Sustainable, Green, Smart and Open City _
Rethinking Mostar

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ABSTRACT **One of the main challenges of the 21st century is that of how to run the city. Development that is based purely on the exploitation of the natural resources is hopefully behind us, but the wounds to be healed are numerous and our consciousness is changing more slowly than expected. Obvious climate changes, causing many problems in cities (floods, landslides, earthquakes...), overpopulation and inadequate spatial planning, bad building practice and lack of greenery, infrastructure that cannot sustain growing settlements, lack of legislation, and inability to adjust to contemporary trends, are the main issues for many of today's cities. Transforming the city into a resilient organism, changing usual practices, is not an easy task for many societies.**

All contemporary knowledge, based on decades of studies and research on this topic, showed that the only ways to approach strategies for city development and spatial planning should be taken holistically, taking into consideration all indicators and constant changes in the circumstances given by many stakeholders and conditions.

This section gives an overview of the challenges faced by the 21st century city, focusing on possible development with the aim of creating, of keeping the city alive. The authors explain and compare sustainable/resilient, green/edible, smart and open cities. Mostar is presented as a case study, along with its historical background, urban development, and current situation. Finally, the authors propose some solutions for Mostar, based on history, acknowledgments, and current trends.

Some of the answers on the ways in which the city can become more resilient to the physical, social, and economic challenges of 21st century lie in their development as sustainable, resilient, green, smart, and open cities.

KEYWORDS urban development, sustainable urbanism, resilient city, open and agile city, smart city

1 Introduction

What makes our cities liveable? For decades, the focus of urban planning was to keep the cars happy, but the city is not just about traffic efficiency and parking spaces. The shape of the city, above all, has enormous impact on the human lives. It is all about how people, not just cars and buildings, use spaces, and how people feel living and walking around them. The fact is that the 21st century is bringing more and more changes at all scales, including urban planning, and more demands and challenges are defining the running of everyday life in the city.

FIG. 1.1 Old Bridge in Mostar: green Neretva shores

Urban ecology is a sub science of ecology – it studies relations between coexisting living organisms and their environment, in this case urban, and mostly high-density, built spaces.

In addition, urban ecology falls into human ecology, dealing with the built environment and unbuilt space. This includes the maintenance, protection, and preservation of the built environment and yet unbuilt space (Morsan, Vahčić, Lušić, & Mladina, 2007, pp. 455-476).

Contemporary studies on urban ecology are very focused on various individual problems, such as hazards, on human lives, and on the

pollution and destruction of bio-diversity, but only a small number of such studies is devoted to the city as an ecosystem. Today's concept of sustainability, in general, is the result of mistakes made throughout the last century. Lack of greenery, pollution, increased heat, vacant buildings, heavy traffic, etc. are all problems that most of cities are trying to solve.

"Sustainable community development is the ability to make development choices which respect the relationship between the three "E's"- economy, ecology, and equity:

- Economy - Economic activity should serve the common good, be self-renewing, and build local assets and self-reliance.
- Ecology - Humans are part of nature; nature has limits, and communities are responsible for protecting and building natural assets.
- Equity - The opportunity for full participation in all activities, benefits, and decision-making of a society" (MACED, n.d.).

Frederic Steiner, in his paper, 'Opportunities, for urban ecology in community and regional planning' published in Journal of Urban Ecology in 2016, says: "Our species plans. That's who we are: plan makers. We rely on knowledge, instincts, and gut reactions to guide our decisions. Good plans rely on a careful reading of a place or a situation. Plans require context. Ecology, especially urban ecology, can contribute much to an understanding of place and context in city and regional planning" (Steiner., 2016, pp. 1).

The organisation of sustainable urban development is a very complex task. It is not just about the repair of the urban tissue that has been damaged in the past - it is about preventing it from further damage, protection of identity, making conditions for development and use of the land, introduction of new technologies, giving response for various demands, and environmentally correct behaviours in everyday situations. Therefore, the question is: how should we make our city liveable, resilient, and sustainable?

