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41



SCOPE AND AIMS

The review is concerned with a multi-disciplinary approach to spatial, regional and urban planning and architecture, as well as with various aspects of land use, including housing, environment and related themes and topics. It attempts to contribute to better theoretical understanding of a new spatial development processes and to improve the practice in the field.

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EDITORIAL

Dear readers,

In this issue of *Spatium*, rather heterogeneous in terms of its contents, we are regularly publishing a number of contributions from Serbia and few other countries, mostly presenting findings of current scientific research, on the following themes: contextualising Palladio's work in the Mediterranean context; the conundrum of reindustrialization policy in Serbia; spatial aspects of urban demographic changes in Serbia; analysis of recently constructed dwelling units in Sarajevo; the issue of monitoring, evaluation and implementation of an urban plan in Belgrade (Vračar); and, analogously, an analysis of problems following the implementation of the Constantine metropolis urban project (Algeria).

Miodrag Vujošević
Editor-in-Chief

PALLADIO AND THE MEDITERRANEAN HERITAGE

THE PATIO, ATRIUM AND PORTICO AS GEOMETRICAL AND WELL-BEING STRATEGIES

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Palladio's heritage has aspects that are interrelated with the vernacular architectural heritage of the Mediterranean, and it entails a collective knowledge. The aim of this research is to analyse his work and its evolution over time, paying specific attention to three architectural design elements: the patio, the portico and the atrium in relation to their proportions and ratios. This work will highlight how geometry shapes the space and the form of these three elements, producing architecture for well-being. The main results may constitute a possible new frontier of research where these three design elements make a connection between interior and exterior spaces, strengthen a greater visibility of the geometry, create "intermediate spaces" and enhance the idea of a "Continuous Monument". The paper will underline how mathematical factors such as proportions, ratios and constructive geometry, together with climatic reasons, are important in architecture for both its configuration and geometry and they are a constant in Palladio's heritage and his Mediterranean cultural influence.

Key words: atrium, portico, patio, Mediterranean heritage, Palladio.

INTRODUCTION

From an architectural and mathematical point of view, the importance of Palladio's works and influence has been widely reflected in the quantity and quality of similar projects built throughout the world. Also, scientific and informative literature has paid attention to his works, generating many scientific articles and books, some of which will be discussed later. Figure 1 shows a summary of some of Palladio's most relevant works and their temporal and spatial relationships, using networking methodology by means of the 5W+1H model (Jia *et al.*, 2016). The 5W+1H pattern-based approach represents what the majority of people want to know about a news story (Kipling, 1902). 5W+1H is an acronym of six keywords: Who, Why, Which, Where, When, and How. 1) Who developed the projects? Palladio and his mentors. 2) Why did the projects occur? Specific clients' requests. 3) Which were Palladio's projects and which architectural solutions were adopted to solve the inherent problems? The answer is graphically represented in the "black circle" in Figure 1. 4) Where did the projects take place? Cities.

"Where" is represented with the grey rhombus in Figure 1. 5) When did the projects happen? Time is represented with the white square in Figure 1. For example, the longest work "Basilica Palladiana" (black circle=W11 and 35 white squares) was completed after his death. The "Porto-Breganze" Bridge (black circle=W38 and 10 white squares) was also built in approximately eleven years. Works such as "Villa Godi", "Villa Thiene" and others are related to shorter time frames. A list of works and approximate construction time is given in Figure 2. 6) How did the projects connect to each other? Causality: from one of Palladio's projects to another one. In terms of simultaneous works, the years of his greatest activity were 1565, 1567 and 1579 ranging from 6 to 7 projects per year. This could be related to Palladio's developed ability to choose his disciples and work teams. Another objective of this research is to understand these working relationships.

Although Palladio's greatness can be seen in his architectural work, his masterpiece is his book entitled "I quattro libri dell'architettura" (The Four Books of Architecture) which he began to develop around 1540 and finished in 1570, after which it was widely distributed all over the world. Amongst the other events which took place in his life, we remember the publication of "L'antichità di Roma" (The

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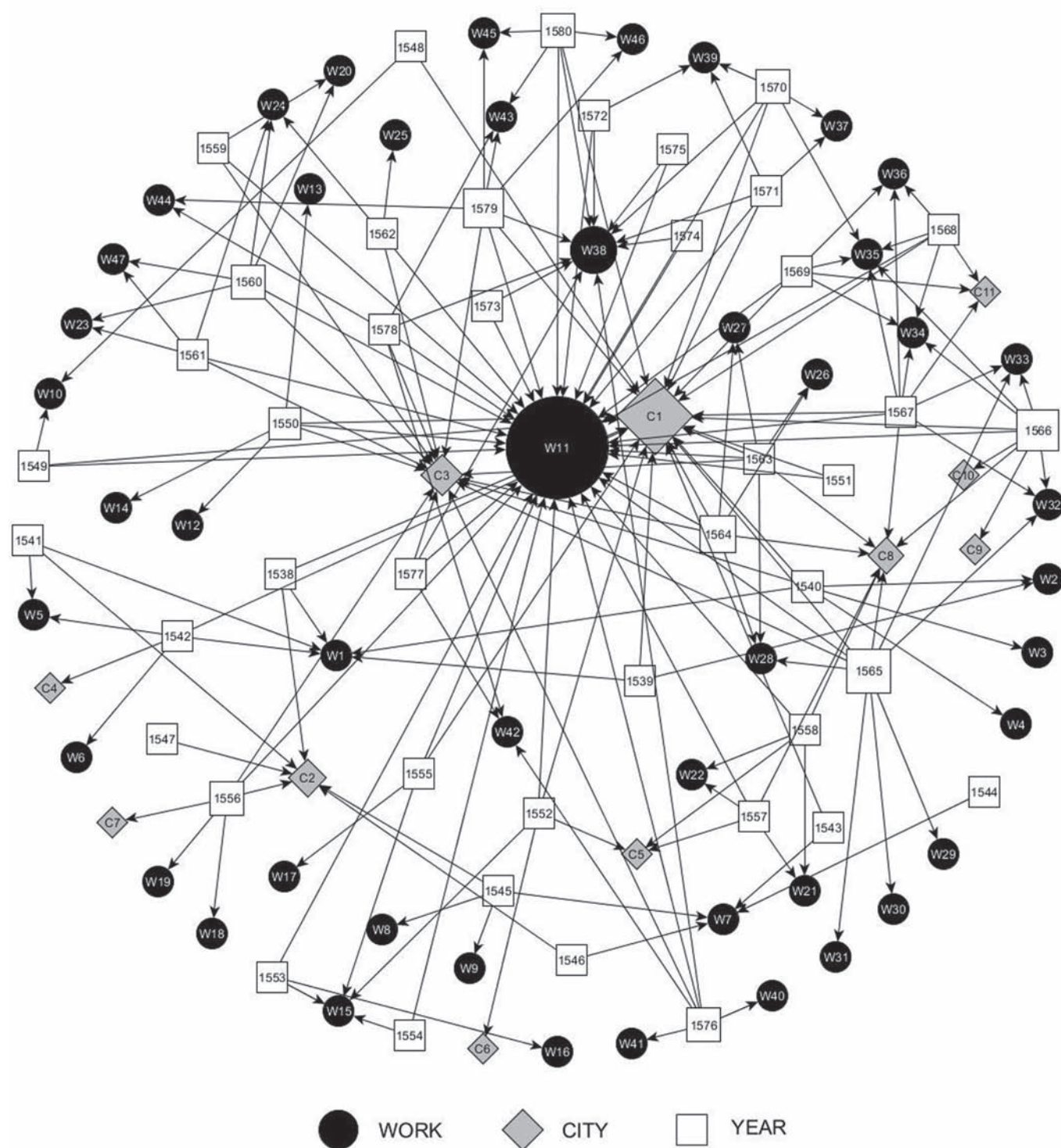


Figure 1. Network of Palladio's work and its temporal and spatial relationships by applying 5W+1H
(Source: Graphic by the authors based on research and a visit to the Palladian Museum)

antiquity of Rome) (1550-1554) and the death of his son and daughter, Orazio and Leonida (1571 and 1572). Both of his publications made Palladio a disseminator. Palladio was notably influenced by trades, travels and work experience such as architecture (1538), building walls (1524), carpentry (1534), arts of the theatre, war and history (1538). Due to his enterprising and adventurous character, he was also influenced by his previous failed attempts to create his own

business, his dedication to observing and reflecting and his self-training in the field of building with stone and wood. Other influences were his mentors, Cavazza de Sosa (1524-1529), his wife Allegradonna (from 1534), Trissino (from 1538), Cardinal Madruzzo (1552), Daniele Barbaro (1556) and Duke Filiberto di Savoy (1566), who all encouraged him to increase his knowledge and create social and professional relationships.

Table 1. Legend

CITIES (C)											
C0	Padova	C2	Roma	C4	Mantua-Verona	C6	Innsbruck	C8	Treviso	C10	Turin
C1	Vicenza	C3	Venezia	C5	Trento	C7	Udine	C9	Firenze	C11	Verona

Work	Name project	Work	Name project	Work	Name project
W1	V. Godi	W17	V. Chiericati	W33	V. Zeno
W2	V. Piovene	W18	P. Antonini	W34	PonteBassano del Grappa
W3	V. Gazzotti	W19	Arco Bollani	W35	V. A. Capra (la Rotonda)
W4	C. Cilena	W20	V. Foscari, Malcontenta	W36	V. Sarego
W5	V. Formi-Feratto	W21	P. Comunale, Feltre	W37	P.Barbarano
W6	V. Pisani_I	W22	V. Barbaro; Maser	W38	P.Porto-Breganze
W7	P. Thiene	W23	I. S ^a Maria de la Carita	W39	Loggia del Capitaniato
W8	V. Thiene	W24	San Giorgio Maggiore,	W40	Santa Corona
W9	V.Saraceno	W25	San Francisco della Vigna	W41	Cappella Valmarana
W10	V. Caldogno	W26	V. Valmarana	W42	Chiesa del Redentore
W11	Basilica Palladiana	W27	V. Emo, Fanzolo	W43	Chiesa delle Zitelle
W12	P. Iseppo Porto	W28	Pretorio, Cividale	W44	Porta Gemona
W13	V. Poiana	W29	San Giorgio Maggiore	W45	Tempietto di V. Barbaro. Ampliacion D22
W14	P. Chiericati	W30	Duomo, abside, volta		
W15	V. Pisani_II	W31	P. Valmarana	W46	Teatro Olimpico.
W16	V. Cornaro	W32	P. Schio, facciata	W47	P. Poiana

As a result of researching Palladio's work and life from a descriptive, architectural and historiographical point of view, this paper aims at making an in-depth analysis of his works, paying special attention to the layout of three key spaces or architectural elements: the patio, the atrium and the portico (named PAP). Later on, selected works and details will be explained in the Mediterranean context.

The research will analyze the Mediterranean housing heritage in relation to five of Palladio's works, focusing on the functions of the patio, atrium and portico to highlight their timeless well-being strategies and use. The five architectural elements or spaces analyzed are: (1) the portico and its contribution to improving public space and its well-being with respect to climate; (2) the streets in the air and the "Sottoportego" associated with ventilation; (3) the atrium; (4) the courtyard, diluting the duality of inside/outside allowing the existence of crossed ventilation and promoting a greater link with nature; and (5) geometric abstraction through the square and the circle. They are analyzed following the principles of Reynolds (2001) in geometric and harmonic terms and progressions. These principles are applied to buildings that were during fieldwork to show the geometrical potential and its connection with well-being because of the proportions used.

To achieve the proposed aim, this paper is organized as follows: first, the objective is stated after studying the Palladian work as a whole. Then, an analysis of the evolution of inhabitation in the Mediterranean is made and finally five of Palladio's works are analyzed in relation to the patio, the atrium and the portico.

METHODOLOGY

The research is based on the collection of primary information through field visits and consultation of models and documents at the Palladian Museum in Vicenza, in addition to the five selected works which have been photographed and re-drawn, exposing in each case their exact location, shown in Figure 3. The five Palladio case-studies were selected according to their answer to the city's challenges (Vicenza) as shown in Figure 3. Four of them are integrated in the urban fabric while La Rotonda is an "architectural manifesto". In addition to the primary qualitative research, arts-based techniques from Bagnoli (2009), "Image-based research" from Manson (2005) and the 5W+1H pattern-based by Jia *et al.* (2016) were applied in order to promote graphic compression and present the concepts through drawings, diagrams, and photographs.

FOCUSING ON DISTRIBUTION STRATEGIES CREATING WELL-BEING SPACES THROUGH GEOMETRICAL IDEALS

According to Wassel (2008), the work that has positioned Palladio in the history of architecture is not a construction of stone or wood, but his treatise "I quattro libri dell'architettura". Its dissemination has led to its "replication" in countless geographical contexts worldwide (Palladio museum, 2018). In scientific literature (Eilouti, 2017), Sinan and Palladio are morphologically compared. Authors such as Sass (2007) and Wassel (2008) have analyzed the villas and constructive grammar in Palladian works. Castiglia and Bevilacqua (2008) carried out research from an architectural, geometric and welfare point of view,

