



## Worldwide City Concepts Analysis: Analysis mapping of over 30 city concepts dealing with sustainability issues

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### **ABSTRACT**

City concepts are essential in supporting cities to position and prepare themselves for a process finding solutions fostering urban development, from single measures to holistic approaches. Actions regarding adaptation, resilience, and sustainable economic growth are aspects of most of these concepts towards a good quality of life in cities. Currently, there is no synthetic information about the variety of these city concepts (like Eco-City, Intelligent City, Smart City, and Renewable City) found in literature. This information is an essential knowledge to back up planning offices work and communities vision to guide building up from a structural point of view to enhance planning and design paradigms for the production of the built environment at the final end. Therefore, the city concept research gives an overview on concepts that have already encountered a minimum success and thus accorded greater attention. This paper challenges the mapping of these concepts dealing with urban issues successively after the analysis which the EIFER research group conducted in 2011.

### **KEYWORDS**

City concept, mapping, smart city, resilience, urban development

## 1. INTRODUCTION

Cities are complex systems undergoing permanent evolution. Nevertheless, the time-frame of changes in cities morphology, appearance or in the way of life they are providing can take years, or even decades. Municipalities also rely more and more on actions within the bandwidth of sustainability for their planning. As a consequence, many performed actions give rise to often contradictory impacts or obstructive interactions. In this case, action is not only reaction, so it needs reflexion and therefore city planning and other policies with a certain level of overview and anticipation. The German case of municipal climate change policies is a good example, which can be verified in most of the European countries. It shows the limits of conventional municipal management, having each department or unit working on precise, segregated, historic fields of competency. This might lead to contradictions or conflicts between different actions (BMVBS, 2010). Therefore, cities try to set up master plans or climate plans (as in France or Germany), fostering integrated policies instead of sectorised approaches, as formulated in the paper of the German City Council, concerning climate adapted and energy efficient urban development (Deutscher Städtetag, 2011). In recent years, the trend goes to a “long term strategy for the city as a whole” (Pahl-Weber and Henckel, 2008).

In other terms, successful impacts on urban evolutions require integrative planning approaches and holistic concepts. Addressing particularly the major challenges for cities, such as climate change or city resilience, are drivers for the development of these kinds of city concepts. This is essential in supporting cities to position and prepare them for a process of finding solutions fostering urban development and form. City concepts are therefore also more and more expected to increase the coherence of local actions and to provide visions to redevelop cities. But it remains difficult to sort concepts and choose one, in order to pick out the most suitable for a specific, existing city with specific goals. In an overview of urban development approaches (BMVBS and BBSR, 2009) it comes up that none of them is satisfying all criteria established of a resilient climate adapted city. Again, several contexts and driving forces have to be taken into account like actors and institutions, structures and mechanisms for shaping, transforming and building up a resilient urban environment: especially moving from vision to implementation of this ongoing process of transformation or transition which is guided by laws, regulations and policies.

Looking at the existing and recently upcoming city concepts and taking them as a seed for building up an integrative vision, it is necessary to keep in mind the level to which these concepts earn their role in starting the process of change, in order to see their boundaries and defining elements. How to choose a concepts which fits? There is descriptive information of all the various concepts available at this time and at the same time, there is a lack of classification or comparison of these concepts regarding business partners, appearance, focus and spreading via networks: therefore it is hard to evaluate if a concept is attractive or not. In this work, a mapping and classification approach will be shown, providing first conclusions and exploring this field of research to provide support and help to find and define appropriate visions and actions.

## 2. MAIN PART

*You cannot have a geography of anything that is unconnected. No connections, no geography (Gould 1991).*

The research group at EIFER has conducted this mapping also called geography within a global work on the potential of a possible Smart City concept development. As the term 'smart' became rather fashionable and is being promoted by official national and also transnational programs such as those EU, cities strive on one hand to become recognized or associated with this kind of 'labelling' and on the other hand look for action to support their socio-economic attractiveness in the competition between cities.