Throughout the world, there are no two cities that share the same history, problems, or solutions. Although diverse cultures, political environments, climate conditions, and other factors have made cities all over the world look completely different – today, they all have the same goals – sustainability and resilience. It is not just the responsibility of planners and architects to foresee future developments - planning now requires the input of many more vocations and experts from different fields, as well as political will and an educated and demanding society.

The city of Mostar, once an oasis of greenery and water in the karst area of Herzegovina, was proclaimed by UNESCO to be architectural masterpiece built up on distinctive styles. During the recent war (1992-1995), the city underwent vicious devastation, but more concerning was the post-war lack of legislation and management, and bad politics, which brought Mostar to its worst phase in terms of urbanism, greenness, resilience, and sustainability. Nevertheless, many citizens, non-

governmental organisations, companies, and educational institutions realised this problem, and decided, from the standpoint of their own expertise, to try to find a new model to make Mostar green again, as well as smart, sustainable, and open. Rethinking Mostar and examining technological tools, business models, and participatory smart development can transform the city, and return it to the list of the most desirable places to live. The approach that is argued for the development of the future city also considers technology as a tool for creating smart, market-based solutions for all citizens. Integrating tools and technologies for big data management allows more objective decisions in urban sustainability planning and development.

Through this chapter, the causal relationship between urban ecology and urbanisation, i.e. the link between urban planning and ecology, according to the principles of sustainable development, is to be shown.

2 Sustainable Development Principles

Mankind started to change this planet with the first furrow planted with domesticated crops. Human settlements continued on this path, which was more or less successful and stable. People learned how to adjust their cities to work with nature, respecting the winds, water, microclimate, fertile soil, geomorphology, resources, and other factors that influenced their future in a certain location. They always used local resources with profound respect and developed practices, crafts, and customs according to them. Growing populations and developments in politics and economy brought cities to divergent phases of its function. The ability to adapt to changes in society, and the development of human skills and technologies became the measure for any successful long-lasting city, capable of transforming to meet new demands.

From Egypt and Mesopotamia, through Persia, Aegean civilisations, China and India, South America, Greek and Rome – different civilisations invented different practices for building sustainable societies. Ancient cities and their stories, told through legends or new scientific discoveries, are valuable sources for understanding how a particular society lived and how sustainable it was. Vanished civilisations are the best examples to show us what happens when the development rushes forward regardless of resources and potentials.

Through recent decades, as we faced global problems of climate change and various social and economic issues, it became clear that we should change attitudes in many areas of human behaviour and, in doing so, many definitions for sustainable development came to life.

The most widely known definition of sustainable development comes from the Brundtland Commission (UN, 1987, pp.3-5), which defined sustainable development as a development that will not compromise the ability of future generations to meet their own needs.

In preparation for the URBAN21 conference in Berlin in 2000, sustainable urban development was defined as: "Improving the quality of life in a city, including ecological, cultural, political, institutional, social and economic components without leaving a burden on the future generations" (What is a sustainable City? n. d.).In 2015, United Nations adopted a set of goal for a sustainable future in its agenda: 17 Sustainable Development Goals and 169 targets, which demonstrated the scale and ambition of this new universal agenda (UN, 2015, pp.3-5). This agenda was made for the following 15 years, taking into consideration all important issues concerning future development (Fig. 2.1).

FIG. 2.1 UN sustainable development goals 2015-2030. *(Image by UN, 2015) Retrieved from http://www.un.org/sustainabledevelopment/sustainable-development-goals/*

The highlights of the declarations comprise 5 Ps:

- **People** - We are determined to end poverty and hunger, in all their forms and dimensions, and to ensure that all human beings can fulfil their potential in dignity and equality and in a healthy environment.

- **Planet** - We are determined to protect the planet from degradation, including through sustainable consumption and production, sustainably managing its natural resources and taking urgent action on climate change, so that it can support the needs of the present and future generations.

- **Prosperity** - We are determined to ensure that all human beings can enjoy prosperous and fulfilling lives and that economic, social and technological progress occurs in harmony with nature.

- **Peace** - We are determined to foster peaceful, just and inclusive societies which are free from fear and violence. There can be no sustainable development without peace and no peace without sustainable development.

