CHALMERS

Urban regeneration in Europe: State of the art and Perspectives

An analytical study interrogating sustainability

Master of Science Thesis in the Design and Construction Project Management Programme

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Department of Civil and Environmental Engineering
Building Economics and Management
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Front page image: Malmö, Sweden, BO01 neighbourhood
Göteborg, Sweden, May 2010

Lyon, France. May 2010

“The reasonable man adapts himself to the world; the unreasonable one persists in trying to adapt the world to himself. Therefore all progress depends on the unreasonable man.”

[GEORGE BERNARD SHAW, 1856 – 1950]

“There is nothing wrong in change, if it is in the right direction”

[WINSTON CHURCHILL, 1874 – 1965]

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Abstract

The paper presents a picture of the state of urban regeneration in Europe in terms of sustainability. The definition and characteristics of urban regeneration is firstly presented to set the frame. The question of sustainability is then raised. A review of all the features of sustainable development which can be applied in urban regeneration is also conducted. The review presents the main stake of each feature towards urban regeneration and the best practices. In order to provide a good picture of the state of urban regeneration practices in Europe, five case studies are presented, concerning Dublin, Bilbao, Malmö, Grenoble and Saint-Etienne.

After this state of the art review, the major trends regarding regeneration practices in Europe which can have been highlighted in this study are presented. Two main trends have been identified concerning economically and environmentally regeneration practices. Then common trends are presented such as the sectoral approach on urban development, the development of high value-added economic sectors, the boom of environmental projects, the increasing concerns towards every forms of diversity such as ecological, social or economical diversity, the use of local democracy and bottom-up approaches and the increasing entrepreneurial attitudes towards urban development.

A discussion is finally run regarding the context in which sustainability can be expressed and developed. The concepts of follow-ups, evolutivity and mutability regarding the urban fabric and composition are introduced in this section, while the structure of projects is questioned regarding the new stakes brought about by sustainable development. The tool project is finally discussed as a brake for developing sustainable cities.

Keywords: Urban regeneration, urban fabric, sustainable, development, sustainability, case study, best practices, project, evolutivity, mutability

Contents

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1 INTRODUCTION TO THE STUDY

1.1 The rise of a new urban environment

Numerous authors discuss for now decades the changes which are occurring in our modern societies. The increasing urban migrations after World War II and the huge development of the Information and Communication Technologies radically changed our ways of living in cities. The modern urban society which is taking place in Western cities does not at all looks like the city of the beginning of the 20th century. Borders are disappearing while speed and exchanges are increasing. The globalisation is also drastically changing our perception of the city and of the world. François Ascher, a renowned French town planner, identifies four main trends of evolution of the city: the development of rapid means of transportation and communication; the metropolisation of cities which is the expression of globalisation interpreted by cities; the increasing autonomy of human beings within systems more and more socialised and complex; the development of societies strongly influenced by the notion of risks where the individual and collective responsibilities have to be expressed and organised through new ways (Ascher, 2001).

The changing face of cities is actually changing the society while the changing face of the society is changing cities. Those new cities and urban environments are requiring new environments which are definitely different from the past. Flexibility and reactivity, complexity and variety are the characteristics of those new environments, of this “new modernity” (Ascher, 2001). Coordination and consultation are also keywords for this new urban environment which is nowadays developing increasingly faster. Those new characteristics, more than requiring new physical environments, implicate changes in the design of the public action and in the economical and social organisation of the society.

In order to adapt to these new challenges and to develop the modern city, two answers are possible: building new objects or renewing what has been inherited from the past. The two answers could be discussed, but in a time where sustainable development and especially environmental issues are of great importance for the future, one cannot only argue to design new cities starting from the ground. Sustainability obliges to think in terms of using the existing resources in order to reduce our load on natural resources and to avoid the production of huge amounts of wastes. Regeneration and renewal operations should therefore be at the core of the development of modern cities.

The current literature on urban regeneration and on sustainable development is extensive but no real methodologies and admitted best practices exist for the regeneration of cities in a sustainable way. Thus, the present paper leads an analytical study on urban regeneration and on sustainable development in parallel so as to provide a good framework for understanding the major stakes regarding sustainable urban regeneration in Europe. This paper does not pretend to bring new concepts and theories to light, but do pretend to provide a better understanding of the situation by giving a literature review on the subject and by comparing it with existing examples of European cities.

1.2 Research questions and purpose of the study

Starting from this analysis of the situation, the question of the place of sustainable development in this new urban environment is thereby interesting to be addressed. The urban field is highly complex due to numerous actors which are interacting in this field. The concept of sustainable development is also very broad since it integrates environmental, social and economical issues. In order to be able to understand the major stakes of urban regeneration to date and to make the best decisions when it comes to act for urban regeneration, it is firstly important to get a good picture of what the features of sustainable development which have to be integrated in urban regeneration operations are. The drafting of the research questions started from this statement. So as to reach conclusions on how sustainability should be addressed in the urban field and especially in regeneration projects, the question of how sustainability is considered and applied in European urban regeneration operations is primarily addressed in this paper.

With an eye to this main research question, a first sub-research question is logically raised in order to define what is meant by regeneration. The first part of the paper will answer this research question.

The analytical study will then move towards a review of the main concepts of sustainable development which can be applied in the field of urban regeneration.

After an exhaustive review of the features of sustainable regeneration, five case studies will be presented in the light of a second sub research question asking what the current status of urban regeneration in Europe is. The case studies will analyse different ways of addressing regeneration in Europe – mainly in Western Europe – in order to set the main trends which exist in the field of urban regeneration nowadays in Europe.

The study aims at assembling existing data of the scholar literature and of the industrial world. The intent is to provide a better understanding of the current situation concerning urban regeneration and sustainable development in the urban field for researchers and professionals in the industry.

The theoretical review will provide an overview of the main features of urban regeneration and of the main stakes concerning sustainable development in the urban field. The examples of regeneration operations provided in this paper enable to understand what the real current practices in Europe are in comparison to what is presented in the theoretical review. Reflections and recommendations will finally be raised in order to enhance discussion on the future characteristics to be promoted so as to improve regeneration operations towards better sustainability.

1.3 Methods

Delimitation of the study

Urban regeneration operations concern a broad range of operations at very different scales. Sustainable development is also a field integrating various sectors and full of different uses. The study presented in this paper will be therefore limited to several characteristics: urban regeneration is only studied for European cities; the operations are projects which are taking place on already built-up parts of the city, it does not concern urban expansion projects for instance. Sustainable development will not be limited to the environmental aspect – like it is sometimes applied in urban projects – but it will include all the social and economical aspects. Nevertheless, the management part of sustainable development in project management or into a structure – such as a company or municipal services – will not be integrated to this study.

Applied methodology

The theoretical framework and the case studies are based on qualitative data found in journal articles, books, newspaper and magazine articles, reports and WebPages. The data have been gathered through libraries, online databases – such as Science Direct® – and through personal interactions with experts from the industry.

The strategy applied for this study was to use existing information, to gather it and to organise it in a way to highlight the main and strategic stakes to be addressed when dealing with sustainable regeneration projects. The data used for this paper are secondary data (Naoum, 2006), consisting in primary data already gathered and interpreted by their authors. During the writing phase of this paper, the author was working in a consultant company dealing with infrastructure projects and urban development. Informal interviews were held with the professionals of the company and helped to build the structure and the arguments presented in this paper. The study is a qualitative research using concepts and words to describe phenomenon, situations and circumstances. This qualitative study is not an attitudinal study (Naoum, 2006) aiming at evaluating the validity of certain school of thought for instance. As the aim is to provide a better understanding of the urban regeneration situation in Europe in the light of sustainable development, the strategy taken has been to develop an exploratory qualitative study. The reader will then be free to make his own opinion on what should be raised as priority stakes for urban regeneration of tomorrow.

A quantitative approach would have been very tedious for this subject since the collection process of data would have been very long for such research questions. Thus, there was a certain advantage in using existing data in order to concentrate on the analysis-gathering process.

Validity and reliability of the study

The study is almost exclusively based on published literature in scientific journals and books. The trustworthiness which can be given to the theoretical framework and the case studies is therefore quite high. The analysis of the current trends used in urban regeneration in Europe and the discussion which is presented after is nevertheless expressing the opinion of the author.

Reading advise

As the paper is relatively extensive, a structure and some reading advises are provided to the reader in this paragraph.

The structure of the paper is divided into three main parts:

1. A theoretical framework
2. Five case studies
3. Findings and reflections concerning the current trends applied in urban regeneration projects in Europe

Theoretical Framework

The theoretical framework is built with a pedagogical approach. Firstly, the context in which urban regeneration takes place in Europe is presented to finally lead to a definition of urban regeneration. The theoretical characteristics of urban regeneration which are applied in Europe are then highlighted.

This chapter then moves to the presentation of the concepts of sustainable development which can be applied to urban regeneration. The first part presents the environmental features of sustainable development. Then the economical and social concepts are presented to finally outline the main concepts used for local governance and the management of regeneration projects – mainly the increasing use of partnerships.

Case Studies

The five caste studies present two major regeneration projects taking place at the scale of the urban community and the city. The case studies present the regenerations of Dublin and Bilbao based on economical driving forces. The three other case studies are dealing with smaller scale regeneration projects at the neighbourhood scale. These examples concern Malmö in Sweden and Grenoble and Saint-Etienne in France. These case studies are related to regenerations driven by environmental motivations.

Findings and Reflections / Conclusion

Finally, the “Findings and Reflections” chapter presents the main current trends regarding the processes used for urban regeneration in Europe. The question of the sustainable aspect of these trends is discussed in the light of the literature review provided in the first chapters. Conclusions are at last given reflecting the main features of the discussion which should be developed in future regeneration projects.

2 URBAN REGENERATION IN A EUROPEAN CONTEXT

2.1 Understanding the relevance of urban regeneration: Cities processes of transformation, and decline

Because of the fluctuating economical and social situation through history from the global scale to the very locale one – industrial reorganisation, globalisation, economic concentration, availability of lands and buildings, etc. (Cheshire et al., 1986 ; Roberts and Sykes, 2000) – each city is subordinate to change and adaptation. Since cities are made of people living and working in a restricted area, those economical and social trends directly impact the forms and the structure of the city (Lang, 2005). Some cities are more likely to adapt to change in a better way than others. Indeed, structural changes can bring about more or less deep crisis depending on the change's combination on all aspects of urban development. Cities unable to re-adapt their structure and organisation to those new trends might experience tragic impacts, for instance high unemployment rates, the loss of an important part of their population (Cheshire and Hay, 1989 p.10), or even structural and physical decay (Lang, 2005).

This inability of certain cities to adapt to new economical or social situations finally induces urban decline of a part or of the entire area of these cities. Very often, the urban decline of a city is uneven from an area to another because this decline affects particularly a certain part of the population (Parkinson and Judd, 1988). The term decline describes undesirable changes that a city has to face: job losses and growing unemployment, social exclusion and segregation, physical decay and declining living conditions (Medhurst and Lewis, 1969). This urban decline was particularly described during the 1960's when some European cities started to face long-term decline (Noon et al., 2000).

Lang defines decline at the urban level as: "(…) a continuous reduction of employment as well as an enduring loss of population; both processes are interrelating and are accompanied by rising social and physical problems" (Lang, 2005). Urban decline is therefore lead by economical problems which provoke social and physical problems. This implication of social and physical problems due to economical issues can easily be understood by the very importance of the working activity for people's life fulfilment and self-esteem (Garcez, 2006). One decisive feature for urban development is therefore the ability of a particular region to provide employment for its population (Lang, 2005). When the economy faces difficulties, social problems arise.

However one cannot speak about urban decline just because a city faces less inhabitants and jobs. Beauregard explains that "(…) the issue is the composition of those changes, their pace and the resultant distribution of costs and benefits" (Beauregard, 1993 p.36). Hence, the losses of employment and population in a city only mean an urban decline if those losses are durable over a couple of years and if the combination and the pace of those changes stop any continuous adaptation.

To conclude, cities are constantly facing undesirable changes. Depending on the combination and the pace of those changes, some cities or urban area within cities can face difficulties to adapt their structure. The consequences of this inability to fit to new situations are mainly economical with, for instance, a raising unemployment rate and social with the loss of population, social exclusion, worsening living conditions, etc. As a result, the structure of such cities is year by year affected by this situation through physical decay, outdated premises and transport infrastructure, etc.

Cities facing such situations do not only need to catch up with this huge delay but also to breathe new life into the area. This is the whole challenge and main stake of urban regeneration.

Urban decline therefore brings about a lot of urban problems easily identifiable at the local level: crime and racial conflicts, increasing unemployment, or some less easy to identify, for instance increasing income differentials, etc. (Pacione, 1997). The urban problems provoked by urban decline can be described as "the relative under-performance of many local urban economies and the resulting mix of economic, social, physical and environmental exclusion, which often appears to be self-sustaining in the absence of external intervention" (McCarthy and Lloyd, 2007).

Understanding this context of urban decline, it is easier to understand why a lot of cities are facing a vicious circle of decline. The processes of those declines very often reinforce each other and finally

cause this self-supporting vicious circle from which it is difficult to get rid of (McCarthy and Lloyd, 2007).

At this stage, a new momentum is required for cities to leave this situation and to regain a healthier physical, economical and social situation. In opposition to the idea of abandoning deprived areas because of the brake they represent for regional and national success (Roberts and Sykes, 2000 p.19), it is important to highlight the fact that the "inner city problems affect everyone". Indeed, the overall performance of metropolitan regions is strictly linked to the performance of their central cities (Stegman, 1995 p.1602). Healthy cities mean healthy regions and nations. The regeneration of declining cities or more often part of cities is thereby not to be argued but to be promoted.

2.2 Urban regeneration definitions and principles

2.2.1 Urban renewal or urban regeneration?

While a lot of authors cheerfully mix up the terms urban renewal and urban regeneration, a real difference exists between those two expressions. Urban regeneration is a term which goes beyond urban renewal - which deals with physical change (Couch, 1990 p.2) - and urban development - which describes the general mission (Roberts and Sykes, 2000 p.18). Peter Roberts, in his Handbook for urban regeneration indicates that urban regeneration implies that all the approaches have to be designed with a strategic and long-term purpose (Roberts and Sykes, 2000 p.18). Urban regeneration is then at the core of cross-sectoral actions, while urban renewal is only addressed to neighbourhoods and housing-estates in reaction to deprivation (Lang, 2005).

2.2.2 Urban regeneration

When dealing with what urban regeneration is, several aspects have to be included in the definition.

The Office of the Deputy Prime Minister (ODPM) in the UK highlights the holistic and the reversing aspect of urban regeneration: "[Urban regeneration is] the holistic process of reversing economic, social and physical decay in areas where it has reached a stage when market forces alone will not suffice" (ODPM, 2003). It is interesting to notice that the ODPM bases its approach of urban development on a free market where the market regulates the economical, social and physical forces of an urban area or a city. This is an inheritance of an American way of approaching urban development in the 1980's (Fitzpatrick, 2000). The holistic aspect of urban regeneration implies that it should be approached with a long term and a strategic purpose in mind (Roberts and Sykes, 2000).

The economical, social and physical aspects of regeneration should be also included in the definition. Couch and Fraser argue that "[urban] regeneration is concerned with the re-growth of economic activity where it has been lost; the restoration of social function where there has been dysfunction, or social inclusion where there has been exclusion; and the restoration of the environmental quality or ecological balance where it has been lost" (Couch et al., 2003 p.2).

Nevertheless, urban regeneration cannot be only restricted to separate economical, social or physical aspects of an area. Each city's history of urban problems and opportunities forms the background for urban regeneration. More precisely, Peter Roberts (2000), identifies five main themes causing urban change and which need to be acknowledged when dealing with urban regeneration: the relationship between physical conditions and social response; the physical obsolescence and the continual need to replace the obsolete elements; economic success as a foundation for good urban conditions – therefore adaptation to economic transition and employment change; the best use of urban land as possible to avoid unnecessary urban sprawl; the fact that social and community issues are directly related to the dominant social conventions and political forces of the day. Sustainable development is a sixth theme, which integrates several themes of the themes previously cited.

On the basis of those six themes, Roberts proposes that urban regeneration is "a comprehensive and integrated vision and action which leads to the resolution of urban problems and which seeks to bring about a lasting improvement in the economic, physical, social and environmental condition of area that has been subject to change" (Roberts and Sykes, 2000). Two main aspects are important to be

highlighted here for a good definition of urban regeneration: Urban regeneration concerns areas having been subject to change and it is an integrated approach.

A last aspect to highlight concerning urban regeneration is its public aspect. "Urban regeneration is the field of public policy that deals with issues previously described (Couch et al., 2003 p.2). Therefore, in opposition to private sector-led development, urban regeneration has to reduce segregation, social exclusion and to enhance the economic reintegration of disadvantaged urban areas (McGregor and McConnachie, 1995).

> *To sum up all those concepts in a few clear and understandable sentences, it is important to note that urban regeneration is a holistic and integrated process seeking for improvements concerning economical, social and environmental conditions in a strategic and long-term perspective of an area or a city that has been subject to change. Beyond improving conditions, urban regeneration has a public mission of reducing segregation.*

2.3 Characteristics of urban regeneration operations

2.3.1 Principles for successful operations of regeneration

Urban regeneration, standing at the crossroads of economic, social and physical matters, needs to be addressed as an integrated discipline requiring a general strategic agenda (Lang, 2005). Urban regeneration is not an academic and well-framed and organised discipline. It is rather a unique project-designed approach. However, Roberts and Sykes, in their handbook for urban regeneration (2000), propose a set of principles for urban regeneration. Urban regeneration should:

- Be based upon a detailed analysis of the condition of an urban area
- Be aimed at the simultaneous adaptation of the physical fabric, social structures, economic base and environmental condition of an urban area
- Attempt to achieve a comprehensive and integrated strategy dealing with the resolution of problems in a balanced, ordered and positive manner
- Develop the strategy and the resulting programmes in accord with the aims of sustainable development
- Set clear operational objectives (+ quantified wherever possible)
- Make the best use of natural, economic, human and other resources, including existing features of the built environment
- Ensure full participation of all the stakeholders with a legitimate interest in the regeneration; this may be achieved through partnership or other modes of working
- Measure the progress of strategy towards the specified objectives and to monitor the internal and external forces which act upon urban areas
- Be flexible to revise the initial programmes in line with the changes that will might occur
- Recognise that the different elements of the strategy progress at a different speed and to provide a balance between the aims in order to achieve all the strategic objectives

Of course, those principles are to be adapted according to the context where the urban regeneration is taking place. The "uniqueness of how things happen in a local area" (Robson, 1988) is very important. The scheme of an urban regeneration operation should thereby include the circumstances and the requirements of the city or the region in which it is located as well (Hausner, 1993).

2.3.2 Major aspects of the need for regeneration

Urban regeneration operations are unique due to their very local nature; nevertheless some common features can be identified. Roberts and Sykes identify four main aspects of the need for regeneration. A fifth one has been added according to a study of around 50 projects in a French context run by the author (Projets Urbains, 2009):

1. Economic transition and employment change (due to deindustrialisation, inappropriate labour market, etc.)

2. Social and community issues (due to counter-urbanization, migration, community decline, etc.)
3. Physical obsolescence (due to obsolescence of buildings or areas such as city centres or suburbs; dereliction; contamination; outdated infrastructure; etc.)
4. Degradation of the environmental quality of the urban environment (due to all of the above factors)
5. Degradation of the city entrances and limits (due to expanded and uncontrolled urbanisation)

2.3.3 Five categories of operations

Five main categories of operations have been identified by Roberts and Sykes (2000) and also checked in a French context through the previously described study of around 50 projects (Projets Urbains, 2009). Urban regeneration operations mainly concern:

1. Neighbourhood strategies
2. Economic development
3. Training and education
4. Physical improvements
5. Environmental actions

In the 1990's a lot of urban regeneration operations were focused on the place-marketing and culture-led aspects of regeneration. The aim was to attract mobile international investments and to develop new industries such as tourism and services. The concept of sustainable regeneration also appeared during this decade. However the environment was too very often considered as the major factor while the others were secondary considerations (Jones, 2005).

