Abstract

**HafenCity Hamburg and the International Building Exhibition Hamburg – projects of sustainable urban development?**

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‘Sustainability is a political choice not a technical one. It’s not a question of whether we can be sustainable, but whether we choose to be’ (Gary Lawrence, Seattle Planning Department, USA)

The Free and Hanseactic City of Hamburg, Germany, aims to anchor the principle of sustainability in its urban politics. Hamburg's general principle of planning of 2009, the ‘Vision Hamburg: Responsible Growth’ (Leitbild Hamburg: Wachsen mit Weitsicht) depicts the matter of sustainability as a major aspect for future development. Two current large-scale projects, the HafenCity and the International Building Exhibition (IBA) Hamburg, which already in its planning state gained international attention, adopted sustainability as a central motif of development.

This study investigates in which sense and to which extent these projects include sustainable development factors, and if therefore Hamburg fulfills its self-set goal to act as a model for other European metropolitan areas to realize high-level sustainable urban development. In order to define the quality of sustainability implied by the HafenCity and the IBA, the general approach of urban sustainability in terms of its adaptation and evaluation is discussed beforehand.

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1. Introduction

Considering the matter of limited resources, sustainable development is an important task for humanity. Since several decades it is known that our current lifestyle is neither ecologically worthwhile nor socially equitable. There is no persistent attitude towards sustainable lifestyle as well as sustainable urban development and an assertive sustainable governing of space and resources is yet to be implemented. However, not only the conversation of nature is of great importance. Over the past decades, ecological scientists have focused on analysis and problem handling of current environmental problems, while now the matter of a sustainable lifestyle and a better living environment in a social dimension are gaining attention. In this course the aspect of sustainability also becomes more important regarding spatial development. Especially in urban areas, where space is limited, a sustainable use of resources is of great significance. The quality of life and living standard of people need to be conjunct with environmental quality as well as economic components. Therefore, modern urban development should not only consider aspects of spatial development of cities but create integrated concepts that combine economic, ecologic and social factors.

As the subject of sustainability becomes increasingly important for urban governance, the city-state of Hamburg adopted the issue as a *leitmotif* for its current and future development. Thereby not only ecological aspects associated with the climate change and economic sustainability linked with a stable growth of the city are included in the cities politics but furthermore social factors are incorporated in order to secure a equitable and high-quality living environment. Two current major projects, the HafenCity and the IBA Hamburg, seize the matter of sustainability and aspire to be international models of urban development. This study paper investigates these large-scale project for their quality of sustainability.

The first section of this paper deals with the general approach of sustainability and its significance for urban development. Theoretical principles and a definition of sustainability built up the basis for further project-analyses. In order to give an overview
of the context in which the HafenCity and the IBA Hamburg are realized, the second part of the paper gives an introduction of the city of Hamburg in consideration of its particular challenges regarding its urban development in the context of sustainability. Furthermore the main action priorities of Hamburgs urban politics and its vision for current and future development are illustrated. Following the case studies of HafenCity and IBA are introduced. The third part of this study combines the theoretical context of sustainability with the case study of Hamburg. Both projects, the HafenCity and the IBA, are analyzed and valued in terms of their sustainability. In conclusion both projects are compared with each other and a final evaluation of the sustainable development quality of the exemplified major Hamburg projects is given.

2. Theory of Sustainable Development

Although the matter and term of sustainability increasingly gains popularity by many authors with different areas of expertise, its versatile applicability and various interpretation possibilities complicate a common definition and practical implementation. (Jüdes 1997) However there are several components of sustainability on which the majority of scientists and politicians agree. In general sustainability is perceived as an integrated concept that aims a ecologic compatible, socially equitable and economic efficient development. In Germany the 'three pillar model', also known as 'pillars of sustainability' or 'triangle of sustainability' dominates the understanding of sustainability, which illustrates the interconnection and inseparability of the three components environment, economy and society. (Diefenbacher et. al. 1997) According to Kopfmüller the sustainability of none of the three factors should be achieved at the expense of another. This implies that the components are mutually interdependent and sustainable development requires the provision for all three factors. (Kopfmüller 2001)
The 'Club of Rome', founded in 1968 as a global think tank dealing with a variety of international political issue, adverted in 1972 to the finite nature and appealed for a responsible handling with limited resources in order to provide for a livable and stable future. (DiGiulio 2003) However, the final report of the World Commission on Environment and Development 'Our Common Future' 1987 was the first official record to depict the concept of sustainable development. The so-called Brundtland Commission defines sustainable development as follows: “sustainable development meets the needs of the present without compromising the ability of future generations to meet their own needs” (DiGiulio 2003: 35). Besides the concurrent and integrative provision for ecologic, economic and social dimensions the concept of sustainability represents the demand for inter-generative compatible development. Sustainable development aims to promote the development of society in consideration of long-term goals. In the following years the notion of sustainability gained importance in scientific and political discussions and established itself on all spatial levels stimulating international, national and local programs guidelines of urban development.
2.1 Sustainable Urban Development