- **Partnership** - We are determined to mobilize the means required to implement this Agenda through a revitalized Global Partnership for Sustainable Development, based on a spirit of strengthened global

solidarity, focused in particular on the needs of the poorest and most vulnerable and with the participation of all countries, all stakeholders and all people." (UN, 2015, pp. 3-5).

The only solution for making the cities liveable, sustainable, and resilient is to take a holistic approach. We must understand the past in order to plan the future; we must know the climate, and have wide knowledge about climate changes, and its possible predictions and scenarios. Additionally, the thinking process must be continuous – after determining indicators, pointing out the problems, determining the goals, finding out the best solution and tools – we must be aware that even if it is possible to implement the whole design – it is essential to provide monitoring and allow new data to be incorporated. Projects of this kind are successful only if they are resilient and sustainable – that means that they must meet real-time problems and changes, and be able to react immediately for different tasks. Natural disasters (floods, earthquakes, landslides...) and changes in trends and policies are the main issues that such strategies need to predict. The time between the emergence of the problem and the appropriate reaction shows us how resilient the system is. The ideal situation would be that such plans and strategies have already predicted and identified these scenarios and are thus able to provide an immediate and effective response.

2.1 Sustainable City / Resilient City

The Oxford dictionary defines the sustainable city as: "A city constructed or landscaped in such a way as to minimize environmental degradation, with facilities (such as transport, waste management, etc.) which are designed so as to limit their impact on the natural environment, while providing the infrastructure needed for its inhabitants." (Oxford dictionary online, n.d.).

Another term that is also used to define the future of city development and its ability to face and accept changes is 'resilient city'. According to Resilientcity.org: "A resilient city is one that has developed capacities to help absorb future shocks and stresses to its social, economic, and technical systems and infrastructures so as to still be able to maintain essentially the same functions, structures, systems, and identity" (Resilience, n.d.). The same source (Resilience, n.d.) determined the main obstacles that cities must be prepared to overcome:

- CHRONIC STRESSES
  Stresses weaken the fabric of a city on a daily or cyclical basis.
  Examples include:
  - high unemployment
  - overtaxed or inefficient public transportation system
  - endemic violence
  - chronic food and water shortages

– ACUTE SHOCKS
Acute shocks are sudden, sharp events that threaten a city.

Examples include:
- earthquakes
- floods
- disease outbreaks
- terrorist attacks

With examples of many unsustainable communities all around the globe that give us an understanding of the risks of reaching the point of no return, many experts started to rethink and change the paths for urban development. Today, thanks to science, media, politics, and responsible individuals with vision, many cities have reached the goals of becoming almost fully sustainable or even self-sustainable. Throughout the world, the improvement of quality of life has become one of the main goals for further development. Cities that are attracting educated and young people who have an awareness of environmental issues have certainly benefited in many fields. Changes to old spatial planning patterns, and new holistic approaches towards life of the city and its inhabitants, have made significant impacts on the quality of life for many cities and countries.

"Sustainable communities are those that believe today's growth must not be achieved at tomorrow's expense" (Initial Report, Governor's commission for Sustainable South Florida, 1995).

Sustainable communities are communities with a vision and a sense of space and time. These towns, cities, and villages are deciding to become and remain healthy and long-lasting. It is not just about preserving ecosystems, it is about how to live and build sustainability through all human values, culture, and businesses. Public health, quality of life, and economy all depend on how the society deals with use of resources, waste management, environmental policy, traffic, land use and other issues.

Many studies were introduced in recent years to show how cities have managed to answer new challenges of becoming sustainable and resilient. Many cities are competing to become leaders and trends-setters in these fields. In relation to Mostar, it is clear that we can learn from past, change current trends of ad-hoc decision-making, and try to make strategies and plans that will allow the city to react in sustainable and resilient ways.

2.2 Green Cities, and Urban Farming

Nowadays, green cities represent a new, post-industrial way of thinking. Nowadays, half of the world's population lives in the cities, while in Europe, two out of three people are living in urban environments. Polluted air, dirty streets and facades, and grey skylines were the background for most of the big city panoramas. Awakened awareness, fear of increasing

global natural disasters brought by El Nino, melting icebergs, and new scientific data obtained by many measuring instruments, have changed the way we see our future. Many responsible individuals with divergent backgrounds and different interests made the first pioneering attempts to persuade society, politicians, and governments to start looking at the world through a practical, smart, and logical prism of possibilities and abilities.

