see figure 2, A). In the larger municipalities it might be in a separate green secretariat, also taking care of other initiatives as Agenda 21, Green City network and other cross-sector initiatives on SUD. The department has to ask the other departments to support these initiatives, which requires extra services from them, and inevitably, extra work. Often, other departments are less willing to do so, as the policy on SUD is seen as "owned" by the Department of Environment and Supply. In Dogme, the responsibility is instead put on the political level, which to a large extent solves this conflict; as long as the Dogme is a politically defined goal, it is legal to spent time and resources to achieve it (officer, Copenhagen).

Figure 2. The difference between traditional SUD-initiatives and Dogme: Traditionally, the political commitment in SUD-initiatives is very limited, and is anchored at the Department for Environment (ENV), who will try to make the other departments (as an example: Economy (ECO), Culture (CUL), Social (SOC), Children and youth (CY)) more sustainable. This is often difficult, as the other departments often see such initiatives as interference from the Department for Environment. In Dogme, the responsibility is formally placed at the political level, with measurable goals defined, which makes it much more legitimate for the Department for Environment to ask other departments to include sustainable actions in their programmes, as the Department for Environment is not seen as the "owner" of Dogme (see figure 2, B).

A. Traditional SUD-initiative

B. Dogme policy



This is particularly important in a large municipality as Copenhagen, with 8 different departments, and was also a main reason for Copenhagen to join the network, as the Mayor was aware of this potential conflict as a barrier for environmental initiatives. As an officer in Copenhagen explains: *“Albertslund has a charismatic Mayor who is able to go to the Department, slab his hands in the table and say: “this is how it should be”. We can’t do that, not in a municipality with 42.000 employed”* (officer, Copenhagen). But also in smaller municipalities the competition between departments can be a problem for cross-sector policies.

The interviews with the officers involved also demonstrated other mechanisms in Dogme that makes the concept anchor internally in the municipalities:

- The external audit, where many different persons in the municipal administrations are interviewed about how they contribute to Dogme 2000 and the different sub-goals makes Dogme known. The persons interviewed include mayors, directors, managers, and general staff in different departments and administrations in the municipality. In the smaller municipalities this includes 20-30 persons, and in Copenhagen more than 50 persons, each interview taking ½-1 hour. Having participated in the interview gives the persons a good knowledge about Dogme, and an awareness about the goals and commitments in Dogme
- The annual Dogme-conference makes Dogme visible, particularly in the municipality arranging the conference.
- Implementing Dogme 3c, environmental certification of the institutions in the municipality. Starting up with an environmental auditing makes Dogme very concrete for the parties involved
- In each municipality there are officers from different departments, having regular meetings on the different initiatives on Dogme, the strategies etc., which strengthens the SUD-collaboration internally in the municipality.

These anchoring mechanisms are absolutely important in a time where many Danish municipalities have reduced their environmental staff and efforts, due to as well economic reductions as modifications of environmental policy under the present government. The officers in the municipalities are aware that the environmental initiatives under Dogme are absolutely voluntary, and the lack of legal obligations (national as international) makes it vulnerable to future cut-downs.

Another big challenge for the municipalities is the anchoring outside the municipality, which is formulated in the Dogme 3a (anchoring in neighbourhoods) and 3b (anchoring in enterprises). The anchoring in the neighbourhoods has been the largest challenge for the municipalities, where most have had problems in making progress. Even in Albertslund, where many neighbourhoods have made local Agenda 21-plans, and green accounts on neighbourhood-level have been published for many years, the audit pointed at a limited local anchoring. According to the municipality, this is a real problem – but it is also a problem how to measure “anchoring” (officer, Albertslund). Dogme measures the anchoring in local neighbourhoods by the number of local Agenda 21-plans. The anchoring of the SUD in the private enterprises is measured by the participation in formalised collaborations, for instance networks¹⁴. However, more officers admit that counting the number of local Agenda 21-plans might give a wrong picture of the anchoring, if they were made 3 years ago, and haven’t been revised since, and more importantly, if they are not used locally. So the challenge is to find a good “measure stick”, without using too many resources on collecting data for it. Also, it is a challenge to develop measures that is able to take the large differences between different neighbourhoods

into consideration. *“Some places they have been sorting their waste in 42 fractions for many years. In other areas they are making a project on keeping the waste away from the local canal, to prevent the area from slumming”* (officer, Albertslund). This is a challenge for Dogme, and for measuring and documenting SUD in general.