Surveying this trend and conference topics, several questions remain. What do these concepts include? Which concepts are relevant for a city's decision makers to picture a vision for its development and to define urban policies and actions?

### 2.1 METHODOLOGY

Due to this specific scope, the study focuses on those kinds of concepts, which are used today by cities in order to reach a higher level of sustainability and resilience as a common base. These are, for example: the Eco-City (Register, 2006), Intelligent City, Smart City, and Renewable City (Droege, 2006) Green City and so on. These and many others are described in great detail across a wide variety of literature.

Thus, the study does not consider the numerous purely architectural and sometimes purely visionary concepts (e.g. "radiant city", "broad acre city", Luc Schuiten's vegetal cities...) which of course, have become deeply rooted in planners' consciousnesses. But these often aim at creating an entirely new city, and are most of time closer to original sources of inspiration than to concepts to which municipalities themselves can contribute. For the mapping it was more important to deal with concepts which take the already existing substance into account. Therefore this mapping will not be an enumerating kind 'Wikipedia'-like bibliography and could have a different outcome due to the questions about city concepts which will be asked.

Indeed, this study was conceived in parallel to another work on city networks, their functioning and their potential as dissemination channels. Therefore, after a primary work that encompassed irrelevant concepts, the study focused more on 'network-compatible' city concepts. And, as a first remark, these concepts mostly build on practical experience which is a sign that they have an impact on urban development.

A prerequisite step in 2011 for the research team was the gathering of information about various concepts dealing with urban development concerning a variety of topics including mobility, energy, urban planning and so on. The study describes criteria like the main issues, contents, initiators, goals and involved business partners to receive a profound grounding.

For the concept evaluation it was decided to gather information from a broad review of different sources: internet search, book revision, journals and databases of published articles from various sources (newspapers, press departments) on urban strategies and concepts.

The frame for the analysis was set on those concepts which:

- are widely spread around the world,
- have recognition in international or national organisations
- are taking several aspects of sustainability into account
- are not purely architectural concepts
- are spread via city networks
- are still implemented

## **2.2 MAPPING**

Due to these filter criteria around 30 concepts were identified to start this mapping and to answer questions such as:

- How are concepts geographically and location worldwide spread? See map in 2.2.1
- What global topics were evolving during 20<sup>th</sup> century? See map 2.2.2a
- How the evolution and topics of concepts does looks like during this timeframe? See map 2.2.2b
- Which of the concepts meets the challenges of resilience best? See map 2.2.3
- How these concepts rely on others and how does an interlinkage between the concepts looks? See map 2.2.4

These questions are just examples to show the spectrum this research can cover and support decision making bodies in finding appropriate guidance.

