Integrated and coherent urban planning based on regional development strategies

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Abstract. Any modern urban community has to overview the development strategy regarding the future development. The lack of such a vision may lead to missed development opportunities, resources which are irrationally consumed, urban chaotic development. The study has been conducted with the focus on the city of Cluj, Romania but the findings are very much applicable to developing city like Riyadh. A harmonious urban development can be achieved only through an integrated approach of all the factors that influence the dynamics of the urban life: economic, environmental, social, cultural etc. This type of approach is crucial in urban design considering the problems facing cities nowadays regarding demographic variations, various economic fluctuations, lack of jobs, climate changes. According to the design regulations, sustainable planning should be based on four principles: global, functional, prospective and democratic. Urban design at regional level means practically a close collaboration at the level of sectorial policies between all municipalities in order to function as a whole. The paper discusses the urban development strategies of the Cluj-Napoca metropolitan area (sectorial strategies, strategic directions, operational programs). The project focuses on the main development problems that have arisen in Cluj-Napoca in the past decades, trying to find solutions in order to improve the quality of life; such as different infrastructure projects, redesign of urban spaces, refurbishing old building situated in historical centre etc. One of the main focuses of the paper regards is the expansion of public transportation, special attention being paid to the persons with disabilities and elderly; development of reliable and sustainable infrastructure at regional level, urban, peri-urban and rural areas in order to support economic development of Cluj-Napoca city. Another focus of the paper discusses the design and renovation of green spaces around the city. The research aims to be a guideline offering valuable suggestions for further urban development guides in terms of sustainable design for cities that are rapidly developing. Furthermore, it is of great relevance for the Saudi Vision 2030 regarding the sustainable cities and communities, building resilient and sustainable infrastructure in order to support economic growth, focusing on retrofitting industry and increasing resource-use efficiency.

Key words: Sustainability, Energy Efficient Design, Retrofitting, Transportation, Green space design, Economic Growth
1. Introduction
Many of us question what is a sustainable city? A sustainable city is a city which offers a high-quality standard for the citizens considering their necessities and the surrounding nature. But trying to achieve the concept of a sustainable city is very challenging for the developing cities nowadays. The paper attempts to discuss and develop concrete principles regarding sustainable development in regional developing cities in their process of urbanization. Although the main guidelines are mainly the same in all academic papers the purpose of this paper besides discussing the existing methods of reaching to a sustainable city is to explore new methodologies, thus offering the opportunity for the future stakeholders to integrate them in their future projects situated in urbanization areas and the municipality to benefit in the further projects regarding the mobility and transformation of the city.

The rapid development of cities has come with great challenges in terms of historical preservation of city as well as protection of environment, thus sustainable development. Urban regeneration projects are essential and could provide effective solutions to the challenges that have arisen with the rapid development of metropoles.

Sustainable development should be a priority in big cities, especially since the population density is constantly increasing and the municipalities are not being able to overcome these changes. A city that is sustainably developing is a real magnet for economic opportunities, innovation and progress. But the major issue in designing such cities is the lack of buildable areas and the available ones need urban studies in order to realise the infrastructure and urban coherence with the existing built areas, thus the population has slowly shifted to neighbouring areas, close villages thus placing the municipality and the city council urban designers, in order to avoid previous mistakes made. One of the issues that Cluj-Napoca is confronting with is the fact that connecting roads between the communes and city centre are overtaken by the large influx of commuters, requiring therefore the construction of express roads, bypasses and new roads in order to take a part of the traffic and reduce the amount of time spent by the commuters on their way home.

At the same time, it is necessary to implement a unitary approach in development of the cities, a strategic and spatial planning at metropolitan level which must take into consideration urban development, integrated mobility, modernization of infrastructure and improvement of public transportation, rehabilitation and modernization of public spaces and creating educational infrastructure.

2. Methodology
The research method used for this paper was mainly based on literature review and case-studies analysis. The ongoing research examines the existing literature and the design codes in order to provide a new perspective and guidelines that can be integrated in practice by the future stakeholders. The research methodology also included studying the design plans of major developing cities, in order to trace the similarities between the design approach used. This helped in evaluating initially the problems that major developing cities are facing and their solutions in reaching to a more sustainable city. Taking into account that the main purpose of the study was to trace new directives regarding the integrated and coherent planning at regional level similarities case-studies were consulted. In-depth research was conducted in order to be able to propose and try to revolutionize the urban planning at regional level, thus allowing planners and stakeholders to meet the needs of the population in major developing cities, such as Cluj-Napoca or Riyadh. The paper combines concepts from planning theory, architecture, transportation, civil engineering and environment engineering, taking into account that all these disciplines need to be interconnected.