Learning

The learning processes are central in GREMI, as in other theories on networks, and on SUD. According to GREMI, the other incentive to join the network for the actors is to gain knowledge from other partners, to increase the local knowledge and activate a continuous learning process and information exchange.

There are different types of forums in Dogme (both political and practical levels), where participants meet regularly. There is established a number of working theme groups, each relating to a Dogme theme¹⁵. In this group, participants from the municipalities meet 4–8 times per year, to discuss problems, progress, and issues emerging. This is the main place for learning, exchanging experiences, developing ideas, making personal contacts etc. According to the officers involved, the regular face-to-face meetings means that informal relations between participants are established, which makes it easier to exchange information and share knowledge. There are several examples on learning from the different working groups. For instance, some municipalities are making a plan for management of chemicals, and can exchange experiences on how to measure this consumption, as well as they exchange information on sustainable buildings, on how to measure the local “ecological space” or ecological footprint etc. Also, there are examples on transferring organisational innovation. An example is Albertslund’s concept on EMAS-certification of institutions. The problem of EMAS-certifying all institutions in the municipality individually is that it is very expensive (typically around 7.000 € per year for an average child-care institution). Instead, Albertslund has EMAS-certified their municipal departments, where the institutions are connected. This means that the institutions have to go through a screening, as being a part of the department, and they also get their name on the certificate – but it will be much cheaper for the municipality; some municipalities in the network have directly copied this concept. Others are obviously going through an “adaptive innovation”, and finding ways to use a similar procedure, that fits the local context, for instance using local certification procedures (officers, Fredericia and Herning). A general understanding is that the innovations and developments in the network primarily take place in each municipality, where the different policies of Dogme have to be implemented (officer, Copenhagen).

An important lesson from the Dogme-network is that it takes as long time to get familiar with the different municipal systems. From the outside, the five Danish municipalities look very homogenous – they are part of the same political culture, the same administrative and economic system, they have the same understanding of sustainability etc. In fact, however, the municipalities are very different, so are the conditions for taking environmental initiatives, implementing them etc. When one municipality presents their strategy, other municipalities might say that it would be impossible to do in their city, as the political system is so much different, which makes it difficult to transform knowledge and practice from one municipality to another. Generally, the first year of Dogme has been spent to establish an understanding of the different conditions and contexts in the other municipalities. Again, this emphasises the importance of the proximity and close relations in the network.

Different scales, roles and challenges for networks

Dogme has revealed a number of potential difficulties about cross-sector initiatives on sustainable urban development, and on anchoring the policies. With the differences between the Dogme-municipalities in mind, the transformation of innovations in European or global networks seems as an enormous challenge. One example is the EMAS-certification of cities. In many cities (especially in the UK), the local authorities are not “owning” schools, institutions, infrastructure services etc., which instead have been outsourced or privatised. This makes the certification quite different to municipalities who are directly responsible for such well-fare services, and makes it difficult for a municipality as Albertslund to find cities with similar experiences of municipal EMAS-certification in EU (officer, Albertslund).

¹⁵ The groups are working with: Green accounting, environmental certification in schools, enterprises, environmental certification in general and organic food. Recently, a group on management of chemicals has started up.

The case study suggests that the scale of the network relates to the mission of the network (political, organizational technical), and to the ability to learn. At the local level, the proximity and the coincidence between the actors involved in the network and the institutions make the dissemination of the innovation and the learning process easier. The local network is to a larger extent composed of actors sharing the same interests and have a closer cultural background, that facilitate the communication as well as the physical proximity does. By increasing the scale and influence of the network (towards influencing national and international institutions), at the same time decreases its ability to give functional input on learning and innovating on a local scale. For the Dogme-officers involved in practical SUD-initiatives in the municipality, ICLEI does not take up much of their time (3 Dogme-municipalities are member of ICLEI). Actually, several were unsure, whether the municipality actually was a member of ICLEI. Generally, ICLEI is seen as an uncommitting forum for as well gaining inspiration and finding collaboration partners, as displaying the local SUD-initiatives and –concepts the other municipalities. In an evaluation from 2003 (Löffler, P. & Payne, A., 2003), the answers seem to reveal a general satisfaction with the campaign, but a more ambiguous conviction that the campaign is a useful tool to encourage sustainable development or that the campaigns ability to influence local policy decisions in direction of more sustainability. There are many statements of positive influence from the campaign – but also a wish for more assessments of the local outcomes of the campaign (policies, initiatives etc.). This suggests that the primary purpose of the ICLEI network is directed at the political level, nationally and internationally. However, it should be mentioned, that the ICLEI network, which is based on the Aalborg Charter, has recently started to encourage partners to commit themselves to measurable goals on the local level (the “Aalborg Commitment”).

