Learning for Sustainable Development in urbanized areas: a joint European experience

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1. Introduction

Since the introduction of the first Club of Rome Report (1972) people in the western world are concerned about the impact of population growth and growth of the economy and wealth. This concern first appeared on the political agenda as environmental problems and environmental policy. In the environmental policy domain policymakers had to deal with a new type of problems that could not be mastered within the existing policy frameworks. Environmental problems are stubborn problems in the first place such as CO_2 emission, climate change or a decrease in biodiversity. In the second place there is a whole range of relatively new problems such as the environmental and health effects of toxic compounds, the environmental implications of modern biotechnology, and the continuously increase of energy use and mobility. These new generation wicked environmental problems are of a supra-national scale and a long time dimension. The effects of these wicked problems are less direct and clear that those of the 'older' environmental problems that are to a large extent manageable by now (bad smell, noise).

Dealing with these complex environmental problems is not easy and the fact that scientific research cannot provide certitude makes policy development a difficult task (WRR 2003). It will be difficult for citizens to understand the problems and consequently it will be difficult for governments to create acceptance for drastic policy measures. To legitimate policy measurements isn't easy either because the serious effects of the problems:

- will occur in the future
- will partly become especially manifest at remote places on earth and therefore ask for international solidarity
- will not happen at all

Adequate policy development will have to be an interplay between different levels of scale, from international to local. An additional complicating factor is that the interaction between government and society is not constant, but is continuously developing. Ideas on sharing responsibilities between governments and other societal actors will change continuously and new forms co-operation between governments and other societal actors (private sector, NGO's) will have to be developed. The interest in good governance principles, participatory development strategies, open policy processes, sustainable development and corporate social responsibility reflect this.

In this paper we will reflect on development processes in complex societal settings and on how individuals and regions can learn to develop and use knowledge in such complex environments. We will fist pay briefly attention to the challenging relation between science and policy making. Then we will describe the concept sustainable development, after that turn our attention to learning in general and subsequently reflect on learning opportunities in European urban environments.

2. The use of scientific data in policy practice

For policy making it is important to take expected data into account. Politicians need both a feeling for future developments and respect for the interactions in the present civil society. That is not new, it has always been so. In almost all cultures rulers have felt a need to develop a 'picture' of the future. The institutions that should provide such a picture differ from culture to culture. We could say that at the origin of Western policy culture there was the Delphi oracle that was consulted by states and kings. The oracle has certainly influenced political and cultural developments in the Mediterranean area. Since that time it has become good practice to turn to science for advice for policy formulation. In both the public and the private domains there is a broad range of organisations offering scientific and expert advice for policy making (Adriaansens 1977). We can discriminate several scientific approaches aimed at supporting policy making (Kronjee and Rabbinge 1997):

- An *analytical-diagnostic approach*: causes of a problem are analysed, the problem is reformulated and a better approach to solve it is developed
- An *engineering approach*: the problem formulation is accepted as it is and is used as a frame for research, the focus is on problem solving and wider perspectives are opened by the designed methodology
- A *pedagogical approach*: policy is analysed with the objective to learn from it; both ex post and ex ante approaches are included

The science/policy interaction is not unproblematic, however. On the one hand policy makers tend to be disappointed about the usefulness of scientific findings in policy making practice while on the other hand many scientists don't feel at ease with the way results of fundamental research are used in that practice. Habermas (1968) uses three stereotypes – technocratic, decisionistic and pragmatic – to describe the science policy interaction. In the technocratic stereotype science is used to increase human productivity, and policy should enable possible scientific developments to become reality. In this stereotype policy making is subordinate to scientific research. In the decisionistic stereotype policy should articulate the societal demands. These demands are the starting point for

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scientific research. In this stereotype scientific research is subordinate to policy making. In the pragmatic approach there is not such a hierarchical order, but scientific research and policy making continuously interact with each other. Policy making can not be detached from possibilities created by research and development and societal demands influence scientific research (van Latensteijn en Schoonenboom 1997). This latter stereotype is the most realistic one to describe policy practice.