2.3.4 Four Types of lands

An overview of several French, British, Italian, Spanish and Danish regeneration projects indicated that urban regeneration is mainly developed on four types of areas:

1. Waste-lands (industrial or military areas abandoned due to a shift in the economy and in the policy of the country)
2. Deprived areas due to social and community issues (migration, market change and shift in the economy explain this type of social deprivation)
3. Deprived areas due to physical obsolescence (lack of maintenance, poor and under-educated population, etc.)
4. City entrances (due to fast and uncontrolled urbanisation, etc.)

2.4 Sustainable cities: cities of tomorrow

The term sustainability is in almost every city document nowadays but was not in the previous decades. Yet, sustainability is an old term used in a lot of different forms from a lot of centuries whenever communities of human beings have treated nature, their built environment and social relations with reverence. On the other hand, unsustainability is quite recent from the raise of industrial capitalism and nowadays with globalization (Levine et al., 2003). Excessive exploitation of nature by mankind and sometimes human beings by human beings provokes this unsustainability that is pointed out nowadays. Hence, this is more the unsustainability that is the core of the fight nowadays in the quest for sustainability.

Long-term unsustainability is actually assessed and measured, but very often on a national or global scale – for instance: climate change, deteriorating housing conditions, etc. This view tends to withdraw the responsibility of the local scale to the advantage of the global scale where the responsibility is shared by everyone and also no-one (Levine et al., 2003).

Cities have therefore to assume their responsibility and their role in the promotion of sustainable development. Indeed, cities are major consumers and distributors of goods and services. They are tightly linked to their immediate hinterlands and to some extent to the global environment. They can be seen as an organic machine which imports resources to live and exports wastes further afield. The

costs of cities' consumption are transferred to other people, other species and other areas (Haughton, 1997). This way of managing the city is to be changed and this is where the concept of sustainable cities emerges.

The main issue when dealing with sustainable cities is that a city is not something that is designed and then built. The design, the construction, the maintenance and the reconstruction of the city is an endless evolving process (Levine et al., 2003). It is therefore hard to define what a sustainable city is since sustainability is also an evolving concept depending on the issues the world has to face: building blocks in the 1950's was seen as sustainable as it provided healthy living places, running water, etc. to a huge amount of people coming from countryside. Some environmental actions taken nowadays might be seen as unsustainable in the future as well. Indeed, the most widely known definition of the Brundtland Commission defining sustainable development as "development that meets the needs of the present without compromising the ability of future generations to meet their own needs" (Brundtland, 1987) is a quite open definition. In that sense, building huge blocks in 1950's was sustainable since it preserved land resources, it enhanced urban density and therefore energy efficiency, etc. However everybody agree nowadays that this way of urbanising was not sustainable. The cultural and social aspects were actually not well addressed in those projects.

Defining what a sustainable city is is thereby a hard task. When looking for sustainable cities on the World Wide Web, several cities pretend to be or to become one of the world leading sustainable cities. Here is a summary of Malmö, Vancouver and Endinburgh main features and strategy to develop a sustainable city:

Malmö	**Vancouver:**
Strategy: "Our broad-based efforts cover traffic, energy and city planning, and also consumption, education and lifestyles". The sustainable aspects of the city consist in: - Urban density and control of the extension of the city boundaries (+ protect arable lands) - Cooperation between key stakeholders for the development of the city: representatives of Malmö, property developers, architects - Energy efficiency and local energy production (buildings energy efficiency, district heating, biogas, solar cells, wind power plants in the sea, etc.) - Recycling (organic and food waste used to produce biogas for vehicle fuels) - Mobility (strong focus on non-motorised transports and public transports, even ecodriving courses! "Ecodriving is a technique to reduce fuel consumption in vehicular transport") - Green and blue areas: urban green spaces, green roofs, water management, etc. - Education and Fair Trade: promotion of fair trade, ethical consumption, organic food, etc.	Strategy: "We are building in a way that reduces our energy emissions, accommodates active and public transportation and ensures future quality of life" (City of Vancouver, 2008) Sustainability consists in: - Greener renovations (public buildings essentially + incentives for private buildings) - Reducing heating in relation with the aim of cutting greenhouse gas emission by more than 50% (Methane gas captured from the Vancouver Landfill is being used to generate heat and electricity) - A new transportation plan which allowed a 44% increase in walking, a 180% increase in bike trips and a 10% reduction in vehicle trips since 1997. - EcoDensity initiatives: a vision for Vancouver of how it will grow while reducing its ecological footprint and while increasing the living conditions ("high quality and strategically located density can make Vancouver more sustainable, liveable and affordable")

Edinburgh

Strategy: "The Council's vision for Edinburgh states that by 2015 Edinburgh will lead the most successful and sustainable city in Northern Europe"

Sustainability consists in:

- Carbon Management Programme: provides councils with technical and change management guidance and mentoring that help to identify practical carbon and cost savings. The primary focus of the work is to reduce emissions under the control of the local authority such as buildings, vehicle fleets, street lighting and waste.
- Standard for sustainable buildings: provide advice and guidance for better energy efficient buildings and on the choice for materials
- A plan for all kind of emergencies
- Social and economical issues: a checklist of all the actions to be taken into account in a project is proposed by the city of Edinburgh but not imposed. It deals with social inclusion providing secure environments, an equal access to information and education, adapting building functions, designing affordable energy schemes, providing infrastructures for local initiatives and creating shared spaces.
- Transportation issues: through a local transport strategy to promote alternative transports to cars (public transports, cycle and walk)
- Rubbish waste and recycling: promotion of recycling, reducing and reusing waste
- Promotion of built and natural heritage, development of the local culture
- Promotion of fair trade through a fair trade guide

These short case studies illustrate very well the current trend of cities development when it comes to sustainability. The ecological part of sustainable development seems very well handled by cities nowadays.

Even researchers are very often only concentrating on the ecological part. For instance, Haughton in his article *developing sustainable urban development models* only deals with environmental and ecological issues and proposes "four approaches to sustainable urban development" which are actually very ecology-focused (Haughton, 1997).

A sustainable city is however more than an ecological city. As a lot of researchers highlight this fact, a sustainable city is based on three main pillars: economic stocks, socio-cultural stocks and ecological stocks (Rotmans et al., 2000). The socio-cultural and ecological parts are too often forgotten and are under-addressed by cities. It is interesting to notice that even the themes promoted by Edinburgh city concerning social and economical issues are actually focused on the design of premises, of buildings and of the whole city. But a very few actions are proposed to tackle unemployment or to fight segregation.

A sustainable city can be defined as a place which seeks to improve the quality of life "including ecological, cultural, political, institutional, social and economical components without leaving a burden on the future generation; a burden which is the result of a reduced natural capital and an excessive local debt" (URBAN 21, 2000). The relationship between ecological, cultural, political, social and economical aspects is very important. If each of those aspects is taken separately, sustainability is not ensured. Having an integrated approach is crucial. Integrated approach is an "interdisciplinary process of combining, interpreting and communicating knowledge pieces from diverse (…) disciplines" (Rotmans et al., 2000).

Sustainability for cities is therefore a complex issue which cannot be defined comprehensively. Its very nature seeks to integrate many diverse disciplines and this is why sustainable development is so hard to integrate in urban or broader political projects (Muschett et al., 1997). Neither pre-designed tool nor general models can be provided to cities. Sustainable forms of cities, unique model of transportation, or of waste management are utopian. Each city has to develop its own sustainable way. Nevertheless, general hallmarks can be identified to enlighten this challenge. In this sense, the following sections of this paper will present firstly the main concepts of sustainable development applicable to urban regeneration and then the current general trends in sustainable urban regeneration for cities in Europe through 5 examples.

2.5 Main concepts of Sustainable development in urban regeneration

Sustainable development is an integrated concept dealing mainly with ecological, social, cultural and economical issues. As previously presented, sustainability is only secured when it is addressed with an integrated approach of all the aspects composing sustainable development. Hence, sustainable urban regeneration has to integrate all those aspects in order to ensure sustainability. An overview of all the concepts of sustainable development applicable to urban regeneration is presented in this section. Then, it will be compared to European examples and best practices of urban regeneration in order to finally map the current trends in sustainable urban regeneration and to provide recommendations.

2.5.1 Designing and organising cities in accordance with the local and the global environment

The question of human impact on earth natural environment seems to be new for a lot of people nowadays. Nevertheless, it is not a new question. In the 18th century, the French natural historian Count Buffon studied the observable contrasts between inhabited and uninhabited lands. He discovered how much the human capacity to change the environment is huge. He also showed how human domesticated plants and animals to match his own needs and will (Goudie, 2006). From the 18th century to date, a lot of researchers showed the huge impact of human's activities on the natural environment. This theme is however central nowadays with the issue of global change and the role of human activities on it. Indeed, the earth system is regulated by interactive physical, chemical and biological processes. Those processes provide the unique conditions for life. A change in this system is then of crucial interest for human beings. The current issue in order to avoid an irreversible change in this balance is to understand in which way these processes are influenced by human activities (IGBP, 2005).

As previously described, cities are importing resources to live and exporting wastes further afield (Haughton, 1997). The role of human activities on climate change can still be debated but no-one questions the huge impact of cities in the total amount of resources extracted, transformed and finally rejected in the form of noxious wastes. Cities are the biggest consumers of resources on this planet and the biggest polluters. Their impact on the earth's carrying capacity is therefore huge (Levine et al., 2003). Besides the debate on the human impact on climate change, cities are emitting a lot of pollutants which are highly unhealthy for their inhabitants. The quality of the local and, to some extent, the global environment is important to be improved.

The two main challenges of cities of the 21st century is thus to decrease their appetite of resources and also to decrease their wastes rejection. A sustainable city is therefore a city which is resource efficient, which recycles and re-use raw and transformed resources and which filters gas rejection. Cancelling out cities' impact on the natural environment is nowadays impossible, but it is time to take the first step towards it.

The following paragraph will shortly present the main topics that have to be tackled when dealing with urban regeneration.

Energy Management

Main Stakes

The issue of energy management is often seen as a national or a transnational issue. Indeed, cities are using energy produced by companies and they do not have the power to decide which type of resources should be used to produce the energy. Yet, even if they cannot choose the raw material used to produce the energy, they can play an important role in the reduction of the energy consumption. And actually the first stake in energy management is not in producing energy with renewable sources, but it is to reduce energy consumptions. The use of alternative solutions for energy production can only be sustainable if the energy demand is at the lowest level as possible. In order to decrease the energy demand and consumption, a broad scope of technical solutions exists. The choice among those solutions is always to be made by finding a balance between the environmental, economical and social stakes (Club Ville Aménagement, 2004).

Actions and Actual Trends

The savings in energy consumptions can be made by two main kinds of solutions:

1. Rationalisation of consumptions

- At the scale of the neighbourhood or the city – non-exhaustive examples:
  - District heating/cooling networks
  - Follow-ups of the energy consumptions of public premises and buildings
  - Use of low energy consumption street lights
  - Design of buildings and city sectors according to sun and wind direction
  - Height of buildings (influences energy losses)
  - Mutualisation of the means concerning production, management and maintenance of the public but also the private premises and buildings
  - …
- At the scale of the building – non exhaustive examples:
  - Natural lighting, heating and ventilation
  - Green roofs
  - Promoting the use to district networks, or the development of a central heating system for the whole building
  - Follow-ups of energy consumption of the building or of the apartments
  - High energetic performance (efficient insulating material for walls, roofs, floors and windows; thermal inertia)
  - Use of solar water-heater
  - Education of the users and implementation of recycling and re-using processes
  - …

2. Local energy production can also be promoted if the area matches specific requirements. This concerns mainly wind and solar power, and biogas production from domestic wastes. However the isolated use of such energy production systems in the urban fabric – such as rooftop micro wind turbines – is useless, except for encouraging people to think about their emissions and consumptions (Montbiot, 2009). The installation of such energy production system has to be well studied in order to produce a fair amount of energy. Wind power is mainly to be used in urban peripheral areas; nevertheless, solar collectors can be highly efficient and thereby of great interest in urban areas for hot water production or heating with a low temperature heating system (Henden et al., 2002 ; Kalogirou, 2004). The production of biogas from domestic organic wastes seems to be also a very interesting way of reusing resources to produce energy (Elango et al., 2006). For instance, it is a solution used in Malmö: after that the 96% of the household waste is recycled, the organic wastes are used to produce biogas which supplies 42% of city buses need of fuel – the non-organic wastes are burnt and the energy coming from the incinerators are used by the district heating system (Malmö City, 2009).

Water management

Main Stakes

The fresh water resource is undoubtedly decreasing everywhere in the world, but especially in the third world where the demand is strongly increasing. Without water, human beings cannot live, therefore this resource is extremely important (World Water Assessment Programme, 2003). In most European countries, the water resource is very often not a problem since a huge amount of ground water is available. Nevertheless, the level of ground water is decreasing in some countries. It is the case of France where the level of ground water is decreasing, especially because of stronger dryness since 2003 (BRGM, 2009). The way of managing this resource is therefore essential.

Actions and Actual Trends

Water management concerns firstly the management of rain and fresh water and secondly the savings of drinkable water.

Concerning rain and fresh water management, the objective is:

- To limit flooding by delaying water streaming through decreasing the sealing of urban areas, re-introducing water in urban areas (for landscape, watering, etc.), increasing the number of green roofs, etc.
- To collect and to re-use rain water
- To rationalise and to improve water processing by separating rain water networks from sewerage networks
- To reduce water consumption by using specific equipments (flush, mixing valves, etc.)
- …

Rain and fresh water management is closely related to the issue of coordination between all the stakeholders, which will be presented later in the paper. Moreover, those actions form a whole which is not attainable at the scale of a single urban regeneration operation.

Concerning drinkable water savings, it is an issue that can be tackled at the building scale but also at the scale of cities' networks by repairing or restoring the existing networks. For instance in France, the losses due to the bad state of the water-pipes networks used for drinkable water can vary from 3.5% to 41% of losses. On the average, this is 25% of the drinkable water which is lost every year (Le Point, 2009). This can be explained by the fact that the French network is old and very often not accessible to repair the leaks in the pipes (ADEME, 2006).

The recommendations that are currently proposed consist in:

- Designing pipe networks that are easy to manage and control
- The use of economic devices
- Monitoring consumptions and leaks

In order to secure sustainability, urban water management has to be tackled with a holistic approach from the water cycle (Marsalek, 2007 ; World Water Assessment Programme, 2003). Actually, in urban areas the hydrological cycle is more complex because of many influences and interventions caused by the urban fabric. Then, it is not a simple model of the hydrologic cycle which should be taken into account, but a more complex model called the Urban Water Cycle (UWC). This UWC is particularly adapted because it includes the influences of the urban fabric and it provides a unifying concept for tackling climatic, hydrologic, land use, engineering and ecological issues in urban areas. This unified approach enables the reuse of storm water, groundwater and waste water along with savings in the water consumption (Marsalek, 2007). Using the Urban Water Cycle in a city is a good way of addressing the water management issue with an integrated and sustainable approach.

Solid and Liquid Waste Management

Main Stakes

The management of solid and liquid wastes in urban areas is a growing problem for every country and recognised by all (Woroniuk and Schalkwyk, 1998 ; Fiorucci et al., 2003). Indeed, waste is an inevitable product of human society as it is a part of the systems producing goods and services, working and playing; it is also a part of the cycle of eating so on and so forth. Solid and liquid wastes are inherent to human society. Solid waste is the general term referring to organic and inorganic wastes thrown away by people, businesses, industries, institutions, governments, etc. (Pinderhughes, 2004). Liquid waste refers to all kind of wastes which are found in the form of liquids, produced by industries, municipalities and households, agriculture, etc. (USEPA, 2009). Cities are discharging huge amounts of solid and liquid wastes every year, but the rejection of such wastes in cities' hinterlands represents two main issues: 1) They do not contribute to the reduction of the use and extraction of resources; 2) They damage the ecological environment.

The main stake in urban waste management is first of all to lower the production of urban wastes, then to increase the amount of wastes going to recycling processes and finally to lower as much as possible the impact of the ultimate wastes on the environment.

Actions and Actual Trends

The scope of actions is very broad when it comes to answer the big challenge of managing human wastes. The horizon is well described by Lester Brown when he says that "the challenge is to redesign the materials economy so that it is compatible with the ecosystem". In this sense, the whole way of producing goods and services in this planet must be rethought so that products can be easily disassembled and recycled, that services are wastes-free, etc. (Brown, 2001 p.138). Waste management in urban areas cannot directly deal with such challenge but urban waste management can play a great role in reducing the amount of produced wastes, in recycling and in storing waste.

Four main gradual actions are possible in urban waste management:

1) Reducing wastes – through education, incentives to industries households, specific design of the urban systems
2) Reusing wastes – through the promotion of innovative and smart applications and the use of incentives to develop this field

3) Recovering wastes – through a better way of sorting wastes and through the implementation of recycling plants, incineration with energy recovery - using fluidised bed technology for lesser pollutants production, composting, waste gas production and refuse derived fuels production.
4) Storing wastes – through landfills

(Fordham, 2005 p.79-85; Fiorucci et al., 2003 ; Brown, 2001).

Above all, waste should not be called 'waste' since a huge part of what we call waste nowadays can be reused or recycled (Global Development Research Center, 2008 ; Pinderhughes, 2004). Indeed, waste must only refer to ultimate wastes which cannot be recycled or reused and which will be incinerated or buried in landfills. Wastes are often not wastes, but real resources that human can use.

Antoine Lavoisier, a great French chemist of the 18th century stated that *« Rien ne se perd, rien ne se créé, tout se transforme » - "Nothing is lost, nothing is created, all is transformed"*. Waste management is about that: wastes produced are not resources that are lost but only resources that can be transformed. "Nothing is created" also highlights the importance of saving natural resources through reuse and recycling processes.

In the view of urban regeneration, it is important to highlight that materials arising from deconstruction or demolition can be reused or recycled in the most sustainable way (Fordham, 2005).

In order to put in place the four actions presented below, only an integrated approach with the public, private and community sectors working together can be efficient in order to reduce the impact on the ecological environment and on the earth natural resources (Global Development Research Center, 2008 ; Fordham, 2005). This integrated approach can be developed for instance through the implementation of an *Integrated Sustainable Waste Management* approach proposed by WASTE, Advisers on Urban Environment and Development (van de Klundert and Anschiitz, 2000).

Materials

Main Stakes

The issue of the selection of materials for construction and buildings is getting more and more important in the field of building construction but it is still rather poor when it comes to materials used for roads, the urban networks or the street furnitures. The main stakes concerning the use of construction materials are: 1) Limiting the impact of the production, use and destruction of those materials on the environment; 2) Preserving scarce materials and 3) Selecting materials which are easy to maintain and to disassemble in order to reduce energy consumption.