The committing element in Dogme however also might keep some municipalities away from joining the network. As an officer points out: *“It takes political courage to be able to say open in public, “we can do better”, and to admit that things are not going well on all points”* (officer, Copenhagen). Transferring some of the innovations can also be difficult due to the local political culture. Such openness has apparently scared Mayors in other European cities for applying a similar concept in their city (officer, Copenhagen), when they were presented for Dogme. Openly admitting that things could be much better is not very easy for the local politicians. Generally, recruiting new members for the networks must be seen as a challenge. For ICLEI, the largest international initiative on sustainable urban development the number of participants is by now 453 (and 42 associated members). In Europe there are 173 ICLEI-members, which accounts for less than 10% of the 1.950 European cities having signed the Aalborg Charter. Again, the number of cities having signed the Aalborg Charter accounts for app. 2% of the number of municipalities and regional bodies in Europe¹⁶, which indicates that the number of participants is relatively small.

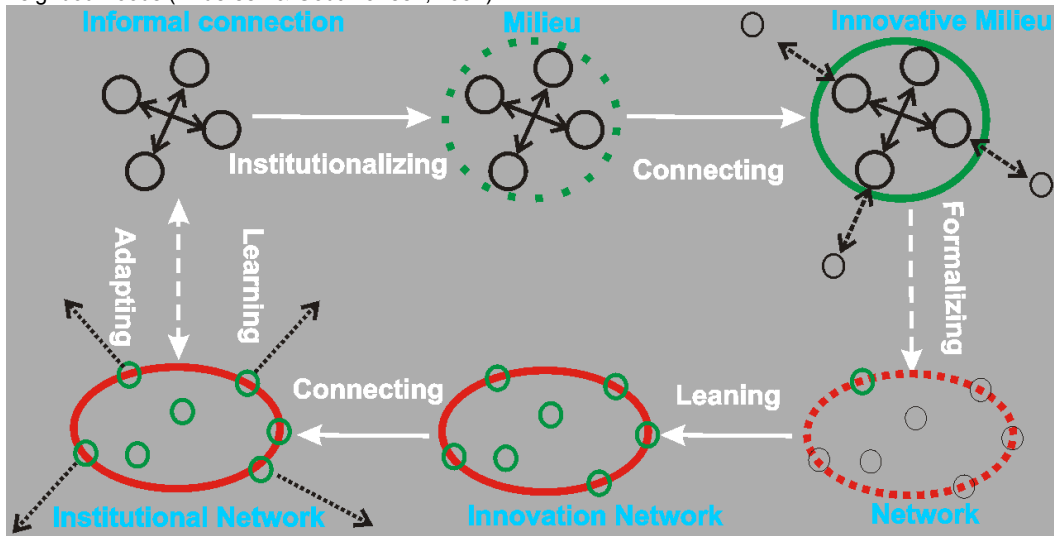
Transferring organisational innovations requires acceptability from the local milieu and the local political culture, or in GERMI-terms, the innovative process depend on the milieu’s ability to be open for innovative resources. If, for instance the concept of a user group should be transferred to other municipalities, it would require openness amongst local politicians. Making users decide themselves how much they should pay for energy and water is a large step, also in a Danish context. When politicians from other Danish municipalities have been presented for the concept of the user group, a frequent comment has been: *“Why run for the city council if you want to give away decision competence?”* (officer, Albertslund). This underlines that many political cultures are still operating in “traditional” ways, with limited influence from concepts as New Public Management, benchmarking, networking etc., which makes it difficult to implement innovations based on networks. Therefore, the Dogme 2000 might not immediately seem as a very appealing concept, whereas other networks on SUD with a less committing character, as ICLEI, could be more appealing.

As a reason for joining the network, GREMI points at the visualization of “externalities” to the other members, i.e. demonstrating the spin-offs and other advantages related to the innovative milieu. Similarly, this could be a point for Dogme. The participation concerning basic daily life environmental questions in Albertslund has been a tool of community building that has been recognized as a strategy to solve social problems present in different areas of Albertslund¹⁷. It is beyond doubt that a strong motivation for the original environmental initiatives in Albertslund were a thread of social decline in the neighbourhoods; 61% of the dwellings in

¹⁶ The number of municipalities and regional bodies in EU and the new member states is about 80.000 (app. 77.600 municipal bodies, app. 400 regional bodies). This does not include the app. 4.000 Portuguese freguesias or the app. 10 000 parishes in UK. Source: Communication with the Danish EU-information office, d. 02.04.04.