To understand the tensions in the relation between policy and science it is good to realise that policy making essentially has normative and subjective elements while good scientific practice asks for objective evidence. Funtowicz and Ravetz, (1991, 1994) have analysed the interaction between policy making and scientific research in a systematic way and they came to the conclusion that scientific arguments are often (mis)used to empower normative conclusions. The developed a classification of the way scientific data are used in policy practice based on uncertainty of those data and the interests at stake. They discriminate between normal science, expert science and post-normal science. In normal science puzzles are solved according to agreed upon scientific methodology and scientific quality is assessed via a peer review system. The results of normal science are valid within the scientific model in which they are verified. Outside this model environment they are not irrelevant but they tend to remain rather remote from great societal interests. As research and development are at the basis of innovation and economic development, however, there will be many situations, where scientific results can more directly influence societal interests. We then enter the domain of expert science. An expert is a person that has proven quality (by peers) within a certain scientific domain and who is, in addition to that, trusted to be able to solve a problem of great societal interest. An expert thus is a person trusted to be able to use scientific findings in a societal context that is of course much more complex that the scientific model in which the results were derived. This implies that the expert will work with greater uncertainty. If there are great interests at stake the opinion of one expert it not enough. A first step to be taken in such situations is to ask a second expert, but in situations with great interests and high complexity like for instance environmental and sustainable development issues, expert science is no longer sufficient; we then enter the domain of post normal science. The domain of post-normal science is characterised by great societal interests, great complexity and great uncertainty. These problems ask for a multidisciplinary approach and for stakeholder participation because the results should not only be of good scientific quality, they should also be societally robust. There is not (yet) an established methodology for post normal science, nor a system for quality assessment of post normal science. According to Funtowicz and Ravetz the quality of post normal science can be controlled via an extended peer review in which not only scientists but also societal stakeholders are involved. Good practises in this field will have to be developed while and by doing.

3. Sustainable Development

So one could say that the Club of Rome put 'the environment' on the political agenda, the next step was set by the Brundtland Committee in 1987 (World Commission on Environment and Development, 1987) introducing the concept Sustainable Development as: '*a process of change in which the exploitation of resources, the direction of investments, the orientation of technological development, and institutional change are all in harmony and enhance both the current and future potential to meet human needs and aspirations – (it is) meeting the needs of the present without compromising the ability of future generations to meet their own needs'*. This definition indicates that from an original focus on nature and natural resources attention has broadened. Sustainable development clearly pictures the tension between the sustainability of ecosystems and economic development.

Central in sustainable development is the thesis that the vitality of the ecosystems of the earth is crucial for all life on earth. Sustainable development links all places on earth and present and future generations. Therefore problems in the field of sustainable development are always complex, multidimensional problems. A broad range of perspectives and interactions is involved, for instance: the influence of human activities on ecosystems as analysed by the natural sciences, the design and technical realisation of innovative solutions, human behaviour as analysed by social sciences, the interaction or confrontation between different cultures, norms and values, and the worldwide division of welfare. Such complex problems ask for a multidisciplinary approach and for stakeholder participation. Interaction and co-operation between a large diversity of individuals and organisations is needed. For instance, interaction is needed between people working with rather well-defined systems in the natural sciences domain and people working with more complex systems in social sciences. Furthermore not only the effects of human activities at a local or national level is at stake, threatening changes at a global level are as well. Within the concept sustainable development an integration has to take place between different system levels (for instance systems from natural sciences and systems from social sciences) and between different scale levels (local, regional, national, global). Sustainable development asks for strategic developments aimed at the innovation of systems; both technical and social components of the systems – and their mutual interaction - have to be dealt with (Jansen 2002).

Technology development forms an important link between ecological sustainability and economic development (Simonis 1994; Barbiroli 1996; van Dam-Mieras et al. 1996; Ayres 1998; Weaver et al. 2000). Technology development can make production processes more sustainable from the ecological point of view. By reducing the amounts of raw materials and energy needed and by reducing the emissions to the environment a cleaner technology can be designed. Environmental laws and regulations and incentives, for instance fiscal incentives, can stimulate the development of cleaner technology. However, cleaner technology alone is not sufficient, also adaptations in society are needed. Often a cleaner production process will result in a lower cost price (less raw materials and energy needed, reduced emissions) and can make the product cheaper, which in its turn will result in

a larger market share and increased consumption. Without accompanying measures in the societal context cleaner technology can again increase the environmental burden in the long run. An important consequence of taking the concept sustainable development serious is that we always have to take into consideration the ecological, economic and social/cultural aspects.

Taking sustainable development serious implies that all actors in society (governments, companies, NGO's and citizens) have to learn for sustainable development. This learning process continues life long and takes place in different learning environments. In this article the focus is on opportunities for context embedded learning of individuals and organisations in European urban regions and for the exchange of knowledge, experience and good practices among European regions.