In last decades, many countries decided to change the path of future – instead of erecting more and more concrete, glass, and steel buildings on every available green spot in the city, they are starting to do the opposite. This is not just to preserve the greenery, but also to add more to existing streets, roofs, and facades.

				INDICATORS			
	PERIODICITY	AUTHOR	CITIES	TOT	CATEGORY	N°QUANT.	N° QUALIT.
Urban Ecosystem Europe	(2006) 2007	Ambiente Italia	Europe/32	25	**Air quality**, Acoustic Environment, Water, Energy, **Waste**, **Transport**, Green areas and land use, Building, CO_2, Health, Equity, Education, Participation	21	4
European Green City Index	2009	Economist Intelligence Unit	Europe/30	30	CO_2, Energy, Building, **Transport**, Water, **Waste** and land use, **Air quality**	17	13
European Green Capital Award	Since 2010	European Commission (DG Environment)	Europe/ cities with more than 200,000 inhabitants	56	Climate Change, **Local Transport**, Green Urban Areas, Nature and Biodiversity, **Air quality**, Quality of Acoustic Environment, **Waste**, Water, Waste Water, Eco-innovation, Energy, Environmental management	52	3
SDG 11	2015-2030	United Nations	World	13	Building, **Transport**, **Air quality**, **Waste**, Green areas and land use, Education, Equity, Safety, Health, Participation	10	3

TABLE 2.1 Methodological characteristics of tools. The categories highlighted with bold font are present in all the indices. *(Pace, Churkina, & Rivera, 2016., pp 15, 16)*

Many studies have been done in last few years that have tried to determine which is the greenest city in the world, but the results vary depending on the criteria set and cities included (Table 2.1). What is

interesting in this race is that every city that starts competing - wins! Even minor changes to the unsustainable systems of the '70s and '80s are bringing multiple changes for the environment and people, resulting in attracting successful and leading industries and young people with visions. Some of the most unappealing cities in the world have now become the most desirable.

But, green cities are not about the percentage and square meter area of greenery – it is about the quality of life. Green cities offer sustainable environment (infrastructure, public transportation, reduced emissions...), good politics, working opportunities, etc.

Not long ago it was almost unthinkable to use the city as a garden. Gardening was reserved almost exclusively for rural areas and for city border areas and suburbs.

Ignoring ancient civilisations like the Egyptian and the Inca, we can find early examples of so-called Victory gardens from WWI and WWII eras, all over USA, Canada, United Kingdom, Australia, and Germany.

FIG. 2.2 Victory Gardens poster *(Retrieved from http://www.crazywebsite.com/Free-Galleries-01/USA_Patriotic/Pictures_WW1_Posters_LG/WWI_Poster_Victory_Garden-3LG.jpg)*

On January 11, 1942, the Office of Civilian Defense (OCD) announced that Local Defense Councils would start community Victory Garden Programmes. The Secretary of Agriculture and DHWS appointed a National Garden Advisory Committee to lead the Victory Garden programme. The Committee included members from industry, extension, home-making, garden clubs, and garden publications (Endres & Endres, 2009, pp. 32-35).

The purpose of the programme was fivefold:

– better the health and nutrition of Americans by increasing the consumption of fresh fruits and vegetables;

- encourage the proper storage and preservation of food; 3) provide money savings to be applied to foods that had to be purchased;
- assist urban gardeners in obtaining communal property in which to grow fruits and vegetables; and
- "maintain the morale and spiritual wellbeing of the individual, family, and Nation". (Endres & Endres, 2009, pp. 32-35).

These gardens were the main supplier of quality food for most people living in big cities in such times of hunger and war, while they also boosted local economy and bonded people in time of crises.

Another example, that continues even today, is Cuba. Its isolation during the Cold War and increased dependence on Soviet merchandise and food, inspired Fidel Castro and his government to introduce various sets of measures from 1960 onward. Nevertheless, the fall of the Berlin Wall and the Cold War drew drastic changes in Soviet politics, and made Cubans hungry again.