The Federal Office for Building and Regional Planning (Bundesforschungsanstalt für Landeskunde und Raumordnung or BfLR) describes sustainable urban development as a development that improves the local quality of life while supplying the needs of current and future inhabitants without constraining those of people living in other regions. According to the BfLR there are three major factors in order to achieve sustainable urban development: resources, regional correlation and spatial structures. (BfLR 1996) Resources like energy or space are limited goods. Therefore sustainable development regards the application of renewable energy sources and technology as well as the limitation of urban sprawl and land consumption. Cities are functional interrelated with their surrounding areas. The division of labor between the city and region can be organized in avail of sustainable development by for instance obtaining the cities supply from its hinterland. Current spatial structures are often energetic inefficient and constitute additional transport while expanding settlement area. In this regard the principle of spatial arrangement of density, hybrid land use and poly-centrality are of great importance of a sustainable spatial concept. A higher spatial density in terms of compact urban construction and a low rate of urban sprawl cater for a more efficient use of energy, water and building area. A hybrid use of space mixing urban functions such as labor, housing, retail and leisure reduces transport, energy as well as land use. Moreover, poly-central multifunctional urban structures relieve the city center and strengthen locality. (Sabancilar 2002)

In conclusion, sustainable urban development regards to the integrated spatial and structural overall development of a city. Sustainable development of urban space aspires a fair consensus between the interests of present and future city people through a responsible use of existing resources. Sustainable urban development can only succeed if measurements and actions implemented equally consider economic, ecological as well as social dimensions.
3. Sustainability in Hamburg – a Case-Study

The city of Hamburg integrates the concept of sustainability in its vision for future urban development and advocates the integral provision for economical, ecological and social aspects. Currently Hamburg carries out the development of two large-scale project sites that are discussed internationally in the scope of sustainability. For this reason the HafenCity Hamburg and the International Building Exhibition Hamburg are depicted as case-studies for the analysis and evaluation of sustainable urban development. An overview of the city's challenges regarding a sustainable development as well as an illustration of general self-dedicated development goals is provided in the following part of this study paper.

3.1. Challenges of sustainable development in Hamburg

The city-state of Hamburg with about 1.77 million inhabitants is the second largest city in Germany. Hamburg is the center of the European Metropolitan Region of Hamburg. It economically dominates the surrounding region and is regards as the central market and settlement area within northern Germany. Commuting is a central dimension of Hamburgs regional correlation. The number of people commuting from the surrounding area into the city of Hamburg is three times higher than people leaving the city to work. The disproportionate use of urban infrastructure in relation to its actual population effects the requirements on spatial use and challenges local and regional politics. (Ahlers/Krause 2006)

While the population only slightly increased during the recent years, processes of suburbanization led to a highly dynamic population development in the suburban centers. (Bauriedl et al. 2008) Between 1970 and 1989 Hamburg lost 200.000 inhabitants due to suburbanization. Although Hamburg recorded a rapid population growth after the German reunification, for the last 15 years population increase predominately proceeded in its surrounding area. Now the urban agglomeration exceeds the city-states border to a
large extent. The resulting superior land use is one of the main problems in the context of sustainable development which plays a major role in Hamburg city politics. (Bauriedl 2007) Nevertheless, Hamburg is one of the few German regions for which a population growth is assumed. The population forecast presumes a population increase of 80,000 people between the years 2004 and 2020, whereas the growth will slow down towards the end of the forecasting horizon. The death surplus will increase, immigration from abroad will maintain constant featuring 6,000 people per year, the negative balance of suburb migration will be reduced by -5,000 and positive migration balance will decrease to 10,000 to 4,000 people. In total the population will increase until 2020 up to approximately 1.8 million people. (Statistisches Amt für Hamburg und Schleswig-Holstein 2009)

Demographic change which is referring to aging and migration of society also affect family and social structures. Greatly emerging household types such as single parents, single or pensioner households have differentiated housing needs and demands on urban society. Urban politics have to broaden its focus on the nuclear family and to adopt to the varied household types in order to satisfy their needs.