(Club Ville Aménagement, 2004 ; Fordham, 2005)

Actions and Actual Trends

The actions which can be taken in urban regeneration concern the design of new or refurbished urban systems - buildings, roads, etc. Public authorities can promote or impose the use of certain types of materials which are assessed as sustainable. Absolute ideal solutions do not exist, however appropriate materials can be selected for each project. The selection of the materials should be based on the following criteria:

- Life cycle assessment
- Their potential to be renewable/recyclable (potential concerning the type of material and the easiness to disassemble)
- Easiness to maintain and to repair
- Toxicity
- Low impact on biodiversity, soil quality and microclimate
- Level of scarcity of the material

(Club Ville Aménagement, 2004 ; Fordham, 2005)

Biodiversity

Main Stakes

Biodiversity in our times is utterly important for our living conditions. Biodiversity, coming from the contraction of Biological Diversity, refers to "the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part; this includes diversity within species, between species and of ecosystems" (United Nations Environment Programme, 1992 p.4). Thus, biodiversity concerns more than an accumulation of species; it also deals with the interactions between the composition, structure and function of all kind of species, habitats and in general biological organisations. The term oversteps all spatial and temporal scales (Savard et al., 2000 ; Armsworth et al., 2004). The balance found in the natural ecosystems is of a great interest for human beings since they are still dependent of their natural environment for survival.

Urbanisation has a huge negative impact on biodiversity since it provokes, inter alia, loss of species through the destruction of their habitats, imbalance in the spreading out of species and in the distribution of species and so on and so forth. Losses of a few population can result in a great destabilization of natural ecological communities and therefore, in a decrement in the ability of those communities to provide a broad range of services (Murphy, 1986 p.72). Urban ecosystems, contrary to what one might think, are highly dynamic and have a high level of heterogeneity (Savard et al., 2000). Preserving and developing biodiversity in such areas is therefore an important issue, even though often neglected.

Moreover, the presence of vegetation, trees and green areas in cities offers several advantages:

- Amelioration of climate (for instance foliage contribute to the decrease of ambient temperature)
- Reduction of wind velocity
- Reduction of soil moisture
- Erosion prevention
- Watershed protection and natural wastewater absorption
- Noise abatement
- Air pollution control
- … (Murphy, 1986 p.73)

The main stake of biodiversity management in urban areas thus consists in to limiting the urban impact on biological diversity inside cities and on its hinterlands and in reintroducing biological diversity in urban areas.

Actions and Actual Trends

The actions that can be taken for preserving and enhancing biodiversity in urban areas are broad and can be introduced at different scales. According to Savard et al (2000), local actions and regional actions are of equal importance. It is the concerted efforts at various scales that produce the best results.

As all sorts of biodiversity actions can be applied, cities should firstly identify at which organisational level and at which geographical and temporal scale they want to act. The management system should be a hierarchical decision system in order to manage biodiversity across scales appropriately (Savard et al., 2000).

Here is an example of actions proposed to preserve and enhance biodiversity in urban areas:

- Increase vegetation areas and its diversity of species(Savard et al., 2000)
- Develop green areas, corridors, ecological greenways, etc. (Bryant, 2006)
- Urban woodlands are also very important for urban biodiversity, more than just green areas with grass. The larger it is, the more species it supports (Savard et al., 2000)
- Protecting and conserving habitat types through the promotion of natural or artificial habitats (Armsworth et al., 2004 ; Savard et al., 2000)
- Spatial heterogeneity and complex vertical structure of wooded areas (Savard et al., 2000)
- Plantation of trees and bushes (Gill et al., 2009)
- Avoiding to tidy up and redevelop brownfield sites (Angold et al., 2006)
- …

The actions are not restricted to this list; a lot of other actions can be taken for developing urban biodiversity. It is important to know that urban ecosystems are rather similar all around the globe concerning their structure, functions and constraints. Similar actions can therefore be applied. However the landscape surrounding a city has a great impact on the plant and wildlife species which will be present within the urban ecosystem. Landscape factors have to be considered in the management of urban biodiversity (Savard et al., 2000). Making an inventory of the natural resources within the city and their organisation can be very helpful in order to establish strategies for preserving and using those resources (Fordham, 2005 ; Savard et al., 2000).

At the scale of the building, the promotion of trees and green areas around the buildings and of green roofs or façades can contribute to the development of an urban biodiversity (Fordham, 2005 p.21; Savard et al., 2000).

Landscape integration

Main Stakes

Landscape integration is an issue which rose those last decades together with the concept of sustainable development. This new pattern is both an answer to the 1950's and later decades of quick and cheap building development in urban areas and suburbs and an answer to preserve biodiversity (Frumkin et al., 2004 ; Hobbs, 1997).

The main stakes of landscape integration are thus:

- To create places which do not clash with the existing environment and participate to the social well-being (Tweed and Sutherland, 2007)
- To create places where people feel well and like to live
- To bring back the natural and ecological environment inside cities in order to preserve and develop biodiversity.

Actions and Actual Trends

Seen the main stakes, the actual trend in landscape integration is twofold: 1) integrating constructions in the urban heritage; 2) developing landscape ecology of urban forms and buildings.

Concerning the integration of new, refurbished or renewed constructions in the urban heritage, it is seen as a major component of quality of life (Tweed and Sutherland, 2007 p.62). Indeed, the organisation *renewal.net* set up by the British Office of the Deputy Prime Minister to develop proposals in order to help regenerating neighbourhoods stated about urban heritage that "the preservation of heritage not only contributes to the state of health of the built environment but also crucially to community and cultural identity and helps to define the character of a place" (Tweed and Sutherland, 2007). It is therefore not to be neglected. However, regeneration is often opposed to heritage since it provides new constructions or at least new organisations of the urban area. Beyond the debate of old versus new, it is the relations between people and the built heritage which are important. According to Tweed and Sutherland (2007), the current methods used in Europe consist in listing individual monuments and buildings and to designate conservation areas. This method is relatively poor since it does not deal with less tangible features such as street patterns or ensembles of buildings in a given neighbourhood. This is however these features which provide to a city its unique character and its cultural identity. One major action for landscape integration is thus to take into account the urban heritage in its entirety and not as a sum of single entities.

Concerning landscape ecology in urban areas, it is a rather new field under development. Current actions taken by cities are focused on promoting green spaces, parks and ecological greenways between urban green areas and forests around urban zones (Club Ville Aménagement, 2004). However researchers highlight the fact that biodiversity conservation pass by the development of ecological landscapes, through green areas, ecological greenways, and all the solutions given in the biodiversity paragraph. All those actions are given at the scale of the neighbourhood, the district or the city. Regarding the scale of the building, the promotion of green roofs, green façades and the use of specific materials or forms integrating the surrounding area are actions which can be promoted for landscape integration.

Land use

Main Stakes

The second half part of the last century and our century are particularly characterised by what is nowadays called urban sprawl. Urban sprawl refers to “dispersed, auto-dependent development outside of compact urban and village centres, along highways, and in rural countryside” (Smart Growth Vermont, 2009). It was quickly perceived as a bad aspect of urban development since it consumes excessive land – “[in such areas] five acres is being made to do the work of one, and do it very poorly” (Whyte, 1958) – it has low densities of inhabitants, it lacks transportation options, it has fragmented open space and has often very bad aesthetics with commercial buildings and expansive parking, it lacks public spaces, centralities and community centres, etc. (Smart Growth Vermont, 2009 ; Frumkin et al., 2004 ; Squires, 2002). In a few words, urban sprawl is not only an aesthetic problem, but it is a major source of environmental degradation, fiscal instability, social problems and inequalities (Vreeker et al., 2009 p.85; Jargowsky, 2002 p.39-69).

The main stakes in nowadays land use are thereby to use as much as possible the already urbanised lands, in order to reduce energy consumption through among others more compact forms, public transports, to preserve natural land and habitats, to avoid social and economic issues related to isolated areas from urban centralities.

Actions and Actual Trends

Since land use is strongly linked with each specific territorial fabric and composition, it is hard to give examples of actions that can be taken. The literature is quite broad concerning this subject. However the attention is particularly paid to compact building design, to developing dense urban areas and to provide a variety of transportation choices. The issue of quality of life is also developed in order to promote new centralities and therefore new places of urban concentration (NCAT, 2009).

Several planning concepts have emerged related to land use and in response to urban sprawl, such as Smart Growth, New Urbanism, Growth Management, and Multifunctional Land Use. These concepts are all related to the reduction of urban sprawl and the promotion of spatial and environmental quality. These concepts are mainly based on solutions emphasising the concentration of different land uses through density and mixed functions (Vreeker et al., 2009 p.85). For instance, Smart Growth is organised around 10 principles: 1) Create range of housing opportunities and choices; 2) Create walkable neighbourhoods; 3) Encourage community and stakeholder collaboration; 4) Foster distinctive, attractive communities with a strong sense of place; 5) Make development decisions predictable, fair and cost effective; 6) Mix land uses; 7) Preserve open space, farmland, natural beauty and critical environmental areas; 8) Provide a variety of transportation choices; 9) Strengthen and direct development towards existing communities; 10) Take advantage of compact building design (NCATNCAT - National Center for Appropriate Technology, 2009).

Transportation

Main Stakes

The issue of transportation and sustainability is not to be questioned. Everybody now agrees that transportation has negative impacts on the city ecological environment and on the society. Black (2010) identifies several negative impacts of transportation:

- The diminution of petroleum reserves – 1 trillion barrels of petroleum has been used since motor vehicles use gasoline as a fuel. The number of people who will use motor vehicles in the future is incredibly higher than nowadays. As petroleum is a non-renewable resource, the world reserves will be rapidly running out of petroleum
- Global atmospheric impact – One third of the human emissions of greenhouse gases are related to transportation. In 2001, the carbon dioxide concentration has increased 31% over its level of 1750. One cannot really predict the consequences of this increase of greenhouse gases in the atmosphere, but breaking a balance which took thousands of years to reach has rarely good impacts
- Local air Quality impacts. Transportation vehicles are one of the main contributors to urban air quality problems
- Biological impacts on biodiversity
- Crash facilities and injuries
- Congestion
- Noise

- Unequal accessibility to transportation and mobility

The current transportation system is undoubtedly unsustainable. The three main stakes of transportation are to develop transportation systems:

1. Which use renewable fuels
2. Which minimise emissions damaging the local and global environment
3. Which prevent injuries and congestion

(Black, 2010)

Actions and Actual Trends

A lot of experts say that sustainable transportation is unattainable since transportation is founded on unsustainable techniques. The problem is not that we do not know how to solve the issue of sustainable transportation, but that we do not know how to do it in an affordable manner (Black, 2010). The shift we have to make in transportation is huge, but we can reach it step by step, actions by actions.

Black (2010) categorises the majority of the possible actions concerning a better transportation system into 4 categories: planning, pricing & policies, education and technology.

Those 4 leverages can be used to address sustainability issues in transportation. While technology is not a leverage which can easily be used at the scale of the city, planning, pricing & policies and education are such leverages. The actual trends are focused onto the promotion of public transportation in opposition to the use of personal vehicles. In planning, this trend is translated into the development of streets and areas with multimodal ways of transportation: tramways, dedicated bus lanes, bikes, pedestrian areas, etc. (Club Ville Aménagement, 2004 ; Rabinovitch, 1995).

Education and advertisement are often neglected at the scale of the city. However they can play an important role in the development of more sustainable behaviour regarding transportation. For instance, the city of Curitiba, Brazil, developed a very broad network of buses. This particularly efficient network attracted a lot of new passengers who previously used automobiles to commute. It also reduced automobile congestion and the reduced traffic allows savings of around 27 million litres of fuel per year (Rabinovitch, 1995).

Sustainable transportation is therefore not always a question of re-imagining the city's organisation, but passes also by education and promotion of sustainable behaviours. Changing the habits and the behaviours in parallel with the development of multimodal ways of transportation could definitely change the transportation landscape towards a more sustainable one.

2.5.2 Designing and organising cities for people

Sustainable regeneration is not only a question of ecological actions preventing urban damages on our natural environment. Cities must reduce their impact on the natural environment through all the themes listed in the previous chapter. Cities must also be organised and designed for their own people. The most perfect ecological city which would have no impact on its local and global natural environment would not be a sustainable city if the majority of its inhabitants is jobless and huge inequalities exist among the inhabitants. Social and economical aspects have to be integrated into the multi-dimensional sustainable urban regeneration process in order to improving the quality of the urban fabric and to reconstruct the local economy (Lang, 2005). The urban regeneration should focus on two main points: 1) the reduction of social exclusions and on 2) the economic reintegration of disadvantaged urban areas (McGregor and McConnachie, 1995). Social and economical regeneration should not be handled separately as it is commonly done in a lot of municipalities nowadays (Lang, 2005). Social and economical issues have to be handled together in order to avoid economic growth which does not contribute to economic and social development and well-being of the population. According to Lang, economy is actually a part of an overarching social structure (Lang, 2005).

In urban regeneration, the socio-economic part is seen as a crucial aspect (McGregor and McConnachie, 1995). Thus the efforts put on urban regeneration should be concentrated on those issues. The ecological issues should be of course integrated in the regeneration process, but they should not take the place of the final aim which is the development of a city designed and organised for its inhabitants. It is too often common to see the ecological issues set as the final aim of the urban regeneration process as if changing the city for a more ecological one would bring equity and provide jobs for its inhabitants. Ecological projects can be used to increase inhabitants' quality of life and the

city's economy such as those cities, members of the British Groundwork network (Carley and Christie, 2000), but socio-economic issues should be still the final aim of urban regeneration.

Functional and social diversity

Diversity is a term often used when dealing with sustainable development. Diversity is also a resultant of globalisation and of the huge development of the Information and Communication Technologies (ICT) and of transportation systems. Social diversity is so often highlighted by experts when they are talking about sustainability because diversity is a way to promote equity, social well-being (Fordham, 2005), mutual enrichment of human experience (Levine et al., 2003) and solidarity in opposition to segregation among social classes. Functional diversity is also very important in the eyes of sustainability. It limits the use of transports; it develops local economy, so on and so forth. It is especially promoted in opposition to suburban areas which lack services, offices, shops, etc. and only provide housing spaces.

Functional and social diversity will be reached when a particular balance will be found between the urban functions – such as housing, shops, services, etc. – and the social functions – housing, social housing, schools, libraries, etc (Club Ville Aménagement, 2004).

Buildings and public spaces are particularly the places where diversity can be promoted. Urban regeneration operations, whether they are big or small, are almost the only opportunities in order to insert functional and social diversity in areas. Such diversity is also a question of political decision, as the French study group *Club Ville Aménagement*, formed with city planners, architects and developer contractors, highlights that fact (Club Ville Aménagement, 2004). Functional and social diversity also highly contributes to the local development.

Local development

Economic regeneration is often criticised as it concentrates more on investments in infrastructure and the supply of land than really bringing unemployed people back to work (Lang, 2005). It means that the economic development is too often addressed at a regional, national or trans-national scale. It is true that without such concerns, a country could not have a healthy economy. However, the local development should not be forgotten. A lot of experts highlight the historical reliance of local development on public sector money and interventions; the public sector is therefore necessary to develop the local scale. Nevertheless, it is important to notice that the public resources are less and less available – cities are actually getting poorer –(OECD, 2003).

Urban regeneration should bring back local economic activities to districts and neighbourhoods. The era of housing districts separated from economic districts is unsustainable since it favours transport commutations, the development of unsecure environments, etc. Local business is a way to reintroduce proximity, functional and social diversity. The reinsertion of local activities can be achieved, for instance, through the implementation of shops on the ground floor or through promoting a balance between the local economic activities: malls, local services and shops, universities, etc. (Club Ville Aménagement, 2004)

The use of private investments can be promoted for community buildings, SME (Small and Medium sized Enterprises) development and for the renewal of brownfield sites. This can often be done through partnerships. The use of partnerships will be developed in a following section of this chapter, heading: Public-Private Cooperation and Partnerships.

According to specialists from the OCDE (2003), local development can be promoted through the development of community buildings, SME or brownfields. Education is also a critical point for local development. The implementation of neighbourhood learning centres run by local people is an efficient tool to tempt people back to learning (British Social Exclusion Unit, 2000).

Community buildings present the advantage that they can create a broad range of activities, such as affordable housing provision, providing skills and training for unemployed people, creating new investment opportunities, improving health or providing access to goods and services that are not provided in certain areas, etc. The public sector has the power to lever this kind of development and it can be helped by the private sector which can see market returns in such investments (OECD, 2003). The OECD identifies 7 levers in order to attract private finance: legislation encouraging private investments in certain areas with penalties for failure to do so; changing perception about the lack of investment opportunities in certain areas; creating intermediaries or consortia to lower risk and group resources to make economies of scale; creating partnerships with not-for-profits who can help create

viable markets; tax credits focused on specific areas to be developed or to be slowed down; direct financial subsidies; motivating investors to get involved (OECD, 2003).

The presence of SME in a municipality is a critical part regarding the sustainability of its local development, since it creates employment and stable growth. On the other hand, such companies usually face difficulties to start especially in terms of access to finance, of appropriate and affordable advices and premises or equipments. Regarding this matter, the public sector can particularly promote the development of SME through making available premises and equipments but also agencies dedicated for loans, advices, etc. Private finance can also be developed in such field. Here again, the public sector can encourage private finance through creating intermediaries, the demonstration of viable markets through practical projects, the allocation of subsidies to reduce capital costs, etc. The development of Community Development Finance Institutions which are private sector financial intermediaries which focus on community development proved to be a very good way to raise the number of SME in a local area (OECD, 2003). It is used in the United States of America, such as the Shorebank Corporation, and it is a powerful tool for economic revitalisation (Shorebank Corporation, 2009).

The development of brownfield sites is another alternative to develop local economy and new economies. However the sprawl of the urban area is actually struggled for sustainable ecological issues. This way of developing local economy is therefore to be used only if the current urban area is already exploited at its maximum.

Social inclusion

Social inclusion, in opposition to social exclusion which expresses the isolation of many persons and households from essential social and economic activities (McGregor and McConnachie, 1995), refers to equity within society, especially equal access to buildings, education, culture, public services and all of the mainstream social and economic activities (Irish Office for Social Inclusion, 2009). Social inclusion is addressed to every kind of people regardless their age, gender, physical and mental health, income level, nationality, culture and religion (Fordham, 2005).

Social inclusion can be developed through design considerations to buildings and public spaces. Buildings should be accessible, attractive, safe and comfortable for all kind of users previously described (Fordham, 2005). Social inclusion can also be promoted through improving housing letting policies, building mixed communities, or through reducing neighbourhood abandonment. Building community confidence and solidarity is also essential. It can be done, for instance, through the promotion of art and sports, making easier local organisations to get funding, developing core public services – for jobs and housing, but also for other considerations such as culture and increasing the service delivery sector (British Social Exclusion Unit, 2000). Decent services have to be promoted. It is ordinary that services are “poorest in the poorest communities” (British Social Exclusion Unit, 2000). Nonetheless, they should be as good they are in other cities or neighbourhoods. The improvement in delivering decent services should firstly start from the public sector; even if the public sector cannot bear all the costs and efforts for this. The private sector should also play a role it does not play nowadays. The involvement of the private sector can be enhanced through public-private cooperation and local strategic partnerships (British Social Exclusion Unit, 2000 ; Friesecke, 2007), but also through a new urban governance (Lang, 2005). Cooperation, partnerships and urban governance will be presented in the next section 2.5.3 “Approaching sustainability by improving the governance and the way of managing urban regeneration projects”. Other specific services could be also introduced in such segregated areas in order to enhance social inclusion, such as increasing supporting school activities, support to families and young people, family/school partnerships, etc. (British Social Exclusion Unit, 2000).

Social inclusion initiatives proposed in this paragraph are examples of what could be done. Social inclusion initiatives are also strongly linked to the neighbourhood and city background. The involvement of the local population and the analysis of each neighbourhood situation is very important in order to put in place well-designed and successful solutions.