## 2.2.1 World map spreading

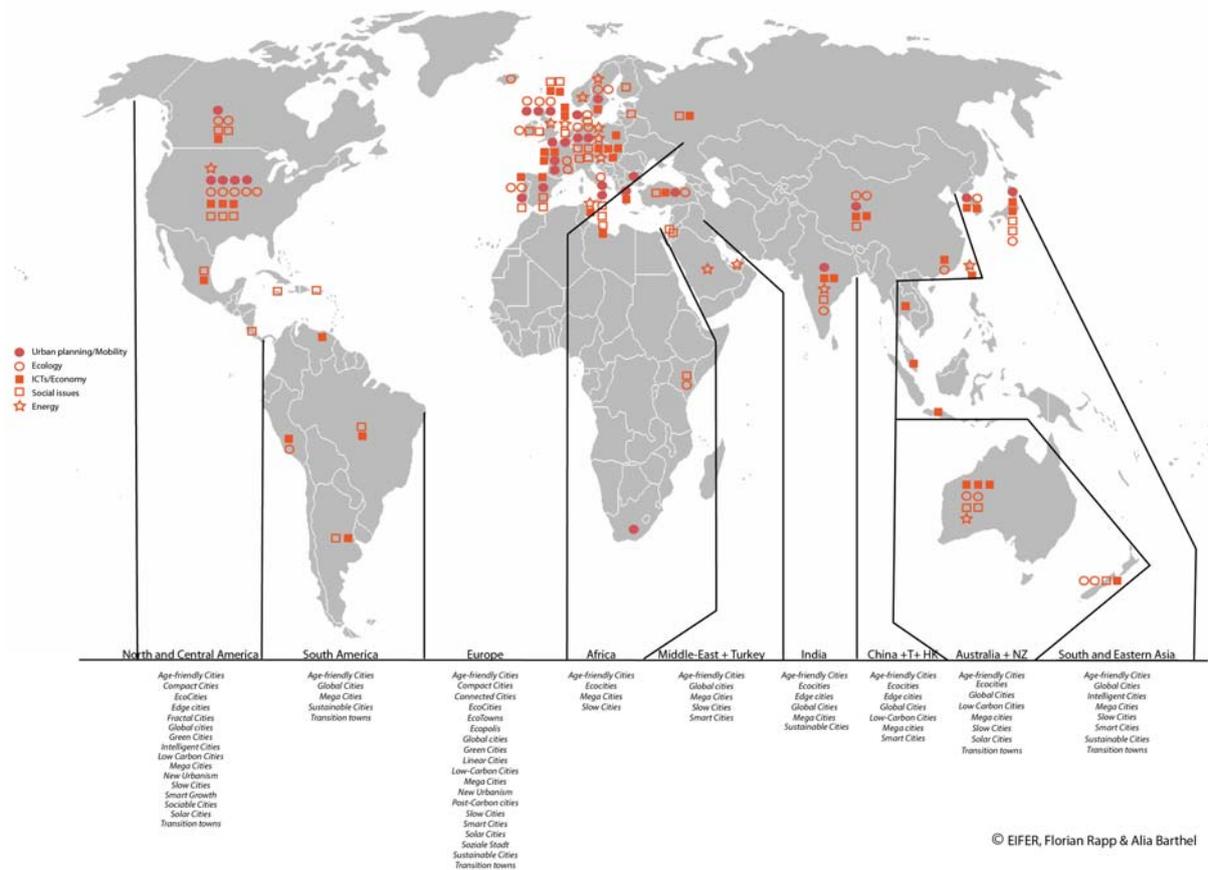


Figure 2.2.1: worldwide spreading of concepts geographically and location

This map shows the spreading of concepts around the world. What can be seen is that not every concept is mentioned in each continent.

A clustering of concepts can be seen in North America, EU, Asia and Australia.

Multiple approaches can be found in the EU due to the urban history, the diversity of policies and density of urban growth and diversity of research activities.

To give a interpretation about the spreading and conglomeration it can be stated the diversity of contexts like geography, demography, climate ... play a role as well as the level of competition between attractiveness of cities (inhabitants, business ...).

The match between identified cities and criteria for each single concept was not checked, but was based on cities' self-identification to a given concept or on their belonging to a network.

## 2.2.2 Global topics and concepts appearances

The first graph shows the global topics evolving during the 20<sup>th</sup> century. Starting with sustainability, it became more specific and more diversified.