One quarter of the total population in Hamburg has a migrational background, which is a greater rate than the German average of 19 %. What’s more, 46 % if immigrants in Hamburg are below the age of 18. (Statistisches Amt für Hamburg und Schleswig-Holstein 2009) This feature underlines the importance of integration and multicultural urban development to political urban development in Hamburg.

Since the crisis in the shipyards, the harbor city of Hamburg underwent a profound structural change in the past decades, with the strengthening as a logistics site as well as expansion of services and the communication sector. (Bauriedl et al. 2008) Although Hamburg is one of the growing economic centers in Germany. It features an over-average economic growth of 1.7 to 1.0 % in 2000 to 2004. In comparison with other German urban areas only Düsseldorf and Stuttgart recorded to stronger economic growth. However, Hamburg can not detach itself from the national and global economic problems and in particular its services and media sector is affected by the crises. Like everywhere
in Germany employment is decreasing, but the rate of labor decrease is lower in Hamburg than in other cities. Furthermore, a change in Hamburg’s employment structures can be observed. So called 'mini-jobs', part time jobs as well as self-employment gained importance whereas the number of employees with social insurance contributions decreased. (Statistisches Amt für Hamburg und Schleswig-Holstein 2009)

3.2 Vision Hamburg: Responsible Growth

Resulting from its socio-demographic and economic current development and future challenges, Hamburg needs to prove itself as prosperous with attractive living space in order to compete within the national and international context for inhabitants and enterprises. The Senate of Hamburg combined its general principles for future development in the development report 'Metropolis Hamburg – the growing city' (Metropole Hamburg – Wachsende Stadt) for the first time in 2002. The updated version of 2009 'Vision Hamburg: Responsible Growth’ (Leitbild Hamburg - Wachsen mit Weitsicht) emphasizes on a qualitative growth model that achieves economic and demographic growth alongside with resource conversation and integrated sustainability. Hamburg aims expand its function as a metropolis and to reinforce its international appeal. The above average growth in the economy and employment sectors shall be promoted and the number of inhabitants be increased. At the same time the quality of life and the sustainability of the city shall be secured. (Stadt Hamburg 2009).

Corresponding with the objectives and fields of action the Senate designated several key-projects in order to make the vision of future development more tangible and enhance the identification of the population with the concept. (Hamburg 2003a) The key concepts are introduced as follows:

The 'Welcome Center Hamburg' was created in 2006 and serves as a versatile service point for potential national and international skilled workers and their families as well as for students, new residents, investors and businesses.
The 'Cultural Metropolis of Hamburg' caters to function as a global hallmark. By offering various cultural attractions such as musicals, theaters, ballets, operas, museums and galleries as well as lively club scene, Hamburg aims to create cultural flair of high quality. One of the main projects is the Elbe Philharmonic Hall, established in the HafenCity area.

Hamburg as a 'Metropolis of Knowledge' is supposed to position Hamburg as hub for research and development not only throughout Germany but also internationally. Various international scientific panels and congresses are being planned. Since 2005, the Academy of Sciences, existing alongside with the HafenCity University, combines science with the areas of construction, architecture and urban planning in particular.

The 'City of Sports' is likewise market nationally and internationally. In this regard top athletic activities are being encouraged and international sporting events organized. During the World Cup 2006 five games took place in Hamburg.

The key project 'Leap across the Elbe' focuses on inner urban development. The development of new inner city housing and working areas shall make use of urban qualities such as density, infrastructure and urban vitality as well as create a hybrid mixture of land use for working, recreation and housing.

The overview of the general principle for Hamburgs urban development and its key concepts demonstrate the emphasizes on sustainable development. Bauriedl (2007) claims that Hamburgs main development goal is the 'growing city' promoting economic sustainability. However, Hamburgs vision of sustainability as depicted in the theoretical framework for development includes ecological and social dimensions. Two current large-scale projects, the HafenCity and the IBA Hamburg, that gain attention of national and international professionals play a major role in Hamburgs present development efforts. Therefore they can be considered exemplary for actual implemented planning and development standards. To which extend not only economical stability but also
ecological and social dimensions are incorporated in these developments will be discussed in the following part of this study.