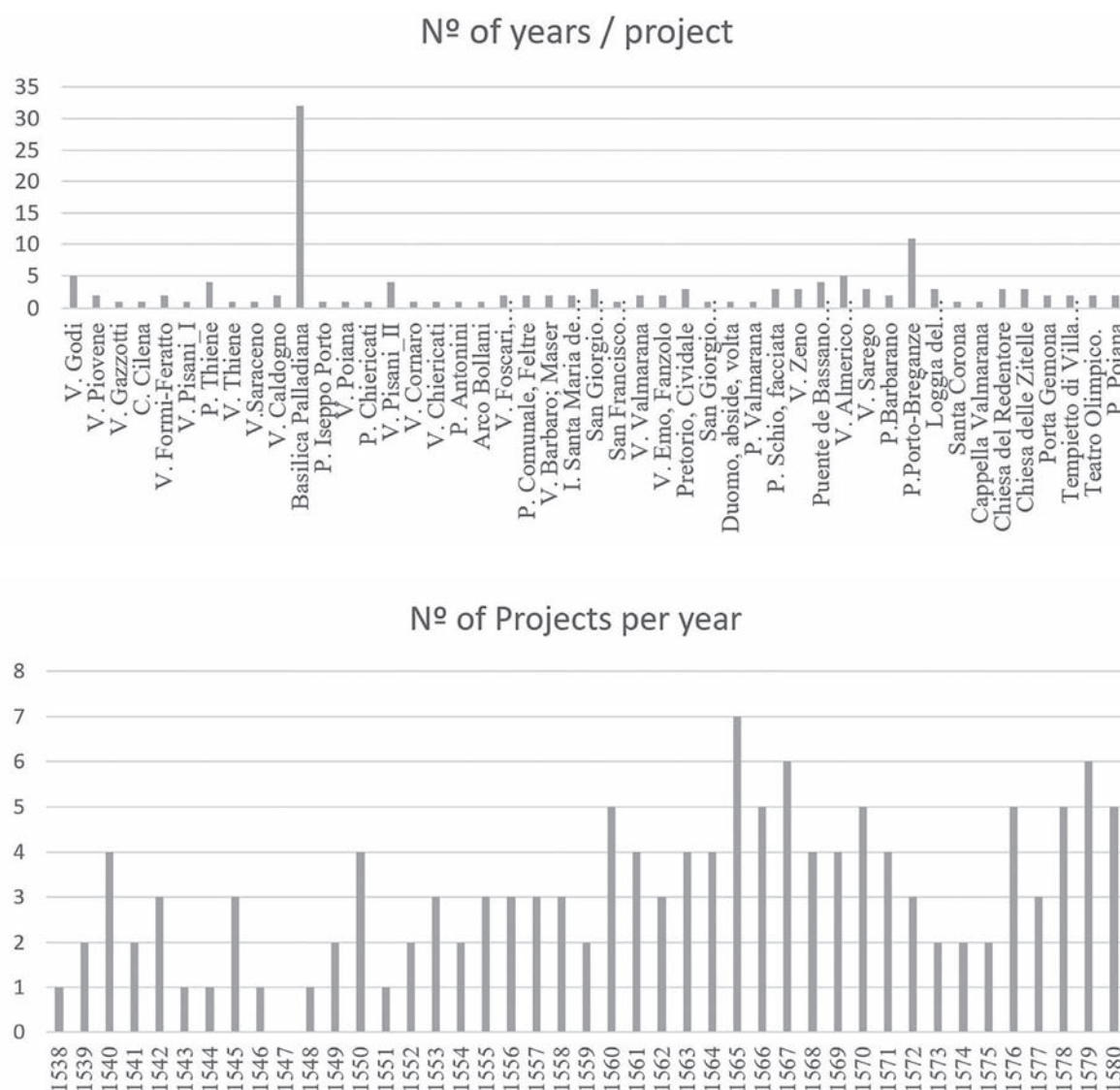


Figure 2. Palladian works and construction time (Source: Graphics by the authors)

focusing on the Turkish baths in Turkey, the Hammam, whose Ottoman origin on the Albanian coast also has a Mediterranean starting point.

In general, Palladio's work has been analyzed from the perspective of symmetry, proportions, sacred spaces, and villas and their patterns; however, the architectural spaces or elements repeated in his work and his distribution strategies with their geometrical ideals, that is to say the PAP, do not really seem to have been completely analyzed in the available literature to this day. Due to its morphology and intentionality, the PAP ensemble is of geometric interest for the configuration of a space and therefore for the state of well-being of those who inhabit it or walk through it. A possible definition of welfare strategies is a set of spaces necessary to live well, healthily (both somatically and psychologically) and in good thermal conditions. Examples of these well-being strategies are: providing shade during high temperatures in summer or protection from the rain during drizzly months, considering north-south orientations in construction, creating human scale

paths, including patios, central or hanging gardens and promoting crossed ventilations. Therefore, an analysis of the vernacular architectures and their geometries around the Mediterranean was carried out.

THE EVOLUTION OF THE MEDITERRANEAN LIVING ENVIRONMENT

The topic of this section is developed in order to understand the influences of vernacular architecture from a geometrical point of view and its relation with Palladian architecture in its specific Mediterranean geographical context. This specific influence can be identified with the existence of an architecture based on a central patio for climatic reasons, as well as an intermediate path and rooms around it. This centripetal distribution is also recognized in Palladio's projects. The study and analysis of the effect of climate are based on the architecture located in dry temperatures and warm conditions. According to Köppen-Geiger's analysis (Kottek *et al.*, 2006), the Mediterranean Sea lies between two climates: the dry climate (A) divided into

warm semi-arid (Bsh and Bsk) and warm arid (Bsw); and climate (C) divided into subtropical (Cfa) and dry summer Mediterranean (Csa). These climates modify and shape the architecture into a specific morphology, growth and form. In this way, architecture responds to extreme hot summers and changing seasons. In the Palladian century, the unit of measure was the sundial.

Two chapters of his treatise have been taken into account, Chapter IV and chapter XI (Book II, I quattro libri). The first chapter deals with the concept of the "Atrium" from the aspects of: *toscano, di quattro colonne, corinthio* and "*testugginato e della casa private*" (Tuscan, four-column, Corinthian and "tortoise and private house"). Chapter XI deals with the "*case private de greci*", Greek domestic

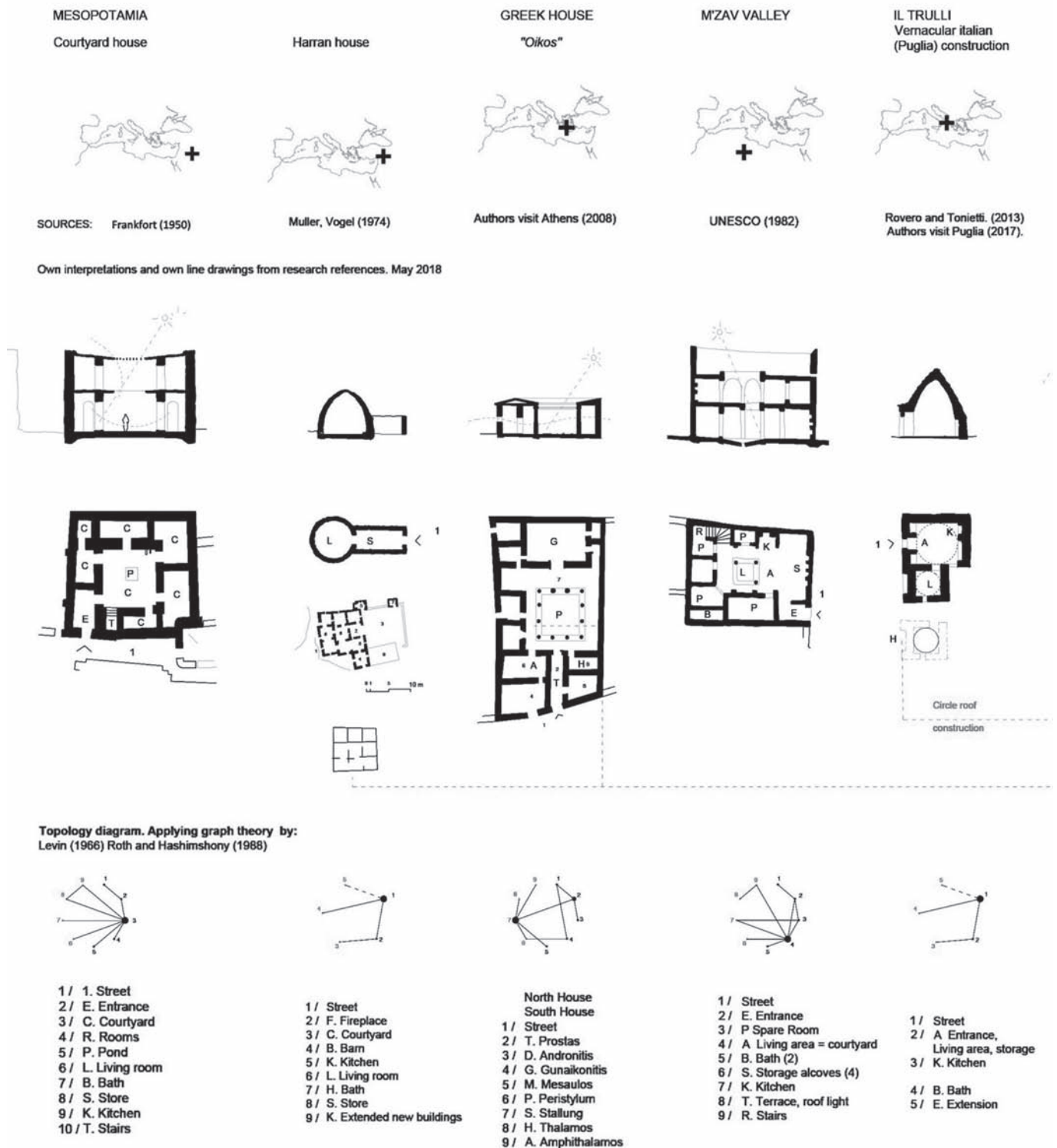


Figure 3a. The evolution of the Mediterranean living environment and heritage. Part 1/2
(Source: Drawings by the authors based on the literature review and in situ visits to some of the architecture drawn)

MEDITERRANEAN EVOLUTION HABITAT IN PALLADIO'S WORK (2/2)

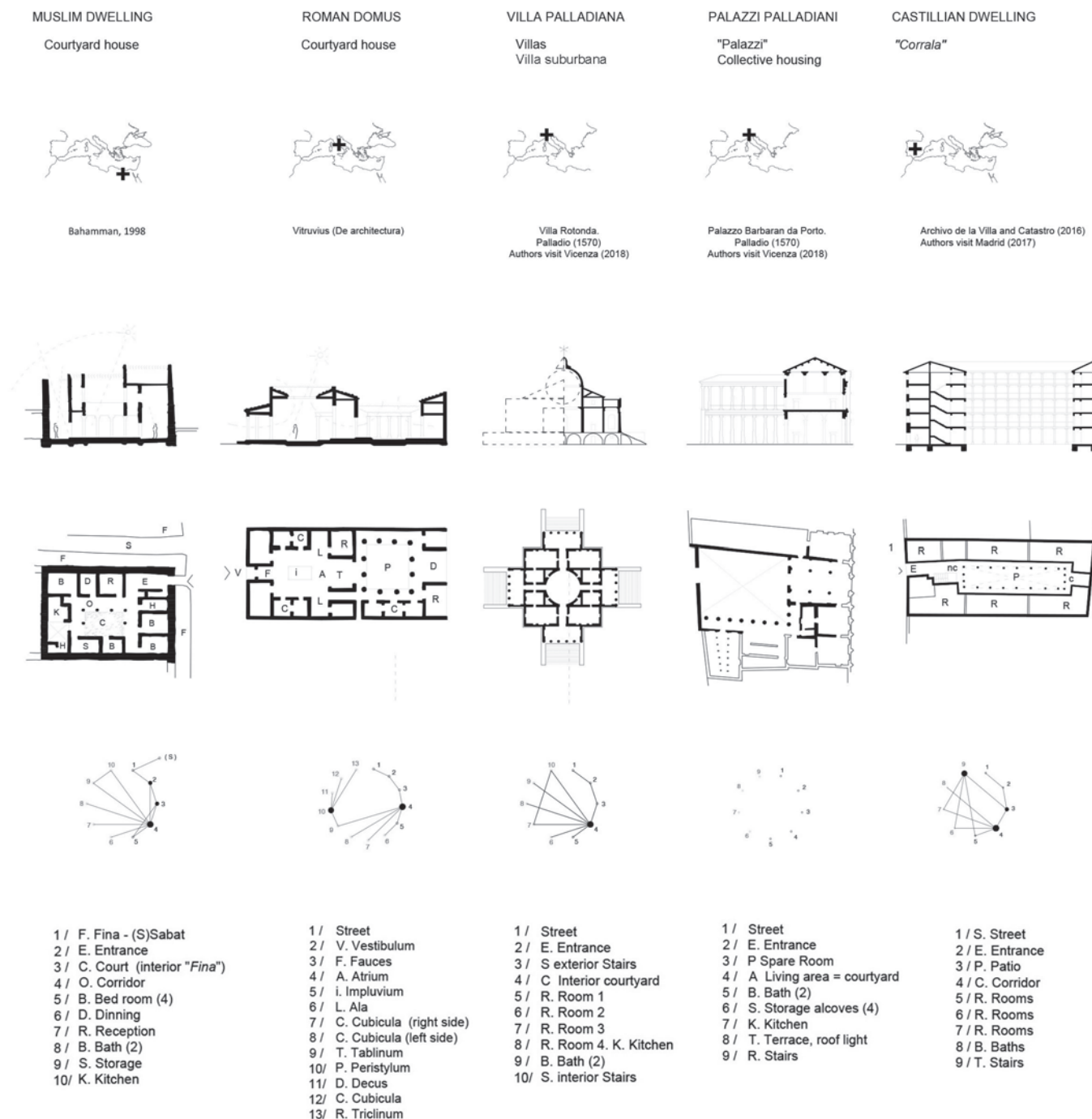


Figure 3b. The evolution of the Mediterranean living environment and heritage. Part 2/2
(Source: Drawings by the authors from the literature review and fieldwork)

architecture in the "Csa" climate. For this reason, a model floor plan of a Greek house and its analysis and evolution around the PAP is included in Figure 3. This analysis has a double objective, the first of which is to graphically investigate the Palladian work on an anthropomorphic and spatial basis that has emerged from the geometrical ideals. The time frame is ordered with precise temporal leaps,

marked with a qualitative leap around the conception of domestic space, the creation of intermediate spaces and their link to public space. The second objective is to analyze the evolution of the space around the PAP regarding five specific works by Palladio, by means of field work that was carried out.

This last objective is based on the analysis of eight patterns of Mediterranean domestic architecture, which Andrea Palladio developed in his trajectory: (1) the courtyard house in Mesopotamia (Frankfort, 1950); (2) the vernacular domed houses of Harran (Özdeniz et al, 1998); (3) a Greek house (Palladio's book, 1570; authors' visit, 2008); (4) a house in M'zav valley (UNESCO, 1982) (5) the "trullo" of *Pugliese* vernacular architecture, southern Italy (UNESCO, Rovero and Tonietti, 2014; authors' visit, 2017; Ruggiero et al., 2019); (6) the Arab courtyard house (Bahamman, 1998; authors' visit, 2016) the hammam or bath tradition (Castiglia and Bevilacqua, 2008); (7) the *Domus* (Vitruvius, De architectura; Bergamasco et al., 2018); and (8) the corrala in Madrid and the "casa di ringhiera or casa a ballatoio" in Milan or Turin (authors' visit, 2017). Likewise, the permanent exhibition in Vicenza shows his career around a map of the Mediterranean.

Once the spatial and chronological diagram was established, two of the Palladian works were contextualized in the frame of Figure 3: a village for its context in the country and a "palazzo" for its insertion in the city. Both are works from the end of his career and have porticoes and courtyards. In this way, their previous Mediterranean influences were analyzed, as well as their distribution in the plan and section under the geometrical and cultural influences that determine an integrated design. By applying the decoding analysis of the house and home around Hanson's space syntax (2003), the distributions of the domestic space were analyzed and can be seen in the last row of Figure 3 for the selected examples of Mediterranean domestic architecture as cultural heritage.