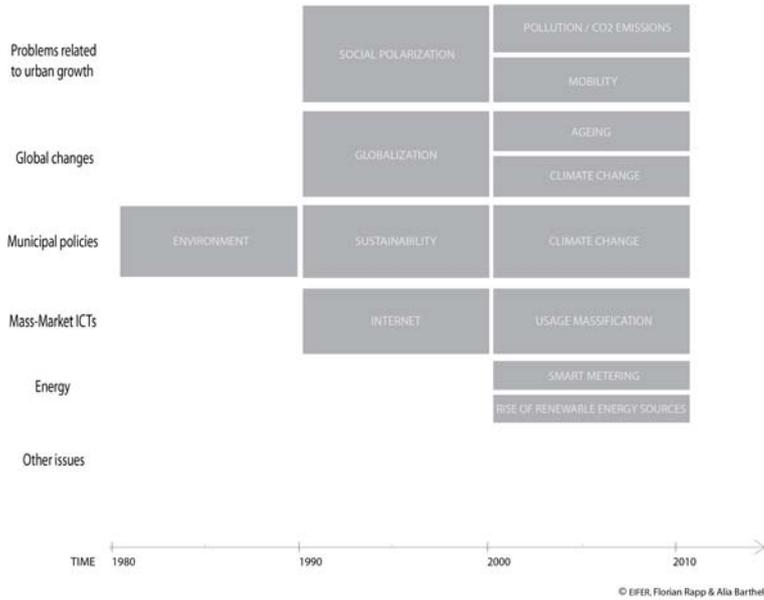


Figure 2.2.2a: global topics evolved in 20<sup>th</sup> century timeline

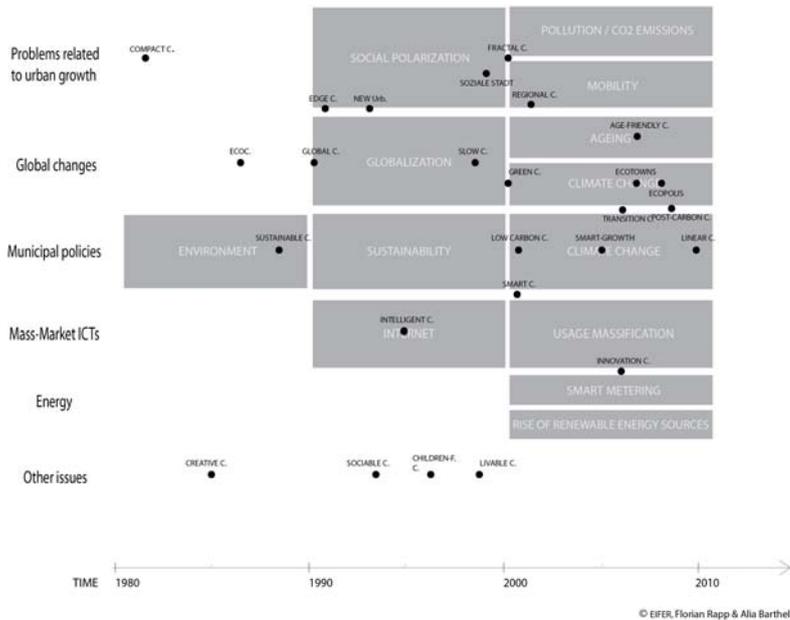


Figure 2.2.2b: combined with the evolution and topics of concepts in time

As a result the diversity of topics and levels are tackled nowadays by concepts: six levels (problems related, global changes, municipal policy, ICT, Energy & other)

What also can be seen is a constant acceleration of concept appearance (see timeline): as there have been four in the 80's, nine in the 90's and 13 from 2000 onwards. It followed a progressive concentration on common topics: for example about globalisation: in the 90's there have been five, now nine and about tackling climate change: in the 2000's there have been nine known and 13 by today.

### 2.2.3 Meeting the challenges of resilience best

This graph brings together thematic outreach concerning the issues of resilience towards sustainability in comparison within the concepts. The position of one may opens discussions if one concept is on his right place within this constellation but the idea was to look if one of them already tackles the ideal support and process for a city becoming resilient. It seems until now this is not to the case.