4. Learning, learners and learning environments

A rather pragmatic description of learning could be the following: Learning is the result of the process of continuous interaction of an individual or a group with its physical and social environment. The learning environment can be formal, non-formal and informal, and the learning process continues life long. Hopefully the individual will use its knowledge in a responsible way during functioning in society. To encourage that there should be a good balance between instrumental rationality (the best way to realise an objective) and substantial rationality (norms and values).

There are many informal learning opportunities: family life, leisure time, visits to a museum or a zoo, etc. An example of non-formal learning is on the job training during a professional career. With formal learning all the learning that takes place within the educational system is meant. It can be calculated that on the average only about 5-10% of the life long learning process of an individual takes place in this formal learning environment. For the life long learning process informal and non-formal learning and interactions between the different forms of learning are much more important.

During the learning process new options are tried out and continuously choices are made on which of those new options should be maintained. Two most important factors in the process are the learning individual and its learning environment. For the learner the learning process contributes to the formation of the social identity in which the individual can recognise him- or herself as a valuable individual with respect to others. The format of the learning environment depends on age, prior knowledge and social activity and therefore will continuously change during the lifelong learning process.

Our society can be characterised as a society in which, because of the ongoing process of globalisation, boosted by ICT and trade liberalisation during the last decades, continuous change seems to be the most stable factor. The content of most professions is changing and most people must be able to integrate the use of ICT-instruments in their (professional) life (European Commission 2000). Furthermore people should be able to reflect critically on information, should develop good social competencies, both normative and communicative, and should be able to work in multidisciplinary teams on complex problems (Gibbons et al. 1994, 1998). It is tempting to state that in our present society individual learning environments should become more dynamic and individualised on the one hand and introduce the international aspects of economic globalisation and its consequences on the other (van Dam-Mieras 2003).

4.2 Ways and levels of learning

The guiding principles of sustainable development change the requirements for and the configuration of ways of learning and competencies – namely on all levels: from individual to organisational learning processes up to learning in networks. The manifold and complex interactions which ranges beyond the borders of disciplines, sectors, environmental media and spatial scales call for a problem-orientated, transdisciplinary approach, to be understood as *"a response to the needs of both science and society"* (Gibbons et al. 1994, 11).

Concerning the *individual learner* this requires special abilities which are connected with a turning away from specialised and factual knowledge leading towards a knowledge that strives for capacities to act and orientate oneself (Fischer and Michelsen 2000). This type of knowledge may serve as a basis for (mutual) understanding – an indispensable prerequisite for social action. Besides, it enables the access to special knowledge and helps to orientate in the information overload (BMBF 1998, 147f.). One has to be aware of the fact, that the 'knowledge concept' is more and more replaced by the idea of 'competencies' whose acquisition has prior importance. An outstanding 'key competence' in the range of education for a sustainable future is the competence to actively shape the future. This incorporates abilities like anticipation and participation as well as reflectivity and the ability to cooperate, for self-organization, decision-making, and responsibility (de Haan and Harenberg 1999).

For *organisations*, willing to stick to the guiding principles of sustainability, it is fundamental to change and learn 'as a whole' and, at the same time, modify their self-conception into socially acting participating units (Godemann 2002). It is a fact that such dramatic changes have to be accompanied by individual learning processes, but furthermore, organisational learning processes are inevitable. Three different levels can be distinguished: *(organisation) related / referring learning* occurs when malfunctions of the organisation are discovered and amendments have to readjust the system back to the standards. This learning level is not associated with far-reaching consequence, whereas *(organisation) deliberate learning* implies modifications in the corporately shared knowledge. Organisational norms, values and mission statements are questioned, meaning that the reference action