Figure 2: Location of case-study sites within Hamburg

![Map of Hamburg with highlighted areas](source: map: maps.google.com; own illustration)

3.3. Case-Study I – HafenCity Hamburg

HafenCity Hamburg is a project of city-planning which rebuilds the old harbor quarters of Hamburg with offices, hotels, shops, official buildings and residential areas, located directly by the waterfront (figure 2). The project is one of the largest rebuilding projects in Europe in the 21st century.
The HafenCity site is located on flats in the Elbe river which was developed into built-up area and port facilities. Workshops, warehouses and merchants' premises became characteristic features of the port-related environment. After the industrial revolution the port area was enlarged and a new 'Speicherstadt' warehouse complex was constructed at the development site in order to replace storage facilities in the city center. Due to increasing container trade the transshipment business has moved to modern facilities south of the Elbe river. (Hafen City 2009 a)

Since 1991, the revitalization of Hamburg's port area was prepared. The plans starting at the time were highly confidential. In the run-up to the development process land which at the time was not property of the city of Hamburg was purchased by the city and existing leases were terminated. In 1995 Hamburg founded the Cooperation for Port and Site Development (Gesellschaft für Hafen- und Standortentwicklung or GHS). (Tölle 2005) In May 1997 the former mayor Henning Voscherau officially announced the plans for the development of the HafenCity. (Voscherau 1997) The master plan for the Harbor City introduced in February 2000 by the Hamburg Senate. (GHS 2000)

The HafenCity Hamburg contains an area of 155 hectares between the warehouse district, the upper harbor and the north Elbe. According to the principle of 'living and working on the water' the recreation of the free-port area forms an expansion of the inner city with housing and businesses. (Tölle 2005). The idea is to not only promote trade and industry, but also to focus on the soft qualities of a city, such as quality of life, culture and the natural environment. The HafenCity seizes the development goals as promoted in the 'Vision Hamburg - growing city' and aims to create a sustainable environment for investors and inhabitants. Stimulate economic growth of the city but also functions implementation on high-quality environmental sustainability. (Hafen City 2009b)

The masterplan divides the area of the HafenCity in eight quarters and eighteen sub-quarters. The sub-zones have a similar structures and form homogeneous units. (Tölle 2005). The development period aggregates 25 years while the basic course of
development is from west to east and spread of building activity over the entire planning area is prevented. (GHS 2000)

3.4. Case-Study II – International Building Exhibition (IBA) Hamburg

The Elbe islands, site of the International Building Exhibition Hamburg, are located in the middle of the city of Hamburg, between two arms of the Elbe (figure 2). Nearly 55,000 people from some 40 nations live in these 52 square kilometers. Whereas the area was agricultural used until the middle of the 19th century, the Elbe islands were turned into port land with the beginning of the industrialization due to the rapid increase in the transport of goods that the old port facilities of Hamburg to the north of the Elbe could no longer handle. After the flood of 1962, the Hamburg Senate originally wanted to declare the whole area as part of the port. At the same time the traditional port industry suffered from the economic structural change towards the service sector and the Elbe islands lost a major part of its economic and urban importance. As a consequence of the change in economic structure in the seventies and eighties, the south of Hamburg attracted attention almost exclusively in terms of its problems, its social trouble spots, its problems with a range of infrastructure, and its many shortcomings in urban planning. The Elbe islands were increasingly neglected as a residential area by the Senate. Moreover, a railway route for freight transport was established in 1974 through the district. In 1994 the Senator announced the construction of an incinerator, followed by plans of 2003 for motor ways running through Wilhelmsburg. (Humburg 2009) By 1997, things had progressed – disused inner-city areas had been opened up for urban development for the planning of the HafenCity. This new district rounds off the semi-circle of the Hamburg central city area towards the Elbe, opening it up to the river. Since 2002 also the Else islands are included in inner-urban development plans. In October 2005 the city council of Hamburg decided the memorandum for the International Building Exhibition 2013 in Hamburg as a thematic model but also as a measurement of the concept ‘Leap across the Elbe’ declared in the development vision of Hamburg. As part of the model concept ‘Hamburg - Growing City’ the development aims to entail
sustainable development in the districts Wilhelmsburg, Klein Grasbrook, Steinwerder and Veddel as well as the Harburg upriver port. (IBA 2009a)