3. Literature review
Literature and specialized articles deal in depth with the topic of sustainability in cities that are constantly developing. There are a multitude of definitions regarding the concept of sustainability, concepts that are also treated in the legislation, such as the Law of spatial planning and urban design
Although the literature deals with issues such as mobility, land use, ecology, biodiversity, each of the disciplines involved in the design plan places looks at these issues from their own perspective. In recent years, interdisciplinary studies have become increasingly common, as these disciplines complement each other. Analysing the research done among the centuries in the domain, it was observed that some studies focus mainly on reducing the ecological footprints on cities [4], with a strong emphasis on reducing pollution, reducing the use of non-renewable resources and shifting to renewable resources, studying also the impact and negative effects on the environment.

4. Findings and actual research presentation
Integrated urban development means the involvement of both local authorities and public sector, civil society, investors in urban regeneration of cities. All over the world, metropolitan urban areas are made up of urban agglomerations, concentrated in built-up areas and a ring belt that helps transiting the city, located at the periphery of the city [1]. However, the big cities, worldwide are affected by a multitude of problems in term of sustainability such as urban sprawl, congestion in central areas, poor mobility, lack of green spaces.

The economic and socio-economic growth of a city can be very much influenced by urban design of it by either encouraging new businesses or attracting entrepreneurs into the city, attracting new citizens or creating new job opportunities, facilities for citizens or creating new services.

According to the European Development Strategy until 2020 the urban areas through the European Regional Development Fund (FEDR) have had the opportunity to focus on regional development that takes into account sustainable urban mobility, encompassing disadvantaged communities. Each EU state had allocated 5% of the FEDR in order to carry out projects targeted on sustainable and integrated urban development, led by local authorities under the close supervision of the Urban Development Network (UDN). The EU’s sustainable target is a low-carbon economy, green infrastructure, territorial cohesion and urban mobility [5].

4.1. Urban strategies around the globe
Unlike the cities in EU, those in USA have the advantage of large land areas that can be urbanized. Currently the urban development in the developing cities situated in USA include directives that define the volume of the building, the construction materials, the arrangement of the elements on the façade, location of the parking places, typology of the roof etc. A particularity of the USA city design is the zoning, that separates clearly the urban areas from the industrial ones, in order to reduce the segregation of the population in the city centre. Thus, the rules regarding the land use, the type of structure allowed, density of services and buildable volume are drawn by the urban codes. [10]

Meanwhile Australia’s principles of urban development focus on creating places for people. The urban design practices prioritize sustainable transportation with an emphasis on pedestrians, cyclists, public transportation and lastly private transportation. Regarding the urban development strategy, it is focused on the needs of the community both and metropolitan and regional level, local and towards the public spaces. A great emphasis is placed on revitalizing and transforming degraded and abandoned areas, retrofitting existing buildings. Urban planning in Australia focuses on creating sustainable housing, mixed use of land and spaces, encouraging the use of public transportation in the detriment of personal cars, combined with a better use of resources, energy and water used in buildings [11].

4.2. General urban plan of Cluj-Napoca
Although Cluj-Napoca benefited from a general urban plan since 1999, basically the old general urban plan took over the provisions of the “Regulations of constructions and alignments for the Municipality
of Cluj-Napoca” from 1933, with slight small differences and updates, taking also in account the area urban plans and detailed urban plans in force at the time the of the approval of the general urban plan.

The general urban plan of Cluj-Napoca divided the urban area into 11 territorial reference unites with related to subzones, such as C- central area and other areas with complex functions, E- area of public equipment dispersed at neighbourhood level and residential complex, F- area of related activities of worship, L -living areas, A – zones of productive activities, B-zones of spa and touristic activities, V-zones of green spaces, T- transportation areas, G- zone of communal management, S- zone with special destination, R- area of major technical equipment.

A peculiarity of the general urban plan of Cluj-Napoca is the height regime established as an indicator of construction in the 19th century, which was related to the cornice of the building in which the University Library is currently located. Subsequently, the height regime to which the new constructions referred was modified, the reporting being made in front of the cornice of the Cluj Branch of the National Bank of Romania, located on Eroilor boulevard.

This approach was also taken over by the PUG in 1999, with minor modifications, therefore if the neighbouring buildings located 100 meters from the headquarters of the National Bank, were higher than the maximum height regime was equal to that of the tallest building. Considering that the city was in a continuous development and the PUG could no longer be legally extended, in 2014 the new PUG was approved with a regulation meant to help a better development and to take into account the expansion of the city.

4.3. Major issues in the urban development of Cluj-Napoca

One of the major problems facing the developing cities, such as the case of Cluj-Napoca, is the chaotic development of peri-urban areas and the reduction of the population density in the central areas. The development I the neighbouring areas of the city occurred in an uncontrolled, unplanned and inefficient manner leading to the massive urbanization of areas which are closest situated to the city, such as Floresti, Gilau, Chinteni which do not have the capability to overtake the population, the traffic and do not offer working options thus leading slowly to the increase of traffic towards the main cities.