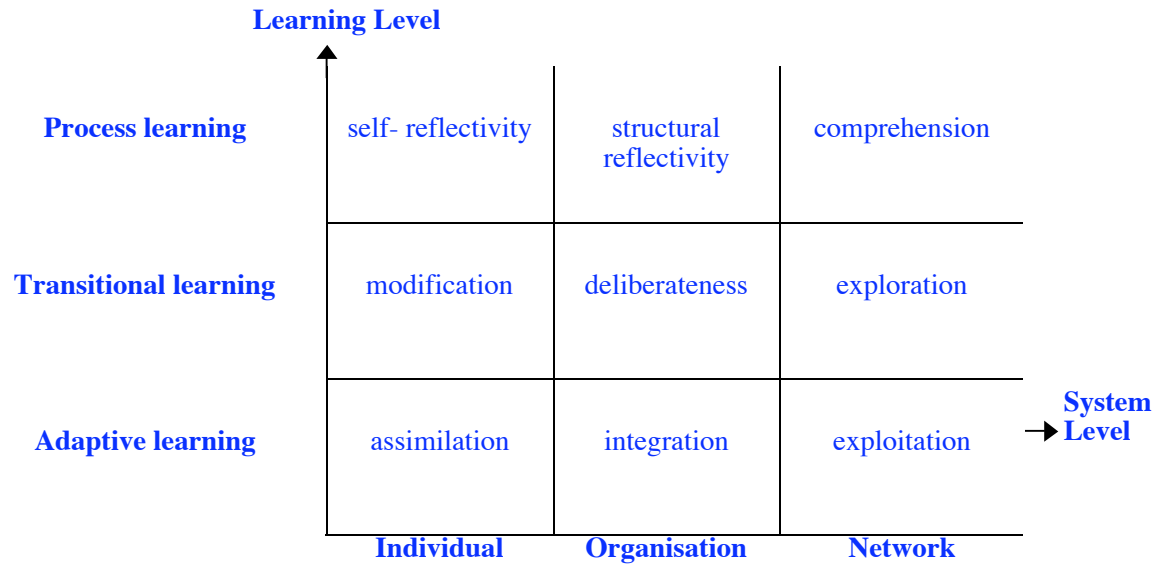
framework of all organisation members undergoes a close examination and is modified if necessary. For this learning type it is essential to be able to both identify established routines and search innovative solutions. Looking at *(organisation) reflexive learning*, the organisation's learning aptitude itself becomes the subject matter. Besides changes of mission statement and action, the learning principles are included, meaning that the ways of learning and striking new paths come into the field of vision. Thus makes it a rather self-critical form of learning.

Sustainable developments, being a normative laden concept, evocates organisational learning processes, that have to reach further than organisation related / referring learning, because what has to be strived for are changes in the mission statement. But constant change is far from being a reasonable goal. What has to be achieved is a permanent willingness to and preparedness for change.

Learning does not only take place on the levels of individuals and organisations, but also on the institutional level, mostly addressing certain regions or branches. This latter type of learning is often referred to as *network learning*. Within polycentric networks a variety of planned and unplanned, formal and informal learning takes place, respectively is supported in a more or less crucial way. Taking that into account, networks may serve as (intentional or contingent) medium for the development of competencies (Sydow et al. 2003: 12).
With regards to (inter-)organisational innovation- and/or learning discourses the differentiation between exploitative and explorative traits of learning processes it of particular significance. *Exploitation* mainly relates to the *utilisation of available knowledge* and already existing competencies and primarily aims at aspects of routinisation, standardisation or, at the most, optimisation. Whereas *explorative orientation* focuses on *creation of new knowledge* and new competencies and can be described by characteristics like search, variation, risk acceptance, flexibility, and innovation. Following this understanding, learning first of all aims for the development of adaptive and adaptable structures. Accordingly the regional-political value of a so understood learning is assessed by the ability to increase the "learning ability of regions" by establishing the prerequisites for future, typically non organized learning processes. Only then regional adaptation and innovation processes are promoted (Nuissl 2000, 472).

In a nutshell: learning (or the development of competencies) in networks can be seen a total of learning processes on different levels (see table 1 for an overview).

Table 1: System and learning levels of individual and collective learning processes



4.2 The European urban environment as a joint learning environment
Let us now turn to European urbanized areas as learning environments. In most regions in Europe the population is concentrated in urban areas. Considering this background, it is nothing but consequent that the "Charter of European Cities & Towns Towards Sustainability" states that *"(…) the city or town is both the largest unit capable of initially addressing the many urban architectural, social, economic, political, natural resource and environmental imbalances damaging our modern world and the smallest scale at which problems can be meaningfully resolved in an integrated, holistic and sustainable fashion."* (Aalborg Charter 1994: I.3). This means that in urban areas the challenges and contradictions between economic development and individual well-being on the one hand and sustainable development on the other hand seem even more prominent than in the countryside or in nature reserves. But each (urban) region is different, so individual ways towards sustainability have to be found. Therefore the urban area is an appropriate joint study object to enhance knowledge in the field of sustainable development. In this study European regions will collaborate and explore how they can learn together by exchanging knowledge, experiences and good practices. The regions are: Antwerp, Barcelona, Graz, Göteborg, Wroclaw, Limburg, Lüneburg, and Prague.