On September 26, 1990, the government declared that the country was in a "Special Period of Peacetime" and that austerity measures equal to being at war would be instituted. On the supply side, Cuba announced a multi-faceted new food programme aimed at increasing domestic production to achieve food self-sufficiency (including state-run farms, farm labour initiatives, farmers' markets, land re-utilisation & small-scale gardens, agricultural extension) (Endres & Endres, 2009, pp. 32-35).

The City of Havana created an Urban Department of Agriculture with satellite offices throughout the city (Murphy, 1999, pp.12-13). Their example was a role-model for many of today's societies.

FIG. 2.3 Urban farming in Ljubljana, Slovenia

Many cities in the USA recently found different motivation for urban farming and edible cities – from economic and environmental, to social motives.

Chicago has more than 40 established community gardens spread throughout its park system, the oldest of which was established during World War II. A partnership between Green Living Technologies and the New York City–based firm Elmslie Osler Architect installed four wall panels in downtown Los Angeles to help feed lower-income and homeless people. Los Angeles also has an initiative called the Urban Farming Food Chain Project, which constructs food-producing wall systems and mounts them on buildings (Lehrer & Dunn, 2011).

Sustainable European and Asian cities also follow these trends, inventing new models and technologies. Urban farming is a link between tradition and technology, all in favour of sustainability and a better life.

Benefits from urban farming are many:

- Reduction of pollution and global warming, improvement of the quality of urban environment, and an increased percentage of greenery in the city;
- Transportation and storage cost reduction, and reduction in energy use and pollution from exhaust gasses and packing waste;
- Involving community, increasing social awareness, poverty reduction, and social interaction;
- Infrastructural improvements (usage of wastewater, absorption of rainwater, forming of sound and dust zones and barriers...).

Urban farms can be situated in various locations – from parks, unused plots, rooftops, public spaces, facades, inner courtyards, etc. Many of these use the principles of "permaculture" for more sustainable development.

In many cities, urban farming became a lifestyle.

2.3 Smart City and Open City – Transformation Strategies

There are several important global trends that shape our future. One of these trends is the rapid growth of the Earth's population. Another important trend is the changed role of the city; 21st century cities are becoming smart and open. To better understand what smart and open cities are, we will explore the core definition of 'smart' and its business models. This will allow us to understand how technology can transform our urban landscapes and improve quality of living.

The smart city is defined in many ways, but to simplify the understanding of smart we will observe the smart city as being instrumented, interconnected, and intelligent. Instrumented means aggregating and interpreting real-time data about all urban activities; interconnected means allowing devices to communicate and data to be exchanged between different cities; and intelligent means applying data analysis models that allow us to better understand city dynamics and therefore make better operational and management decisions (Albino, Berardi, & Dangelico, 2015, pp. 3-21). The smart city allows us to learn and

innovate through using its digital infrastructure, and in order to be able to innovate we must question the known methods and learn how to ask the right questions. This will lead our cities to become open cities that transparently share insights with its citizens, allowing them to directly participate in development and innovation processes.

A citizen-centric approach to developing new services in smart cities is perceived as a sustainable model. However, business models around this approach are not firmly set and will certainly evolve over time. The evolution of the business model for Mostar and other similar cities depends on how citizens and businesses reflect upon the digitalisation of their city and their expectations of city government.

CONTENT PROVIDER	Providing static and dynamic content, including contact information, organisation information, product and service information, and news.
Direct-to-customer	Directly providing services to customers and/or businesses. Various stages can be determined, including the information, communication, and transaction stage.
Value-net-integrators	Collecting, processing, and distributing information from several organisations. This is a networked type of business model that often focuses on a particular customer segment; for instance, entrepreneurs.
Full-service provider	Enabling interaction through directly providing information and services. This involves the collaboration of several departments and/ or organisations to create a one-stop shop.
Infrastructure service provider	Providing infrastructural services to support the creation of an online presence.
Market	Matching the supply and demand with regard to information, human resources, services, or goods; for instance, matching volunteers with requests for volunteers.
Collaboration	Providing the instruments and tools needed to participate in activities like policy-making projects and decision-making, including visualisation and simulation tools that can be used to predict the implications of policies.
Virtual communities	Providing a community of recurring customers, including user-generated and shared content, and the sharing of content.