But unfortunately, the much-desired new regulation did not lead to a better management of the development of the municipality with a lot of deficiencies that led to the need to develop a new general urban plan for 2024 to address the problems of sustainable urban development in the last decade. The new PUG that is emerging addresses issues such as the construction of traffic rings around the municipality - an inner belt and an outer belt to connect the A3 highway in the area of Ciurila commune, the goal being to relieve the municipality of current heavy traffic.

4.4. Controlling the urbanization process

Planning strategically and sustainable the development of cities is very important because it makes easier the coordination in space for any further investments [2]. The elaboration of a new general urban plan places great emphasis on sustainable and coherent urban development oriented in principle on the accessibility of public transport, non-motorized transport, reducing the number of parking lots in the central area and creating parking lots at the exit from the city, improving the street network in the area central heating, the creation of new green spaces and the rehabilitation of existing ones, in a word, the improvement of the quality of life of the citizens. In fact, it is desired to develop and transform the industrial areas in order to achieve economic development spaces with complementary functions and endowments, the so-called regional development poles such as Cluj Innovation Park.
4.5 Innovative practices towards coherent and integrated sustainable development

Considering the lack of buildable space in Cluj-Napoca, innovative practices should be considered, such as temporary use of vacant spaces, renovation or reconversion of buildings, temporary use of spaces for activities, revitalization of old architectural buildings situated in central area, redesigning previous projects in order to make them more accessible to the current needs. Such projects have been developed already in Cluj-Napoca, for example the rehabilitation of the Firefighters tower, rehabilitation of Elisabeth promenade, redesign of the skate park, restoration of Tailors Bastion.

Tailors Bastion was first rehabilitated in 1924 (Figure 1) and transformed in museum by the Commission of Historical Monuments, followed by another restoration in 1959. During the communist period, it was designed as a history museum, which included a photography laboratory and restoration workshop. But because of the communism regulations it was never opened to the public. After the end of the communism in Romania the Tailors Bastion was left unused and thus lead to degradation. In 2007 the municipality of Cluj-Napoca conducted a project that aimed to restore the architectural building and transform it into a gathering place for the local events. Between 2007-2009 that building underwent a major renovation and rehabilitation project (Figure 2) transforming it into the Urban culture centre, with a conference hall and various exposition spaces. Besides the conference hall and the exhibition spaces, the Tailors Bastion also shelters a coffee place and is a perfect place for conference, cultural events and concerts. This is just one of the projects that can make a difference regarding the reconversion of buildings into a building that can fulfill the needs of the century we are living in.

The Firefighter’s Tower (Figure 4) is another revitalization project conducted by the City Hall of Cluj-Napoca, based on the winning project of the contest organized by the Romanian Architects Order, Transylvania branch, in 2017. In 2018 the City Hall signed the rehabilitation project, that is done partially on European funds. At the end of the project, the building will be an Urban cultural centre just like the Bastion Tower, hosting events and exposition spaces. An interesting aspect is that...
the Firefighter’s Tower will also host the touristic information point and a 360 degrees observation platform towards the city (Figure 3).

Figure 3. Firefighter’s Tower 360º observation platform  Figure 4. Firefighter’s Tower before the rehabilitation

Besides the above-mentioned projects, high importance should be paid to the reconversion and modernization of the old architectural buildings situated in the city centre. Taking into account the fact the buildable space in the historical centre is reduced, some of the abandoned historical buildings can be transformed in new attractive buildings, having either touristic functions (hotels, apart-hotels) or offices. By implementing this type of projects, the new is integrated within the old, by keeping the architectural character of the historical centre untouched. Such an example is the reconversion of the Melody hotel situated in the city centre of Cluj-Napoca into a university.

Another innovative project towards achieving a sustainable coherent city is the revitalization of parks situated in the city of Cluj-Napoca. The majority of parks have been abandoned since the end of the communism era thus they need to be modernized but also build new green spaces and parks in the new developing neighbourhoods. The municipality of Cluj-Napoca is carrying an intensive program of renovation of such parks, for example: The 14th July Square, the National Theatre Park, the Farmec park etc. The aim of such projects is to bring them to life by creating gathering spaces for both the youth and the elder people, with lots of greenery and adequate workout devices, seating places, a place for socialising.

5. Conclusion and final holistic performance achievements
As shown by the study, revitalizing old buildings can lead to creating new cultural and administrative spaces, thus attracting new activities in the city, by putting them in a new view from socio-economical point of view. A sustainable city focuses on the community and by creating gathering spaces for the community the citizens in order to feel involved in the development of the city. The public administration should revise the regulations currently in use according to the market conditions and constantly improve them in order to make them more appealing and attractive for the stakeholders.
6. Recommendations for further research

This research is just a preliminary study of the measures that can be implemented and must be taken into account in order to achieve a coherent and integrated sustainable design of a developing city such as Cluj-Napoca or Riyadh. Further research should be conducted in order to address the questions that the majority of citizens and stakeholders are asking, regarding the urbanization process, how they can be involved in the design process and the solutions for reaching the so much wanted sustainability of the city.

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