During the last century the International Building Exhibitions developed as a tool for promoting planning and building culture in Germany that furthermore gained international recognition. It has long since been transformed from its original concept as simply an architecture and urban planning exhibition, to become a tool for solving complex and long-term issues of urban development by means of examples. The IBAs treats specific local or regional problems and addresses to social problems and future issues of social change. The developments aims to find model solutions for current economic, building-cultural, environmental and social challenges. The IBA Hamburg is realized in the period 2006 to 2013 with the goal to eliminate the spatial, cultural and social separation between the north and south of Hamburg. (IBA 2009a)

In order to structure various threads running through the complex debate on cities IBA Hamburg adopted key themes to address on several levels, such as social integration, town planning or environmental interests. At the sociocultural level the 'Cosmopolis' theme refers to its international urban community. It applies to cultural and social issues by establishing various offers such educational programs like language support or the Environment and Science Center. In town planning terms, IBA aims to demonstrate how the inner peripheries, the 'Metrozones' may be redeveloped. The long-neglected project area will constructional be transformed which aims to increase the attractiveness of the area by means of a hybrid mixture of waterfront, port, city and industry. Due to the simultaneous implementation of the International Garden Exhibition IGS the district also undergoes landscaped changes. The key theme 'Cities and Climate Change' is about countering climate change. The main focus lies on the avoidance of greenhouse gases, the use renewable energy, energy supply solutions, and energy saving measurements. In total there are 36 leading projects in the fields of construction, energy, education and culture. Each project provides a contribution to one of the three above aforementioned themes 'Metropolis', 'Cosmopolis' and 'Cities and Climate Change'. (IBA 2007)
4. Analysis and Evaluation of the Case-Studies in terms of sustainability

The brief introduction of the case-study sites HafenCity and IBA as provided before allows an insight view of the planning context and development conditions. The development sites are analyzed in respect to sustainability in economic, ecologic and social dimensions. According to the extend of integration of these factors the projects are evaluated in regard to their quality of 'sustainability'.

4.1. HafenCity – analysis of a case study

The HafenCity GmbH itself describes the HafenCity as a sustainable project, furthermore the media conceive the development a sustainable urban development project. According to the chairman of HafenCity Hamburg GmbH, Jürgen Bruns Berentelg, the progress towards a sustainable development is clearly visible in the project development. He claims the project management to be a pioneer in the field of certification and refers to the HafenCity as a founding members of the German Society for Sustainable Construction (DGNB), which recently awarded the first certifications that involves among others sites, the Commercial Center Harbor City of Hamburg and the Hamburg Emporio which both are located in the HafenCity. (DGBN 2009)

In 2007 the HafenCity GmbH established an own environmental certificate to evaluate the constructions. Developments that are particularly ecological and sustainable are awarded with a silver award for special and golden award for extraordinary achievements. This measurement aims to create a competitive situation and to increase incentive of energy efficient and sustainable building development. Originally conceived as a voluntary element, it is now a prerequisite for purchase of several properties. In order to be awarded a building needs to fulfill certain building standards. (Venn 2009) The primary energy use of buildings must be reduced and significantly undercut legal requirements. A sustainable management of public goods such as use of water saving fittings or implementation of architectural competition must be given. Furthermore
environmentally friendly building materials are required to be used. Buildings should to be built without using halogenated materials, volatile solvents and biocides. Another category is the integration of health and comfort in the form of a healthy room temperature, air moisture and hygiene. Finally the sustainable operation of the building is investigated for instance according to low maintenance requirements or use of durable materials. For the achievement of the label, three out of the five given categories have to be fulfilled according to the aspired standard level. (BSNB 2008)

The HafenCity GmbH points out that the whole area is a brownfield development. The previously industrial land is reused whereas no expansion of the urban space by transferring green areas on the outskirts is needed for the project realization. Furthermore, the HafenCity as being a inner city expansion development achieves a high density with a floor space index of 2.5 to 3.0. At the same time the dense construction reduces land consumption and soil sealing. Out of 122 ha land area 22ha are used for promenades, public open space or green zones. (Gefroi 2008)