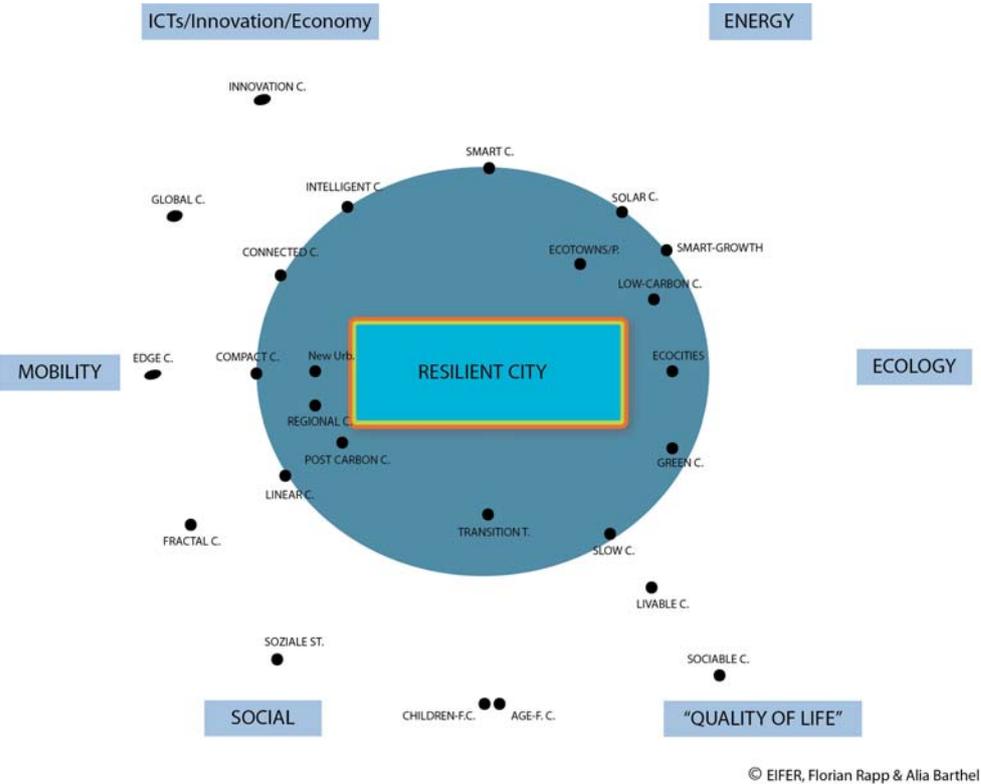


Figure 2.2.3: meeting the challenges of resilience best

There is no implemented concept fully encompassing all the challenges of urban resilience, in terms of meeting all criteria established for a resilient climate adapted city (BMVBS and BBSR, 2009) or sustainability but 15 of these concepts tackle at least several important aspects.

### 2.2.4 The relation and interlinkage between concepts

The last graph follows the question how these concepts may rely on one another or be a consequent further development of another.