¹⁷ Tollin, 2003, The operational milieu of VA: Albertslund the dogmatic environmental approach to sustainable development, Unpublished

Albertslund are non-profit housing, and this owner-type has (as in many other countries) during the last decades suffered from income- and education-drainage. Apparently, this strategy has been successful, and the environmental initiatives and the network-management have had an “empowerment-effect” in the neighbourhoods (Andersen & Godt-Hansen, 1997).



Conclusions

We have argued that the municipality of Albertslund and the Dogme 2000-network have many parallels to the innovative milieu and networks, as described by the GREMI-theory: The close and informal personal relations between different stakeholders, the innovative entrepreneur, the institutionalization of the relations, the commitment to sustainable development, the organisational innovations and the specific context (starting with the district heating and the user group), the continuous learning process on environmental policy, and the incentives to join networks. For the Dogme network, the commitment and local anchoring is indispensable, which is demonstrated in the contrast to other SUD-networks that are based on good intentions, but no commitment. As underlined by GREMI, visibility and “story-telling” is important in the network, demonstrating to others the advantages of the local SUD-policies, and for anchoring the policy internally in the organisation. The experiences from the Dogme network have demonstrated some successful ways of transferring environmental knowledge. The form of the Dogme means that informal networks between officers and other actors are shaped, experiences are exchanged, and concepts are copied or adapted locally. The local milieu is a precondition for developing sustainable practices and gaining benefits from national and international networks on sustainable development; networks do not create sustainable development if the local organisational framework is not ready for it – but if it is, the Dogme has demonstrated several potentials of a committing network. It should also be stressed that participating in external networks helps to maintain the innovative processes in a local milieu, by improving knowledge, starting continuous learning processes, co-generating virtuous processes and practices.

Although GREMI is not able to identify the precondition for the origination of the milieu, except that it is generated through not formalized dynamics, often based on the key role played by an innovative entrepreneur, the theoretical approach is a fruitful way of analysing local sustainable developments. This underlines that communities are important unities in the process of learning and innovating, in contrast to the urban theories advocating for the places becoming less important in urban competition (Bradford, 2003). In theories of the network society it has also been assumed that the “space of flows” (relations through electronic networks) would become the dominating space of relation, compared to the “space of place”, as face-to-face relations (Castells, 1996).

References

- Andersen, D. & Godt-Hansen, C., (1997). *Lokal Agenda 21 á la Hyldebjergvej*. Social Politik, 5/97.
- Aydalot (1986) *Milieux Innovateurs*. Paris: GREMI
- Batten, David F. (1995) *Network Cities: Creative Urban Agglomerations for the 21st Century*. Urban Studies, Vol. 32, No. 2, p. 313-327.
- Belussi, F.; Gottardi, G. (2000). *Evolutionary patterns of local industrial systems: towards a cognitive approach to the industrial district*, Aldershot: Ashgate,
- Belussi, F.; Gottardi, G.; Rullani, E. (2002) *The Net Evolution of Local Systems: Knowledge Creation, Collective Learning, and Variety of Institutional Arrangements*. Amsterdam: Kluwer.
- Bradford, Neil (2003) *Cities and Communities that Work: Innovative Practices, Enabling Policies*. Discussion paper F 32, Family Network. Canadian Policy Research Networks (CPRN / RCRPP).
- Camagni, ed. (1991) *Innovation Networks: Spatial Perspectives*. GREMI. New York: Belhaven.
- Castells, M. (1996) *The Rise of the Network Society*. Blackwell Publishers.
- Castells, M. (1999) *Information Technology, Globalization And Social Development*, Geneva:Unrisd
- Dogme 2000-homepage, located d. 19.3.03. <http://www.dogme2000.dk/>
- Elle, M.; Nielsen, S.B.; Jensen, J. O. & Hoffmann, B (2003). *The seven challenges of sustainable cities*. Paper for COST C8 final conference, 6-8 november 2003 Trento, Italy
- Elle, M (2001): Infrastructure and Local Agenda 21: The Municipality of Albertslund in the Copenhagen Region. In Guy, Marvin and Moss (2001): *Infrastructure in Transition. Urban Networks, Buildings, Plans*. London: Earthscan.
- Fischer, M. M.; Suarez-Villa, L.; Steiner, M. (1999), *Innovation, networks and localities*, Berlin: Springer.
- Hall, P. and Pfeiffer, U. (2003). *Urban future 21. A Global Agenda for Twenty-First Century Cities*. Federal Ministry of Transport, Building and Housing of the republic of Germany / E & FN Spon.
- Jensen, J.O (2003). *Medfinansiering og følgeinvesteringer ved helhedsorienteret byfornyelse. Praksis og erfaringer fra kommunerne*. Statens Byggeforskningsinstitut, By og Byg. Unpublished.
- Jordan, A.; Wurzel, R.K.W.; Zito, A.R. (2003). "New" Instruments of Environmental Governance: Patterns and Pathways of Change. Environmental Politics Vol. 12, p. 1-26
- Landry, C. (2000), *The Creative City*, London: Earthscan.
- Löffler, P. & Payne, A. (2003). *An initial evaluation of the European Sustainable Cities & Towns campaign*.
- Maillat, D.; Quévit, M.; Senn, L. (1993). *Reseaux d'innovation et milieux innovateurs: un pari pour le developpement regional*. Neuchatel: GREMI/EDES
- Marchetti C. (1981), *Society as a Learning System: Discovery, Invention and Innovation Cycles Revisited*. Research Report, Laxenburg: IIASA
- Perrin, J.C (1991). *Innovative networks*. In: Camagni (1991).
- Proulx, M. U. (1994). *Milieux innovateurs: concept et application*. In: Revue internationale PME, vol. 7, n. 1.