Upon completion, the project site is supposed to be a mixed-use development consisting of living and working, and moreover offer a range of culture, retail, education, tourism and entertainment facilities. This small-scale mixed-use development aims to strengthen the centrality of the individual compounds and to reduce traffic. However, it is questionable whether this aspect actually applies after completion of the HafenCity and residents of the new district are able to or willing to find a working place in the HafenCity and whether offered convenience and retail store are able to satisfy their daily needs. (Hafen City 2009b) Moreover some developers decided to offer more profitable housing in the building ground levels instead of implementing stores or medical practices as originally assigned by the HafenCity planners. Due to these kind of financial-oriented measures the local primary supply and the quality of a hybrid development structure is significantly reduced. (Gefroi 2008) Although the HafenCity promotes various open and green spaces, most public recreation space is sealed and only a few areas are naturally designed green spaces. Figure 3 gives an overview of available green space in the
HafenCity district. Dark green colored areas regard to open green spaces and light green areas to private green spaces. Light gray colored areas illustrate promenades and public squares.

Figure 3: Green Space in the Hafen City Area

Due to its central location the HafenCity is accessible without the use of individual cars. The new metro line U4 crosses the U1 and U3 and directly connects the HafenCity to the city center of Hamburg. General accessibility by bike or foot results from large pedestrian walks and bicycle lanes. (Hafen City 2009b) Due to its central location the HafenCity is accessible without the use of individual cars. The new metro line U4 crosses the U1 and U3 and directly connects the HafenCity to the city center of Hamburg. General accessibility by bike or foot results from large pedestrian walks and bicycle lanes. (Hafen City, 2009b, 38). However, there are no car-free zones or shared spaces and separated bicycle lanes are absent. Therefore the accessibility clearly stands in favor of motorized vehicles. (Gefroi 2008)
The HafenCity will not contain above-ground parking garages but instead compose underground parking spaces. However, according to the 'Allgemeiner Deutscher Radfahrclub' (ADFC) this feature interferes with the well-developed cycle routes by crossing underground car park exits at intervals of a few meters and thus present a danger to cyclists. (IVV 2009)

The heating of the development is planned to be configured with a significant reduction of CO2 emission. The energy supply of the building results from community heating, decentral heat production through energy contained in the fuel and solar heat. (Antoniadis 2009) In total not more than 175 grams of CO2 are supposed to be released per kilowatt-hour. Considering these standards, the pollutant emission can be reduced by 27 % compared to a building-gas heating. (Hafen City 2009c) Further ecological measurement include rain and gray water treatment, thermal energy saving measures, the orientation of buildings towards the southwest for ideal use of sunlight and heat insulating construction types. (IVV 2009)

4.1.1 HafenCity – evaluation of a case study

Regarding economic aspects of sustainability, the certification of buildings is noteworthy. The initiators favor developers that comply with high environmental standards and aim to exhibit a large number buildings featuring a low CO2 emission rate, low energy consumption or the use of alternative energy. Since there are no requirements to adhere to these standards and because the projects are currently under construction or only partially completed, no final evaluation in this regard can be given. Other economic indicators such as unemployment rate can not be valued at this point of the development process. The HafenCity combines parts of four formerly individual districts. Therefore no statistical data of this new city district is available yet.

Several environmental aspects are taken into consideration by the project management. The HafenCity is a brownfield development which does not demand additional land use of greenfield. There is no data regarding the consumption of water but measures of rain
and gray water treatment are provided. The CO2 emission of certificated building is kept low and renewable energies are implemented. On the other hand, the HafenCity offers a very low proportion of green space which is generally not considered as environmentally sustainable. Most open public spaces are sealed area.

Large-scale and high-price developments such as the HafenCity often lack sustainability in the sense of social development. It can be assumed that neither poorer population groups such as welfare recipients or groups with migrational background will be integrated in a project site that is as centrally located and features as high building standards as the HafenCity. The HafenCity offers modern office buildings and penthouses that are due to the high land and rental prices only affordable for population groups with a high income. Therefore the population structure will be homogenous and does not allow integration of financially and socially disadvantaged. However, cultural offers are widely integrated in the project site. The International Maritime Museum opened in the summer of 2008 and a Science Center including a 'science theater' will open in 2011. The Elbe Philharmonic Hall used as a center for various cultural events will be completed by 2012. (Hafen City 2009b) Nevertheless, these cultural offers particularly target high-income groups.