Developing urban centralities and proximity

Nowadays, most European cities are suffering of congestion and of limited organisation focused on a single pole, or centrality. It is the case, for instance, of Paris in France. Paris is currently no more limited to its historical boarders. The whole Paris region is a kind of suburban area dominated by the

cultural, economical and social influence of the city of Paris (Panerai, 2009). There is a huge imbalance between Paris and the rest of Paris region. Paris city is nowadays congested and suffers from its own success. Every expert agrees that the future of Paris and its region is in the "relaxation" of Paris city to the advantage of other centralities all around Paris region (Devillers, 2007). This "relaxation" of all the centralities concentrated in Paris region will enable the economic, cultural and social development of the rest of Paris region currently suffering from the huge influence of Paris city (Devillers, 2007 ; Panerai, 2009). Paris region will be then a multi polar region with a greater economical, social and cultural potential of development.

This example of Paris can be applied to smaller cities or urban areas all over Europe. The development of new urban centralities is a sustainable feature since it is an answer to the urban sprawl issue. Such development enables to create proximity and thus to avoid extra-transportation consumptions and the creation of a kind of urban ghettos. This concept of urban centralities and proximity can also be applied at the scale of the neighbourhood in order to develop local business, services, and culture.

Urban centralities are important for they bring "life" to an urban area, in terms of concentration and positive interactions of services, of mixed functions, cultural and/or historical identity and of different kind of activities. The birth of new or renewed urban centralities cannot be done by just advertisement and campaigns of promotion. European urban centralities are located for centuries on hubs and crossroads of commercial, transport, or cultural exchanges. Nowadays, it means that such new centralities must be located at the crossroads of the main networks of public transports – the main networks depend at which scale the new centrality is needed, if it is at the regional scale, the networks of public transport will not be the same as if it is at the scale of the city (Panerai, 2009). Several attempts to implement new urban centralities have failed because the city developers tried to implement "fake" genuine urban centralities. This forced instillation of genuineness and culture did not mislead people and such projects failed. New centralities must rely on the existing heritage with a good commercial core punctuated with equipments and public institutions (Panerai, 2009). The development of shared spaces is also often cited as a feature for sustainable cities (Fordham, 2005 ; Friedman, 2007). New urban centralities should create differences from the existing heritage to secure a step towards the future – the other steps will be taken year after year with the constant evolution of the project.

Safe and secure environments

Safety, protection and security are fundamental needs for human beings. For instance, the American psychologist Abraham Maslow classify safety as one of the basic human needs in his hierarchy of needs (Businessballs, 2001). The sustainable city should thereby ensure safe and secure environments where people can freely live. Such features refer to environments secured from natural disasters (FNAU, 2008), crime, insecurity (Fordham, 2005) and all kind of nuisance or events which could put people in danger.

Prevention against natural disaster is particularly in the hands of the public sector through national, regional or municipal decisions and actions. It is typically related to the specificities of the location of each city. No actions can be advised concerning preventing natural disaster, except that existing and future natural disasters must be taken into account for the safety of the people.

Safety and security can be provided to people through urban design, but also through services, technology and systems. For instance, Max Fordham (2005) in his *Sustainable Guide* for Edinburgh City, highlights the point that all pedestrian, cycle and car routes should be safely lit and all car parks as well. In addition to light, all pedestrian, cycle and car routes should be safely designed in order to prevent any kind of needless accidents. Monderman's model of safe street is quite interesting. According to Monderman, safe streets are "naked streets" were all the things that are supposed to make the street safe for the pedestrians – traffic lights, railings, kerbs, etc. – are removed. Such spaces are open with no differences of level between pedestrians and cars. Motorists and pedestrians are then closer and more in harmony in a shared space. This model seems to be nowadays more and more implemented (The Times Magazine, 2008).

When it comes to crime reduction in areas with particular problems, dark secluded areas in stairwells or too many access points to a building are designs to avoid. The use to CCTV systems is often cited as a solution to lower criminality and providing help to people (UK Department for Transport, 2006 ; Fordham, 2005). Working in partnerships is also an essential point in order to increase safety and security (UK Department for Transport, 2006).

Providing safety and security to people is a fundamental point for sustainable cities. Achieving such goal can only be done through the involvement of a lot of stakeholders from city council, city planners, the police and other institutions and organisations from local associations to the inhabitants.

Making the best use of urban resources

The urban fabric and composition is designed and built with a purpose and to help the population. Each building, road, pedestrian pathway, etc is built to be used for something or by somebody. Nevertheless, habits and needs change throughout decades while changes in functions occur more and more rapidly in our times. Building and razing to the ground premises or buildings at each time they do not match the current needs is a process which is utterly unsustainable since it consumes huge amounts of resources and energy and have negative impacts on the natural environment (PricewaterhouseCoopers, 2009). Urban resources are existing resources with high potential to help and serve each city's population. These are resources already taken from the earth capacity and they should therefore be used as long as possible in order to avoid unnecessary wastes and negative impacts on the environment. Making the best use of all existing urban resources is therefore one of the most sustainable feature in urban regeneration. Buildings can be adapted to meet new needs and functions (Fordham, 2005), premises and urban lands as well.

Certainly, adapting the use of the existing urban resources should not be done blindly just to adapt new needs and habits. This should be done in parallel with a life cycle cost analysis (Outrequin, 2008), also called life cycle costing or whole life costing. An entire life cycle analysis could be even better. Life cycle cost analysis are considered as one of the best tools to help achieving sustainability (Kotaji et al., 2003). The life cycle cost analysis enables to analyse the total cost of ownership (British Office of Government Commerce, 2009). It includes all the costs related to the design, the construction/renewal; the costs related to the acquisition, to the finance of the operation and the costs linked to maintaining and operating. These costs are particularly interesting since they permit to avoid short term point of views focusing only on the rapid return on investment after construction. It is important to notice that the costs related to design and construction compared to the costs related to operation and maintenance only represents about 25% against 75% (UNTEC, 2006). Having a long term strategy - when building or renewing an urban resource - is therefore highly recommended to avoid unnecessary extra costs, pollution and consumption.

The new environmental concerns introduced a lot of demands regarding energy consumption, the emission of pollution and wastes, the use of construction materials, natural resources conservation, etc. All of these concerns can be translated into the cost analysis. In France, two main life cycle cost analyses are nowadays promoted: *Coût Global "Elargi"* – "Expanded" Life Cycle Cost and *Coût Global "Partagé"* – "Shared" Life Cycle Cost (UNTEC, 2006 ; Outrequin, 2008). *"Expanded" life cycle cost* analysis does not only focus on the value of the building or the premises, but on the value of what the building/premises will host during its whole life. *"Expanded" life cycle* analysis is centred on the use made of the building/premises during its whole life. *"Shared" Life cycle* analysis do not analyse all the costs related to one building/premises but is centred on the impact of a building/premise on the environment in its whole life cycle from design and construction to its destruction (UNTEC, 2006).

These two types of life cycle analysis enable to enhance decision making according to the collective benefits which could be generated for the environment, the operator and the whole society. Beyond the technical difficulties of the analysis to assess all of these features, this kind of life cycle analysis enables to change the mentalities and the point of view when dealing with construction and urban development. A good part of the questions of the integration of a building/premises in its environment as "light" as possible – coming from the concept of a building which should "touch-this-earth-lightly" (Wheeler and Beatley, 2004) – and of the adaptation of a building/premises to the actual needs of the population can be answered by using such life cycle analyses.

The direct question of the mutability of buildings and spaces is often developed in the literature through indirect ways, by talking about "making the best use of buildings" for instance (Fordham, 2005). However when dealing with the construction of a new building/premises or the renewal of an entire building/premises, this question of the mutability should be more directly addressed in order to secure sustainability for the future.

2.5.3 Approaching sustainability by improving the governance and the way of managing urban regeneration projects

Developing sustainability involves changes; changes in the way of designing, of building or refurbishing and renewing, of maintaining, of operating, etc. Reaching sustainability implicates that everything should be thought towards sustainable goals. In an unsustainable world, changes are inescapable and necessary. Changing the way buildings, premises and urban spaces are designed, built, maintained and operated implicates changes in the way of managing and of applying governance in urban areas. The ways and the forms Western European cities have been governed since the 1990's have been subject to change. It is particularly diverse but a general trend towards new forms of governance and partnership including private and other actors traditionally not concerned with urban management is observed (Lang, 2005). Local democracy has for instance significantly increased in the previous decades (Elander, 2002). Nonetheless, urban governance is still not referring to common theories but more to a collective name or container for a large range of approaches dealing with urban development (Lang, 2005).

The literature seems to point out that changes are occurring in current European urban governance and in the way urban or construction projects are nowadays managed. So as to make sustainable urban regeneration happen, the Bristish Royal Institution of Chartered Surveyors states that "politicians need to show leadership, private stakeholders need to see the financial and long-term benefits (…) and citizens need to be given and seize opportunities to get engaged and take responsibility" (RICS, 2008). Designing and building objects is thus a good thing to develop sustainability, but it is not good enough. Urban governance and urban regeneration project management should be also adapted to secure sustainability in urban regeneration.

Matching public policies and sustainable urban regeneration goals

Sustainable urban regeneration cannot be achieved without coordination with public policy. This coordination is vital since the "market itself will not deliver sustainable urban regeneration" (RICS, 2008). As highlighted by Lang (2005): whatever the form of governance the local government is still the only body with legal authority which can make decisions and answer urban issues. Public policy has therefore an important role to play in sustainable urban regeneration. Not matching public policies with sustainable urban regeneration goals is thus synonym to failure in assuring sustainability. According to the British Royal Institution of Chartered Surveyors (RICS, 2008), regeneration operations can have an impact only if the policies are clear and coherent. A lot of policy domains affect regeneration such as regional funding mechanisms, state aid, transport, energy, air quality, waste, etc. The RICS even states that "urban regeneration should be a policy area of its own". This emphasizes the importance and the impact of public policies on regeneration. Sustainable regeneration is even more dependant on public policies since such regeneration often requires extra commitment of developers and city planners.

Policies for sustainable urban regeneration should not be put in place to maintain the way the world works today, but to change it (RICS, 2008). Sustainable change is then the core issue and main stake of public policies of nowadays.

Public and private sectors: Blurred boundaries

The present trend in European cities tends to develop "governing styles in which boundaries between and within public and private sectors have become blurred" (Stocker, 1998). In this sentence, the private sector does not only refer to industries and private individuals; it refers to the entire business world and civil society. Such statement does not mean that governments are losing their power and their role in such new governance, but that the relationships between government and private sectors are changed (Lang, 2005). The public sector in Europe is also looking for finance since it is lacking resources over the years (OECD, 2003), especially municipalities (Friesecke, 2007). The organisation of the way of governing cities is thus changing, in parallel with new needs regarding sustainable development.

The reorganisation of governance in most European cities is a good opportunity to adapt the mechanisms of governing to increase the adoption of better sustainable behaviours, decision-makings and development. The classical organisation is the so called "top-down" perspective where the decision, the strategy or whatever else begins at the top of the organisation and then is implemented at each level down to the organisation. This way of organising governance is more and more criticised

since it tends to implement formal strategies or decisions often disconnected from reality, or from empirical experiences (Bogason, 2001). The bottom-up organisation is nowadays promoted by several political organisations or researchers – in France, the well-know *Démocratie participative*, which could be translated in English in *"Participative democracy"*, promoted during the 2005 presidential election and the *Grenelles Environnement,* a national workshop on sustainable development are in the vein of this kind of bottom up approaches of governance. According to Bogason, using bottom up processes seems to be an appropriated adaptation to this new type of society where decision-makers are less in control than before (Bogason, 2001 p.104).

The introduction of the private sector into the local governance enables strengthening local development since it promotes the commitment of local actors in contact with what is happening on a day to day life. It also facilitates the involvement of private participation and funding to urban projects. Using bottom-up processes can help the local government in involving the private sector and thus enhancing sustainable ideas and commitments.

Integrated approaches: stakeholders, specificities and skills

The construction industry is fragmented in a lot of processes which makes difficult to run projects (Fewings, 2005 p.369). As to the urban regeneration field, it is hugely fragmented since a lot of very different actors are implied in the process. Urban regeneration involves a lot of projects run by very different actors in different fields. The danger is in the fragmentation of each of those projects with no common and unified strategy towards sustainability. Sustainable urban regeneration projects have to implement integrated approaches in order to secure sustainability. According to Friesecke, urban regeneration can be effective if it is based on the participation and cooperation of a broad range of actors and stakeholders, such as municipalities, institutions, regional and/or national governments, property owners, investors and all kind of organisations (Friesecke, 2007). In general, the European local authorities have to get rid of their sectoral approach to policy making with traditional functional and departmental boundaries if they want to reach sustainable project development (OECD, 2002).

One of the main step in implementing an integrated approach is to develop integrated teams because of the many fragmentary processes involved in the construction process (Fewings, 2005 p.369) and to some extent in the regeneration process (OECD, 2002). Integrated strategies including different stakeholders, specificities related to the project and skills are stronger strategies optimising risk and value (Fewings, 2005 p.369).

Each urban regeneration project has its own specificities depending on the city, the goals to be achieved, etc. Integrating all of the aspects related to sustainability is of course not achievable in a project, nevertheless using an integrated approach enables to look at other features that could be inserted in the project in order to take into account the interactions that a project can have with its environment. Bringing together disparate parties into a holistic approach to the delivery of the project is one key aspect for a successful project (Fewings, 2005 p.369).

It is interesting to note that the literature is not very developed concerning integrated approaches in urban development or regeneration. However the city planners and the developers seem to be aware of this essential aspect in order to develop real sustainable projects, as Pr. J. Ratcliff states in the OECD Report *Glasgow: lessons for innovation and implementation* (2002). Developing integrated approaches will enable to rely more on a holistic approach developing intuition, participation and adaptability in opposition to the former and traditional mechanistic, empirical and rational approach relying on observation, measurement and logical analysis. This new approach sees the city more like an organism and is process-oriented (OECD, 2002).

Public-Private cooperation and partnerships

Nowadays in France and more generally in European countries, municipalities are the ones who bear all the risks related to urban development: from designing the project until the last urban area is built, equipped and finished. When it comes to urban development or regeneration, the legitimacy of private initiatives is often seen as low, except in the UK where such practices are developed for several years (Club Ville Aménagement, 2007). However private initiatives put in place in cooperation with the public sector can turn out to be a very powerful and useful way of development or regeneration (Lang, 2005 ; Friesecke, 2007). Partnerships are nowadays discussed in a lot of European countries as a particular

approach to answer changing conditions and to develop integrated approaches for urban development and regeneration (Lang, 2005). Public-private cooperation and partnerships are especially discussed in France since such cooperation is seldom used and do not really fit with the national political culture. Moreover, French companies and to some extent a lot of companies implemented in Europe are not used with taking risks on such long periods (Club Ville Aménagement, 2007). However experiences in other European countries like in the United Kingdom, Switzerland or Germany show that the particularly high financial stakes invested over so long periods guarantee seriousness and sustainability of such private involvement (Club Ville Aménagement, 2007 p.13).

In this paper, the term partnership will be used to describe all kind of public-private cooperation. Lang (2005), with the help of several authors, defines partnership as "a formally organised coalition of interests comprising actors of different sectors aiming at policy-making and implementation with a common agenda and action programme". Informal relations can thereby be seen as partnerships.

Partnership is currently particularly promoted since it is a good way of producing integrated approaches on urban regeneration. Indeed, it gathers the knowledge, skills and resources of different actors and it helps to coordinate all the activities related to urban regeneration (Lang, 2005 p.18; Friesecke, 2007 p.10). One other important advantage of partnerships which is not often publicly proclaimed but very well described in the literature is that it allows municipalities to get private finances (Friesecke, 2007 ; Lang, 2005 ; Club Ville Aménagement, 2007). Since European municipalities are increasingly lacking financial resources (OECD, 2003), it is a quite good opportunity for municipalities.

Partnership presents several other advantages. According to the experience, such cooperation seems to produce greater efficiency in the use of public resources and synergetic effects among partners. It enables better policy coordination and facilitates multi-dimensional approaches (Friesecke, 2007 ; Lang, 2005). Partnerships are also a way of promoting long term policy of development of the built capital which is essential for regeneration (Club Ville Aménagement, 2007). The distribution of the risks among public and private parties is a good advantage of partnerships, as well. The public party can then share the risk it usually bears alone with the parties best able to manage it; in compensation the public party loses a part of management control (Davies, 2004 p.579) and of the project initiative (Club Ville Aménagement, 2007).

One last advantage which is of interest to be highlighted in the context of urban regeneration is that partnership seems to be a good tool for regeneration since it often achieves better overall economic performance and it engages for "better urban environment and the better functioning of the urban and economic system" (Lang, 2005). Indeed, some successful local partnerships showed that it can contribute to tackling unemployment and social exclusion in a very good way (Geddes, 1998).

Nevertheless, Geddes (1998) showed that not all local partnerships work effectively and that no real explanation can answer the question of what exactly makes partnerships working effectively. What can be underlined is that successful partnerships are said to depend on huge investments of time and resources. Lacks of strong local associative and collaborative tradition added to political turbulence are parameters that can actually endanger partnerships (Geddes, 1998). Partnerships present also disadvantages such as a loss of management control already described or the risk of creating less accountable policy arenas (Lang, 2005 p.18). A lot of partnerships are not as efficient as expected and the use of partnerships can be regretted. It is important to notice that successful partnerships depend on strong and competent leadership, on good and manageable formal engagements and accords, on common long-term vision and realisable medium-term objectives and on skilled staffs (Lang, 2005). Good partnerships are also partnerships which have more than contractual relationships namely informal relationships and extra-contractual trust relationships (Club Ville Aménagement, 2007).

Partnerships for urban regeneration can take different forms. They are quite common when it comes to develop one kind of urban function, such as business, tourism or leisure activities; they are however more seldom and thus experimental when it comes to developing an entire portion of city mixing several urban functions (Club Ville Aménagement, 2007).

The most famous form of partnership in France is the Public-Private Partnership, usually called PPP; however several other tools can been used in order to develop partnerships for urban regeneration. For instance, *Business Improvement Districts (BDI)* are a kind of partnership between municipality, property and business owners designed to provide services supplementary to municipal services; for instance: maintenance of public spaces, removal of litter and graffiti, social services, etc. (Friesecke,

2007). *Urban Regeneration Companies (URC)* are another form of partnerships developed in the United Kingdom. Such partnership is formed by local authorities, business and community stakeholders and members of the regional development agency. URCs have the mission to coordinate plans from the public and the private sectors and to attract new investments through the promotion and the regeneration of the areas they are responsible for. They are independent companies and their revenue funding comes from the partners (Cullingworth and Nadin, 2006 p.377). Such form of partnership can be an efficient way of tackling urban regeneration through an integrated approach involving private partners for the common good.

Developing new urban governances?

The economic, social and environmental situation is changing, as the previous sections of this report pointed it out. Thus, the way of governing cities need changes as well. The new concept of urban governance which shall be followed is a multi-actor and multi-sector approach and not only state authoritarian (Lang, 2005). Urban decline and the search for sustainability, that cities are facing, force cities to develop more integrated approaches on urban regeneration. The growing share of the private sector into city governance is a core characteristic of this new governance. As Stoker points out in his five propositions for governance "boundaries between and within public and private sectors have become blurred" (Stocker, 1998).

The promotion of bottom-up approaches in urban projects and in the governance life of the city is included in this rapprochement between the public and the private spheres. This rapprochement leads to more pragmatic and intuitive and adaptable ways of governing where participation is at the core (OECD, 2002).