DISTRIBUTION STRATEGIES

This section presents, following some contemporary considerations about Palladio's work, analyses carried out in five sub-sections: 1) about the portico and the public space, Palazzo Civena; 2) about "Sotoportego", Palazzo Pojana; 3) about the slabs and ventilation, Casa Cogollo; 4) about the atrium, Palazzo Barbaran Da Porto; and 5) about geometric abstraction, Villa Rotonda.

Regarding the temporal context of Palladio was the Italian Renaissance, known as the century of humanism. Notable figures such as Isabella d' Este, Marie Le Jars de Gournay, Isotta Nogarola and Olimpia Fulvia Morata and Tarquinia Molza were contemporary and fundamental professionals, famous for their knowledge of classical Greek science (Haraguchi, 2003; Alic, 2005; King, 2014).

In Figure 3 of the Mediterranean analysis, as in his own writings, we can see how classical Greek architecture had a great impact on Palladio's work. Figure 4 shows a selection of five works by Palladio. The selection was carried out by analyzing Palladio's work starting from the beginning of his career in order to study its evolution. Four urban buildings (Palazzo Pojana, Casa Cogollo, Palazzo Barbaran and Palazzo Civena) were analyzed due to the innate complexity of developing a project in an environment with many restrictions, such as the existence of adjacent buildings, the presence of architectural elements such as chimneys on the

façade, compliance with a series of regulatory parameters, greater geometric and/or aesthetic visibility of the architecture in question, and the materiality of the context. The Palazzo Civena of 1540 was selected as one of his first works, and the Palazzo Barbaran as his last Palazzo in 1575. Also, the villa "*La Rotonda*" was chosen according to its ideal geometrical configuration.

The floor plans of these five works are shown in detail in Figure 4. The urban geography, the layout of the project and the floor plan are shown in horizontal order from left to right.

According to Book II of Palladio, with regard to the theory of proportions and to an analysis done by Mitrović and Djordjević (1990), the seven best morphologies for the room distribution are related to the geometrical platonic square, rectangle or circle with a length of $2/1$, $R2/1$, $3/2$, $4/3$ or $5/3$. In the five case-studies selected, it can be appreciated how in "Villa Rotonda" (as seen in Figure 4) the room dimensions are $26/15$ and $15/11$ as stated in book II, due to the possibility of being able to look towards the landscape on the four faces of the cube. "Casa Cogollo", one of his first projects, shows a ratio of $2:1$. Also, in Palazzo "Civena Trissino" the room dimensions are $12/7$, and in "Palazzo Poiana" they are $30/17$, while one of the buildings with a greater variety of room dimensions and Palladio's ratio is Palazzo Barbaran Da Porto, with $5:3$, $3:2$ and $1:1$ ratios and seven different room dimensions ($12/7$, $16/16$, $16/12$, $19/16$, $24/16$, $24/19$ and $41^{1/2}/25$).

The portico and the public space applying harmonic and geometric progressions. Palazzo Civena

The Civena Palace houses a small public gallery that contributes to the creation of public space on a human scale. It is situated on the periphery of the Retrone River. It is currently an outpatient clinic. It is a resilient building that has had varied adaptation to programmatic diversity. This work by Palladio is among his first ones. It expresses the intention to "create a city" based on a "continuum" or continuous monument (Figure 5), through the sequence and extension of its public space, thanks to the continuous portico on the ground floor.

In addition, Palazzo Civena provides a real sequence of internal spaces. It is a system of interrelated proportions, with a correlation of $1:1$; $2:1$ and $3:2$ (Figure 5. N2), corresponding to Fibonacci ratios as shown in Figure 4. This design strategy and scheme became a key theme in the Palladian design system in his later career.

The Sotoportego and the 2:1 ratio. Palazzo Pojana

As in the previous example, this project also "creates a city" and improves public space. In the centre of Vicenza lies the Palazzo Pojana, built in collaboration with Domenico Gropino, as indicated at the Palladio Museum in Vicenza (authors' visit, 2018). The beginning of the building starts from the union of two different buildings erected in two different time frames. The space that gives rise to the current Palazzo Pojana is the horizontal tablet on the arcade façade and the façade front (Figure 6.P1) that serves as a link and hinges between the two original buildings.

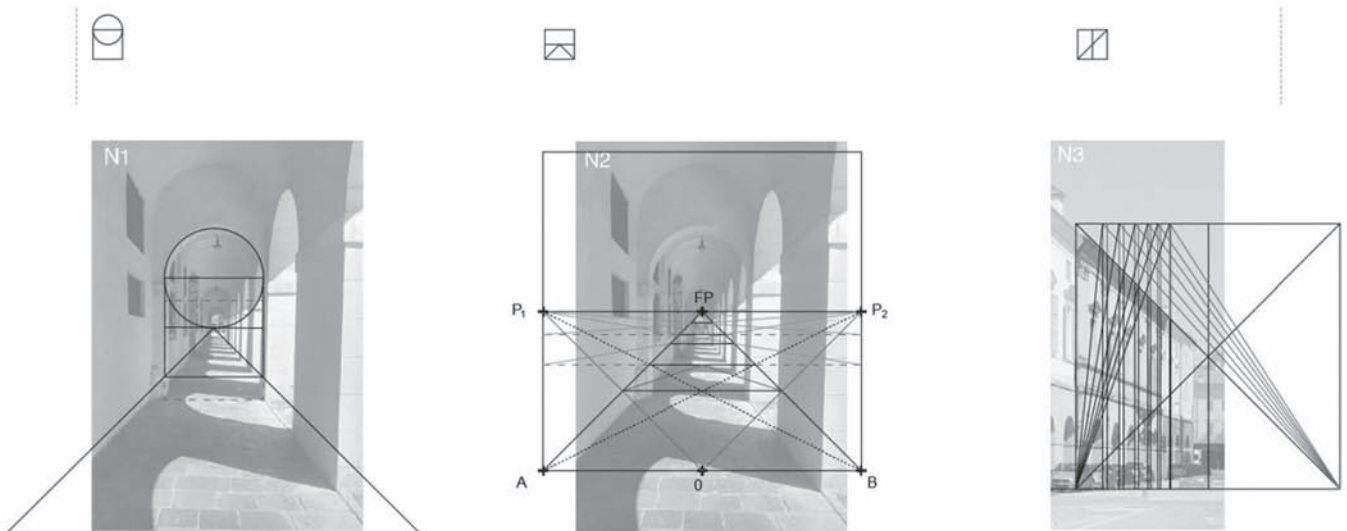


Figure 5. Re-visiting Palazzo Civena. According to Reynolds (2001), one parallel point in the perspective grid (Photos and superposed diagrams by the authors, 2018)

To this day, several growths have arisen around the Sottoportego, one of them is the street in the sky, or habitable bridge, at the intersection between the Palazzo Pojana and its adjoining buildings (Figure 6.P2-P3).

The Palazzo Pojana is an example of “problem-solving” in meticulous and ingenious ways related to the problem of building in a city as well as using existing materials, as in the case of Palazzo Pojana inserted in the medieval Vincentian urban fabric. In Figure 4, the authors revisited the Palazzo Pojana’s ground-floor plan, drawing the new additions with a dotted line and the original Palladio building with a continuous line.

The slabs and the ventilation from the platonic geometries. Casa Cogollo

The approach of insertion in historical places is also highlighted in these projects as in the previous examples. The intuition of constructing and distributing can be seen in the mediating rod in “Casa Cogollo”, a small building compared to ones around it, where the efficiency and the

genius of Andrea Palladio are contemplated. The chimney is located at the front of the façade (Figure 7) in order to create a “building with a noble face”. The access slab allows ventilation through a perforated floor with starry floral geometries from the intersection between the platonic square and circle geometries (Figure 7). In addition, the mouth of a protagonist located at the same point facing the ceiling (Figure 7, C3) works as ventilation. The inner courtyard (Figure 7, C4) through the atrium, the porticoes and the courtyards are in fact a constant in Palladian works, given its influence based on Mediterranean architecture.

The atrium and the room proportions. Palazzo Barbaran Da Porto

Whilst the other projects have a continuous atrium, the approach to this project is to have a discontinuous atrium. The interior of the building is a sum of identities expressed through different room proportions (see last line in Figure 4). These intentions are already present in the Olympic theatre, where the signs of different eras can be glimpsed on



Figure 6. Re-visiting Palazzo Pojana (Photos and diagrams by the authors, 2018)

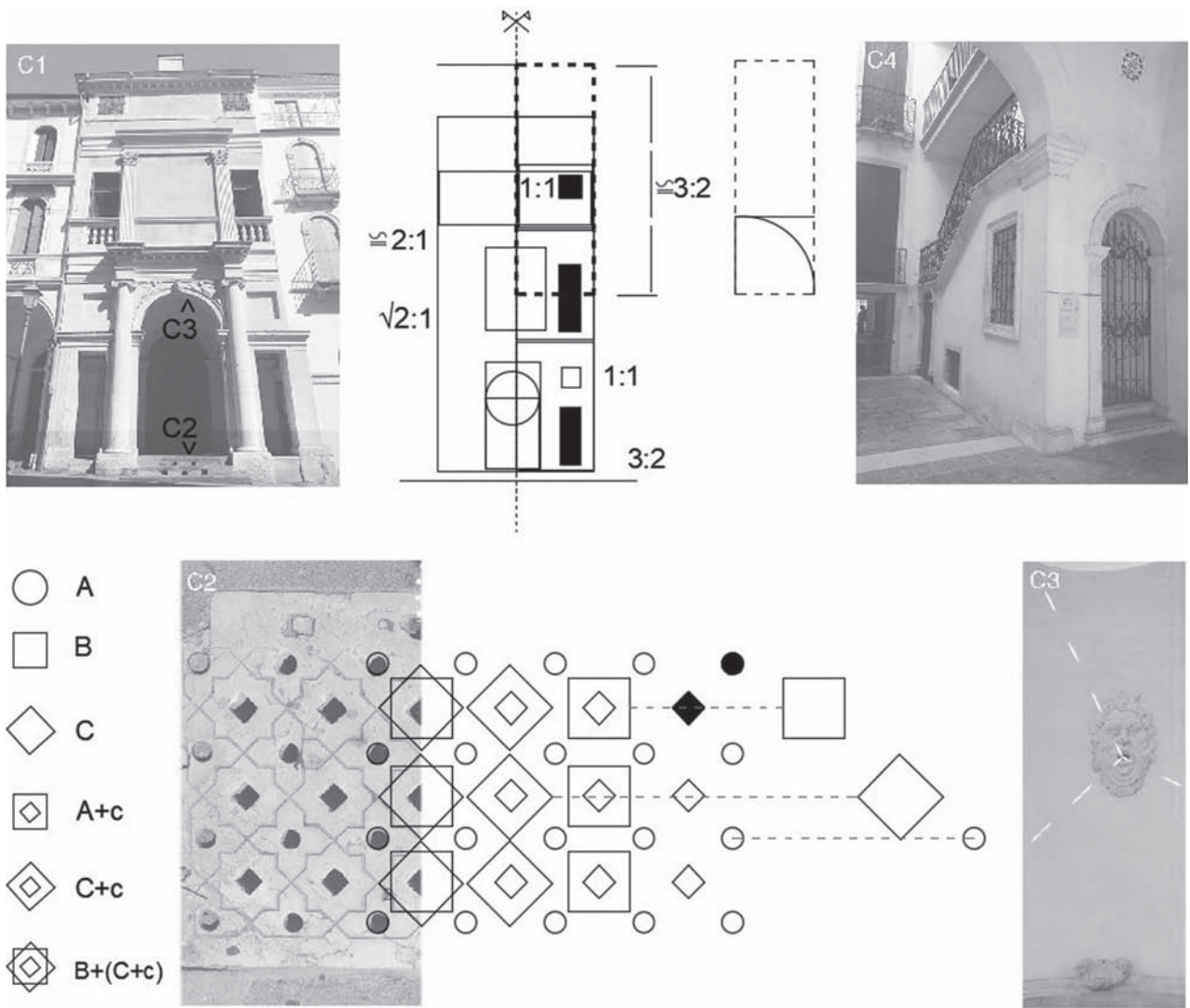


Figure 7. Re-visiting Casa Cogollo. Left: Applying Palladio's ratios 3/2, V2/1 to the Cogollo façade and right: the square and circle combination in the technical slab for ventilation, with the openings in solid block (Photos and diagrams by the authors, 2018)

the façade. The pillars, as shown in section B1 of Figure 8, are designed to reduce the cost of the building, with bricks cut into triangles. Finally, everything is coated to make it look like a "noble" and continuous material.

Geometric abstraction through the circle and square. Villa Rotonda

In his four books, Palladio analyzed several round temples. Among them is the "Tempio de Vespa" (Vespa Temple), which is of singular beauty because of its simple plan layout based on two concentric circles, one "solid continuous" and the other dotted with concentric radius pillars. Palladio calls this space "The Roundabout" due to its resemblance to the element of earth. This Platonian spherical space is one of the three elements of geometry in the Villa Rotonda, the circle or sphere representing the universe along with the triangle representing fire and the square representing earth. The centre and its inner dome are similar to the architectural astrolabe, like the element designed by Hipatia of Alexandria to investigate astronomy, to observe the stars and to measure the horizon (Alic, 2005), which remained valid until the invention of the sextant in the eighteenth century.

In addition, this centripetal space can be interpreted as an example of flexibility in terms of different interpretations without fixed functions (De Paris and Lopes, 2018). In the Villa Rotonda the dome is a space of observation and almost meditation. It is also a tradition in Harran where the central space or hall is a dome (Ozdeniz *et al.*, 1998), or in the freestanding "Trullo" structure of Apulia in Italy where this space is the roof.

Palladio describes this space in his treatise as the first path with the first measure, the first rule and the first typology. It is in this space that the sphere meets the cylinder in its most radical abstraction, inviting the viewer to look at the central point of the astrolabe's dome, the Hipatian "stargazer", or sky of the village. The Villa Rotonda could also be morphologically interpreted in its square layout as an abstraction of the Mausoleum of Halicarnassus represented in Vitruvius De Architectura. The geometric abstraction has a relationship with the four geometries (March, 2001). In this villa, Palladio's constructions around the arithmetic, geometric and harmonic means described in book II seem to create a holistic approach.