Considering the thesis that sustainability is only given when the three dimensions of economical, ecological and social sustainability are integrated, the evaluation of the HafenCity project does not declare the project as a fully sustainable development. The development plans include good approaches in the field of economy and ecology. Given the building standards will be realized as declared, the project tends to achieve economic sustainability. If a sufficiently number of constructions adopt the high environmental standards designated, the overall trend can also be valued as a sustainable development site in the ecological dimension. Still, it remains open whether the given standards will be met upon completion. The social dimension is disregarded in terms of sustainable development. Bauriedl claims that, although Hamburg refers to its challenges regarding social integration in its political program, the implementation of this task is not
consistently taken into account in the planning for the HafenCity. (Hoja 2001) 'Displacement of social groups is not just a side effect of this strategy, but as well its aim' (Ronneberger et al. 1999) In conclusion an integrative understanding of sustainability in the HafenCity is not realized, but remains a secondary objective. (Bodemann 2001)

4.2. IBA – analysis of a case study

The three key themes of the IBA Cosmopolis, Metrozones and Cities and the Climate Change represent a series of projects with different sustainability goals and can be assigned to the different dimensions of sustainability. Cosmopolis particularly deals with social issues. Metrozones includes projects that depicts structural measures and solutions to problematic issues such as building stocks in need of rehabilitation and therefore reflects the economic component. The theme Cities and Climate Change refers to ecological projects and encounters environmental challenges. (IBA 2009b) Since a large number of projects are developed in the context of the IBA, the analysis of sustainability realized by the IBA is conducted by means of dedicated essential development projects. Based on selected projects this study paper displays to which extent components of economical, ecological and social sustainability are taken into account.

IBA Hamburg seeks to establish a 'Cosmopolis' between HafenCity and Harburg as a modern urban space where many cultures integrate and live together. For instance the renovation activities of the housing area in the southern part of the Reihorstiegviertel aim to create a 'World Quarter' of inter-cultural living with 1,700 inhabitants from 30 countries. Before the urban design competition was arranged, several public participation programs were held. The implementation of civic participation early in the development process through for example inter-cultural planning workshops increases the acceptance of reconstruction in the neighborhood. (Hamm 2009)
The education center 'Gateway to the World' treats sustainability in the social as well as in the ecological dimension. The project comprises a education and counseling center that combines public rooms for educational purposes, a secondary school, a language school, a School & Business Center and an Environmental and Science Center in one complex. (IBA 2009g) The center is planned to fulfill efficient energy standards and to provide a wood-fire plant, a solar heating system as well as a photovoltaic system. The education center is only one of several projects in the range of educational and cultural promotion. Various projects serving this purpose are distributed throughout the Elbe islands. Due to their different conceptual frameworks they closely cooperate with each other. (IBA 2008)

The Elbe Islands are a good example for spatial structures of inner peripheries of many European cities. They feature a patchwork set between city and port, industry, leisure and marshland areas, divided by Hamburgs major southbound traffic arteries. The diversity and central location of development site offers great potential for profound urban and landscape reorganization. Core of the spatial reconstruction is the new Wilhelmsburg center (Neue Mitte Wilhelmsburg). Alongside with the IGS 2013 several IBA projects will be realized in this area. They include the construction of new industry and business buildings, a hotel, experimental residential buildings as well as the new building of the Office for Urban Development and Environment of Hamburg which targets to function as an example in terms of sustainable construction and operation of buildings. The new urban center will comprise an estimated 30ha and be surrounded by green spaces established in the context of the IGS. (Hamm 2009)

Hamburg’s Elbe islands illustrate a gap between growth and environmental concerns. On the one hand the port has to keep expanding to function as an economic growth engine while new residential neighborhoods on the Elbe Islands allow the city to grow in terms of population development. On the other hand, there are still unspoiled natural areas; the marshlands represent a green waterside biotope which need to be reconciled with the imperative to protect the climate and conserve resources. The key theme 'Cities and the Climate Change' aims to find solutions for allowing urban growth without stressing the
environment but additionally producing energy instead of only using it. The 'IBA Dock' represents a floating exhibition and office building at the Müggenburger Zollhafen. (IBA 2009c) The construction is a zero-balance-energy concept and includes a CO2-neutral air-conditioning and optimal insulation. The cooling and heating can be reduced to a minimum and a solar-assisted electric heat pump will be implemented. Energy is produced by photovoltaic on the roof of the construction. From 2014 on it will host start-up enterprises. (IBA 2008)