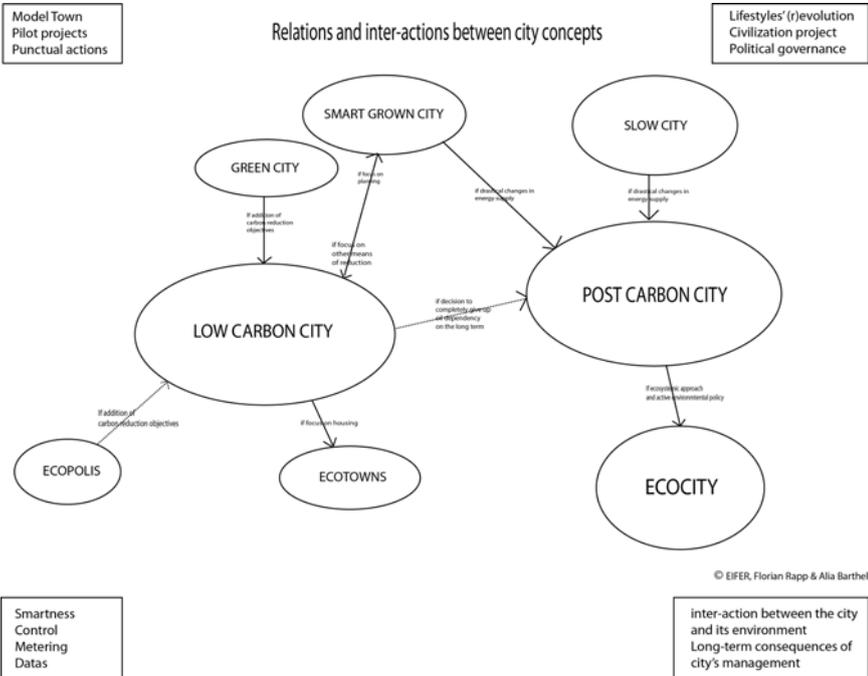


Figure 2.2.4: the interlinkage in between the concepts

The mapping of this kind of constellation of concepts is a complex approach but it serves to give a deeper understanding towards consequent assembly and practical steps afterwards. As a result, some concepts can be seen as a partial approach of other concepts with a larger holistic intention. These can be: highly specific, planning based, comprehensive & process oriented or comprehensive & goal oriented.

According to this, their level of influence is variable in networks: on one hand some concepts remain in their specific space or on the other hand some concepts are more widely known and discussed.

## 2.3 FINDINGS

In general one can say the level and accuracy of information varies greatly from one concept to another, as well as the degree of finalization. Some are still discussed, in which case some alternative definitions could appear. But, as a first step, the mapping shows that there are concepts to endow inspiration, giving chances to build up a vision interlinked with information about their segregated or integrative approach. Another outcome of this first concept geography is a cluster of low carbon initiatives examples happening unequally around the world with identifiable regional clusters.

A historic mapping of concept timelines suggests two ways of appearance. The first one is a form which was elaborated as a ready-to-implement scheme, which is often defined by corporate, public or academic actors, and then disseminated among cities (often with mitigated results as cities have to operate a re-appropriation of the concept content). We called it 'theory and action' while the other 'action and success to theory'. This second one is resulting from the aggregation of field experimentations by cities: going in the same direction with a bundle of actions at the end. These are wrapped up as a conceptual approach towards common actions which also could tackle other issues than climate or energy.

## 3. CONCLUSION

The study has shown that the idea of "city concepts" actually covers a broad and diverse reality. It seems that concepts encountering success among cities (i.e. being broadly adopted) are very much based on concrete experience from engaged cities that was spread afterwards among their counterparts through channels like city networks.

Thus, it somehow follows a 'bottom-up' dynamic, as concepts are constituted through an aggregation and mutual recognition of concrete examples (i.e. 'best practices'). For example: the actions promoted within the C40 Clinton Initiative as part of their strategies. A consequence of this is the following: some cities can implement actions corresponding to precise concepts, without claiming that they are adopting these. An intuitive way could rather be: to start a campaign or integrative work with decision makers and planning offices developing a process to define policies and actions and, accordingly, concept towards a pictured and a deliberated future.

The conceptual approaches are generally defined independently from a specific city. A concept may also be applied and adapted to the other contexts according to local needs and structures. It remains uncertain, if actions one city has carried out may serve the best practice in another city, but experiences help finding ways to reach the same results: achieving the same visionary picture of an aspired concept. Practically city concepts can help to structure urban management by strengthening specific topics and goals and also by bundling the appropriate levers in a co-ordinated, holistic approach.

As there is a great diversity of city concepts regarding different local needs, a huge amount can be suitable for the pathway one city will take even if city concepts are uneven distributed in the world.

One of the most important findings is that city networks are playing a decisive role in the dissemination of best practices, communication of ideas and concepts and as platform for exchanging to overcome structural obstacles as many actions still are taken up separately and not in an integrative manner.

Concepts are guiding and accompanying processes of cities' development. They are linked with the discussion to globalisation: they structure discussions, themes become more concentrated, diversities & similarities become clearer... Urban environments are supported reaching higher level of sustainability and resilience by concepts.

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