- Ratti, B. (1997). *The Dynamics of Innovative Regions*. GREMI, Ashgate,
- Rhodes, R. (1997). *Understanding Governance. Policy Networks, Governance, Reflexibility and Accountability*. Buckingham: Open University Press.
- Sassen, S. (1991). *The Global City: New York, London, Tokyo*, Princeton NJ, Princeton University Press.
- Sassen, S. (1994), *City In The World Economy*, Thousand Oaks: Pine Force Press.
- Scheurer, Jan (2003). *Urban Ecology, Innovations in Housing Policy and the Future of Cities: Towards Sustainability in Neighbourhood Communities*. PhD Thesis. Located d. 06.03.03 at: <http://www.wistp.murdoch.edu.au/publications/projects/jan/>
- Sehested, K. (ed.) (2003). *Bypolitik mellem hierarki og netværk* (Urban Policy between hierarchy and network). København: Akademisk Forlag.
- Sharpf, Fritz W. (1994): Games real actors could play: positive and negative coordination in embedded negotiations. In: *Journal of Theoretical politics* 6 (1), p.27-53.
- Taylor, P.J.; Catalano, G.; Walker, D.R.F. (2002) *Measurement of the World City Network*. *Urban Studies*, Vol. 39, No. 13, p. 2367-2376.
- Åberg, Hjalte (1996): Time for Gathering. In: *Kulturøkologisk Årbog 1995/96*. Den kulturøkologiske højskole i Albertslund.

Annex 1. The three Dogmes

Dogme 1: the municipality's, the neighborhoods and the industries' environmental impacts must be measured and annually reported in the green accounts. This includes three sub-goals:

- A. Green accounts are made every year. The borders of the municipality are regarded as borders of a local community, which in total is committed to the goals. Green accounts as a minimum includes the municipality's own buildings, all residential areas and industries.
- B. Green accounts state the developments in reuse of waste and as a minimum includes use of district heating, electricity, gas, oil, traffic, groundwater and pesticides.
- C. Based on the consumption rates, the Green accounts must inform the areas' total contribution to pollution (for instance NO_x) and climate change (for instance CO₂)

Dogme 2: Goals for resource-consumption and environmental impacts have to be made, and included in a local Agenda 21 plan. The municipality must be leading in the environmental efforts. This includes three sub-goals:

- A. Agenda 21 includes the total local community, as well as the green accounts
- B. Agenda 21 must include goals for resource-consumption and environmental impacts, based on the principle of environmental space
- C. In acknowledging that the public sector must take the leading role in the transformation to sustainable development, the following demands should be respected:
 - At least 75 % of the public food consumption has to be organic
 - herbicides must not be used
 - the municipality should respect environmental sustainable guidelines with the construction sector
 - all planning has sustainability as the overall goal
 - an environmentally sustainable purchase policy must be formulated

Dogme 3: The environmental work has to be anchored in residential areas, in industries, and in the municipality. This includes three sub-goals:

- A. The residential areas must be involved in the formation of local Agenda 21's.
- B. The industry must be involved in a formalised way in developing a better environment. For instance, agricultural land must be aimed at organic farming.
- C. The municipality's own departments and institutions must over time become environmentally certified, and the environmental work included in the business-plans, staff policy etc.