A 40m tall former bunker in the middle of a residential area will be transformed into an 'energy bunker'. A 3500m² large solar thermal plant on the roof, a biomass co-generation plant and a seasonal storage for more than 20,000m³ water will provide approximately 800 apartments in the surrounding area. The water and heating supply can be supplied with the produced energy while a portion of the generated electricity is fed into the public service networks. (IBA 2008)

The co-called energy mountain ('Energieberg Georgswerder') is a landfill mound on which wind turbines and photovoltaic systems will be installed. At least 2,000 households on the Elbe islands are supposed to be supplied with electricity through this project. (Hamm 2009)

4.2.1 IBA – evaluation of a case study

Regarding the economic component a promotion of financing social and environmental investments is given. The citizens of the IBA area are encouraged to switch to renewable energy which is financially supported by the city of Hamburg. Furthermore the project strengthens the innovative capacity of sustainable development. Various new constructions initiated by the IBA feature high-quality technology that provides superior energy standards.
In terms of environmental criteria many IBA-projects are planned in considering of high standard energetic construction or rehabilitation. Not only in the individual IBA-projects throughout the Elbe inland, but also a large number of the existing building stock that is not included in actual reconstruction plans are supposed to be modernized in favor of low energy consumption and renewable energy. Through the implementation of solar thermal, photovoltaic systems or wind turbines the transition to renewable energy is sought to achieve 100%. Regarding the land use, building areas are being reorganized or renovated. No greenfield area is converted into new development land.

Several social aspects are integrated in the IBA development plan. The site is inhabited by people from many different cultures. The proportion of people with a migrational background and of people receiving welfare benefits is over-average. Unemployment is a greater issue compared to the rest of Hamburg. Social integration is promoted through various projects such as educational and public participation programs. Neighborhoods that undergo a structural upgrading process are often characterized by processes of gentrification. This development can not yet to observed in the IBA district. However, it can be assumed that such a displacement of current inhabitants might take place if development strategies are positively accepted by higher income groups from outside and rental prices increase.

In conclusion the development project of IBA Hamburg fulfills several aspects of sustainability in the economical, ecological and social dimension. The economic component is approached by financially supporting ecological and social investments. A clear trend towards sustainable development in regards to the environmental dimension due to the implementation of high-ecological building standards is depicted. Social sustainability is catered by various projects offering educational programs and establishing multi-cultural social activities.
5. Comparison of the case studies and final conclusion

Both projects, the HafenCity and the IBA Hamburg, are long-term developments that are realized over a period of several years and both anchor the objective of sustainable development. However, there are some structural differences between the projects that complicated a direct comparison. The spatial location differs in terms of centrality. Whereas the HafenCity is directly attached to the city center and therefore described as an inner city expansion, the IBA site is located with more distance from the city center and has long been a neglected district in terms of territorial development. Furthermore, the HafenCity provides a much greater financial budget and exclusively features new building constructions rather than the rehabilitation of an existing neighborhood. Despite the different development conditions a final assessment of both sites in regard to their sustainable quality is provided as follows. The analysis shows that both developments, given that indicated measurements are realized upon completion, fulfill aspects of economic sustainability. Furthermore the HafenCity as well as the IBA Hamburg focus on the implementation of high-quality environmental standards and therefore can be depicted as sustainable in the ecological dimension. Considering social aspects of sustainability, the IBA Hamburg includes several measurements to create a socially and cultural stable living environment. The HafenCity however only regards to few social components and does not indicated social integration of disadvantaged social groups. Finally, the question arises, to which extend the case studies can be classified as products of sustainable development efforts. According to the this study underlying understanding of sustainability as a development that combines economical, ecological as well as social criteria to the same extend, the HafenCity can not be considered as a sustainable development project. Whereas the HafenCity only meets two dimensions of the sustainability concept, the IBA site presents development efforts in all three aspects and is valued as a project of sustainable urban development. However, a final evaluation of the case studies can only be provided after the successful completion and implementation of the development projects.
6. Bibliography


Voscherau (1997a): Rede von Bürgermeister Dr. Henning Voscherau am Überseetag, Pressestelle der Freien Hansestadt Hamburg