As problems and challenges in the field of sustainable development are always complex and ask for multidisciplinary approaches and stakeholder participation it is highly relevant that stakeholders in the participating regions jointly participate in the project. In this project stakeholders are the regional authorities and knowledge institutions. Together they will have to identify the organisations that have to be involved in order to fulfil the project goals.

The joint objective is to work on the development of new policies on sustainable development. Hypotheses are that a more integrated approach to policy development is needed and that a joint learning process of European regions can result in more interregional understanding of the topic. The long term result aimed at would be the implementation of new policies on sustainable development based on the interregional (European) understanding of urban metabolism.

In this regard, some research approaches for sustainable development may also be utilized for learning processes. For our project, the *Syndrome Concept* of the German Advisory Council on Global Change (WBGU) might be of particular interest. This integrative approach *"permits the operationalization of the net-worked thinking that is essential for mitigating global change"* (WBGU 1996, 3). Starting point of this model is the fact that a regionalized analysis of the Earth System reveals typical and unfavourable functional patterns (syndromes) of natural and civilizational trends and their respective interactions, which can be identified in many regions of the world. A total of 16 degradation patterns are distinguished and differentiated into three major groups of "utilization", "development" and "sink" syndromes.

For our joint project, the *"Urban Sprawl Syndrome"* is of special interest because it refers to the *"destruction of landscapes through planned expansion of urban infrastructures"* (WBGU 1996, 123). What makes this approach particularly suitable for learning processes is its capability to combine the preoccupation with aspects of sustainability into generalizing patterns without over-simplifying or trivialising. Complexity, interdependences and openness on the activity level are not concealed (Fischer and Michelsen 2000, 164). Quite the contrary: they become (self-)explanatory and comprehensible, offering manifold facilities for the individual purchase of competencies and, at the same time, focus on options for actively shaping the future.

5. **Urban metabolism**

Any urban region can be studied as a complex system where people interact with the environment, with economical options, with socio-cultural options and with each other. Studying this complex system and looking for optimization of the system seems a good basis for sustainable development. Maintaining the system in the long run without decreasing the opportunities in other regions equals the goals of sustainable development. What we can learn in a specific region by looking at solutions in urban development can be of impact for many regions and their future planning and policy making.

Within urbanized areas many topics can be addressed to study, topics that can contribute to an overall sustainable development. But how should such topics be studied? A classical approach would be a disciplinary approach, which means an in depth study of a specific part of the complex system. Such a disciplinary approach has contributed a lot to technology development, innovation and economic development over the past centuries and certainly will be most useful for the future as well, but there is a risk in studying topics in such a way. What seems an optimal solution in one disciplinary model can be an ineffective solution in another. What seems to work on a detailed scale can turn out to be a rather a bad idea on a larger scale. Therefore, in addition to the disciplinary approach, a complementary approach in a (more) integrated environment represented by an urbanized area seems a highly needed complementary approach in knowledge generation. Good practices for that will have to be developed by and while doing.

Within the integrating framework of an urbanized area several topics can be studied without loosing an overall view. A short list of topics can look like the following:

- energy efficient living (housing, commuting, recreation etc)
- water efficient living
- massive events (large scale events that have implications for infrastructure, city development etc.)
- corporate social responsibility in SME's
- aging population
- awareness creating at schools (start with the youngest, the future generation)
- materials cycles (waste management, resource recycling etc.)
- urban neighbourhoods development
- interfaces with surrounding areas
- stakeholder dialogues
- cultural heritage

In the figure below the setting for the study is indicated as an abstract model of a typical European urban area.