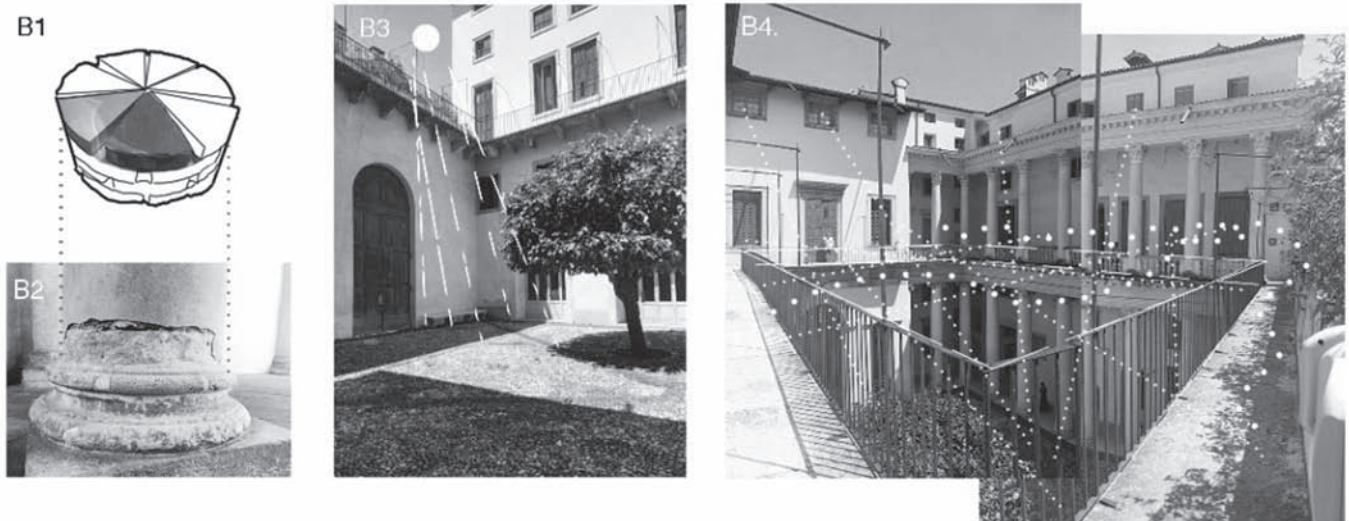


Figure 8. Re-visiting Palazzo Barbaran Da Porto. B1-B2) Constructive system pillars. B3) Patio and tree "silk" market (Photos and diagrams by the authors, 2018)

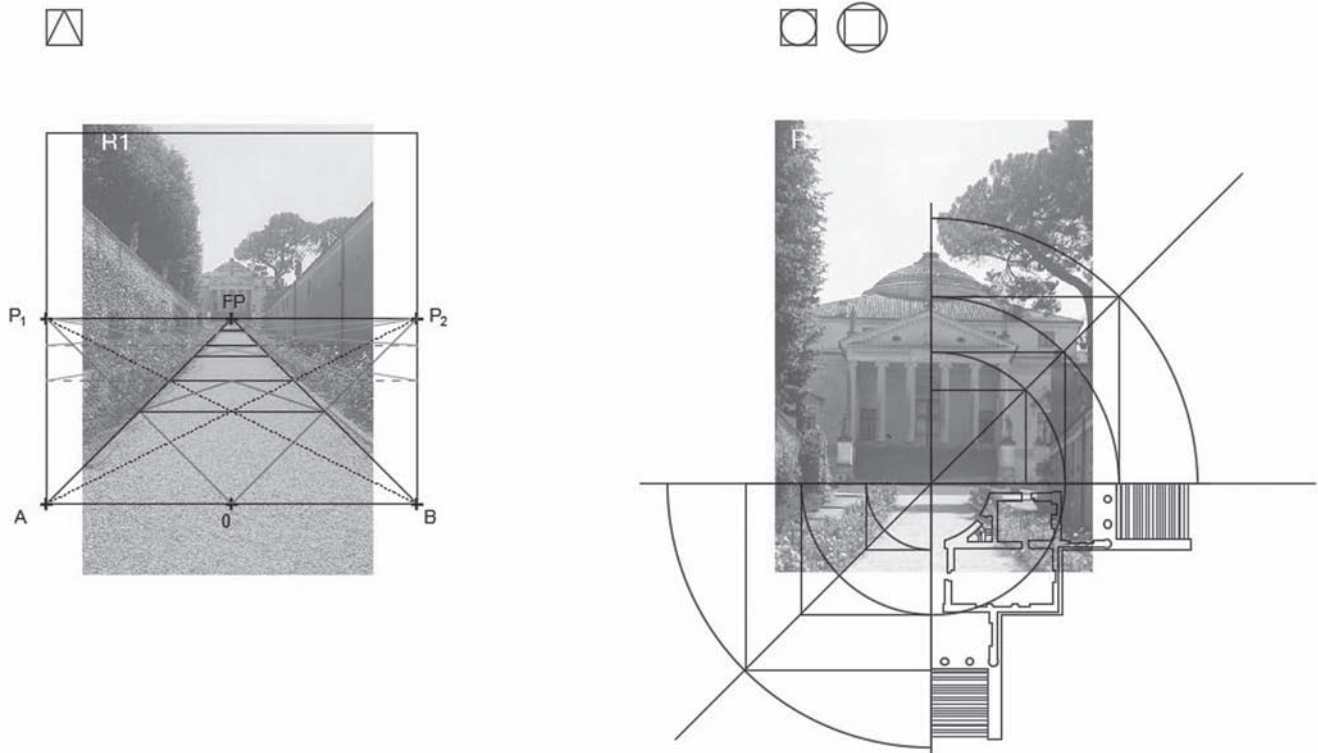


Figure 9. Re-visiting Villa Rotonda. Left: Perspective grid using harmonic and geometric progressions as in Reynolds (2001). Right: squares and circles in the front façade (Photos and diagrams by the authors, 2018)

In his treatise, Palladio (1570) describes the building site as one of those pleasurable places that can be found above a mound of easy ascent, bathed on one side by the navigable river Bacchiglione and surrounded on the other side by other very pleasant hills that seem like an amphitheatre with crops, abundant fruits and excellent vineyards. Therefore, since it offers beautiful views from all sides, some close, some more distant and others ending in the horizon, the lodges were built on the four façades. The reason for its four façades is due to its location and therefore to its "Genius loci".

The composition of the interior patio, designed to be extended by Palladio, allows crossed ventilation and visual connection between spaces (B4, Figure 9). The inner patio expands the space. In addition, the portico galleries both on the ground and upper floors designed by Palladio are a constant in his work. The incorporation of porticoes and portico galleries allows the use of space in all seasons of the year, regardless of the weather; the space allows its use because of the continuity of the architectural elements. It is an intermediate space between the interior that is totally enclosed and the exterior without a roof, and it also generates ventilation of the building.

RESULTS

One of the main findings is that the centripetal growing or spatial organization with a polyvalent function in the Palladian work is a legacy of Mediterranean heritage. Another finding is the repetition of three elements, which, despite their different nomenclatures, could be grouped in the portico, the atrium and the patio or PAP, with the patio being the centripetal focus. Finally, a consecutive relationship was found between these elements and well-being strategies. For example, the courtyard allows the crossed ventilation of the internal rooms and the visual linking between spaces. The portico provides shade from the sun or shelter from the rain since it is a continuous path that encourages use of the space throughout the year. This last element, as appreciated in the Palazzo Pojana or Casa Cogollo, creates liveable cities and makes pleasant public streets.

CONCLUSION

The aim of this research has been the analysis of Palladio's heritage from the architectural, social and professional points of view in its spatial and temporal evolution, paying special attention to the distribution of the patio, the atrium and the portico as design strategies from a geometrical perspective. In these three elements, geometry shapes the space and its proportional form in relation to the climate, producing a state of well-being. Moreover, his architecture is cultural heritage associated with the Mediterranean basin, which brings a collective knowledge and Palladio is interrelated with it. This collective knowledge has been materialized for centuries in collective domestic heritage such as "i trulli", the concept of Oikos, the houses in the M'Zav Valley, and the courtyard and the dome houses of Harran, most of which are protected by UNESCO as the work of Palladio.

These housing architectures have been developed under climatic and geometric distribution strategies. The main results of this work constitute a possible new line of research in which the three spaces analyzed allow firstly, a connection between the interior and exterior, blurring their limits and widening the intermediate space, thus contributing to the state of well-being of the user. Secondly, they allow a strengthening of greater visibility of the geometry, the creation of which is carried out around the configuration of a square, around a circle surrounding the atrium or patio, around a straight line, or in an L shape. These configurations accentuate the centred perspective or break it down. Finally, these spaces create "intermediate spaces" and promote the idea of continuity, enhancing the "Continuous Monument". The concept of developing architecture in response to the climate, given its distribution and geometry, is significant and it can be found on the pathway of Palladio's work. It has been important to analyze the "well-being" characteristics of Palladio's work in order to understand its relationship with the Mediterranean heritage and living environment and to learn how project strategies are still shaped by form and climate, as they continue to provide strategies for timeless spatial design.

The importance of field analysis in Vicenza for this work has contributed significantly to understanding the work of

Palladio. However, there have been limitations such as the impossibility of accessing some of the original plans, as well as the lack of access to some of his buildings from the inside. Perhaps another limitation could be the implications of the section analysis with these welfare strategies; however, it could also be a possibility for future work. Future extensions of this work could be aimed at expanding the analysis of Palladio's work in a systematic way, with well-being strategies creating timeless designs with potential for use in current and existing buildings.

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RETHINKING DEINDUSTRIALIZATION, AND THE REINDUSTRIALIZATION POLICY IN SERBIA

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The paper explores deindustrialization as the main development problem in Serbia and examines the possibilities for a new industrial policy and its implementation. The aim of the paper is to re-examine the process of deindustrialization in Serbia (its causes and consequences), and to give useful suggestions related to Serbia's existing strategy of long-term industrial development until 2020 and to new industrial policies. Addressing the deindustrialization process is an issue of developmental and economic policy. A reindustrialization strategy or a new industrial policy could be one answer, and this has to be addressed if the share of industry in the GDP is to increase. Both qualitative and data-given approaches have been applied to the analysis of deindustrialization and to the question of how to improve the conceptual framework for reindustrialization in Serbia. Also, some recommendations to the on-going national reindustrialization strategy, or the "smart specialization strategies" are made.

Key words: deindustrialization, reindustrialization, new industrial policy, Serbia.

INTRODUCTION

Serbia is faced with the process of deindustrialization, which is one of its the most challenging development problems. It is manifested in a decreasing number of manufacturing employees as a share of the total number of employees and a decreasing value of the industrial gross domestic product (GDP) as a share of the total GDP. As a consequence, the formation of Serbia's GDP is unlike other less developed countries and more similar to a developed country. A more problematic outcome is the lack of tradable goods for international trade, which has negative consequences for the balance of payments. In answer to the question of why the process of deindustrialization appeared, the answer is twofold: firstly, it was due to the breakup of the common market of the former Socialist Federative Republic of Yugoslavia (SFRY) and international sanctions introduced during the 1990s, and secondly, because of the neo-liberal approach to transition. With the deindustrialization process, Serbia experienced a development path similar to other transitory economies. However, it is important to address whether deindustrialization is simply a myth or an important process with negative consequences. It is also important to examine deindustrialization at the national level and at the macro-regional level, in order to see whether the situation is similar or different from a regional point of view.

To address the process of deindustrialization one has to ask the question of whether there are adequate development and economic policies. Having a reindustrialization strategy and industrial policy could be an answer, with the aim of increasing the share of manufacturing in the GDP to or even beyond 20%. Existing companies have to be restructured, and more importantly a lot of new companies need to be established. These manufacturing companies should be green, with a high involvement of Research & Development/ R&D, training and education and oriented to the international market. The role of foreign direct investments (FDI) is important, but it is also important to support those investors who want to export only.

The aim of the paper is twofold: firstly, to re-examine the process of deindustrialization in Serbia, its causes and consequences, and secondly, to make useful recommendations regarding both the national reindustrialization strategy and related industrial policy.

DEINDUSTRIALIZATION/REINDUSTRIALIZATION – LITERATURE REVIEW

Deindustrialization can be understood as a decreasing contribution of industry to the formation of the GDP, and manufacturing employment having a decreasing share in the total employment (Hadžić and Zeković, 2013), as well as a reduction in or relocation of industrial activity due to economic or social change. The negative consequences of this trend are mainly related to a worsening foreign trade

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balance and total balance of payments, as there are not enough tradable products for export (Bošković, 2011). Kovačević (2016) points to the growing importance of foreign trade for the economic growth in liberalization and the globalization process.

Williamson (1990), as a proponent of the “Washington Consensus” (a set of free-market economic policies supported by financial institutions such as the International Monetary Fund / IMF, the World Bank, etc.) and its modification by a new set of policies (the New Agenda of “After the Washington Consensus”), suggests rethinking towards a new global governance (Williamson, 2003, 2008). Marangos (2014) indicates that the Washington Consensus, as a neoliberal manifest, received a lot of criticism, and suggests a new context to uncover US, IMF and World Bank policies that affect developing countries. He also offers an alternative to the Washington Consensus and the “After the Washington Consensus” based on Keynesian proposals (Marangos, 2009). From the perspective of industrial development, the most frequently recommended policies relate to the Keynesian concept as an alternative, including: the national interventionist policy used by industrialized countries; returning the savings to the national economy, harmonization with its industrial policy; supporting a low level of interest rates and movement of capital; strengthening competitiveness, especially in globalization and the Fourth industrial revolution (4IR).

There is a distinction between the two forms of deindustrialization: one form takes into account changes in sectoral structure and changes between those activities that produce added value, and the other form does not. This enables a better analysis of deindustrialization than the sectoral approach. Recent analyses have been led by heterodox economics, based on a concept of sectoral specificity and the role of manufacturing in growth (Tregenna, 2014). The concepts have existed as sustainable alternatives to the neo-classical postulates (Reinert *et al.*, 2016) and to mainstream economics. Chang (2002) indicated the role of endogenous factors and institutions in development, emphasizing the internal process of their shaping. Chang and Grabel (2004) highlighted a change of focus from the institutional form toward the institutional function, as opposed to the mainstream neoliberal approach.

According to Rowthorn and Ramaswamy (1997) deindustrialization is not a negative phenomenon, but a consequence of further growth in advanced economies. The pattern of trade specialization among advanced economies explains why some countries deindustrialize faster than others. On the global level, North-South trade has played only a very small role in deindustrialization (Rowthorn and Ramaswamy, 1997). Usually, deindustrialization is seen in a negative context, as it makes less room for employment, although some authors have given careful consideration to the causal relationship. Deindustrialization is related to tendencies which have occurred in developed countries, like the USA, whereby manufacturing has experienced a downward trend in its share of employment in comparison to other industries, predominantly the service sector (restructuring). It is important to envisage those tendencies

together with other causal relations, like wages, relative wages, productivity and output (Lošonc and Ivanišević, 2014). The national level of development achieved is relevant, as different tendencies regarding manufacturing output, employment and productivity have appeared in developed, less developed and under-developed countries (Developed Income Countries/DICs, Middle Income Countries/MICs and Low Income Countries/LICs) (Feinstein, 1999).