Private participation in the public mission is more and more developed since it can provide resources that the public sector cannot; above all finances (Friesecke, 2007). The new urban governance is therefore coming to be more oriented to include private actors.

Partnership is a form of cooperation increasingly used in Europe nowadays and seems to be one of the answers given to the changing conditions of urban governance. It seems that the legal framework already exists in most European countries for the implementation of partnerships, however the political culture is still missing in some countries, such as in France or even Germany (Club Ville Aménagement, 2007). However the private sector shall not take the place of the public domain. As it has been done for Birmingham's urban projects and taken up by Club Ville Aménagement (2007): the vision of the city to be designed and to be created with social, economical, environmental and functional ambitions should stay the property of the public domain, while the realisation of the urban projects themselves can be let to the private sphere.

The "new urban governance" will actually not be written with the singular form but with the plural form: "new urban governances". Indeed, urban governance cannot be described as one single way of regulation and steering but it is more like a container name for different approaches in order to deal with urban development. Thus, new urban governances need to be developed by local community with the idea of integrated approaches, bottom-up organisations, private participation and partnerships in mind.

2.6 European sustainable urban regeneration: best practices and main characteristics

After this whole review of the main features implied by the concept of sustainable urban regeneration, this section will present several European regeneration case studies. Each case study corresponds to an icon of a kind of urban regeneration process. Those case studies intend to give an overview of how urban regeneration is considered and applied all over Europe. The European practices will be then compared with all the concepts, theories and features previously presented. For that purpose, the question of the sustainability of each regeneration project will be asked at the end of each case study.

The case studies which will be presented are not all "sustainable proclaimed projects". They were selected for their relative success in regeneration in making better living places with increased living social, economical or environmental conditions.

2.6.1 Dublin, Ireland: regeneration and knowledge economy

"A visitor to Dublin, so lively and cosmopolitan today, would find it hard to believe that only a few decades ago it was gloomy and depressed" (The Economist, 2004a).

Dublin is particularly well-known and is often a model for other cities all around the globe and particularly for the new EU states. Dublin has emerged from a relative economic decline characterised by a predominant agriculture, a weak industrial sector and emigration of its population to a successful model of "knowledge-intensive" and innovative city-region with high economic incomes and rapid demographic growth (Redmond et al., 2007). The rapid growth of Dublin permitted a more national growth that was so fast that it changed the image of Ireland in a decade (The Economist, 2004a). For instance, unemployment fell from 17% to 4% from 1987 to 2003 and the government debt fell from 112% of GDP in 1987 to 33% in 2003 (The Economist, 2004b).

Dublin regeneration is undoubtedly a success and it enabled Dublin to become one of the major European global gateways. It is now a model of development for sustainable cities all around Europe (Williams and Redmond, 2006). This case study presents Dublin background situation and then the main stakes and features of the regeneration process to finally lead to a critical discussion of this case study compared to the theoretical review presented in the previous paragraph.

Background situation and regeneration process

Dublin, the capitol of Ireland, is the most urbanised city of this country. It is also the centre of the country concerning economical, political, social and cultural matters (Redmond et al., 2007). Even if Dublin was one of the major cities of the British Empire during the Georgian Period (1720-1810), Dublin faced a relative economic decline since the 19th century and until the 1990's. Even the industrial revolution which enriched most of the Western European countries, did not touched Dublin and Ireland due to the lack of exploitable natural resources in this country (Williams and Redmond, 2006 p.8). Until the 1960's, Ireland and Dublin area was characterised by a predominant agriculture sector – 46% of the Irish population in 1949 (Duff, 2007) – even if industrial production was already introduced in the country. Dublin, and thus Ireland, faced stagnant economic conditions with modest growth and development and accompanied with high level of emigration and unemployment (Redmond et al., 2007 p.1).

From the 1950's the government started to introduce several policies in order to protect and develop its national economy. This first stage consisted in the industrialisation of the predominant rural society and to attract branch-plant manufacturing activities. Protectionism was predominant at that time with a market using local investments and resources for local consumption and small exports.

In the period of the late 1970's and 1980's, Dublin experienced a second phase of economic development where the local economy evolved towards a more advanced and global one with the help of inward and foreign investments especially from the United States of America (Williams and Redmond, 2006 p.8). The first attempts to open Dublin's economy to a more globalised one, in the same time with new low-wage competitors in Asia, resulted in a strong downward trend in the economy where multi-national firms tended to cease operations due to the uncompetitive position of their location (Redmond et al., 2007). The 1980's was characterised by a high unemployment rate reaching 18% of Dublin's population and an emigration peaking at 40 000 in 1986 (Burnham, 2003).

This economical crisis stopped in the 1990's when Dublin successfully shifted its economy towards high-tech and knowledge-based sectors with strong investments in service activities. The shift has

been facilitated by low tax rates and incentives which helped to attract new investments. Meanwhile, Dublin developed and attracted a high-skilled labour force which placed the city in a more competitive position and facilitated the development of the service sector (Redmond et al., 2007).Until the 1990's Dublin's strategy was only to develop and attract local and foreign investments. The result was the development of numerous assembly-based manufacturing activities with no strategic connections among each of those activities.

A new strategy was then adopted in order to develop and sustain a long-term economy for Dublin and consequently for Ireland. Creativity, innovation and knowledge were identified as central for a successful long-term economic development by the Irish and Dublin governments. The first attempts focused on recommendations expressed by the Culliton Report (1992) concerning industrial policy. It stressed that Ireland and Dublin should re-focus their industry on a higher level of the value chain, the importance of attracting new growth sectors such as ICT, pharmaceutical or financial services, that the state should support the Small to Medium Enterprise sector and that the country and especially the Greater Dublin Area should develop a reliable and efficient telecommunications and transportation network (Culliton, 1992). This new strategy enabled Dublin to attract a lot of creative companies in the ICT, finance, higher education and Research and Development (R&D) sectors. This new development strengthened Dublin in its position as a gateway for the knowledge economy. National development plans finally have been applied for the period 2000 to 2006 with the ambition of developing a strong academic base with high quality in R&D, an adequate labour, the right environment for translation of research output to innovation to company to product and finally to market stages. The development of a good industry infrastructure and availability of equity and finance is also one of the priorities highlighted by the Technology Foresight Ireland Report (ICSTI, 1999) which is the core of the 2000-2006 plan strategy. The main goal is to develop a Biotechnology Cluster in Ireland. The core of the strategy is to develop "a pyramid where industry, the higher education sector, government and society are the four inter-linked faces forming a partnership at all levels" (Redmond et al., 2007). Excellence should permeate and overhang all the faces of the pyramid.

This 2000-2006 plan also included the development of policies towards innovation and creativity. It aims in developing hard and soft infrastructures in order to increase linkages between Third level institutions and industries related to innovation (ICSTI, 1999). The current 2007-2011 plan confirms this strategic move towards a sustainable knowledge economy relying on its intellectual capital. The plan supports particularly the Research and Development field, by allocating specific funding for this domain (Redmond et al., 2007 p.83).

Nowadays, Dublin is one of the leading economic capitals of Europe with a position of gateway city within the global economy and is a model for economic development for many other cities all around the globe. This particular shift has been made visible since the mid 1990's through deep economic and social changes; however the regeneration process started decades ago when Ireland started to move from an agricultural and rural economy to a more industry based economy. Indeed, the ACRE report on Dublin as a global gateway highlights the fact that a lot of foreign companies which had developed small-scale activities in this first period before the 1990's economic boom and nowadays well established in Dublin now see the city as a potential European headquarter (Redmond et al., 2007 p.82). The regeneration process that is highlighted in this case study relies on a highly interventionist government at the national, regional and city scale and across a broad range of policies such as tax, education, welfare and planning (Redmond et al., 2007 p.81). All of those step by step and long-term policies aimed at creating an open and export-oriented economy and at developing appropriate conditions for the development of creativity and innovation towards a knowledge economy.

Consequences: Economic growth and social change

Dublin's economic, demographic and social structure has been fundamentally altered by this deep regeneration process. Relying on economic regeneration, it is the entire city which has been actually regenerated. The economic growth has been directly accompanied by deep changes in the social and consequently in the urban landscape. Indeed, Dublin rapidly shifted from a place of emigration towards a place of immigration. As a result, the city experiences a multi-ethnic and young population which enriches its competitiveness and attractiveness. Gender equality, civil rights and equal employment opportunities are also improved. Nonetheless, Dublin was not ready to absorb such changes in its social and urban landscape and even seems to manage poorly this new situation (Redmond et al., 2007 p.74).

The planning approach in Dublin has been characterised by a market-led entrepreneurial approach until 1998. This resulted in a local crisis of access to housing and imbalance in the distribution of the urban functions (Redmond et al., 2007 p.75). In 1998, after several criticism against this kind of approach (Mc Guirk and McLaran, 2001), a more collaborative and integrated approach to urban planning was put in place. Nevertheless, a lack of social inclusion aims is still claimed (Redmond et al., 2007 p.76). Dublin is thus currently facing a real problem concerning housing affordability and in the distribution of urban functions, population and transportation networks in the city and in its suburban areas. Urban sprawl is particularly growing towards West where lands are free since the Northern Sea is occupying the east part of the city.

In response to a more cosmopolitan city, racism and intolerance are rising in parallel with other social problems such as crime or discrimination. The lack of good infrastructure transports and especially public transport implies congestion problems all over the city and even population decline in some suburban areas. Concerning urban governance and management, poor cooperation among local stakeholders is observed with poor local democracy and a lack of initiatives (Redmond et al., 2007 p.80).

All those resulting problems from Dublin successful economic regeneration erode its competitive position. Environmental and social sustainability of Dublin are thus strongly questioned nowadays.

Critical discussion of the case study

This case study is particularly interesting since it shows how regeneration processes can change an entire city and even a country which was 40 years ago seen as the worst West European economy and is now one of the richest with a GDP per head far above the average of the EU 15 (The Economist, 2004a). Dublin was not fated to become one of the world leading cities regarding the knowledge industry but the city finally reached it with the help of successful strategic policies and the implication of all the level of the governing authorities aiming at deeply regenerating the economy of the city. Such regeneration is long and can only be successful with the cooperation of a lot of governing authorities, policies and stakeholders at all levels. The use of tax incentives and the emphasis on the higher education firstly paid to instil a first strong foundation for industry in Dublin. The introduction of National Plans secondly helped in focusing the strategy in order to develop a self-sustaining economy.

The success of such economic regeneration is presently unquestionable and all experts seem to agree on it. Nevertheless the question of the sustainability of such regeneration needs to be raised. Indeed, is Dublin regeneration sustainable? Well, people will certainly answer that it depends from which standpoint you are. Actually, from an economical point of view, this case study is more than a good example: it is a model for every other city's regeneration. It brought long-term economic prosperity to Dublin and to the entire country. From poverty, Dublin moved towards richness and economic sustainability. Consequently, the economic regeneration process had also a good impact on the social aspect. From 18% of unemployment in 1986 (Burnham, 2003)., Ireland moved towards an unemployment rate of less than 5% at the beginning of the 2000's (Redmond et al., 2007 p.80), even if due to the 2008/2009 crisis, the unemployment rate raised to 10,4% in January 2009 (Slattery, 2009). This raise in the unemployment rate shows that the Irish economy, and particularly Dublin's economy since it comprises 40% of the national labour force (Williams and Redmond, 2006 p.5), is still weak and fresh. It needs to be reinforced and to become more autonomous as the Technology Foresight Ireland Report identified it (Redmond et al., 2007 p.67). The Irish economic boom attracted a lot of former emigrants back to their country and attracted immigrants from all around the globe. The

immigrants are currently constituting 10% of the labour force (Williams and Redmond, 2006 p.23). Social diversity was thus enhanced and a lot of other improvements for social well being with it, such as gender equality, civil rights and equal employment opportunities.

From a cultural point of view, such regeneration process is particularly good as well. Dublin, described as gloomy and depressed only a decade ago is now seen as one of the most lively and cosmopolitan city in Europe. Economic prosperity brought with it a broad range of different people and culture which influenced and transformed Dublin.

However, Dublin was not prepared to absorb such economic and demographic growth. The economic boom was prepared by the political stakeholders but no real preparation of what could be Dublin after the economic growth had been settled. Of course, one can argue that since nobody expected such economical success the city could not be prepared to face such situation. Nevertheless, it seems that even 15 years after the economic boom, Dublin does not seem to really address environmental, social and economical problems which are actually consequences of the economic success. As it was described in the previous sections of this chapter, congestion, housing affordability and undeveloped transport facilities seriously impact the quality of life and Dublin's competitiveness. From an environmental point of view, Dublin is not a sustainable regeneration success since environmental issues were not integrated in the urban regeneration processes. Dublin's rapid growing population forced the development of new urban areas with no real concern towards environmental issues. The lack of good transportation infrastructures both for the industry and the population and the market-led entrepreneurial approach on urban planning taken by the Greater Dublin are good examples showing the lack of sustainable concerns.

To conclude, *yes we can* say that Dublin is an urban regeneration success since it transformed a gloomy depressed and ruined city into a vibrant, cosmopolitan and rich city. However, the lack of environmental concerns and the lack of a long-term urban development vision show that this regeneration process cannot be qualified as a sustainable regeneration process. The regeneration process was mainly tackled from an economic perspective and not with concerns towards environmental and social sustainability. Even if partnerships have been well used for Dublin's urban regeneration, this is particularly the lack of integrated approach which is to blame here since no environmental and social concerns have really been integrated into it.

2.6.2 Bilbao, Spain: culture and entrepreneurship regeneration at the core

"Just 15 years ago, Bilbao was a grey, cold and unfriendly industrial city. Foreigners came only for business motives and normally avoided staying over the weekend" (del Castillo and Haarich, 2004 p.2).

Nowadays, Bilbao is a vibrant and modern city featured by culture and cultural tourism where tourists from all around the globe are hurrying. This rapid recovery and major success could easily be compared with Dublin's case study. However the regeneration process used for Bilbao has been different than for Dublin as it used culture and a flagship regeneration project through the Guggenheim Museum. When it comes to urban regeneration, Bilbao is one of the most famous case studies of the last decade. Bilbao is currently moving from a region based on traditional industry mainly steel and shipbuilding towards a modern region based on cultural and tourist industry. The key features of this success is analysed in this section and the question of the sustainability of such regeneration process is then raised.

Background situation and regeneration process

Bilbao is a city-region, capital of the Basque Country, located in the far Northern part of Spain close to the Atlantic Ocean and on both sides of the Nervión River. Its geographic position close to the ocean with a River passing through the city was a great advantage that Bilbao used for its industrialisation. Bilbao's industrialisation came a bit later than other big European industrial cities such as Belfast, Sheffield or Leipzig (Plöger, 2007 p.7). Bilbao's industry was mainly based on mining, metallurgy and shipbuilding. Bilbao saw a great accumulation and investment of capital which brought prosperity. At the beginning of the 20th century, Bilbao became the most dynamic province of Spain. The large exports of iron particularly enabled the development of the largest railway system and brought Bilbao

as the city with the largest number of ships registered of the country. The economic and demographic growths were huge at that time and during this "first industrialisation" phase (Gomez, 1998 p.108).

The Spanish civil war and Franco's dictatorship (1939-1975) marked Bilbao politically and economically speaking due to stagnant policies and high protectionism (Plöger, 2007 p.8; Gomez, 1998 p.108). During the 1950s and the 1960s the situation slightly changed and Bilbao experienced a second phase of industrialisation based on heavy manufacturing. This second industrialisation relied on massive immigration from other less developed region of Spain; Bilbao's population doubled from 216 000 (1950) to 410 000 (1970) (Plöger, 2007 p.8). Unemployment was rather low: 3.2% in 1975 (Gomez, 1998 p.108); the urban growth accompanied such economical success and Bilbao's hinterland was rapidly transformed into working-class towns. The difficult topography also forced Bilbao city and its urban area to build tall blocks even in prosperous suburban areas (Plöger, 2007 p.7-8).

This "Spanish economic miracle" lasted until the mid 1970s with the end of the Franco dictatorship. The economic crisis then arrived during the late 1970s and during the 1980s. The Spanish government did not anticipate the crisis and asked for more production of indigenous steel in the 1970s (Gomez, 1998 p.109). When Spain was hit by the world crisis its effects were particularly disastrous for Bilbao since its economical structure was built on heavy industries (Plöger, 2007 p.10). Bilbao was the Spanish region most hardly hit by the crisis but a bit later than the other Western European cities which faced the crisis at the beginning of the 1970s. Between 1975 and 1995, almost half of the industrial jobs – 60 000 jobs – were lost which corresponds to a fall from 46% to 27% of the proportion of manufacturing jobs (Eustat, 2006). Some large industrial companies managed to modernised and to continue production but this was not enough to avoid a major crisis. The industrial sector as a whole lost 34% of its jobs between 1975 and 1992. Although the Basque Country experienced an economic growth between 1986 and 1989 and the tertiary sector strongly developed, this was not enough to curb the industrial decline and stop unemployment to drastically increase. As a consequence of this major crisis, violent labour conflicts burst out (Gomez, 1998 p.109; Plöger, 2007 p.10-12). The social impacts were dramatic especially for the young population while the unemployment rate among youth reached 50% in 1980s. Bilbao rapidly faced huge population losses from 1980 until the mid-2000s – the major population losses occurred between 1980 and 1995 were the city lost more than 70 000 people corresponding to a loss of 16% of its population (Eustat, 2006 ; Plöger, 2007 p.12). In short: Bilbao was ruined, a huge part of its inhabitants run away while the others faced a generalised demoralisation. The economic decline rapidly commuted to urban conditions decline were dereliction was increasing year after year letting derelict industrial areas and a very negative image.

From the beginning of the 1980s, the government started to think about actions to be taken in order to overturn the negative image and impacts of deindustrialisation. The Spanish government recognised that it should be tackled through strategic plans in order to be effective; however it took almost a decade for a first strategy to emerge in the late 1980s through the "Strategic Plan for the Revitalisation of Metropolitan Bilbao" establishing the framework for regeneration and the first projects were only realised in the mid-1990s (Plöger, 2007 p.17). The Strategic Plan was based on the Harvard SWOT Analysis model but its lack of statutory powers staved off this plan to be a real recovery instrument for the city's regeneration (Gomez, 1998 p.16). The Spanish accession to the European Union strongly boosted the economic and urban regeneration process through a stronger focus on land-use and through the development of infrastructures. So as to develop Bilbao as a modern and post-industrial city, a Master Plan focusing on flexible and integrated interventions was set up for Bilbao, in parallel with the creation of an agency Bilbao Ría-30 in order to promote the objectives set by the plan. Four fields of action were established: 1) Formation of a knowledge-based high-tech sector; 2) Inner-city urban renewal; especially revitalisation of the old neighbourhoods; 3) Environmental intervention: river cleaning, industrial land recycling and implementation of an Agenda 21; 4) Strengthening of cultural identity through culture-led regeneration (Plöger, 2007 p.16). The main idea of this fourfold approach was to develop an integrated approach to urban regeneration not only focusing on investment attraction.

Although the idea of tackling urban regeneration through an integrated approach dealing with the development of a new and modern economic sector, of urban and transport infrastructures, of the physical urban environment, of environmental interventions and with the strengthening of cultural identity was a particularly good and efficient approach, Bilbao's regeneration did not run very smoothly and efficiently. Indeed, several other strategic plans emerged such as the new General Plan of Bilbao

and another development agency was created, Bilbao Ría 2000. The constant overlapping coexistence of strategic plans, the complex organisation of the Basque and Spanish institutions and the poor territorial planning framework lead to dispersal, competition, duplicity and waste of regional resources (Rodriguez, 1996).