TABLE 2.2 Business model for e-government, several studies *(Janssen et al., 2008; Weill and Vitale, 2002., Kuk, G., & Janssen, M., 2011.)*

Building digitalised city architecture will enable citizens and businesses to better access such services, and will enable a city government to reach its citizens more quickly, by offering them online access to both information and services. However, to initiate this transformation the city needs to implement an e-government system comprising four stages: online documentation archive, online transaction system, and vertical and horizontal integration (Kuk and Janssen, 2011, p. 40). There are several examples of business models that e-government brings to cities, which are: providing direct customer-to-customer communication and enabling direct transaction; aggregating information and distributing it to a different target audience (e.g. visitors, entrepreneurs, and investors); establishing one-stop-shops that allow full service and prevent time waste; developing collaboration tools and prediction models for increased productivity and improved decisions; and enabling virtual communities that share content freely (Kuk and Janssen, 2011, p. 42).

An important component of developing a smart and open city is participatory planning, which understands the engagement of citizens in policy decisions. Citizens can directly communicate their opinions and suggestions. This in turn contributes to building more cohesive

communities within the cities that are willing to share information and learn about the different challenges their cities face. However, to promote participatory planning, cities first need to implement appropriate technological tools. These tools comprise three layers: the first layer is used for big data such as spatial visualisation; the second layer enables stakeholder direct engagement; and the third layer represents applications used for various purposes (Stratigea, Papadopoulou, & Panagiotopoulou, 2015, pp. 43-62). To be more precise, two brief examples of citizen engagement enabled through technological tools are outlined: The first example is the city of Trento that established a R&D lab so that its citizens can volunteer and test various innovative products, such as mobile and desktop applications. The second example is the city of Barcelona, which motivated its citizens to use public spaces and test different city government products and services relating to urban planning, mobility, tourism, and education (Stratigea et al., 2015, pp.43-62).

Transforming any city into a smart citizen-centric city requires the right set of values and tools, but to begin such a transformation the city government must change its approach to tackling current and future challenges. The suitable approach is to build an ecosystem in which citizens will be able to participate in different discussions and activities. This again entails building a platform for digital services. To do so, the city must offer a simple process for public-private partnership projects and involve IT business leaders as partners in the transformation process.The city of Ghent can serve as an interesting example for a transformation strategy that developed it into a smart city. The city is home to a quarter of a million inhabitants, it has a high level of entrepreneurial activity, and it is a student city that houses a significant student population (Van der Bergh & Viaene, 2016, pp. 5-19). Ghent focuses on investing in human capital and exploiting its natural resources in a sustainable manner. Citizens can co-create plans and community actions and there is a healthy relationship between them, city government, and technology. It is interesting to note that the city decided to establish an IT venture that has a mission to develop digital infrastructure for the city and be a partner in building a sustainable digital ecosystem.

3 Mostar – Green, Smart, and Open City Challenges

Mostar is a city with rich and stirring history. Throughout last 500 years, Mostar witnessed several episodes of near breaking points of its civilisation, and drastic change in all aspects of its existence. All of these changes are clearly visible in its urban tissue, even today.

The first notion of Mostar as a city (more a settlement), is found in a Dubrovnik archive from 1441. At that point, it was a small town with a dozen houses and a suspension bridge. The surroundings had been settled long before – traces of Neolithic settlements, and Illyrian, Greek and Roman cultures are still visible today.

FIG. 3.1 Mostar – aerial view *(Image by Ledić Domagoj, 2015. Retrieved from https://www.jabuka.tv/jabuka-tv-na-prvom-letu-mostar-osijek/)*

Since the time when Ottoman empire entered Bosnia and Herzegovina, a strong and important medieval kingdom, cities that were at cross-roads, river crossings, or strategic points took primacy. Within such a big empire, the importance of Mostar as a centre for trade and transportation was immense. From that moment on, Mostar developed into a vivid and prosperous city.