During recent decades, the global industrial concept has been strongly reshaped by deep structural and technical changes. Global and regional industrial networks have moved their economic structures, territorial patterns of production and international trade as a result of outsourcing and changing industrial development resulting from multi-supply chains. This has resulted in the industrial dislocation of some developing countries.

In analysis the evidence of deindustrialization in developing countries Kaldor's savings model has usually been used as the main source of economic growth (Kaldor, 1965). Evidence of premature deindustrialization in these countries includes a lower level of income, lower GDP growth, jobless growth, and a high share of informal economies. Di Meglio *et al.* (2018) support the Kaldorian framework of manufacturing contributing to a growth in productivity. They suggest repositioning the debate on (premature) deindustrialization within broader opportunities for development related to structural change by restructuring.

Deindustrialization of developed and developing countries

During the period of restructuring after the oil crises, between 1980 and 1998, DICs succeeded in finding the right path for their development through the deregulation process and restructuring. In this period the share of manufacturing in the formation of the GDP dropped from 37 to 30% (Figure 1). They introduced a neoliberal approach, making more space for entrepreneurs and private initiatives and diminished the role of the state in the economy. A similar tendency could be recognized among MICs as their manufacturing share in the GDP dropped from 42 to 33%. However, in LICs the share of manufacturing as part of the GDP for the same period was stagnant (38-39%).

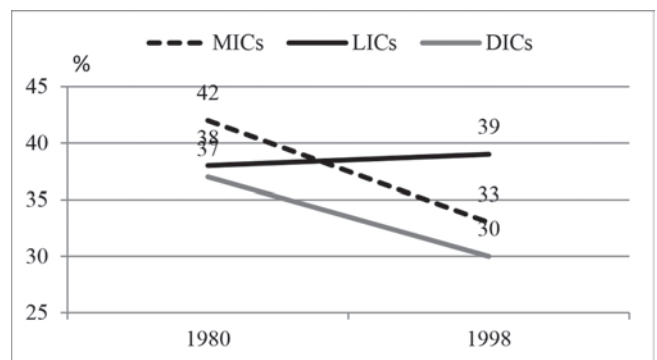


Figure 1: Manufacturing output as a share of the GDP (%)
(Source: World Bank, <https://databank.worldbank.org/data/source/world-development-indicators>)

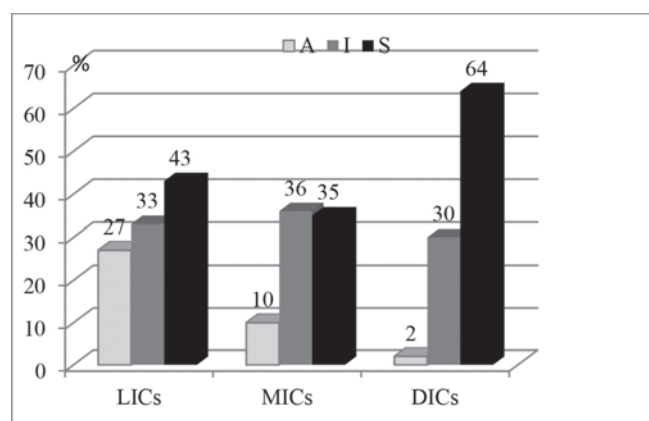


Figure 2: GDP formation in 1999 (A-agriculture, I-industry, S-services)
(Source: World Bank, 2019)

After restructuring the economic structure of DICs, they had a dominant share of services in their GDP (64%), while manufacturing became less important ($\leq 30\%$) (Figure 2). MICs had a more balanced GDP structure, with a similar share of services and manufacturing (35-36%).

Deindustrialization of CCEE – transition

After political changes in the early 1990s, the deindustrialization process in the Countries of Central and Eastern Europe (CCEE) and Serbia had different causalities.

In CCEE, a so-called “planned economic model” and an industrial-led development strategy were introduced and as a result the rate of manufacturing growth was higher than the world average (Table 1). After political changes in the early 1990s CCEE entered a period of transition. In the first part of the decade the transition was based on liberalization, privatization and stabilization, the path prescribed by international financial institutions, the so-called Washington consensus (Bukvić, 2010). This resulted in CCEE facing a transitional shock in the form of a drop in output and manufacturing (Božić, 2009). Later this shock therapy was transformed into a more harmonized, gradualist approach (Stiglitz, 1999; Nellis, 1999; Fisher and Sahay, 2000). During the following decade, recovery in CCEE began, but more advanced transitory economies (Hungary, Poland, the Czech Republic, Slovakia, Slovenia) managed to adjust better to world market requirements, whereas the other economies did not.

Period	World	Socialist countries/ CCEE	DICs	LICs
1961-1985	5.1	6.9	3.9	4.6
1971-1985	4.2	6.6	2.7	3.1
1981-1985	3.2	5.5	1.8	-0.5

Table 1: Industrial output increase (% per year) (Source: Vukmirica (1988))

DEINDUSTRIALIZATION OF SERBIA - NON-ECONOMIC FACTORS AND TRANSITION

For several decades Serbia has experienced a somewhat specific economic model, a mix between a market and a planned economy. Although it followed an industrial-led development strategy, investments from the late 1950s have been reoriented from the production of machinery more towards the food, textile, leather and furniture industries (consumption products) (Hadžić and Zeković, 2013). From the 1960s to the 1990s manufacturing had the highest share in the formation of the GDP, above 40%.

The causes of deindustrialization in Serbia were different to other CCEE. The main causes of deindustrialization in Serbia were non-economic: the split of the single market of the former SFRY, international sanctions and damage resulting from the bombing in 1999. During the 1990s, together with a drop in the GDP of 50%, traditional manufacturing exporters were most hampered, for example the textile, leather and shoe industries, and the manufacture of furniture and metal products. At the same time food production and the energy sector experienced a minimal slowdown (Figure 3).

Serbia started its market reform in 2000. During the period 2001-2008 it achieved a high rate of GDP growth of average 5.4% per year, without a transitional shock. The explanation is simple: the statistical base was too low, due to a sharp drop in GDP during the 1990s, as it entered the transition period with a national income of only 1000€ per capita (Hadžić and Zeković, 2013; Božić, 2009).

The deindustrialization process started in the 1990s and continued during the transition. The manufacturing growth rate was less than average (2% in the period 2001-2008), while services grew faster than average. The GDP in Serbia in 2017 was made up of: manufacturing 15.1%, mining 2.1%, agriculture 6%, and the electricity and gas supply 3.6%, while services were $\geq 70\%$ (Statistical Yearbook, 2018). This continuation of deindustrialization can be explained by a neo-liberal approach to development and the lack of any development strategy. In other words, there were no (long-term) development policies introduced that would transform the national economy, but rather (short-term) economic policies only, for day to day survival (Vujošević *et al.*, 2010).

Another dimension of deindustrialization can be recognized by looking at the structure and growth of employment. During the 1990s, in spite of the economic crisis, Serbian companies could not adjust to the new less favorable circumstances by lowering the number of employees, due to the fact that layoffs were abandoned. So, Serbian companies went into transition (from 2000) with huge surpluses of employees. The share of industrial workers in the total employment structure in Serbia decreased from 2000-2008 (Figure 4) and continued to decrease until 2018 (Figure 5). Many workers lost their jobs during the restructuring of their companies and were unable to find new ones because the development of entrepreneurial sector, made up of small and medium scale companies, was too slow to absorb the surpluses of employees. The main negative consequence of this was that a sharp increase in unemployment affected almost 1/5 of the workforce.

During the economic crisis 2009-2014, the rate of Serbian GDP growth was almost zero (0.6%). From 2015 to 2018 the recovery started (the GDP increased by 1.8%, 3.3%, 2% and 4.4%). For the 2017 GDP, the industrial gross value added (GVA) was 15.1% and for agriculture it was 6%, while services had a share of more than 70%. The average GVA of industry in the total GDP in the EU-28 was 25% in 2017.

DEINDUSTRIALIZATION ON THE NATIONAL AND MACRO-REGIONAL LEVEL

Kuttor and Hegyi-Keri (2014) stated that deindustrialization has especially negative effects when the decline in employment in the industrial sector is not compensated for by the tertiary sector, and consequently there is an increase in unemployment. During the transition from a planned to a market economy all industries were transformed, but in particular the manufacturing industry. During this period, industrial policy was affected by several factors: a lack of previous experience, the time factor (transition may be a never-ending process) and inertia (path dependency hindering development) (Botos, 2010; Lux, 2009). Kuttor and Hegyi-Keri (2014) noted that deindustrialization has primarily positive reasons, secondarily external reasons, and lastly, causes related to negative internal processes.

An investigation into the process of deindustrialization in the Visegrad group of countries of Central Europe (Hungary, Czech Republic, Poland and Slovakia), led to interesting results at the national and macro-regional levels. Differentiation of the types of deindustrialization: absolute, relative, virtual and reindustrialization (Table 2) was based on the use of three categories: the number of manufacturing workers, the total number of workers and the ratio of manufacturing workers as a share of the total employment. Absolute deindustrialization is the case when all three categories are decreasing. Reindustrialization is opposite to this, when the number of manufacturing workers, the total employment and the share of manufacturing workers in the total employment are all increasing. Relative deindustrialization and virtual deindustrialization are seen as interim stages with mixed tendencies.

On the national level Hungary and the Czech Republic experienced deindustrialization from 1999 to 2012, while in Poland and Slovakia quasi (virtual) industrialization took place. The global economic crisis resulted in some regions being affected more than others. Kuttor and Hegyi-Keri

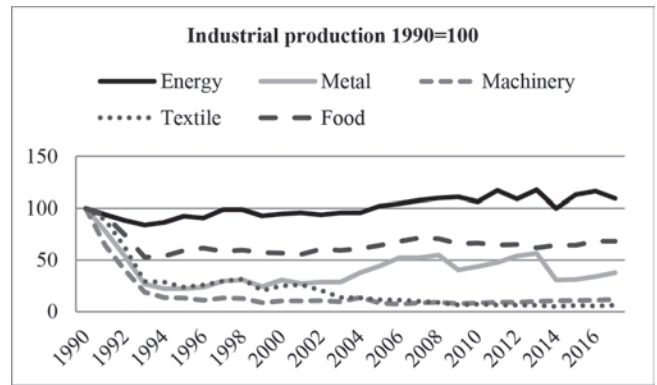


Figure 3: Serbia*, Industrial production, 1990=100
(Source: Statistical Yearbook of Serbia, 1991-2018)
*Serbia, without data for Kosovo and Metohija

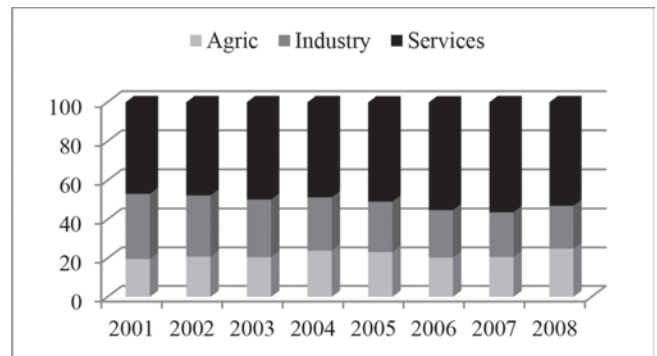


Figure 4: Serbia*, Employment structure
(Source: Statistical Yearbook of Serbia, 2001-2008)
*Serbia, without data for Kosovo and Metohija

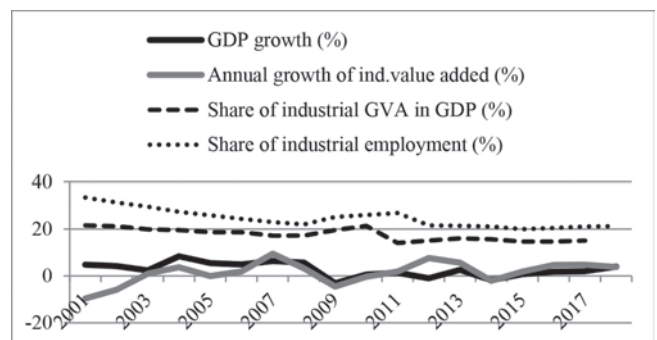


Figure 5: Indicators of Serbian industry* (p.a. in %)
(Source: Statistical Yearbook of Serbia (2002-2018); Statistical Office of the Republic of Serbia; National Bank of Serbia (2019); WB (2019))
*Serbia, without data for Kosovo and Metohija

	Manufacturing employment	Ratio industrial/total employment	Total employment
Absolute deindustrialization	Decrease	Decrease	Decrease
	Decrease	Decrease	Increase
Relative deindustrialization	Increase	Decrease	Decrease
	Decrease	Increase	Decrease
Virtual Industrialization	Increase	Decrease	Increase
	Increase	Increase	Decrease
Reindustrialization	Increase	Increase	Increase

Table 2: Deindustrialization type Source: Kuttor and Hegyi-Keri (2014)

(2014) concluded that 26 out of 35 regions experienced deindustrialization, including all regions in Hungary and the Czech Republic, while 9 regions in Poland and 3 in Slovakia were affected.

We conducted an analysis of deindustrialization in Serbia from 2001 to 2018 including employment trends at the national and macro-regional levels. For the regional level we included the following macro-regions: Vojvodina, Belgrade, Šumadija and West Serbia, and South-East Serbia. It is worth noting that AP Kosovo and Metohija is not included because of missing data.

At the national level (Serbia) (Figures 5 and 6) in the period under consideration (2001-2018) one can differentiate two sub-periods (2000-2014 and 2015-2018), with completely different results of the analysis. Namely, one can see a declining trend in the total employment, manufacturing employment and manufacturing employment as a share of the total employment in the period 2000-2014 and an increase during the second sub-period. In other words, an absolute process of deindustrialization in Serbia was under way in the first sub-period, while in the second, Serbia experienced (initial) reindustrialization.