Despite this untidy organisation and coordination, Bilbao experienced integrated regeneration in several different fields: transport infrastructure; environmental clean-up; economic restructuration and brownfield lands development.

Bilbao's transport infrastructure network has been strongly developed through huge public investments in order to improve accessibility and connections both for the city and international purposes. Bilbao developed a new metro system, tramway lines and suburban trains. An extended and modernises airport is under development since 2000 and a high-speed train is planned. The expansion and modernisation of Bilbao's port is also planed and will be normally achieved by 2020 (Plöger, 2007 pp.21-22).

Environmental actions were also taken to regenerate the city since the industrial era let derelict and polluted sites, untreated sewage and a heavy polluted river. A new water sanitation system for the entire city has been installed from 1984 until 2006 for a total investment of €1 billion (Plöger, 2007 p.22). This huge project had a very positive and significant impact on the city's quality of life and the city's aesthetic and image. The river and Bilbao's estuary, which were environmentally dead, were cleaned-up and are now recovering ecological life (García-Barcina et al., 2006 p.959).

Bilbao's economic restructuration has been tackled from 1981 when the Basque government created SPRI – Sociedad para la Promoción y Reconversación Industrial – a dedicated business development agency. The main focus of the agency has been to adapting Bilbao to the new economic requirements and to reach the goals set by the different strategic plans. EU funding since 1986, when Spain joined the European Union, strongly helped Bilbao's economic recovery as well. The promotion of economic competitiveness and employment was the priority from the beginning until 1999. Innovation is nowadays the main focus of the economic restructuration policies. €50 billion were invested from 1981 until 2005 for the economic development of the region through the SPRI agency (SPRI, 2010). The development of Technology Parks was the major activity of the agency (Plöger, 2007 p.23).

In addition to these regeneration actions, Bilbao's regeneration process particularly focused on specific opportunity areas regeneration. Barcelona, Sevilla and Madrid, three main cities of Spain, based their regeneration in the 1990's on flagship projects: Barcelona hosted the Olympic Games, Sevilla the International Exposition, while Madrid became the Cultural Capital of Europe. Influenced by those successes, Barcelona turned its regeneration strategy towards the same system to create a new forward-looking image and to brand its name in the new competition between the European Cities-Region (Ceballos, 2004 p.177). Glasgow's regeneration, also based on culture and flagship projects, influenced Bilbao's regeneration strategy as well (Gomez, 1998 pp.113-114). This way of tackling urban regeneration is not specific to those cities but, according to Ceballos (2004), it more generally takes part in a trend of structural changes in the capitalist system and in the relationship between European Cities-Region where those cities are businesses competing against each other. In the Western World, firms are increasingly requiring a new kind of employees as a new key to productivity that is productive and creative. Such employees require a stimulating environment which can support their personal and intellectual development (del Castillo and Haarich, 2004). Cities fulfilling such requirements are more likely to attract investments and people to them and this through the development of cultural infrastructure, better living standards, urban amenities and good communication.

Bilbao definitely adopted such policy to brand Bilbao as a city moving from a declining industrial city to a vibrant and modern post-industrial metropolis of the 21st century. The regeneration of four designated "opportunity areas" took place on derelict old industrial sites. The most famous and emblematic area is Abandoibarra in central Bilbao where the iconic Guggenheim Museum designed by the architect Franck Gehry is located. The project cost €144 million and was entirely financed by public sector funding. Another major project in the same area was the construction of the Euskalduna Conference Centre - €72 million. The aim of the Guggenheim Museum was to enhance the regional cultural offer, to create a regional identity, to increase the region's attraction for people and business, and to generate a social and political climate open to innovation and change in regional governance and politics (del Castillo and Haarich, 2004). The construction of the Guggenheim Museum was undoubtedly a success since it attracts around 1 million of visitors per year since it opened in November 1997. The museum branded the city, put Bilbao on the map and first of all largely

developed the tourist and cultural industry of the city and the region. Such development still has a huge impact on Bilbao's economy and in reducing unemployment (Plaza, 2007a).

Consequences: a transformed vibrant city but entrepreneurial and unequal

Bilbao, through its regeneration process, experienced a strongly improved quality of life concerning air and water quality, connectivity and transport, urban spirit and architectural quality. All these regeneration operations had a good impact on population's optimism and self-esteem (Ceballos, 2004 p.181). It also helped in creating a regional identity especially around cultural projects (del Castillo and Haarich, 2004 p.3). The role of the Guggenheim museum in this enhancement of regional identity and population's self-esteem is particularly strong. This successful landmark project increased Bilbao's attractiveness and opened the city and the region to change and innovation. However, the improvements in the quality of life cannot be attributed to this single flagship building. The real force is indeed located in the infrastructure improvements especially concerning public transports – the municipal bus system was rewarded for its efficiency and accessibility by the EU in 2005 (Emparanza, 2007), the clean-up of the environment campaigns and the new waterfront development (del Castillo and Haarich, 2004 p.5).

As every successful cities Bilbao experienced a strong decrease in unemployment moving from 23% in 1995 to 10.3% in 2005. From the 2000's its population also started to increase again after huge losses from the 1980s until the 2000s (Eustat, 2006).

Despite the fact that the physical changes and regeneration process are due to the infrastructure improvements and the clean-up campaigns, the Guggenheim Museum had a very strong impact on the specialisation of Bilbao's economy, on the way of governing and approaching governance, and on the way of planning the city.

This landmark project attracted all the attention of the social and political spheres. Its success reinforced the idea that such political and planning approach was beneficial for the city and the society. In addition to the economic project in itself which had outer effects by attracting tourism, changing Bilbao's image and promoting vibrant cultural offer, the Guggenheim project is also a strategic instrument provoking inner effects especially change in institutions as well as policy framework and governance.

Concerning outer effects, the Guggenheim Museum is the "heavy hitter" of Bilbao's redevelopment towards an innovative and creative economy. According to del Castillo and Haarich (2004), Bilbao's business structure is changing towards a huge tourism sector, but also towards the development of other cultural and creative sectors such as advertising agencies, graphic arts and publishing, art, etc. Nevertheless this economic success hides a danger. According to some experts Bilbao is losing some important functions to Barcelona and Madrid due to the fact that except for the tourist sector, Bilbao does not offer strong perspectives. Consequently, the most highly-skilled local workforce is moving towards more dynamic cities and local universities are losing positions in national rankings (Martínez, 2007 ; Vicario, 2007 ; Plaza, 2007b).

Concerning inner effects, the Guggenheim project had a strong impact on population's and leaders' attitudes towards the future and thus in ways of leading policies and planning the city. Ceballos in her paper describing *the role of the Guggenheim Museum in the development of urban entrepreneurial practices in Bilbao* even described politicians' attitude as "inebriated by the success of the Guggenheim" and by taking "a much more entrepreneurial, pro-active and risk-taking approach" (Ceballos, 2004 p.177). This trend towards more entrepreneurial approaches is not specific to Bilbao (Doucet, 2007) and the museum is not the direct cause of these new practices but the success of the Museum consolidated this trend since most of the "local and regional governors involved in urban regeneration (…) are truly convinced of their success" (Ceballos, 2004 p.181). This entrepreneurial approach is nowadays extended to other projects (Plöger, 2007 p.36).

The entrepreneurial and project-led planning approach is particularly risky since it bases the regeneration process on a very few projects which could not be successful and then let the city ruined. Adopting this approach for urban planning in Bilbao increased urban fragmentation where selected areas received huge investments to become the façade of the city brand while the rest of the city is still waiting for receiving attention of its governors (Ceballos, 2004 p.179). Such changes in urban planning and policies lead to a polarised and fragmented society relying on tourism and on services directly subordinated to the iconic parts of the city.

Entrepreneurship also endangers local democracy and governance. The Guggenheim project was not a result of the strategic plans elaborated for Bilbao's regeneration in the 1980s and the beginning of the 1990s. The implementation process of the museum has been a strongly top-down process without public participation (Plöger, 2007 p.35). This process challenges the democratic nature of the project since it was firstly opposed by most of the population (Ceballos, 2004 p.181). The final success of the Museum actually reinforced the local political sphere in the idea that since they have been democratically elected, their decisions are democratic even if they are made against the opinions of the local population (Ceballos, 2004 p.182).

One last finding about Bilbao's approach on urban regeneration is that the design of the city and especially the new public spaces are more created for tourism and affluent groups purposes than for the urban society as whole (Plöger, 2007 p.35).

Critical discussion of the case study

Bilbao's case study is particularly interesting since it represents very well the actual trend in urban planning and regeneration of most of the European Cities. Regenerating cities through branding and entrepreneurial approaches is more and more common; Glasgow and the Greater Paris project are some examples of this trend. However, the question of the sustainability of such process should be asked. Concerning Bilbao, the conclusions on sustainability are twofold like it was for Dublin.

On the one hand one cannot deny the success of Bilbao's regeneration. Far from only achieving economic regeneration, Bilbao succeeded in renewing its infrastructure systems, in increasing quality of life through a huge clean-up campaign and through physical regeneration of public spaces, brownfields and of the public transport system. Bilbao's regeneration has been a success because the process relied on several sectoral regenerations, mainly: flagship projects, infrastructure network, physical urban environment and environmental quality. The general quality of life has been significantly improved while the economic situation grows strongly year after year. From an economical point of view, it seems that the regeneration process is sustainable although the city and the region are nowadays strongly dependent on tourism especially depending on the Guggenheim Museum's attractiveness which could be argued to be a risky dependency.

Moreover, the shift towards urban entrepreneurial practices by local governments produces a fragmented and polarised society around landmark projects. Such urban development is more interested in the promotion for branding and growth than committed to the distribution of goods, services wealth and social welfare within the city. The logic of gigantic urban projects with spectacular buildings and cultural infrastructures and events is predominant in such policy. Flagship projects and urban entrepreneurship promote cities as "businesses that compete, take risks and have constant need to innovate" (Ceballos, 2004 p.178). This kind of urban regeneration is thus speculative and highly risky (Doucet, 2007). Such approach also fails at really addressing the issues of poverty and inequality. Public resources are only used for the promotion of certain parts of city while governance and local democracy are the great losers of this process.

Concerning environmental issues, it is important to highlight the great effort put in the clean-up campaign which is by definition sustainable since it leaves restored natural resources to the future generations. The question of energy consumption can be considered as partly addressed through the development of a very efficient and accessible public transport network.

Bilbao's regeneration model is thereby both a good model to follow and a risky one. The strategic and integrated approach taken for Bilbao's regeneration is particularly interesting and should be adopted by a lot of cities all around Europe. However the shift towards entrepreneurial and pro-active practices and the project-lead approach on urban development taken by the local governmental actors is quite risky and surely unsustainable. Good references are to be taken from this example, but not all of them.

2.6.3 Bo01, Malmö; Quartier de Bonne, Grenoble and Pont de l'Âne, Saint-Etienne: Finding new centralities and developing eco-neighbourhoods

The two previous case studies gave examples of huge regeneration processes taking place in former industrialised cities. Those case studies reflect a certain trend of regeneration operations in Europe. A more recent trend is nowadays occurring at a more little scale with the development of regenerated neighbourhoods. While the two first case studies were not particularly "proclaimed" as sustainable

operations, an important number of urban operations are taking part into projects branded as "sustainable" urban projects and developing sustainable neighbourhoods.

In order to analyse this new trend in the production of "sustainable" neighbourhoods, the projects of Bo01 and of Norra Sorgenfri in Malmö, Sweden, of *Quartier de Bonne* in Grenoble, France, and of Pont de l'âne in Saint-Etienne, France, will be analysed.

Presentation of the projects

Bo01, Malmö, Sweden

Malmö's Bo01 project takes part into a long term development plan for the urban development of the Western Harbour area – Västra Hamnen. This area is a former shipyards area but due to the decline of heavy industries in Europe, this area was left as a lot of industrial areas all around Europe. The decline of the industry caused mass unemployment in Malmö but in the mid-1990s, Malmö started a new plan in order to regenerate the city mainly by building a new university and mounting a European housing exhibition for 2001 named Bo01 (Rose, 2005). The aim was to produce a leading example of the city of tomorrow. Bo01 neighbourhood, 25 hectares and completed in 2001, is only the start of the urban redevelopment of the whole Western Harbour area of 160 hectares. The project intends to promote an attractive model of sustainable neighbourhood through the development of environmental sustainability in parallel with architectural quality, social and functional diversity (Energie Cité, 2005). The project is financed by public investments by the Swedish State, the city of Malmö, the EU, Skydraft – A regional Power Company – and private developers. In order to assure good environmental, architectural and urban quality, a quality programme has been set up between the city, the developers and the designers (Jisander, 2003). Bo01 rapidly became Malmö's new façade and pride of its population (Rose, 2005).

The keywords reflecting the strategy of the project are diversity in terms of forms, functions and social patterns, quality in terms of environmental and architectural goals, and extension of the city centre.

The first environmental action was the decontamination of the soil. A total of 6000 m^3 had been removed in order to be decontaminated and treated (Jisander, 2003).

A particular attention has been paid by the designers to Bo01's master plan. It has been designed in order to reduce wind effects which are strong on the coastal part of Malmö. Taller apartment blocks were placed on the outskirts of the neighbourhood and facing the sea in order to protect the smaller-scale buildings of the inner from heat loss by the cooling effect of the wind. The streets are particularly arranged chaotically in order to protect the streets from the strong winds and also to create a character of the area as whole. Density has also been promoted in the master plan in order to avoid urban sprawl. The buildings are on the average three storeys high - a height which is not very high regarding density - however the buildings are built close to each other. This particular design enables good thermal performances with less heat loss due to fewer surfaces in contact with the outer space. Diversity is certainly Bo01's most important keyword. No two buildings are the same since 21 architects participated in the design of the neighbourhood. The forms and the materials are really diverse while the colours of the façades are varying from pale to bright colours. It is also inevitable to speak about the Turning Torso tower designed by the architect Santiago Calatrava and which gives Malmö a landmark building for the future. This landmark tower is also a way of attracting tourism besides the sustainable housing exhibition. Concerning the buildings, each building had to respect low energy consumption goals of 105 kWh/m².yr including household electricity (Energie Cité, 2005 ; Jisander, 2003 ; Rose, 2005).

The environmental quality of the neighbourhood has been particularly promoted through the introduction of various vegetation on buildings or in public spaces. A public park – the Anchor Park – with a lot of natural habitats has been created in order to preserve and increase biodiversity. Alder carr, bat nesting boxes, oak and beech grove, butterfly flowerbeds, canals with salt water or recreational harbours can be found through the neighbourhood. The quality of the public spaces has been thereby improved (Energie Cité, 2005 ; Jisander, 2003).

Concerning energy consumption, the neighbourhood is served by 100% locally renewable energy sources. For heating needs, 85% of the needs are met by heat pumps extracting heat from seawater and aquifer. The remaining 15% are produced by 1 400 m² of solar thermal panels set on building's façades or roofs (Jisander, 2003). The aquifer is also used for summer cooling. Electricity production is generated by a 2 MW Wind Turbine located three kilometres away and by 120 m² of photovoltaic

panels. The neighbourhood is also connected to Malmö's energy systems in order to regulate supply and demand (Energie Cité, 2005 p.5).

At Bo01, rainwater is treated locally by using surface run-off systems. A network of green roofs, channels and dams has been designed in order to assure the management and the treatment of rainwater independently of the rest of the city (Energie Cité, 2005). The buildings have been designed with a purpose to minimise the amount of household wastes. Each kind of waste is sorted: newsprint, cardboard, metal, plastics, coloured glass, plain glass, residual waste and organic waste (European Green Building Forum, 2001). Waste management is particularly sustainable since it uses organic wastes as energy sources. Food wastes are collected and then grinded in order to be collected in a tank. The sludge obtained is taken to a biogas plant and transformed into biogas. After, this biogas can be used as fuel for cars and buses or even to produce heat and electricity if burnt (Jisander, 2003).

Besides the environmental and architectural quality, the question of connectivity and transport has been raised in the Bo01 project. The priority has been given to pedestrians and bicycles. The inner of the neighbourhood is car free. A 0.7 parking space rate per household has been set and a multi-storey car park has been built outside the area. The priority has been also given to public transports through a regular local bus service connected to the train station and the city centre serves the area every seven minutes. Bus stops are located within 300m's distance from the flats. Carpool is also promoted and a fleet of rentable electric cars have been implemented in the area (Jisander, 2003 ; Rose, 2005).

The economic activity is promoted through offices, restaurant and cafés, shops and the implementation of large and smaller companies. In 2003, 6000 people were working in this area.

Bo01's picture seems to be almost perfect. However sustainability has not been reached in every field as it was expected. Social and functional diversities are actually not very good at all. Indeed, due to the high quality of this neighbourhood, the accommodations are utterly expensive. For instance, a three-bedroom apartment starts at more than the double of the national average; and this not to mention the high standard rental-only Turning Torso which is called by some local population the "Fucking Torso". Such situation deeply impact social and functional diversity since only a certain category of the population can really afford to live in such area. This neighbourhood, instead of implementing a sustainable way of living among citizens increases the fragmentation of the society.

In addition, Bo01 inhabitants' lifestyle proved to be incompatible with the low energy consumption standard expected by the city. Indeed, energy consumptions are raising high above the initial assessments. The ideal of a car free area with inhabitants using public transports is also far from being accomplished since many dwellings have two or even more luxury cars. According to the Guardian, the fleet of rentable electric cars "sat unused for years before (being) taken away" (Rose, 2005).

Bo01 is thereby not the perfect neighbourhood, but it is a good step towards it and a very good example to get experience and learn from it. Bo01's experience could be still a good start for the redevelopment of the rest of the Western Harbour in the coming years.

Quartier de Bonne, Grenoble, France: Extension of the city centre and Eco-neighbourhood

The project of *Quartier de Bonne* is an urban regeneration project started in 2001 in order to redevelop the old military garrison house site. The project is run on an area of 8.5 hectares corresponding to an entire neighbourhood, close to the city centre. The regeneration process experienced a long but enlightening process of public consultation the different local governments, the associations and the inhabitants (SEM SAGES, 2008). This process permitted to develop a project supported by the population and the governing parties and to design the main strategic objectives that this new neighbourhood will have to fulfil. From an urban development point of view, the project aims at developing new centralities and extending the city centre towards the south where the city is particularly dense. The other main objective is to promote a new participative and sustainable approach of urban development and ways of living by favouring local democracy, accessibility and energy efficiency. The *Quartier de Bonne* project is a landmark project encouraging the use to renewable energies and the development of bioclimatic approaches in building design. The three main keywords for this project are: environmental quality, energy efficiency and accessibility for all population (Eco, 2004). The project is financed through public and private investments. In order to secure the achievement of the objectives, charters with specific objectives have been set up between public and private stakeholders (de Bonne, 2007).

Concerning energy efficiency management, the aim of the city is to achieve: 100% coverage of electricity needs through cogeneration; 50% coverage of domestic hot water needs using solar thermal energy; the coverage of heating needs, limited to 50 kWh/m².year, using clean or renewable energies and focusing especially on biomass; electricity production through photovoltaic solar panels and small hydro power plants in dense urban sites (Grenoble, 2007).