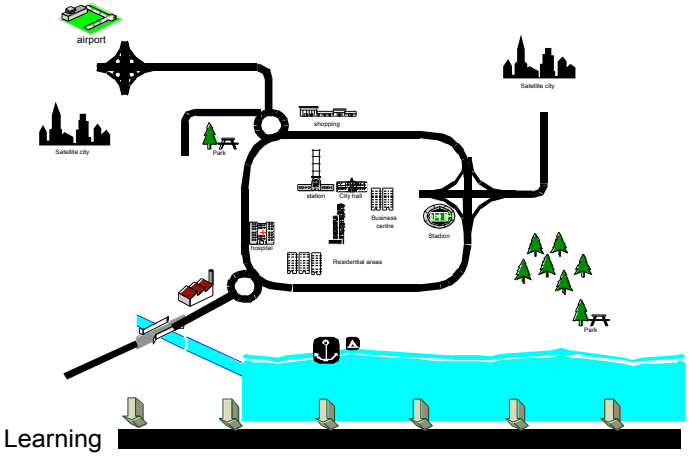


Figure 1: The Urban Metabolism as an object of study for sustainable development

The model in the figure is a generalized model and emphasis on the components will differ between European regions. Working together among European regions implies that regional peculiarities can be taken into account and that each region can focus on topics that are appropriate for that specific region. The regional focus is determined by what the region itself sees as the most important topics at the moment. By exchanging knowledge, experiences and good practises between European regions a more complete system approach can be generated. Joining European forces in this way will create value both at the European and the regional level.

The goal of the joint approach to 'Learning for sustainable development in urbanized areas' is to contribute in a trans-European way to the development of innovative ways of learning (in a broad sense), to new policy making models, new policy tools and new instruments for monitoring policy implementation. Below the vision behind, and the objectives for, that joint approach are worked out in more detail.

6. Operational plan for the European RCE network

Below a first version of the operational plan for the European RCE network is described.

Vision

Since the publication of the first Club of Rome Report (1972) many people in the western world became concerned about the impact of the growth of the world population and the growth of economy and wealth on the vitality of 'System Earth'. This concern has now spread over the globe and resulted in special attention to the environment and care for nature. As such this special attention has resulted in remarkable progress in preserving nature and inawareness of environmental issues. The knowledge we now have on these topics stems from studies devoted to valuable area's were nature should be protected, from studies on the necessity of and ways to reduce the use of natures resources, and from studies looking for solutions and alternatives in technological development.

The Brundtland Report (1987) introduced the term Sustainable Development as follows: *Sustainable development is development that meets the needs of the present without compromising the ability of future generations to meet their own needs*.

This definition indicates that from an original focus on nature and natural resources attention has broadened to what is now called sustainable development. Several parallel developments have over time lead to the introduction of new terms like corporate social responsibility, governance, sustainable building, etc. reflecting the broadening of attention to sustainability issues.

In most regions in Europe the population is concentrated in urban areas. This means that if sustainable development is to become a mainstream concern in Europe the challenges and contradictions between economic development and individual well being on the one hand and their impact on the ecosystems of planet earth on the other should be related to the urban areas. Enhancing knowledge in the field of sustainable development therefore implies that in addition to a continued concern for the countryside and nature protection there must also be a focus on the European urban areas. Such a shift of attention is considered to be a necessary next step. It is highly relevant that stakeholders in the different regions jointly participate in the studies of sustainable development in urban areas.

To support and coordinate a systematic study of urban area's as well as to enable sustainable development activities and implementations in those areas, a network of Regional Centres of Expertise (RCE's) is proposed. This network

can gain momentum by cooperating with United Nations University (UNU) and UNESCO at the start of the Decade Education for Sustainable Development. In the Higher Education Information Brief on the Decade (www.UNESCO.org) it is stated that such regional centres are crucial in the effort to build a sustainable future. The European network of RCE's will in turn be part of the global network of RCE's envisaged by UNESCO and UNU. The European RCE network will consist of RCE's in European regions in which local and regional stakeholders cooperate in research, development and implementation. Through the network regions will communicate and exchange information.

Mission statement

The European RCE network will contribute as a European wide network to mainstreaming SD in all societal activities by (re)defining -in interaction with a broad range of stakeholders – good practices for (co)learning (formal, non formal, informal and life-long) for SD.

The European network is made-up of regional RCE's formed by public and private domain organizations, NGOs and knowledge Institutions that cooperate in establishing innovative and mutual learning processes.