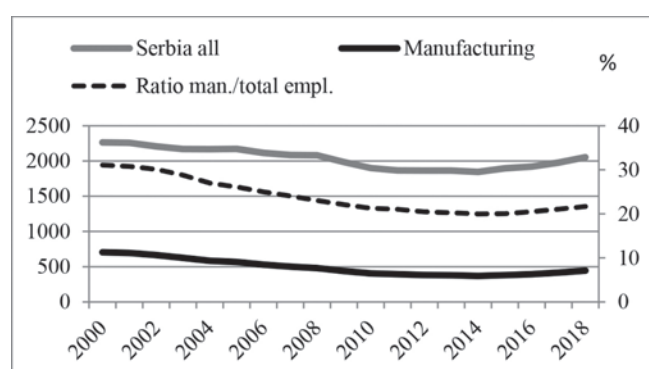


Figure 6: Serbia*, Total employment, manufacturing employment (000, left scale); Ratio: Manufacturing/Total employment (% , right scale) (Source: Statistical Office of the Republic of Serbia, Statistical Release, Registered Employment 2000-2018)

*Serbia, without data for Kosovo and Metohija

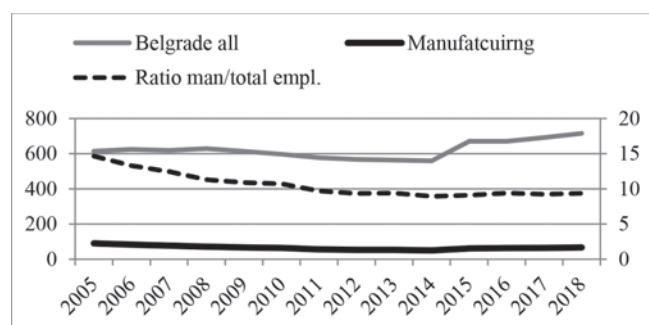


Figure 7: Belgrade, Total employment, manufacturing employment (000, left scale); Ratio: Manufacturing/Total employment (% , right scale) (Source: Statistical Office of the Republic of Serbia, Statistical Release, Registered Employment 2000-2018)

We obtained similar results for the macro-regional level. Belgrade experienced the same path as Serbia (Figure 7), namely, in the period until 2014 there was a decreasing number of total workers and manufacturing workers, while the ratio of manufacturing employment as a share of the total employment also decreased (absolute deindustrialization), but during the second sub-period all three categories increased (reindustrialization).

Vojvodina was faced with the same trends, absolute deindustrialization until 2014, and from 2015 until the present, there has been reindustrialization. The rate of manufacturing workers is much higher in Vojvodina than in Belgrade (from 15% to less than 10% in Belgrade and 23% and 27% in Vojvodina). As for the Šumadija Region including West Serbia, we can recognize the same path as for the whole of Serbia, absolute deindustrialization until 2014 and reindustrialization from 2015 to the present. The rate of manufacturing employment as a share of the total employment in Šumadija is even higher than in Vojvodina (30%). The South-East Serbia Region also experienced the same path of deindustrialization until 2014 and reindustrialization from 2015 onwards.

We can conclude that at both the national and regional levels the trends were the same (until 2014) with a decrease in the total employment, manufacturing employment and the rate of manufacturing employment, which characterized the process of absolute deindustrialization. From 2015 until the present, Serbia and all of its macro-regions have experienced an increase in total employment, manufacturing employment and the rate of manufacturing employment, so we can talk about reindustrialization.

REINDUSTRIALIZATION AS A POLICY

The main challenges to Serbian industry are weak growth, competitiveness, socio-economic inequalities, new technology, and creation of new values (e.g. GVA, new chains, etc.) as the base for innovative, sustainable and more balanced territorial growth. A new industrial strategy for Serbia, based on the European framework of "research/regional and innovation systems" (RIS), the 4IR and globalization, could be used for improving structural weaknesses, increasing competitiveness, and increasing innovative, sustainable and inclusive growth. A new industrial policy should be considered as the main vehicle for reducing the gap in competitiveness and improving economic growth and well-being (Warwick and Board, 2013; Bailey et al, 2015).

A reindustrialization strategy or "Strategy of Smart Specialization" (S3) in accordance with the new European industrial policy (based on the 4IR and RISs) is now under preparation. Also, Serbia and SEE countries have adopted a common SEE 2020 Strategy with a focus on mainstream economics and hi-tech development in their service sectors without industrial development (Zeković and Vujošević, 2015). It remains a conundrum to see how SEE countries can achieve fast growth in the global industrial race.

In order to overcome the situation, a reindustrialization policy is seen as a key by economists and decision-makers, almost without disagreement. It is seen as part of a new

export-oriented development model of Serbia (Đuričin and Vuksanović, 2013). It is important to note that it is in line with the European contemporary development strategy (Adžić, 2010). Two lines of activity are essentially important: on a macroeconomic level, a Development Industrial Policy (DIP) (Pitelis, 2014), and on a microeconomic level the restructuring of existing companies, in order to make them efficient and competitive abroad, as well as the establishment of new companies with high value added. However, when it comes to defining a DIP and recommending the necessary policy measures and instruments, disagreements are more evident.

The European Union is facing long-term deterioration of its competitiveness on the world market, sovereign debt, centripetal forces (BREXIT) and a low growth rate. The debate concerning the future development path has overemphasized macroeconomics, macroeconomic policy on the back of micro-economics and DIP (Pitelis, 2014).

Zeković (2019) indicates that after the Lisbon strategy (2000), the industrial strategy in Europe applied the "horizontal" approach to policies until 2010, e.g. the creation of supra-national and national competitive conditions for growth and innovation by regulating different rules, competition policy, human capital, etc. Savić and Zeković (2004) have shown that the focus of the Lisbon strategy included the improvement of industrial competitiveness, regional innovation, regulation, an institutional framework and conditions for better industrial functioning, knowledge transfers, etc. Bailey et al. (2018) argue that the policies of some EU countries specializing in innovative value creation activities, with the manufacturing of commodities from low-cost emerging economies, resulted in unaffected and non-captured "created value" within the EU. Zeković (2019) indicates that new technology can transform existing industrial structures, open competition issues, education, skills, regulation and global governance. Pitelis et al. (2012) indicate that the industrial strategy should contain different measures to enhance the outcome towards desired aims. According to Cimoli et al. (2009) the measures should support the "start-up" industry, policies (science, technology, innovation, regional, anti-trust policy, FDI, industrial clusters), regulation, state procurement, access to finance, etc.

According to the Europe 2020 strategy, the EU industrial strategy has changed its approach towards more "vertical" coordination. The EU Innovation program and Cohesion policy 2020 have included S3 as their main component, with mandatory adoption at the national level in all member states until 2020 (EU, 2017).

The development success of BRICS countries (Brasil, Russia, India, China and South Africa) was mainly based on developing the supply side of industrial policy. The role of the state in perpetuating growth abilities and DIPs has become important again. It is also interesting to be aware of Krugman's criticism toward the content of national competitiveness, since he states that there is no national competitiveness, but rather it only exists at the level of the firm (Krugman, 1994). In globalization and 4IR there are

several approaches towards international competitiveness and development industrial policy: the Washington consensus (and the "After the Washington Consensus"), the Japanese/Chinese approach, and the system of innovation known as Porter's competitive advantages (Pitelis, 2014).

First, the Washington consensus is based essentially on Ricardo's explanation that free trade gives the opportunity to all nations to benefit from their comparative advantages.

Second, the Japanese, later Asian and the latest contemporary Chinese industrial policy is based on important role of the state, hand in hand with business, in creating comparative advantage.

Third, systems of innovation, together with clusters and agglomerations are oriented through evolution, resources, capabilities and systemic support to improve and create comparative advantages (Freeman, 2004; Lundvall, 2007). Fourth, Porter's approach puts together the factors and conditions of demand, as well as the firm and industry structure and development strategy (Porter, 1990).

It is difficult to define development industrial policy (DIP) (Warwick, 2013). Originally, industrial policy referred to manufacturing, but later on it became a broad approach to stimulate the development not only of manufacturing, but also of services, even agriculture, considering their interdependences, with the content of long-term development policy. It is essentially state intervention, mainly because of market imperfections, by measures and instruments aiming to stimulate the performance of firms, sectors, industries, clusters and regions, including resources used to achieve given objectives and organizational and contingency arrangements (Pitelis, 2014). From this perspective one can see that European DIP has changed over time. The broader frame of European DIP is a neoclassical one, which is easily understandable, as the original idea of a common and later on united market is in line with benefit for all in free trade without any monopoly. However, during the 1960s and 1970s a number of European countries introduced IP "national champions" and "picking winners" policies. It included identifying potential successful sectors and firms and introducing supportive measures like subsidies and tax breaks (Pitelis, 2014). Considering the strong battle on the global market with companies from the USA and BRICS, during the last decade the EU has again introduced more explicit DIP measures and instruments and has overcome so-called "horizontal measures" only. In an EC document, for instance, it was argued that measures need to be introduced in line with specific sectoral needs in order to strengthen competitive forces and abilities (EC, 2002). Also, a later document talked about the need to overcome the deindustrialization trend by the introduction of a "regulative framework", a "sectoral approach" and the "synergy of policies" (EC, 2004; Pitelis 2014). During the first decade of the 21st century the EU explicitly talked about DIP within the framework of a "new growth strategy", which emphasized sustainability and competitiveness, as well as coordination between central and local levels and smart, inclusive and sustainable growth by the Europa 2020 Strategy (EC, 2010; EC, 2011).

In order to define an adequate DIP for a region or a country, several steps are necessary: making a diagnosis, defining the national position, analyzing cost differentiations, strengthening innovation and introducing DIP measures and instruments, all based on the framework of the 4IR. Firstly, it is necessary for a country to answer the question of whether there are competitive and/or potential comparative advantages, which seems give a more lucrative outcome in the future; secondly, there is national positioning, with the aim of defining a low relative cost while maintaining a high relative image to other countries; thirdly, it is necessary to find a way to improve competitiveness by reducing unit costs, improving differentiation and strengthening innovation capabilities due to shifts in the 4IR; and finally, DIP measures and instruments should be defined, like encouraging FDI, supporting clusters, improving business ecosystems and forming special economic zones (Pitelis, 2014).

"A new model of economic growth in Serbia", an export oriented development strategy, can be useful as a basic framework for defining an appropriate DIP for Serbia (USAID, FREN, Economics institute, 2010.) Its main objective is reindustrialization. The Strategy and policy for the Industrial Development of Serbia for the period 2011-2020 have already been defined, but they have to be reconsidered in line with relevant European documents (MERR, RZR, 2011) and new principles and requirements of the 4IR.

First, it is important to discuss Serbian competitive and/or comparative forces, as well as contemporary and potential/future ones. Usually, those sectors and sub-sectors identified are seen as development priorities and would be supported by DIP measures and instruments. Some economists have argued that agriculture can be seen as Serbia's comparative advantage, focusing on "organic food" and "green technology" (Đuričin and Vuksanović, 2013). However, there are more arguments that it is false and could jeopardize potential future growth (Mičić and Zeremski, 2011). Instead, Serbian agriculture could be the basis for development in the food industry and the promotion of exports. In order to define the priorities for DIP support, it is important to note that whole sectors can only be used exclusively, groups of product rarely and products mainly as priorities. Such priorities could be: the automotive industry and the production of components, machinery and equipment, the production of ICT equipment and food production (Mičić and Zeremski, 2011), but not the energy sector or metallurgy (Đuričin and Vuksanović, 2013). Zeković (2019) indicates the need for changes in the DIP as a consequence of the 4IR.

Second, national positioning is relevant. It means that the country itself tends to be low cost in comparison to other countries and also well-branded. If it is not successful then relative costs would be high, because of pure infrastructure, high taxation, low innovative abilities, and the low skills of employees. Also, it would be low differentiated, which means that its products would be of low quality, inferior in technology and other qualitative aspects. An example of high relative cost and low image position is the Serbian export structure, with a high share of agricultural products, raw materials and semi-final products.

Thirdly, the DIP needs to be defined in a way that mobilizes the relevant subjects at a national, local and company level, with the aim of improving the competitive image on the world market reducing unit costs and strengthening innovative capabilities, the transfer of knowledge, and the education of workers. An example of the changing image of Serbia and its reorientation towards export is the success of the software export of SMEs, mainly start-ups (1.1 billion euros in 2018). In this regard it would be important to change the SME supportive policy, from general support to more specific support for "gazelles" and fast growing and high-tech companies (Hadžić and Pavlović, 2017).

Fourth, DIP policy measures and instruments have to be as detailed as possible and introduced at a different level. Encouraging FDI is necessary because of their importance in overcoming the relatively low level of domestic investment. It is important to note that existing FDI policy (if any) has overemphasized subsidization, which is wrong, but necessary in order to overcome unfavorable business conditions, and more importantly it includes stimulations to foreign investors to place their products on the domestic and not on the global market. Thus the overall result of such foreign investments is negative for the trade balance and the balance of payments (Boljanović and Hadžić, 2017). The formation of supportive clusters is seen as an important vehicle for DIP which has already begun, but there is a lot of room for improvement in the sectors of former traditional exporters, and more importantly in high tech ITC.

CONCLUSION AND RECOMMENDATION

Deindustrialization and its outcomes can be seen as one of Serbia's main development problems. The contemporary structure of its GDP formation and employment is unlike less developed countries and similar to developed countries. The consequence of this is that there are not enough tradable products for foreign trade, which hampers exports, the trade balance and the balance of payments. By looking at the causes of Serbian deindustrialization and comparing them with CCEE, it can be concluded that deindustrialization started in the 1990s as a result of specific, non-economic and economic factors. Later on, during transition Serbia did not face a drop in production like other countries and continued with deindustrialization, due to inertia and a neoliberal approach to development.

This investigation of the path of deindustrialization measured by employment indicators over the last two decades at the national and macro-regional levels points out that at both levels absolute deindustrialization was taking place until 2014, when reindustrialization began at the national and regional levels.

Development industrial policy is in accord with the EU reindustrialization strategy. A new model of economic growth, which is another name for an export-oriented development strategy, could be a good broad framework for DIP.

To make a diagnosis, one can say that Serbia has no single competitive force, but has only potential. No whole sector can be a priority, but rather only some subsectors, groups of products or products. Priorities could be the automotive

industry, machinery, equipment, ITC and food production, as well as the renewable energy sector, and some innovative products of the 4IR.

To create an average Serbian product to be low cost and well-branded is a very difficult and complex task. It is affected by education in innovative technology, training existing workers, the transfer of knowledge and technology, improving the infrastructure, the formation of clusters, lowering taxation, improving innovation, and supporting R&D and branding.

DIP has to be well coordinated at the national, regional, local and company levels. It is essential to avoid development mistakes like subsidizing FDI.

The global framework and progress of technology (in the 4IR) deeply change the essence, skills, cooperation, and allocation of future development. This requires a new perspective (green, low-carbon, sustainable, innovative) for a new Serbian industrial strategy-S3. Successful industrial policy requires respect towards the key contextual factors such as the institutional framework, a more even distribution of revenue, equity, etc. Developmental and industrial policies have to match key social objectives, with priorities in the improvement of institutions, a new governance, and the distribution of socio-economic and territorial outcomes.