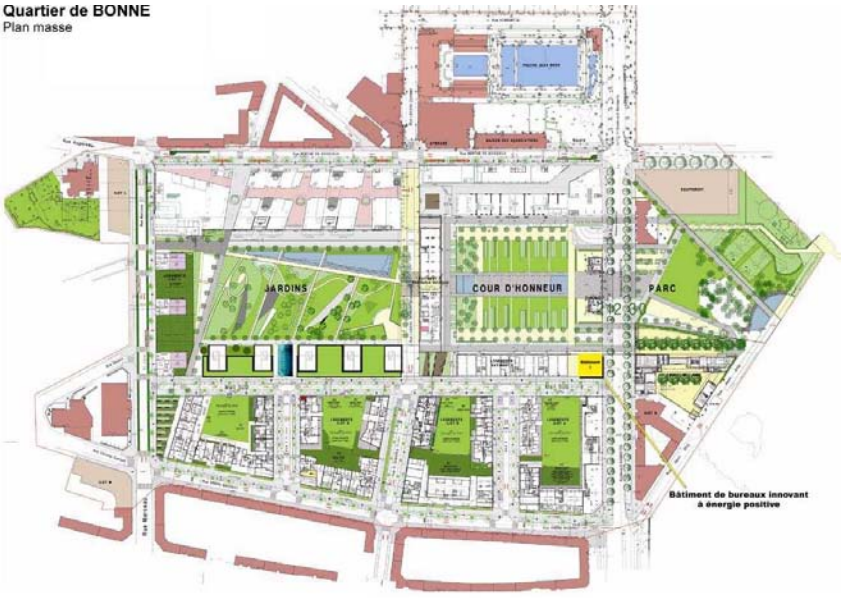
The core of the project is a public park of 4.5 hectares. It will be located at the centre of the area of the project while the buildings will be at the periphery. The public park will have a twofold mission of connecting the different neighbourhoods like a linking hub for pedestrians and bike users and of assuring high environmental quality and biodiversity. The biodiversity will be assured by various types of vegetation and habitats. A “soft” maintenance for this park will be promoted through the use of eco-friendly products and a specific maintenance adapted to the different kind of vegetation. Water will be also a strong element of the park.

In order to develop new centralities a shopping mall of 15 000 m² and a cinema will be built. A special attention has been paid in the design of those buildings in order to respect architectural and environmental quality. A 1000 m² photovoltaic power plant will be implemented on the top of the building. The implementation of such activities will increase the functional diversity of this neighbourhood which is surrounded by housing buildings. In addition to the shopping mall, commercial activities will be implemented in the ground floor of the housing buildings (de Bonne, 2007).

A school will be also built so as to improve quality of life and proximity for the inhabitants of the neighbourhoods. The building of the school will respect high environmental quality standards – the French environmental label *HQE* – and will be energy efficient using the district heating network.

850 new accommodations with 8 500m² of offices will be built all around the park in low energy consumption buildings. The buildings will be seven storeys high and have an energy consumption which should not exceed 50 kWh/m².year. A specific charter has been established between all the stakeholders in order to assure these objectives along with other objectives of environmental quality. 35% of the housings will be social housings and a special attention has been put so as to keep control on housings’ affordability for families in order to improve and promote social diversity (de Bonne; MEDD, 2009).

Finally, a flagship building is under construction with an innovative and avant-garde architecture. It will be a positive energy building producing more energy than the amount of energy it consumes. The design of the building will enable to lower the heating needs under 10 kWh/m².yr. The building will be covered by a façade made of polyurethane foam of 16 cm. In order to minimise the energy consumptions so far as possible all the energy consumptions due to offices activities will be lowered to a maximum consumption of 30 kWh/m².yr. Offices activities refer to lightening, ventilation or the working of all the office automation systems. In addition only free cooling will be used. This building will have a very low energy consumption and will produce energy in order to become a positive energy building. For this intend, 430 m² of photovoltaic solar panels will be installed on the roof of the building for a total production of 43 430 kWh/yr. The building will host exclusively offices for companies (Sidler, 2007).



(SEM SAGES, 2006)

Figure 1 - General Plan of the *Quartier de Bonne* regeneration project

The first constructions have been commissioned in 2008 while the project should be finished in late 2010. The *Quartier de Bonne*, which is actually an eco-neighbourhood, won the 2009 French national price for Eco-neighbourhoods. The project was rewarded for its good "integration of all the aspects of sustainable development" (MEDD, 2009). Indeed, the project particularly promoted:

- Local governance and public consultation and participation
- Social diversity through the promotion of social housing and the control of the accommodations' affordability for families
- Mobility and accessibility
- Architectural quality
- The insertion of green spaces and water inside the city promoting the preservation and development of biodiversity
- Energy efficiency and performance for buildings
- Local energy production – essentially through solar panels and small hydro power plants
- Sustainable waste management – especially through waste sorting on working sites
- Sustainable water management – especially storm water

Saint-Etienne, France: Regeneration by renewing a city entrance

In 2009, the city of Saint-Etienne, France, started to think about its evolution regarding its territory and about its city entrances. Due to urban sprawl and the implementation of large shopping areas, a lot of cities have lost their entrances. For some cases; city entrances of a new kind have been designed, such as airports or TGV stations (Hazel and Parry, 2004). The entrance of a city is highly important in terms of image as Hazel says in his book *Making cities work* (2004). In an era where branding is becoming more and more important, cities need to rethink the image they give to the visitor and the inhabitant when entering their borders. The following case study deals with this issue with an eye on sustainable development.

The city entrance of *Pont de l'âne Monthieu* in the city of Saint-Etienne is currently exclusively a functional city entrance dedicated to cars and commercial activities. Nowadays the neighbourhood is perceived as an area with no real urban quality and marginalized from the rest of the city (EPASE, 2009 p.4). As part of the development of the city and more broadly of the whole urban community, this area needs to be rethought and reshaped in order to regenerate its urban qualities. The area is located in-between railways, roads and a highway. It is therefore an area dominated by cars with a

very few sidewalks and not adapted for pedestrians (EPASE, 2009 p.5). The area is a very heterogeneous neighbourhood due to the natural topography and to the important number of shopping centres with huge billboards of different shapes and colours. The area lost little by little its natural character, the natural relief has been changed by all the infrastructure operations and 65% of the area is nowadays covered by streets, car parks or buildings which drastically lower the natural permeation effect and produces water management problems such as overloading of the networks. This area is however a strategic area for the whole urban community of Saint-Etienne since it can be seen from the highway and it is the place of the historic entrance to Saint-Etienne (EPASE, 2009 pp.6-9).

The project aims at promoting innovation and sustainable development in terms of urban regeneration. Actually, the project almost exclusively focuses on the environmental aspect of sustainable development. It promotes a master plan thought in terms of urban and environmental quality, soft modes of transportation, openness of the neighbourhood towards the natural environment and a reorganisation of the urban functions in order to promote a complementary offer at the scale of the city.

The master plan of the future *Pont de l'âne Monthieu* neighbourhood will focus on the development of activities adapted to the topography and to the environmental strains and opportunities of the area. The activities and functions of the neighbourhood will be organised by sectors in order to enhance resource sharing, e.g. waste management, energy allocation and even production, water management, etc. The spatial organisation of the buildings will be also rethought so as to reduce acoustic pollution and to promote high urban quality (Egis Conseil, 2009 p.2).

Concerning transportation, soft modes will be particularly promoted through bicycle and pedestrian paths and through public transports. A new LRT (Light Rail Transit) line will be implemented and the activity of the bus line already existing will be raised. Concerning deliveries for the shopping area and all the economic activities of the neighbourhood, a partnership between logistics' local professionals and the local actors will be developed. Deliveries will be mutualised and provided by railway transports rather than trucks so as to reduce energy consumption and greenhouse gas. The number of cars will be also reduced in the area: streets will be reorganised and a "park and ride" solution will be developed (Egis Conseil, 2009 p.3).

Environmental quality is one major keyword of this project. First of all, the city will take over the control of the billboards in order to harmonise them and to limit their impact on the quality and on the image of the neighbourhood. Storm water will be managed independently at the scale of the parcel and of the neighbourhood through the implementation of natural buffer tanks and dykes. These solutions will enable the reintroduction of water into the neighbourhood. Canals will also be created in order to create a more "natural atmosphere" in the area. Biodiversity will be preserved and enhanced through the development of natural habitats and ecological greenways connecting the different natural sites and parks of the neighbourhood and of the other natural environment of the city or close to it (Egis Conseil, 2009 p.4).

The urban activities – mainly shopping – will be kept. In order to provide a better environment, to limit disparities and the impact on shopping areas on the urban atmosphere, all the shops – which are nowadays very disparate – will be group together in one high quality and environmental friendly shopping mall. The offer will be also redesigned in order to be complementary with the shopping offers of the other shopping areas, especially the city centre. The city centre's offer is centred on culture, leisure and personal goods (Egis Conseil, 2009 p.5). The new area will thereby develop food and household goods. In order to enhance local economy, a particular attention will be paid to reintroduce and strengthen a local craft industry. The diversification of the functions will be also secured by the introduction of housing buildings (EPASE, 2009 p.24).

Finally, in order to develop and promote social participation into the regeneration process, several public consultations will be organised at the beginning of 2010. The project will be presented to the inhabitants and then workshops and other events will be organised in order to receive the opinion, ideas and expectations of Saint-Etienne's population (EPASE, 2009 pp.29-30).

Critical discussion of those case studies

Those three case studies introduce a new kind of urban development where sustainable environmental concerns are the driving forces of the regeneration process. Such regeneration process is operated at the scale of the neighbourhood in opposition to the scale of the urban community presented in the examples of Dublin and Bilbao.

The Saint-Etienne case study tackling the issue of city entrance with a sustainable concern is quite uncommon. The stake is though particularly important since it develops periphery of the city and start to restructure it. The restructuration will enable moving from a mono-function area – in this case study only shopping – to a multifunctional area which can become a new centrality for the city. Creating new centralities at the periphery of the city is a major stake when it comes to sustainability. It enables a more fair allocation of the urban resources and functions. It also promotes proximity and thus restricts transportation moves. This case study is therefore quite interesting since it brings sustainability towards the outer areas of the city. Nowadays the majority of regeneration projects are taking place in the central parts of the cities.

Each project presented is claimed as developing a “sustainable” neighbourhood. The question of the sustainability of such project should be thus discussed.

In those projects, the environmental part is particularly well addressed. The technical solutions adopted in those projects – and especially in Malmö’s Bo01 – are very efficient in reducing energy consumption, in reintroducing nature within cities and in preserving biodiversity within those areas. Waste and water management are also improved for a better preservation of the natural environment. This is a very good step towards sustainability for these neighbourhoods. The projects cannot be accused of denying the environmental challenges for the future since they promote efficient solutions for the main environmental challenges: reducing energy consumption, preserving biodiversity and natural resources within cities and reducing wastes rejected by the city on its hinterland. The long descriptions given in the case studies illustrate very well the efficient solutions implemented in the regeneration project for a better sustainable future. One can however argue that even if these areas become models for the development of the city such environmental sustainability is only applied to a very tiny part of the city and does not seem to expand to the rest of the urban area.

The social part of urban sustainability is also indirectly affected by such projects. These projects proved to have bad effects on social cohesion of cities. Indeed, the introduction of environmental quality in the urban perimeter, and thus higher quality of life, implies drastic increase in housing prices and finally such regenerated neighbourhood becomes rapidly a rich neighbourhood exclusively reserved for the upper social classes of the society. Far from bringing sustainable social diversity, it rather creates a more intense fragmentation between social classes where the rich part can get better living standards preserving the natural environment. This should not be the picture of a sustainable city. Developing such high quality sustainable neighbourhood is even counter pedagogical since it seems that sustainability is only reserved to people who can pay for it. Hence, more than developing sustainable neighbourhoods, cities must develop projects with which they can keep control on housing prices. Promoting social housing is one good solution but it is not enough. Indeed, the middle-class which is the biggest social class in Western countries can neither access social housing nor sustainable neighbourhoods. Sustainability cannot be reached through the marginalization of the biggest part of the society; it should be accessible for all.

Nevertheless, some features of social sustainability are met with these projects. It is particularly the case of local democracy and public consultation. In every project previously presented, public consultation and other forms of local democracy have been used with the intention to incorporate the population in the development processes of its own city. In this sense, social sustainability is enhanced by such regeneration projects.

The economical sustainability of such project is a tricky problem. Developers of these kinds of projects often argue that they perfectly deal with the economical part of sustainable development since they introduce a bit of functional diversity by implementing shops and service activities in the regenerated areas - the current trend is in implementing economical activities at the ground floor of housing

buildings. Some also argue that economical sustainability is promoted by the fact they build high efficient buildings and thus that savings are made on the energy bills (MEDD, 2009). Of course, the last argument cannot be seen as acceptable. Shops and service activities are fine, but it is not good enough for the economy of an entire city. The examples of Dublin and Bilbao show the real introduction and then implementation of a sustainable economy. But can these processes be reached at the scale of the neighbourhood? – Presumably not. The economic part of sustainable development should be addressed at least at the scale of the city. The regeneration of a neighbourhood can however be the opportunity to develop a part of a new economical strategic plan for the city, or to insert the future regenerated neighbourhood in the existing plan. The introduction of SME (Small and Medium-sized Enterprises) is also particularly adapted at the scale of the neighbourhood. Besides, according to the literature SMEs can have a significant impact on a city's economy and influence.

These three case studies are quite recent urban regeneration projects in Europe. They actually show the existence of a new trend in urban regeneration with environmental sustainability as the keystone for regeneration.

3 FINDINGS AND REFLECTIONS

3.1 Current trends regarding the processes used for urban regeneration in Europe

The case studies presented in this paper do not pretend to represent an exhaustive model of urban regeneration in Europe. The regeneration operations are highly various and depending on the local context. Nevertheless the case studies are representative of iconic kinds of regeneration operations. Dublin and Bilbao are examples of how major European Cities can regenerate from an economy based on a derelict industrial sector to modern economies. The examples of Malmö and Grenoble are representative of regeneration operations at the scale of the neighbourhood. These regeneration processes depicts particularly well the current trends – after 2000 – in urban regeneration concerning sustainability. Saint Etienne's case study is presented in this paper to show that regeneration processes do not always take place – although very often – in old industrial areas in city centres. The author is aware of the lack of regeneration projects in derelict areas due to social problems which would give a complete scope of urban regeneration in Europe. Nevertheless the aim of those case studies is not to show on which kind of areas urban regeneration in Europe takes place, but what the processes used in those regeneration projects are. The case studies presented are then good enough to draw the picture of the trends in the processes used for urban regeneration in Europe

The case studies presented in this paper do not only show regeneration projects which have been claimed as sustainable but also other successful regeneration projects since sustainability can also be questioned on these projects. Indeed, regeneration operations permitting cities to escape a deep crisis and high poverty can easily be seen as sustainable from an economical and social point of view.

3.1.1 Economical vs. Environmental driving forces

The case studies can be divided into two major types of regeneration: 1) regeneration driven by economical impulses and 2) regeneration driven by environmental impulses. Dublin and Bilbao were poor cities hit by the industrial crisis of the last part of the twentieth century. Their regeneration has thus been motivated by economic interests in order to stop the economic and social crisis cracking down on those cities. Bilbao's regeneration actually integrated a fair environmental aspect, but the main goal was more to fix the foolishnesses inherited from the past than to develop a more environmental friendly city in order to withdraw the burden of human activities on the planet. The driving forces which permitted the whole regeneration process of those two cities were thus essentially economical, since the basic motivation was to recover from a deep economical crisis; even if we can recognize that without the other aspects – especially environmental and social aspects – the regeneration process would not have been so successful. Such regeneration projects often lack deep environmental concerns in order to produce new pieces of cities lowering their ecological impact on the earth's carrying capacity.

Concerning the three last case studies, even if the economical part was important, the basic motivation was to provide environments which will be seen as a model for urban areas of the future in terms of environmental concerns. The main goal in those regeneration processes is to produce a piece of urban area which lowers its impacts in terms of inputs and outputs on the natural environment and which provides an urban atmosphere closer to nature. These examples show a second type of regeneration operations where the economic aspect only plays a third role, while the environmental aspect takes the first place and the social / living conditions takes the second one. The main idea in these regeneration processes is to provide better environments concerning the impact on nature and natural resources, but also concerning living conditions for people. Economical concerns are of course integrated in these regeneration processes in order to be sure to get money back from the investment granted. This is done through the implementation of shops and SMEs in the areas. The implementation of such economical activities presents the advantage of being compatible with environmental concerns and creates new centralities for the urban area. However one can blame the lack of real economical strategic plans which are essential in order to raise a long-term economy.

3.1.2 Recent major trends in Europe

Besides these two kinds of regeneration process previously described, new major trends in the regeneration processes applied currently in Europe can be highlighted. Here again, the aim is not to provide an exhaustive framework stating that the following trends are exactly what is urban regeneration in Europe nowadays.

Sectoral regeneration due to a focus on a very few aspects of urban complexity

Nobody could believe that Dublin would rise from the dead in a so short period of time, maybe not even Dublin's politicians and developers who prepared it. The aim was to recover a healthy economy and the goal has been reached. However, with the economical success came immigration and huge demographic growth. Dublin was not prepared to absorb such flows and consequently the quality of life and even Dublin's competitiveness has been severely damaged.

Dublin's case study is thus a very good case to question sustainability of such regeneration process. From an economical point of view, there is no doubt concerning sustainability since it brought prosperity to its inhabitants and even the whole country. However the rapid demographic growth has an unsustainable impact on the environment and on the living conditions in Dublin. Dublin is therefore a half-part sustainable regeneration project.

But what if Dublin would have addressed also environmental and social concerns in its regeneration process? The straight answer from a developer would be the traditional: *If wishes were horses, then beggars would ride*, or in French: *Avec des "si" on mettrait Paris en bouteille*. Nevertheless, one can argue that only a very few aspects have been addressed in Dublin's regeneration operation. This is actually the same when it comes to the other case studies. Bilbao lacks environmental and social concerns, while Malmö, Grenoble and Saint-Etienne lack real economical strategic plans in order to develop affordable living areas with a long-term economical perspective, instead of developing the classical shopping areas.

Thus, regeneration operations are characterised by their rather small capacity to develop an integrated approach on complex urban issues. They often tend to answer one main issue without paying attention to the real complexity that a city or a neighbourhood is facing. Using specific concerns as driving forces for the regeneration process is not blamed, but this is the lack of a holistic vision on the urban fabric and composition which is emphasised here. Having a holistic vision of what and how the sustainable city of tomorrow should be enables to develop integrated approaches dealing with and coordinating environmental, social and economical concerns in the same project. In this context of coordination of the whole urban fabric and composition towards sustainable strategic goals, better outcomes can be achieved in terms of economical sustainability, quality of life and environmental sustainability.

Developing new and high value-added economic sectors matching the European context

Europe, especially Western Europe, faces difficulties in developing a healthy economy. Its glorious times in terms of economical prosperity are far behind. Experts often say that Europe fails in restructuring its economy in a post-industrial era. Western Europe's economical future seems to stand in the development of high value-added sectors of the industry, in Research and Development and in the service sector.

All the case studies presented show this evolution towards such economies. Dublin moved from a derelict economy based on heavy industry to a highly dynamic and competitive knowledge economy. Bilbao developed the tourism industry and wants to develop a knowledge economy centred on culture and on the art industry. At a smaller scale Malmö, Grenoble and Saint-Etienne take part in this trend towards those new economic sectors characterised by high added-value in the economic chain. They try to attract SMEs or to develop a local craft industry located in the high-tech or service sector.

The trend of the current regeneration operations, whether driven by economical or environmental impulses, is therefore in the development of leading edge sectors which are far more competitive than the sectors related to traditional industry. These projects contribute to the restructuration of city's economy towards a more long-term economy. Nevertheless, the regeneration operations at the scale

of the neighbourhood often lack a strategic vision of the economy to be developed and which would be in accordance with the city's global economy. Such short vision is a brake to city's competitiveness and restructuration process.