Objectives

The partners in the network aim to:

- reconsider critically the effectiveness of scientific knowledge in the complex societal context
- remove the boundaries between formal, non-formal and informal learning and make sure that learning becomes a life-long process
- identify the opportunities that the urban areas present for learning for SD
- link sustainable development cluster partnerships across European regions,
- map the competencies of the clusters and organise a process of continuous benchmarking to identify improvement potentials and best practise exchange opportunities
- convert the outcomes into tools and policies to enable regions to apply SD principles to the transition
- promote public/private co-operation in the innovation of knowledge generations and –transfer
- contribute to awareness-raising in society on SD

Activity lines

The activity lines for the network include Research, Development and Implementation projects. The network initiates these projects throughout the network and in collaboration with others. Moreover the network facilitates activities in the nodes by:

- Developing methodologies for effective and efficient co-learning for SD
- Identifying relevant stakeholders for effective and efficient co-learning for SD
- Creating synergies between existing projects in the nodes (FP6 and FP7)
- Identifying opportunities for funding in both the public and private domain
- Sustaining the network via for-profit-projects although being a not-for-profit-network
- Working on effective cost reduction by using virtual space

Dissemination

The network makes accessible the joint knowledge base by developing/organizing:

- E-journal
- Website
- Workshops
- Learning materials
- Scientific publications

The network and its members will next to their mutual activities actively participate in existing dissemination channels.

The role of stakeholders

To create a connection to existing initiatives and structures it is the first aim for the regional or local nodes in the network to integrate in existing structures/dialogue platforms. As an example we refer to the Barcelona advisory council, taking the Barcelona Indicators 21 as a local agenda. As stakeholders we identify: regional and local authority, companies, ngo's, universities and other knowledge institutions and the media.

The role of universities

The universities have to redefine their traditional position in society. Nevertheless they will maintain there double role in research and education. In research the universities in the network will focus on inter- or transdisciplinary topics (post normal science) and will collaborate in research projects and in addressing funding opportunities.
In education the universities will aim to have sustainable development incorporated in quality assurance systems in education and in accreditation requirements.

The redefined role of universities can best be described as:
Changing from participating observant to observing participant.

Existing networks

Every node in the European network will be member of several existing networks because the nodes will have members that are already connected to these networks. We give the Barcelona-Catalunya situation as an example:

- ICLEI: NGOs-companies-public dialogue (some U)
- Eurocities (network of biggest cities in Europe)
- Medcities
- Climatealliance
- Energycites
- European Association of Cities for recycling
- CEMR (European Council of Municipalities and Regions)
- Fundacio Forum Ambiental (local WBCSD in Catalonia)

Next to these networks the European network will be part of the global network of RCE's under the DESD. The centres will in addition connect to the Global Higher Education for Sustainability Partnership (GHESP is a type 2 UN partnership).

General model

To approach the central theme 'Learning for sustainable development in urban areas' in a structured way we need a shared vision on how to structure the activities of the European network. As the activities are learning activities situated within urban areas and the effect of the activities in the end will be implementation in these areas a relationship with both the learning cycle and the policy cycle seems logical (see below).

Policy cycle

In the policy making cycle the following stages can be discriminated:

1. Introduction of a new issue in the agenda
2. Gathering information from society by collecting inputs from as many voices as possible
3. Decision making by those legitimated in a democratic way to do so, and communication of the decision to citizens
4. Making sure that society respects the decision (Legislations and Incentives)
5. Monitoring the outcomes of the agreed upon policy in societal practice and bring it back onto the agenda if needed (restart the cycle)

In the first stage of the cycle an item appears on the policy agenda. The reason for that may be concern from policy practice (stage 5 of the cycle), scientific concern, or societal concern expressed via NGO's and or pressure groups.

In the second stage information must be gathered and as many voices from society as possible should be heard. No democratic mandate is needed to participate in this stage; all new perspectives and opinions are welcome during this stock taking step of the cycle. Respect for other opinions is needed and via a dialogue new information can lead to new perspectives and opinions.

I the third stage a decision is taken and this can only be done by those who have a democratic mandate from citizens to take decisions. In this stage all knowledge, arguments and concerns of stakeholders gathered during stage 2 are weighted and a decision is taken. Such a decision is always a normative decision and it will not be supported by all stakeholders. Therefore a transparent process and communication about both the process and its results are very important.

One the decision taken during the political process it should be made sure that it is respected. The responsibility for further elaboration, implementation and maintaining is with the governing bodies. They can use as instruments both laws and regulations and (fiscal) incentives.

The last stage in the process is also a mandatory one because the most constant element in our present societal context is continuous change.

Learning cycle

As the major aim of the European network is LEARNING for sustainable development the different stages of the learning process should be taken into account when trying to understand and support the policy-making cycle. If we accept that learning in addition to an individual component also has a social component we generally can describe also learning as a cyclic process. The following stages can be discriminated in a learning process:

1. The learner becomes engaged in the process
2. Learners explore a topic in mutual interaction
3. Learners explain concepts relevant to the object of study
4. learners extend the learning process by applying the concepts to other contexts

In stage 1 the learner becomes engaged in the learning process via interest and curiosity in the topic of study. In this stage the person coaching or facilitating the learning process (traditionally a teacher) should also get informed on prior knowledge and existing (mis)conceptions.