The Ottomans made the settlement on the narrow and longitudinal left (eastern) side of the city (XVI century), allowing the citizens to have their gardens on the right side, which was wider in all directions and had the benefit of running water from river Radobolja. The houses were made of local materials, stone, lime mortar, clay and wood, covered with stone tiles.

During the following centuries, Mostar also spread towards the west, across and along the Neretva river on both sides. The Ottoman principle of "mahala", city quarters with different crafts, housing, and a mosque was the main principle of urban development.

The Austro-Hungarian arrival created drastic changes in the small-scale urban tissue of Mostar. Big building blocks in the old city core, generous spreading of the modern city towards the west, wide streets and alleys, public buildings and infrastructure, all gave Mostar a new European look. Suddenly, from having a picturesque and cosy eastern appearance, over just a few years Mostar became a modern European city.

Over the following periods, the Kingdom of Yugoslavia and the Socialist Federal Republic of Yugoslavia continued the development of the city, all carrying the latest trends in architecture and technical improvements. The city continued to spread toward once rural surroundings, forming natural suburbs and satellites, based on geomorphology and existing infrastructure.

Every new government was ignorant and contemptuous towards the built heritage and urban matrix created by those who had now been conquered. The Austro-Hungarian builders had disrespected the Old Town with new large-scale buildings, and the post WW2 period brought even more devastation of cultural heritage to the city core. The ideology of mass confusion about the difference between religion and tradition almost destroyed the most valuable monuments in Mostar – Kujundžiluk Street and Old Bridge, accusing them of being "sacral". Fortunately, common sense prevailed, and these unique pearls of architecture escaped the destiny of most of the city mosques.

FIG. 3.2 Mostar – pedestrian and vehicular streets

Unfortunately, at the end of 20th century, this city went through one of the most destructive phases of Balkan conflicts. From 1992-1994, most of the Ottoman city core and its surroundings were destroyed, together with the symbol of the city, the Old Bridge, built in 1566. Over the past 500 years, Mostar has suffered from fires, earthquakes, violence from new conquerors, ignorance, and neglect, but these events brought so much destructive power that the city became unrecognisable.

It was not just physical devastation that occurred in Mostar; the worst damage has been done through political decisions that aim to artificially keep the city divided. No city is resilient to this kind of vandalism. Cities like Mostar, Berlin, Beirut, and Belfast share a need for another dimension of resiliency – against post-conflict political decision that divide a once integral and whole city into two unnatural parts.

Besides all obstacles that the transitional, post-war country is bearing, the city of Mostar became a perfect example of bad politics, a city without spatial planning and with maximum opportunism by suspicious investors.

Despite all of its problems, Mostar can still be an excellent example for a learning-by-doing system. Its great geographical position, mild climate, and long tradition of good and prosperous governance can put this beautiful city back on the list of most desirable places to

live. Before the conflict of 1992, Mostar was a living example of the 3P principle – it cared for people, the planet, and was economically prosperous. Resources, production, and education were all in good relations, which was also a trigger for sustainable growth – together with industry grew sport, culture, and social awareness. The main resource of Mostar was the people; firstly, people with the vision and understanding of possibilities and needs, and then young people with proper education. The schools and faculties followed the needs of the industry, educating young professionals in close cooperation with industry, and thus providing immediate employment.

FIG. 3.3 Radobolja and Neretva river in Old Town neighbourhood

Today, after more than five years of war, the city is full of unused plots (especially on the "division" line), and devastated or abandoned buildings, which look depressing but which hold great potential to be easily transformed into a temporary or permanent green oasis. Those could be the spots for urban farming and social interaction, but also a means to reduce $C0_2$, improve the environment, and provide healthy food, as well as creating a greater offering for tourism and healing the lost connections of inhabitants.

Another potential that Mostar offers is the creation of green paths (as was planned in 1980) throughout the city and on Neretva shores. This would boost pedestrian and bicycle transport routes and would lead to improvement of traffic in general. This intervention only requires minor changes in the way that the streets are used, allowing safe and uninterrupted connections between disparate parts of the city. City transportation could be solved with one electric tramline on Bulevar Street, going from North/North-West to South/South-East.