Looking for ecology: the boom of environmental projects

The beginning of the 21st century shows an increasing interest of the European population in environmental issues. Several eco-neighbourhoods have been created in the manner of the Vauban Neighbourhood in Freiburg, Germany, BedZed in the UK, or Bo01 in Malmö. When looking at urban development operations or urban regeneration operations, if the operation is claimed as "sustainable" then the project is certainly centred on environmental concerns. In France, the "*Grenelle de l'Environnement"*, a national workshop concerning the development of a society limiting its impact on nature and on the earth's carrying capacity had a huge impact on the development of so-called eco-neighbourhood or at least urban environmental projects. One could almost speak about a kind of fashion concerning the French cities which all want to develop eco-friendly operations, reintroduce tramway lines in city centres, develop public systems for bike renting, etc. The sustainable city of the future is then almost always presented as an environmental friendly city.

This trend consisting in developing environmental friendly neighbourhoods is very good news towards a more environmental sustainable future. Nowadays, the projects which integrate such high environmental concerns produce neighbourhoods with a specific attention paid to architectural quality and more generally to a higher quality of life. Priority is once again given to inhabitants instead of favouring economic and individual transportation flows. Nature is in essence reintroduced into cities through increased attention to develop green areas, corridors, parks, etc. and even to the buildings through green roofs or façades. This greater attention paid to the natural environment can only be beneficial for cities.

However the development of such neighbourhoods proved to produce negative side effects: eco-neighbourhoods become expensive neighbourhoods which are actually only reserved for high ranked social classes. Bo01 is a good example of this negative side effect. Are we developing expensive living areas reserved for a category of population or are we developing living areas for all? Such questions need to be raised when developing such areas since it touches the heart of sustainable development. The second problem when developing such urban environmental project reflects the first trend regarding sectoral approaches of urban development: those projects very often focus on environmental features but do not develop strategic social and economical features in order to produce a fair and sustainable neighbourhood. Developing eco-neighbourhoods which are open to and affordable to every inhabitant is fundamental for the future or the fragmentation of the society will be increased where rich social classes will be able to live in environmental sustainable places while the other social classes will have to pay the abuse from the past.

Looking for diversity

Diversity is another keyword when describing the trends concerning the processes used for urban regeneration operations in Europe. Functional and social diversity are promoted, but nature is also not forgotten since more and more cities try to preserve and enhance biodiversity within their own urban areas.

Functional diversity is developed in opposition to a sectoral development of the urban fabric inherited from the past where transportation flows have been separated from pedestrian flows, where housing function has been separated from the shopping function, etc. Such division in the urban functions pushed towards an increase in transportation… which is quite unsustainable. Moreover, dividing the urban functions into dedicated areas does not promote social diversity and equity of access. The trend is nowadays being reversed. The new neighbourhoods developed in European cities tend to integrate mixed functions with this intention to give priority back to the people. The limit of the process is that except for re-implementing shopping functions in city centres and suburban neighbourhoods it is hard for developers to really attract other economic activities. SMEs' implementations are often the first objective of developers but it is already difficult to get such implementation since the lands are more expensive in housing and central neighbourhoods than in industrial parks. Companies' headquarters

are even harder to convince, although the proximity of the national and transnational transportation network or the proximity of a landmark project can convince certain companies such as the implementation of Iberdrola in Abandoibarra's neighbourhood – the Guggenheim neighbourhood – in Bilbao.

Recent regeneration projects show an increasing interest in increasing social diversity in neighbourhoods. This was the aim of *Bo01* – even if it totally failed – but also the aim of the *Quartier de Bonne* Project in Grenoble. The only leverage that the city or developers are currently using is the use to social housing quotas. In France, such quotas are imposed by a law for every city corresponding to 20% of the housing capacity. However this is not good enough to promote social diversity. The issue of affordability and accessibility of those neighbourhoods must be addressed as well. New and innovative levers should be developed in this sense. Even if social diversity wants to be increased by cities, or sometimes developers, the experience proved that social diversity does not increase by new regeneration projects but rather decreases due to those projects. Keeping control on lands' and accommodations' affordability by local authorities is thus central for developing sustainable cities.

The trend towards increasing diversity is also expressed in terms of ecological diversity, or biodiversity. The projects are looking to more "natural" solutions when it comes to the urban systems such as waste management or water management, especially storm water; and at looking to reintroducing nature in the urban environment. The introduction of green areas inside the urban perimeter enables to enhance biodiversity and thus to produce healthier cities. The choice of tree and vegetal species is selected carefully in order to preserve or develop the presence of certain animal species. Some vegetal species have useful properties for urban environments such as cleaning-up or hygrometric properties. Biodiversity promotion is developed through identified solutions: green areas and public parks, natural buffer tanks and dykes, ecological greenways linking all the green areas of the city and the outer natural environment; but also green roofs and green façades at the scale of the building.

A shift towards entrepreneurial regeneration

Due to the globalisation of the economy and the development of fast transport systems, from nowadays almost two decades European cities are facing an increasing competition between each other to attract investments, companies and tourists. In order to answer these new threats, cities try to develop a new vision of their city far from the industrial city. The keywords for cities are currently turning towards creativity, dynamic and profitable environments to invest in. The development of such image is also a good way to enhance tourism and thus another economic sector. Developing such image is done through flagship projects and by using entrepreneurial attitudes in terms of urban development where the priority is given for branding the city's image and to promote economical growth and private investments. Such approach proved to be more or less successful for several cities such as Bilbao, Dublin, Glasgow, etc. Nowadays it even seems that such approach of urban regeneration is seen by local governments, planners and developers as the best solution concerning deindustrialisation and regional economic stagnation.

It appeares that entrepreneurial approach of urban regeneration and development can be successful, even if, for instance, Glasgow does not really enjoy the return on investment expected (Gomez, 1998 ; Doucet, 2007). Local politicians seem to be convinced to adopt this new trend regarding regeneration. However, the literature is increasingly warning about the risks in adopting entrepreneurship as a local policy trend. The authors claim that rather than increasing the overall economic growth, entrepreneurial regeneration only deviates the few resources cities still have from essential areas such as housing, education or social welfare. Such regeneration actually only increases the spatial polarisation of the society where a very few area of the city is developed on the back of the rest of the urban area and this for a very restricted part of the population.

This trend towards entrepreneurial regeneration is therefore a risky bet that cities are making since they invest a huge part of their money in a very few areas to brand their image and attractiveness. Moreover, the city's image and attractiveness is restored at the expense of the major part of the population. Are cities designed and developed for foreign investments and tourists or for its own population? The sustainability of such approach on urban regeneration is therefore to be questioned.

When some flagship regenerations proved to be finally successful for the whole society, one can claim that entrepreneurial regeneration proved to bring a sustainable social and economical environment, but what about the rest of the non-successful projects? Can such risky and unfair approach on regeneration be qualified as sustainable? – Probably not.

Local Democracy

The use of local democracy seems both to increase and decrease depending on the projects. Local public consultation and participation processes are increasingly used when it comes to regeneration operations driven by environmental impulses. The local inhabitants are implicated into the process of regeneration through public meetings and workshops. Local associations are also consulted for the design phase and can be asked to manage a part of the neighbourhood's activities such as public park development and maintenance or the promotion of waste sorting, etc. The local population is asked to take part into the neighbourhood's activities in order to secure that the new neighbourhood fits the local population's expectations but also to give a sense of responsibility to this population in terms of lifestyle, environmental impacts, etc. Local democracy is a good way to develop sustainable projects since the main users of the urban object will have an increased awareness of what sustainable lifestyles and behaviours are.

Nevertheless, when it comes to bigger regeneration projects at the scale of the city for instance, the use of local democracy processes is less predominant. Bilbao's example even show how the governing authorities bypassed the public consultation claiming that the population could not know what was really needed for the city's own good. When it comes to large scale projects, it seems that the governing authorities prefer to elaborate their own action plan without submitting it to the local population. Bilbao's case is not an isolate case. Such attitude towards local democracy seems to be actually a consequence of a shift of several cities towards more entrepreneurial approaches on urban development.

More generally, it still seems that there is an increasing use of local democracy when it comes to urban regeneration in Europe. The use of bottom-up strategies is emerging in the governing authorities' practices.

An increasing use to cooperation processes

In recent urban regeneration projects, the use to public private cooperation processes seems to increase. It is particularly motivated by a financial aspect since public finances are quite bad and cities have currently no resources to finance costly regeneration projects. This is still a quite new practice but the private sector is taking an increasing part in urban development of European cities. It is the start of a new way of making urban development where the private sector is taking commitment on a long-term basis in order to develop the urban landscape. Private investments and commitments are increasingly present in urban development, in local public transportation, in the construction and the maintenance of roads, schools, hospitals or even in cultural and sport facilities. The level of use to public private cooperation depends on the country and on the legislation but the current trend seems to stand in an increasing use to such processes since cities have no choice but to look for private investments if they want to regenerate and revitalise their urban area.

Public-private cooperation is also a good way to attract new investments and it can positively affect the local economy as the British examples – for instance Liverpool – proved it. However those partnerships do not work if they are isolated. Partnerships require a strong investment of the authorities through the support of agencies and organisations at the local level, but also at the regional and national levels (Friesecke, 2007).

It is interesting to notice that partnerships are well developed when it comes to equipments, premises, buildings and specific services, but it seems more rarely used for projects dealing with environmental sustainability. In this domain of action, it is still the public sector which remains the leader in reconnaissance mission.

In the vein of the increasing use of entrepreneurial practices and the need of branding cities' names and competitiveness, the development of partnerships is logical since entrepreneurial attitudes encourage the development of huge projects and look at attracting private investments. A way of

attracting private investments and recognition is then to give opportunities to the private sector to take part in huge development projects demanding risky investments but giving the opportunity of good financial returns.

3.2 Critical reflection and discussion

Compared to the literature studied in this paper, the trends which are highlighted in this section show more or less sustainable features. Compared to the huge amount of features that are presented in the literature which deal with the development of sustainable cities, the current trends represent a very small part of it. The results from this case study analysis are positive and show a growing concern towards the development of sustainable features in regeneration projects. These trends show a good start but real improvements still need to be done.

The shift of some cities towards entrepreneurial attitudes and the lack of integrated approach characterised by more sectoral approaches cannot be considered as taking part in a new trend towards more sustainable development in urban areas. Even if such approach can lead to sustainable development of urban sectors, those approaches are very limited. As described more accurately in the previous section, entrepreneurial attitudes can be very efficient regarding regeneration but such attitudes are financially risky and increase the society's fragmentation and polarisation. As to the trend which consists in using sectoral approaches for regeneration, it only enables to improve a very limited number of sustainable features in an urban area. How can an environmental friendly neighbourhood be qualified as sustainable if it is only affordable for a restrictive rich part of the population? Is sustainability only restricted for the rich part of the society? – Of course not. The problem in this example – which is often the case for eco-neighbourhoods – is that developers and designers only effectively address one major stake which is in this case the environmental part. Even if one sub-objective is also to promote social diversity, such projects fail in achieving this objective because it was not addressed as a major stake of the project. Sustainable development requires to tackle urban development as a whole and thus to deal with the entire complexity of the urban environment. Stacking projects one after the other cannot lead to sustainable regeneration even if each aspect of sustainable development is finally addressed when tacking all the projects together. In sustainable regeneration, the whole is greater than the sum of its parts; which means that sustainability is to be taken as a whole which should not be divided into sectors. Thus Regeneration can only be sustainable if addressed through an integrated approach.

If sustainable development would only deal with the environmental part, it would be easier to produce sustainable urban areas. Indeed, environmental sustainability's stakes are easily identifiable since they are related to tangible scientific facts. The answers are then expressed in terms of objects and technical solutions which lower the impact that cities have generally speaking on the earth's carrying capacity. The social and the economical pillars of sustainability make the understanding of sustainable regeneration far more complicated. They cannot be expressed in terms of tangible scientific facts or observations. Social and economical stakes are related to intangible concepts such as culture or economical capital development. The answers which could be provided are therefore not easy to find and are often subjective and fluctuating. This can be a part of the explanation of why current sustainable urban projects are primarily dealing with environmental concerns.

Thus, sustainability stands in finding a balance between the environmental, social and economical stakes that an urban area is facing. This balance can only be found by approaching the specific environmental, social and economical stakes of a city or of a neighbourhood through a holistic approach. Having a strategic development plan seems to be essential to produce a sustainable area. In this sense, regeneration is done with a broad vision of what will be the city in, for instance, 30 years in mind. A strategic plan enables to develop a holistic and integrated approach on urban development. A view of what should be the city in the future and how it should be developed is then set. This approach enables to secure sustainability even if all the regeneration which should be done to reach sustainability will not be realised all at once. The strategic plan should be always revised year after year in order to stick to the complex evolutionary stakes of the urban environment. Having a holistic and integrated approach also means thinking in terms of global costs and life cycle in order to provide solutions which are sustainable during their whole lifetime. Sustainability also implies that those solutions are updated during their lifetime in order to always match the stakes and expectations of the

moment. Building blocks of the 1950's were actually sustainable at that moment. But they are not sustainable at all nowadays. Those solutions which have been provided in the 1950's to answer the stakes of those years did not evolve during the years in order to match the current stakes and new expectations. Nowadays, it is often necessary to raze everything to the ground and to rebuild anew. Is this process sustainable? – Certainly not. It requires huge amount of resources and energy and produces massive amount of wastes which pollutes the natural environment.

In order to avoid such scenario, it is necessary to understand the use of the objects and of the processes making up the urban environment. The uses can be easy or highly complex to describe. But the main stake is in following the evolution of the uses more than in describing the uses. Nowadays, it seems that serious technical solutions and concepts exist to produce sustainable neighbourhoods. Progress needs of course to be done and will always be needed, but the existing basis is strong. However sustainability is not something intangible but it is always in movement, always changing to fit new lifestyles and new stakes in order to lower the burden of human's lives on their planet. Actually, sustainability in the urban environment cannot be addressed without addressing the *evolutivity* of the urban objects and structure. How long is a solution sustainable? This could be a good question to be studied. Even if one cannot provide a detailed and quantitative answer, one know that a solution is never sustainable its whole lifetime. Sustainable solutions currently promoted need to evolve during their lifetime. This is what we call the *evolutivity* of the solutions. Sustainable solutions, beyond the fact that they have to evolve, can also need to be changed during their lifetime. Then solutions are changed to meet new needs and expectations due to a change in the use of the object or the service, etc. This is what we call the *mutability* of the solutions.

Evolutivity and *mutability* of regeneration solutions seems thereby to be fundamental in order to secure sustainability. More than providing solutions at time t, sustainability requires constant evolution and mutation of the solutions since sustainability is not an intangible truth.

The examples of urban regeneration and more generally the regeneration practices which have been presented and discussed in this paper are related to pretty substantial regeneration projects. As described previously, sustainability is often thought in terms of razing "old-unsustainable" buildings and premises to rebuild new-sustainable ones. Like if sustainability could not be expressed in small-scale regeneration, such as the scale of the building or of the accommodation. Actually sustainability should rests upon a step by step change of the urban fabric and composition, using the existing structures. Isolated actions, if they are taken in accordance with the strategic plan already mentioned, are to be promoted for a better sustainable regeneration process. Sustainability is currently in the hands of regeneration projects razing the existing environment to the ground, but it should be primarily and above all in the hands of regeneration projects keeping the existing environment but adapting it to meet the sustainable goals of the moment. Here again, at the smallest scale of the urban environment, the questions of *evolutivity* and *mutability* should be addressed. Regeneration is therefore not only a matter of big projects, but it integrates a broad scope of operations from small operations at the scale of the accommodation to the broader-scale of the entire city or urban community.

Thus, this is the whole way of addressing urban development which is to be rethought. Projects have by definition a start and an end (Maylor, 2005), but sustainability requires a start with no ending. Constant improvement is required by definition for sustainability. Urban development is therefore more than ever a matter of public policy where public authorities have the responsibility to provide the framework enabling a constant evolution towards sustainability. In short it seems that urban development is an activity which needs to evolve from a sectoral project-based approach to an integrated ongoing-project-based approach. The way the tool project is used nowadays in the public sector however is not compatible with a sustainable approach in cities. Since sustainability requires follow-ups, monitoring and constant readjustments, each part making a whole city has to be integrated into a monitoring process where sustainable objectives are set and are designed to be revised. Partnerships are actually interesting in terms of sustainability since performance objectives are set by the public authority and monitoring is settled in order to fit to these performances. Sustainable cities must be developed on the same model where projects are not start and ended but where projects start with performance objectives and where those objectives constantly evolve towards improving sustainability.

Developing a new legal frame and tool such as the project tool in order to developing sustainable cities is actually a whole new field of research which should be addressed in the coming years.

4 CONCLUSION

Cities are changing and they are changing fast. Entering a new era of competition, cities are responding differently according to their background and their aims regarding development. Nevertheless cities are commonly moving towards more competition and therefore a need to branding and improving attractiveness is emerging.

In this context, the question of sustainability is utterly important in order to avoid the mistakes from the past. A blind fast development would be as efficient as the urban development of the 1950's which are strongly criticised nowadays. Thus, there is currently a chance to develop more sustainable cities, which means cities that are better integrated in their environments. From an environmental point of view, a better integration means decreasing cities' withdrawals on the earth's resources and decreasing its load of rejections and discharges of pollutants and wastes on its close and on the global environment. Such processes are in accordance with the logic of decreasing cities' inputs and outputs.

From an economical point of view, a sustainable city has to develop a viable and fair economy for its population taking into account the existing economy. Developing fast growing sectors which create a lot of financial resources but do provide jobs for a restricted part of the population is thereby highly unsustainable. The entrepreneurial attitudes adopted by some cities tend nevertheless to ride this unsustainable tide.

From a social point of view, a better integration in a city's environment means a city which is responding and adapting to the current needs of the population. This means that a city has to evolve in parallel with the needs and expectations of its population and integrates sustainable practices and objects in its day-to-day life.

In order to respond to all of these challenges, cities have to adapt their way of approaching urban development and regeneration. Cities have to move from a sectoral approach of urban development to a more integrated approach embracing the complexity of the urban fabric.

The use to more holistic approaches of urban development is a keyword towards sustainability. Such approach should be taken with a strategic approach of urban development in order to set the horizon where the city should go.

The fundamental approach of urban development through projects has also to be rethought. Indeed, approaching the urban environment through the development of projects implies a tripartite dynamic: development, exploitation and maintenance, redevelopment. The evolutivity and mutability of the urban structure and composition is nowadays only possible through a long and jerky process while it needs rapid and smooth transitions. It is actually the approach of urban development by projects which imposes such jerky process since a project has a start and an end but no real continuity after. This approach implicates a lot of wastes in terms of finances and natural resources since one always has to design, build and operate to finally redesign and rebuild in order to readapt new needs and expectations. Such redesign and rebuild process cannot however be done at each time needs or uses are changing. They are therefore done when the building or the facility is at the end of its expected life. Then a new object is built to meet the current needs but a bet is taken for the future. Sustainability implicates a sober use of resources. Such approach is therefore not compatible with sustainable development.

There is thus a need to shift from a project-based approach towards a smoother process which would be based on follow-ups, continuity, evolutivity and mutability of the urban fabric and composition. The notion of follow-ups is actually very important in order to be always up to date and adapt to the real needs.

Sobriety, monitoring, evolutivity, mutability and integrated are the keywords for our future towards sustainability. One does not have to look for the best and for reaching supremacy over the world's resources, but to live and develop in accordance with our environment.

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