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A SPATIAL PERSPECTIVE ON DEMOGRAPHIC CHANGE IN SERBIAN CITIES AND TOWNS

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The majority of European countries share challenges related to demographic change. A decline in the total population size and population aging have already spread from rural to some urban areas. The case of Serbia is no exception. The focus of this article is the parameters of demographic change analysed particularly for larger (cities) and smaller (towns) urban settlements – population size, birth rate, rate of natural increase, average age of first-time mothers, total fertility rate, share of the young and elderly population, average population age, and developing demographic trends. The paper also stresses the necessity to use other definitions for a “city” than the one used in legislation or statistical reports, by showing the extent to which results might differ depending on the chosen definition. One of the definitions used in this paper relies on a slightly adapted division of settlements used in statistical reporting, while the other is based on the Law on Local Self-Government (2007), the Law on the Territorial Organization of the Republic of Serbia (2007) and functional urban areas defined by the Spatial Plan of the Republic of Serbia. Cities and towns are observed from the perspective of their spatial distribution; therefore, each parameter is considered at the settlement, regional and district level.

Key words: demographic change, urban demography, territorial balance, spatial development, Serbia.

INTRODUCTION

While the global population is increasing (United Nations, 2017), most European countries are dealing with aging populations (European Commission, 2014) and most East-European countries face depopulation (Mohdin, 2018). Even though the processes of depopulation and population aging, known as “demographic change”, were initially related to rural areas, currently they also refer to an increasing number of shrinking cities (Wolff and Weichmann, 2017). These trends are taking place in spite of a decades-long influx of migrants to urban areas, which are the zones of the highest population concentration (Pejin-Stokić and Grečić, 2012). In addition, there are frequent cases where cities within the same country appear to significantly differ from each other, which leads towards a territorial misbalance at the regional, national and thus international level (Pantić and Živanović Miljković, 2010; Elledge, 2015).

The demographics of Serbia are going through undesirable trends regarding the population size, age structure, number of births, fertility rate, etc. (Penev, 2014; Marinković and Radivojević, 2016). In spite of decades-long emigration from rural to urban areas, the general trend of depopulation,

which has lasted since the 1950s, indicates that even immigration zones could be endangered by demographic decline. The “brain-drain”, which has been characteristic of Serbia for some time now, also supports this hypothesis (Kupiszewski *et al.*, 2010).

When preparing the Spatial Plan of the Republic of Serbia (2010), population size was used as one of the criteria for defining functional urban areas [FUAs]. The number of inhabitants taken as the cut-off point between areas with and without the potential for being a FUA was 100,000. The number refers to the population inhabiting units of local self-governance [ULS] that were taken as the gravitation centre for a particular area. After combining with other criteria, a total of 32 FUAs were defined, or 25 FUAs excluding the territory of Kosovo and Metohija. Their distribution on the map shows two obvious and rather large areas with no regional centre and no coverage by FUAs: the Ivanjica-Prijepolje area and Majdanpek-Bor area. These are examples of conspicuous depopulation and emigration zones in the country. In addition, the gravitational power of urban centres in Serbia is not balanced. Almost a quarter of the population lives in the capital city, while the population size of the next biggest cities is much lower – Novi Sad, the second largest, is almost five times smaller, Niš, the third largest, is 1.5 times smaller than Novi Sad, and so on (SORS, 2014a).

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As the demographics of urban areas, which used to be the most powerful gravitational zones in terms of population migration, are significantly changing, this article analyses the diverse elements of demographic change and their potential outcomes in the future, specifically focusing on cities and towns. Due to the large differences between urban settlements in terms of their population size, this paper aims at a two-tier analysis – one embracing urban settlements of all sizes, and the other focusing solely on the largest urban centres (in the context of Serbia). The paper also addresses the issue of using diverse definitions of cities, which frequently depend on which statistical data are available. In order to save time, scholars frequently use the urban-rural dichotomy applied in statistical reporting (with its all deficiencies) instead of creating a new database, or cities are not defined at all, relying instead on default definitions. Presentation of the potential consequences of the issue is an additional aspect highlighted in the discussion and conclusion sections.

METHODOLOGICAL APPROACH

In addition to the main focus – analysis of the demographic capacity of the urban population in Serbia – this article makes a parallel comparison between two definitions of cities. The purpose of the comparison comes from the fact that there is no commonly used definition, even when it comes to different spatial development analyses. Most analyses of this kind rely on the definition given in statistical reports by the Statistical Office of the Republic of Serbia [SORS]. The disadvantage of the division used in these reports is that the criteria for the typology are not uniform, but are locally declared. There are two groups of settlements recognised – “urban settlements” and “other”. The result is as follows: some functionally rather rural settlements are given the status of an urban settlement, while certain settlements with urban elements (e.g. public services) belong to the group of “other” settlements.

In one of the definitions used in the paper, 122 “urban settlements” were chosen from a list of 179 “urban settlements” used in national statistical reports. The settlements excluded from the list are those that are not the seat of a local self-government unit, and the list was additionally shortened in the case of the capital, where districts kept separate in reports (e.g. Belgrade – Voždovac, Belgrade – Čukarica) were taken as one settlement – Belgrade. The definition is known as “SORS” because it mainly corresponds to the list of “urban settlements” as they are defined in SORS reports.

A city is defined by the Law on Local Self-Government (2007) and the Law on the Territorial Organization of the Republic of Serbia (2007) as a “unit of self-government, which represents the economic, administrative, geographic and cultural centre of a broader area and which has more than 100,000 inhabitants”. This implies that a city is an administratively defined territory consisting of more than one settlement – of which some are urban, while others are rural; a settlement that represents the gravitational centre of the territory is called the “seat of the city”. On the other

hand, a “settlement” is defined by the Law on Territorial Organization as part of the ULS territory with residential buildings, a communal infrastructure and other facilities that fulfil the needs of its permanent residents. The aim of this research is to focus on settlements as such, particularly urban settlements; therefore, another definition that is used in the analysis actually deals with the “seats of the cities” (urban settlements), which are here, for reasons of simplicity, addressed as “cities”. This implies that the definition of a city by legislative acts is not equal to what is here defined as a city: whereas the first definition refers to an administrative territory, the second refers to the urban settlement itself. The concept of a settlement was chosen because this makes the two chosen definitions of cities/towns mutually comparable; hence it was possible to conclude whether the size of a settlement matters in the evaluation of demographic change.

The choice of settlements for the purpose of the second definition is derived from the Law on the Territorial Organization of the Republic of Serbia (2007) and the definition of FUAs in the Spatial Plan of the Republic of Serbia (2010). Namely, the Law counts 27 cities and the City of Belgrade as a ULS with special status, while the Spatial Plan addresses 26 FUAs including the City of Belgrade². Even though both sources rely on the criterion of having “above 100,000 inhabitants”, they actually extend the list of cities and FUAs to areas with a lower number of inhabitants. Since cities as ULs have a different status in comparison to municipalities (another form of ULS), the decision to embrace even areas with less than 100,000 inhabitants in the Law and in the Plan reflects the political and strategic attitude of the State towards the improvement of territorial and regional balance in the country. On the other hand, the purpose of this paper is to evaluate the actual demographic capacity of the largest settlements. Therefore, the second definition used in this paper embraces settlements that are gravitational centres of ULs with more than 60,000 inhabitants, with Zaječar as an exception. The Zaječar ULS is the only one to have a smaller population size but still be included in the analysis, because it is the largest ULS below 60,000 inhabitants and it is relevant as a representative from the typical depopulation zone in Serbia. Its specificity is stressed in several places through the analysis. For practical reasons, the definition is abbreviated here to “CS”, which stands for “city seat”, and embraces 23 cities. In other words, a CS or a city seat is basically the largest settlement of the same name as the city or municipality it belongs to.

A slight deviation is made in the case of cities consisting of more than one municipality³. In the case of Belgrade, the SORS definition includes the seats of city municipalities that are considered to be “urban” in statistical reports: Belgrade, Lazarevac, Mladenovac, Sopot, Surčin, Grocka

2 The data refer to the territory of the Republic of Serbia without Kosovo and Metohija. They were not taken into consideration due to the unavailability of statistical data.

3 According to the Law on Local Self-Government (2007) and the Law on Territorial Organization of the Republic of Serbia (2007), the territory of a city (as a ULS) can be divided into two or more city municipalities.

and Obrenovac, while the CS definition includes only the settlement of Belgrade because other listed settlements are not the seats (the largest settlements) of ULSs, but rather the seats of city municipalities. The same principle is adopted for Niš, Vranje and Požarevac. In the case of Novi Sad, both definitions embrace the settlements of Novi Sad and Petrovaradin, because they practically represent a continuous built-up area.

For the natural components of population growth – birth-rate, rate of natural increase – statistical data are available only at the ULS level, since an analysis of these indicators was not conducted at the settlement level. Instead, the data for cities with more than one municipality were calculated only for municipalities that have at least one settlement classified as urban by SORS. This drawback is not the consequence of the methodology set for this research, but it is a general issue due to data availability being solely at the ULS level.

Values at the regional/district level are calculated as the sum of or as the average value of all cities that are located in the corresponding region/district, as defined by the SORS and CS definitions.

The demographic elements analysed here are related to the main aspects of demographic change: depopulation and population aging. Therefore, an analysis of the cities and towns, as defined in this section, was conducted by considering: population growth over a long time-span – from 1948 to 2011; the birth rate (number of live-born per 1,000 inhabitants); the average age of first-time mothers; the average number of children per mother for each year between 2008 and 2016; the share of the young population (0-14) compared to the share of the elderly population (65+); and the average age of the population for the last two censuses (2002 and 2011). The difference in these time-spans by groups of indicators was partially a result of the character of each variable, but also because of the rational use of time, since some data sets are still not available in digitalised form (older publications).

ANALYSIS

Population size (1948-2011)

Between 1948 and 2011, the population in Serbia increased by 10.1%. This growth occurred mainly in urban settlements: in cities and towns defined by SORS the population size increased by 148.7%, but according to the Spatial Plan definition by 208.2%. In other settlements, the population decreased by 39.4% or 22.3% respectively, depending on the definition (based on SORS, 2014a).

The population in Serbia increased until 1981, after which it started to decline. When observed according to the settlement division presented in SORS publications, where settlements are differentiated as urban and other based on traditional, locally set and mutually uncoordinated criteria, the number of inhabitants in cities (with insignificant fluctuations) has been stagnant since 1981 (Figure 1). The right-hand side of Figure 1 shows that the population in CS cities increased for a decade longer (until 1991), although it still had a rather stagnant character.

Following the SORS settlement definition, the population in rural areas was higher than the population in urban settlements until the inter-census period 1981-1991, while application of the CS definition shows that the rural population has always been higher and will equalise with the urban population only in the future (Figure 1).

Regional aspect – population size

From 1948 to 2011, the Belgrade region encountered the most significant change in the urban population size (SORS definition). Even though the size of the urban population in the Vojvodina region was highest until 1971, the urban population of the Belgrade region overtook it after this. A period of fast growth for all regions lasted until 1981, after which the size of the population in cities started to stagnate, fluctuate or even slightly decline. The Šumadija and West Serbia region is the only region where the urban population has been constantly growing, in the Belgrade region a decrease in the size of the urban population occurred in

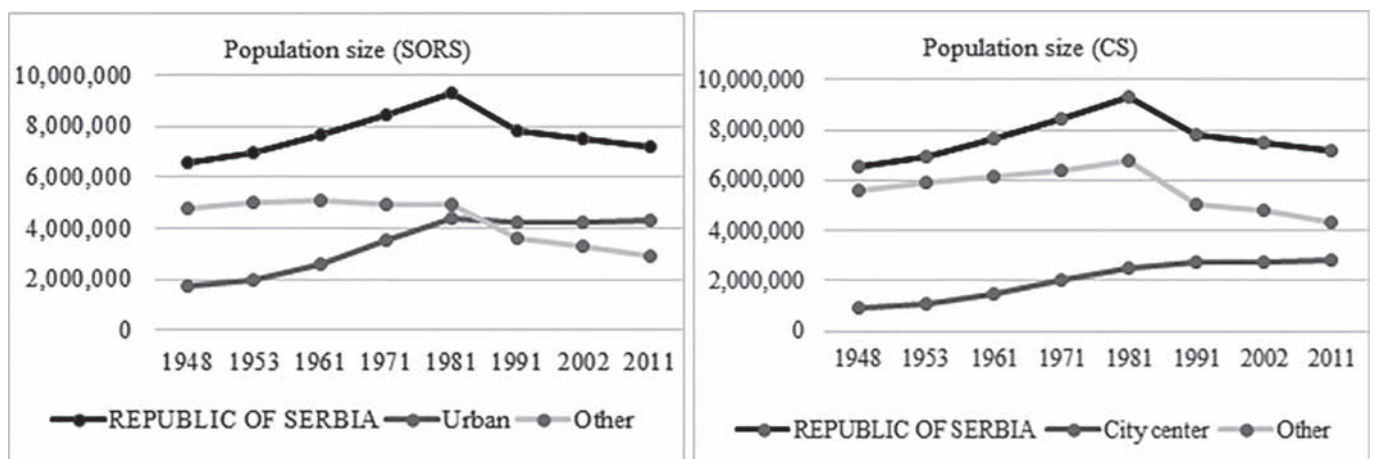


Figure 1. Population size 1948-2011 (SORS and CS definitions)
(Source: elaborated by the author based on SORS, 2014a)