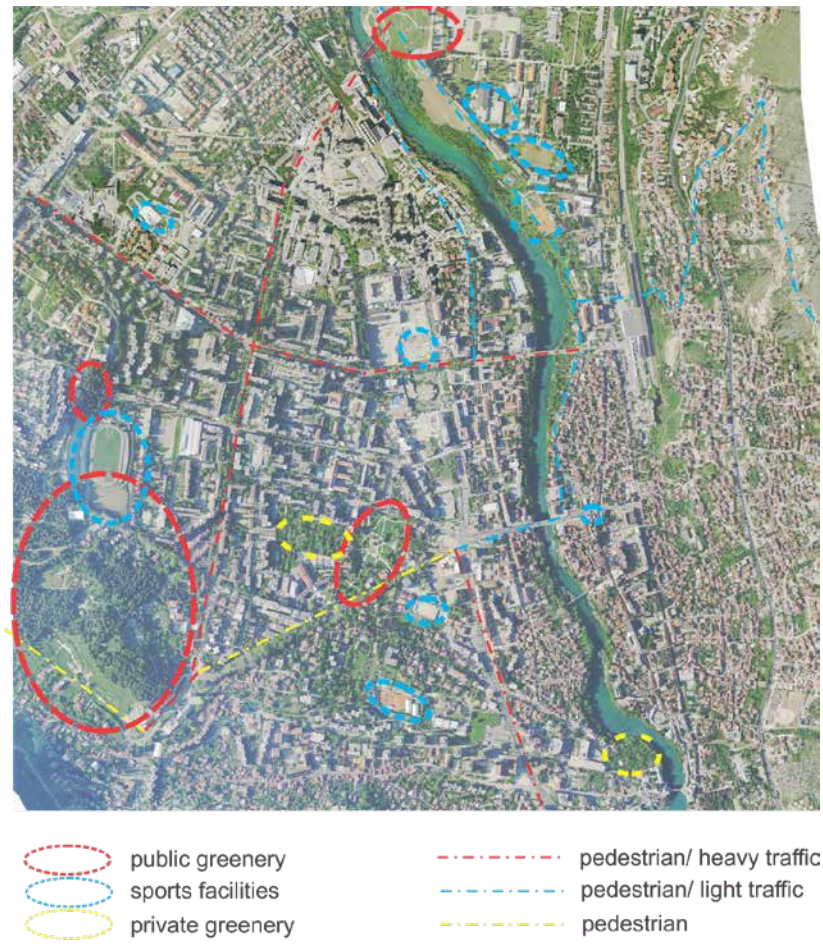

FIG. 3.4 Mostar map – greenery and pedestrian/cycling paths

To change the negative trends, the change must go both ways: bottom-up (citizens' initiative) and top-down (government set of new laws and legislation).

FIG. 3.5 Mostar- traditional urban farming

The city of Mostar can position itself as an open and smart city through cooperation with existing IT companies, business leaders, increased sustainable agricultural practices, and knowledge institutions. Partnership could bring needed change and focus on building a sustainable smart architecture and environment. It could also stimulate more

intensive cooperation and more effective communication between different segments of city administration. A transparent e-system would ease the flow of information and reduce its distortion. Citizens would be incentivised to participate in different activities within the city planning and execution, since they would be able to directly communicate via a digital system and see the results. This in turn would offer a better overview of city processes, data aggregation and analysis, and improved decision-making.

Mostar is a city with great potential; change of policies, new technology, and know-hows could make it green, smart, and sustainable in just a few years.

4 Conclusion

Today, sustainable, resilient, and smart cities have become a goal for most countries. According to forecasts, 96% of urban growth will take place in developing countries. A holistic approach to the planning of cities, towns, and buildings, their treatment as a living organism in accordance with the terms of micro-location and tradition, considering all aspects of sustainability, has proved to be the only possible way to avoid the further destruction of this planet.

Cities around the world are competing to fulfil all goals of sustainable and resilient design, to decrease emissions, improve energy efficiency, and become flexible in all issues related to new requests and technological improvement.

Trends are showing that only green, resilient, and determined cities attract young and capable people and smart enterprises.

Mostar is a city of great history. Rebranding it from a case-study of a problematic city to a city of the future is possible through smart solutions, a lot of good will from the government, and the decisive attitude of society.

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