In stage 2 participants explore a topic via discussions during which existing mental models are challenged. They should be given opportunities to work together without direct instruction from the person coaching or facilitating the process. The facilitator or coach can help participants to frame questions by asking questions based on observations. Using Piaget's theory (references to be added), this is the time for disequilibrium; participants should become puzzled. This gives participants the opportunity to test predictions and hypotheses and/or form new ones, try alternatives and discuss them with peers, record observations and ideas and suspend judgement.

In the third stage the learners reconstruct their mental models via discussion and dialogue. The facilitator or coach should encourage participants to explain concepts in their own words, ask for evidence and clarification of their explanation, and encourage the learners to listen critically to one another's explanation and to compare their concepts with those of experts. The facilitator can provide the learners with such expert views if needed.

During the next stage of the learning cycle participants should apply their concepts and skills in new (but similar) situations and use formal labels and definitions. The facilitator or coach can remind participants of alternative explanations and provide the learners with existing data and evidence as they explore new situations. Explore strategies apply here as well because participants should be using the previous information to ask questions, propose solutions, make decisions, experiment, and record observations. After this stage an new round of the learning cycle starts.

Throughout the whole learning cycle evaluation should take place. The facilitator or coach should observe participants' knowledge and/or skills, application of new concepts and a change in thinking. Participants should assess their own learning, and as a group the learners should also evaluate the collaborative learning of the group. In this constructivist perspective the learners are not just 'importing facts into their minds' they are constructing their own knowledge.

What RCE-Europe wants to do is to intertwine the policy cycle and the learning cycle by using the local urbanized area as a meaningful learning environment. That environment should support learning in a broad sense (formal, non-formal, informal, and life long) and as a result of such an approach the knowledge development during the learning process will become closely linked to the urban development process.

The European network of RCE's and the constituent regional/local RCE's (the nodes in the network) will identify activities to support the process of intertwining of the learning and policy cycles at the local or regional level, but will also enhance a 'commuting' of learning experiences over time and place. Via the co-operation between European urbanized areas in the network knowledge and experiences can be shared and a 'learning spiral' can be created that will bring the learning experience from the local level to a higher level: regional, European, Global. Simultaneously the 'learning spiral' will bring higher level learning experiences back to the local level. In this way the European network facilitates the commuting of learning experiences between levels of scale.

Stakeholders roles in the network nodes

As we identify the stakeholders for the regional and local nodes in the network, it will be helpful to chart out their present roles in the policy and learning cycles. Using as an objective the intertwining of policy and learning cycles we can then subsequently identify their future role in both cycles as well. A first attempt to do so is given in the scheme below. The present roles are indicated in black, the future roles in red. The table illustrates the close relation between knowledge developments by learners to regional development.

Stakeholder	**PM Cycle**	**Learning cycle**
Regional administration Municipalities	Experience with the p-m-c Regional knowledge (data, social/cultural structure, actors involved) Regulation framework (3, 4) Policies, plans and programmes (Ex: Local A21 processes) Decision-making (3)	Educational policies To complement SD policies with effective learning opportunities for citizens
Universities	Active engagements in the change from participating observants to observing participants (1, 2, 5)	Scientific knowledge and methodology Long-term perspective (scenarios, road-mapping) Methodology for knowledge transfer (particularly between scale levels) Facilitate all types of learning in life-long

		learning Science-shops
NGO	Awareness (1, 2, 5) Pressure groups	Contribute to learning environments Science-shops Informal
Companies	Lobby (1, 2) Evaluation (5)	Contract RDI Non-formal (training prog.) Contribute to learning environments (consumers) Life-long
Citizens / consumers Civil society	Vote (3) Influence environment (society) by their life-style Consume	Science-shops Formal educational Informal Non-formal Life-long
Mass-media	Shape public opinion (1) Evaluation (5) Support (3) by communicating	Life-long Informal Become part of the learning environment by introducing actual and glocal issues

By using European urban environments as meaningful learning environments for the life long learning process (formal, non-formal, informal) and by coupling learning processes at different levels (individual, organisation, network) learning can be coupled to urban development via a process of co-leaning and co-development of knowledge.

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