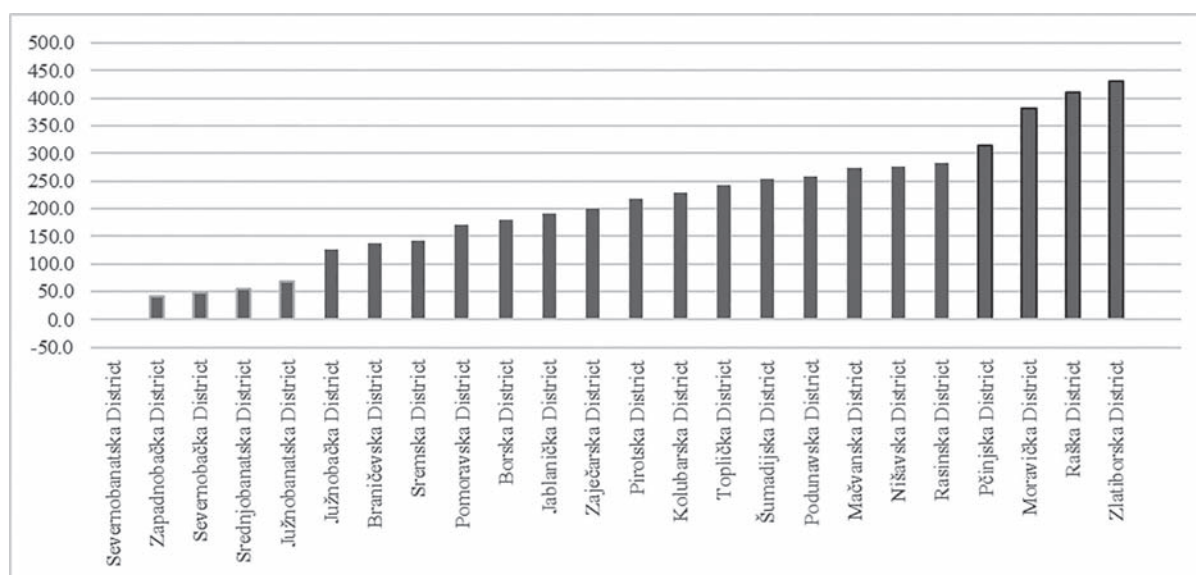


Figure 2. Districts by SORS: urban population growth rate 1948-2011 (%)
(Source: elaborated by the author based on SORS, 2014a)

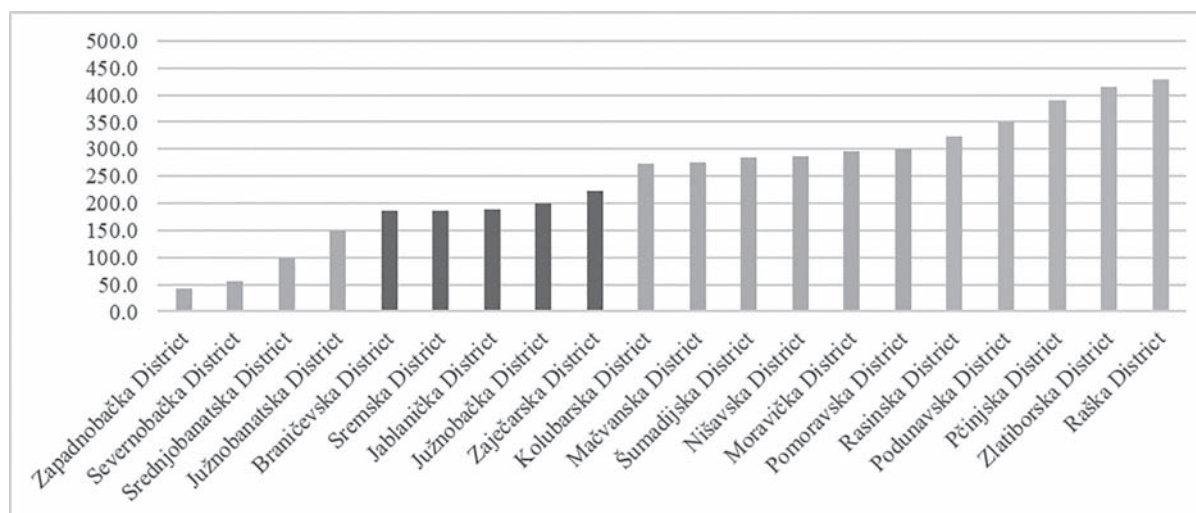


Figure 3. Districts by CS: population growth rate 1948-2011 (%)
(Source: elaborated by the author based on SORS, 2014a)

2002⁴, in Vojvodina only the last census in 2011 recorded a decline, while the South and East Serbia region has been encountering population loss since 1991. In addition, the urban population size in South and East Serbia has been the lowest in comparison with the other regions since the beginning of the 1950s (based on SORS, 2014a).

According to the CS definition of cities, the trend of growth/decline in the urban population is practically the same as in SORS definition of cities, but only if the trends are observed for each region independently. In contrast, comparison of the trends between regions shows significant differences between the Belgrade and Vojvodina regions. Namely, in this case the Belgrade region has extended well beyond other regions in terms of its total city population size since the

beginning of the period analysed. This difference began at the beginning of the 1950s and the Belgrade region grew disproportionately compared to the other regions until the 1980s. None of the other three regions experienced such rapid population growth in their cities. The South and East Serbia region constantly recorded the smallest urban community, while the Vojvodina region had higher growth than in the Šumadija and West Serbia region until 1981. Since then, those two regions have recorded shifts in the advantage of one over the other (based on SORS, 2014a).

At the district level, three main groups of districts (SORS definition) can be distinguished: five districts in the Vojvodina region with a city population growth of less than 100%; three districts in west Serbia and one in south Serbia where the rate exceeds 300%; and 15 other districts recording between 100-300% city population growth rates (Figure 2).

⁴ The census methodology in 2002 did not count internally displaced persons from Kosovo and Metohija, which was changed in the 2011 census.

If the population of cities as defined by CS is observed by district, then the Severnbanatska, Borska, Pirotka and Toplička Districts are excluded because, by this definition, they have no cities. It can be noticed on Figure 3 that in this case there are four groups of districts distinguished. According to the SORS definition, the lowest population growth is again in Vojvodina districts, only this time Severnbanatska is missing on the list because it has no cities. By this definition, growth rates in this group go up to 150%. This time the Rasinska and Podunavska districts join the group, with over 300% growth, taking over from the Moravička District, while the Pčinjska, Zlatiborska and Raška Districts remain on the top of the list, only with slight changes in their order. The difference between the remaining two groups is not large, but it still indicates that city populations in north and east Serbia are growing less than city populations in west and central Serbia.

Natural component of population growth

In this section of the paper, the methodology is adapted to the fact that statistical reporting presents the information at the municipal, instead of the settlement level. Therefore, the data for cities with more than one municipality were cumulated only for municipalities that have at least one settlement classified as urban by SORS. In addition, values at the regional level were calculated as average values for all municipalities that fitted the previously mentioned criteria.

The birth rate, or number of live-born per 1,000 inhabitants, for the total population of Serbia shifted between 2008 and 2016 from 9.0 up to 9.6‰. Another parameter, even more indicative in terms of natural population growth is the rate of natural increase, because it reflects not only the birth rate, but also the death rate. When the number of births is compared with the number of deaths (average for 2008-2016), it is clear that cities in Serbia have been losing their inhabitants regardless of which type of definition is used – either SORS or CS. However, the loss appears to be smaller in cities defined by CS: -4.3‰ compared to -7.7‰ (based on SORS, 2010a; SORS, 2010b; SORS, 2011; SORS, 2012a; SORS, 2013; SORS, 2014b; SORS, 2015; SORS, 2016; SORS, 2017). In contrast, mothers in the cities defined by CS postpone the decision to become a mother by one year compared to cities defined by SORS (27.7 compared to 26.7 years old), although they have more babies (1.5 compared to 1.4) (based on SORS, 2015; SORS, 2016).

Regional aspect - natural component of population growth

At the regional level of analysis the Belgrade region is the same in both the SORS and CS definitions. Namely, the Belgrade region has a higher birth-rate and higher population growth than the other regions (based on SORS, 2010a; SORS, 2010b; SORS, 2011; SORS, 2012a; SORS, 2013; SORS, 2014b; SORS, 2015; SORS, 2016; SORS, 2017), even though the average age of a first-time mother is almost two years older than in other regions (based on SORS, 2015; SORS, 2016). It is also intriguing that population loss is largest in the South and East Serbia region, despite first-time mothers being younger there than in other regions.

Results for the Vojvodina region and the Šumadija and West Serbia region differ depending on the city definition used. According to the SORS definition, the birth rate is higher in the Vojvodina region, while according to the CS definition it is higher in the Šumadija and West Serbia region. Also in the case of the average age of a first-time mother: in line with the SORS definition the Vojvodina region has “younger” mothers than the Šumadija and West Serbia region, while for the CS definition the opposite is true. Regarding the total fertility rate, the Belgrade and the Šumadija and West Serbia regions (but only by the CS definition) have 1.5 children per mother (based on SORS, 2010a; SORS, 2010b; SORS, 2011; SORS, 2012a; SORS, 2013; SORS, 2014b; SORS, 2015; SORS, 2016; SORS, 2017).

At the district level, the birth rate in 2016 spanned from 6.5‰ to 9.0‰ in most districts, except in Raška and Beogradska where it was 10.7‰. The birth rate in cities (CS) by district strongly fluctuates from year to year, but for the majority of districts the trend is descending. A few peaks are noticeable, for example in 2008 when the birth rate in the Južnobačka District (with Novi Sad as its urban centre), Raška District (due to Novi Pazar) and Braničevska District (due to Požarevac) stood out with relatively high birth rates compared to the national average (based on SORS, 2017).

The natural population growth rate in cities is negative in every district when using the SORS definition, but when they are defined by the CS definition, Južnobačka and Raška Districts are the only ones to achieve a positive growth rate on average from 2008 to 2016. By both definitions, cities in the Zaječarska District have the lowest natural population growth rate (SORS: -14.7‰; by CS: -10.7‰) (based on SORS, 2010a; SORS, 2010b; SORS, 2011; SORS, 2012a; SORS, 2013; SORS, 2014b; SORS, 2015; SORS, 2016; SORS, 2017). The average age of first-time mothers in 2015 and 2016 is lowest in the Jablanička District (SORS: 25.4; CS: 26.0) and highest in the Beogradska District (29.8). The total fertility rate is, by both definitions, almost equally distributed throughout the districts, ranging from 1.4 to 1.5 children per mother; and only the Toplička District stands out using the SORS definition, with a value of 1.6, and the Zaječarska District stands out using the CS definition, with 1.3 children per woman of child-bearing age (based on SORS, 2015; SORS, 2016).

Population age structure (2002/2011)

Between the last two censuses (in 2002 and 2011), the total population of Serbia grew older. The difference in the share of young and elderly people increased from 0.9% to 3.1% indicating a higher percentage of elderly individuals. Consequently, the average population age changed from 40.2 to 42.2. The trend is the same in cities in Serbia, too. Defined by SORS, the average age of the population in cities grew from 38.4 to 41.3, while according to the CS definition the rise was from 38.7 to 41.0. A comparison of these two definitions indicates that SORS cities had a younger population than CS cities in 2002, but that the situation had changed by 2011. The aging trend compared in the two definitions is additionally confirmed by analysis of the share of the young and elderly populations: in 2002, there were 3.6% and 2.9% more young people (SORS and CS definition respectively), while in 2011, the values were 0.6% and 0.1% more elderly people (based on SORS, 2003; SORS 2012b).

In 2002, the youngest population was in Novi Pazar (with 18.6% more young than elderly people), while the oldest was in Belgrade (with 2.6% more elderly than young people). Nine years later, the leading position, which Novi Pazar gained in 2002, remained intact (with 16.8% more young than elderly people), while the difference between young and elderly grew making it 3.5% more elderly than young people in Belgrade. Zaječar (-3.9%) and Sombor (-4.4%) have become cities with the oldest population in Serbia. This refers to cities according to the CS definition.

When it comes to the SORS definition, the situation in Belgrade changed significantly from 2002 to 2011: firstly, it was at the bottom of the list as one of the four oldest cities, with 2.6% more elderly, but then it jumped up to being the 26th oldest city even though it "grew older" (with 3.2% more elderly individuals in 2011). This indicates that much smaller cities, such as Vrnjačka Banja, Dimitrovgrad and Kučevo, grew older at a much faster pace than the capital. In contrast, the top position was held by Novi Pazar in both census years.

The undesirable tempo at which cities in Serbia are growing older can be pictured in the fact that in 2002 there were 19 cities out of 122 with a higher share of elderly than young people, while this number increased to 77 cities in 2011 (SORS definition). According to the CS definition, at first there were two cities of this kind, but later the number grew to 17 cities out of 23 (CS definition).

Regional aspect – population age structure

Observed at the regional level, age structure significantly depends on the definition of cities. Thus, according to the SORS definition, the Belgrade region was the "youngest" (average population age of 40.8) in 2011, while the CS definition ranks the region as the "oldest" (42.2). The "oldest" region according to SORS was the Vojvodina region (42.0), but in the CS definition the oldest were the Šumadija and West Serbia and the South and East Serbia regions (both 40.9). Those two regions were also the "youngest" in 2002 (CS definition), while according to the SORS definition, only the Šumadija and West Serbia region was in this category. According to the SORS definition, the Vojvodina region was again the "oldest". On average, the population in each region grew older by two years between 2002 and 2011 using the CS definition, and by 2.7 years using the SORS definition.

When considering the share of young and elderly individuals, most of the regions, regardless of the definition used, had a higher percentage of young people than elderly in 2002 (between 1% and 5%). Only the Belgrade region using the CS definition had a higher share of elderly people by 2.6%. Aging of the population becomes obvious when the same comparison was made for 2011: the share of elderly people overtook the young population in two regions (the Vojvodina region and the South and East Serbia region according to SORS, and the Belgrade and the Vojvodina regions using the CS definition). In addition, the difference between those two population cohorts decreased even in the regions where the young population remained higher (there were more young people only by 0.2-0.3%).

A comparison of districts in Serbia shows that a large number of districts had a higher share of elderly than young individuals in 2011, according to both definitions. According to SORS, this was true of 17 out of 25 districts, and for CS 16 out of 21 districts had more elderly than young people. The most desirable situation was in the Raška District and the least desirable in the Vojvodina region and east Serbia (the eastern part of the South and East region), where 16 out of 21 districts had a higher share of elderly individuals according to the CS definition. The distribution of districts from the best ranked to those at the bottom of the list is similar in the case of the SORS definition, with only one exception – the Belgrade district. The SORS definition, which includes the Belgrade settlement and other physically detached urban settlements within the administrative region of the City of Belgrade, puts Belgrade in first position, while the CS definition, which includes only the Belgrade settlement, ranks it last.

In 2002, the situation was quite different: only one district, using SORS, had a higher share of elderly than young people (Severnobačka District). Using the CS definition, the Beogradska District was added to the list, while the Raška District was again best rated using the CS definition and the Pčinjska District using the SORS definition.

DISCUSSION

Trends

Over a time-span of 63 years, the population of Serbia has increased by 10%. A significantly larger increase was recorded in cities (over 100%), which indicates that urban settlements "grew" predominantly due to immigration and not as a consequence of natural demographic factors (a high birth-rate and natural population growth). This has been proven by an analysis of the natural population growth between 2008 and 2016, which showed that the death rate is higher than the birth rate.

The age structure of city populations is moving towards a more and more aged society, although it already belongs to a group of deep demographic age⁵ category. Between 2002 and 2011 the share of the young population in the total population went in an undesirable direction – the population in cities in Serbia gained a much higher share of elderly individuals. Over only a nine-year time span (2002-2011), the percentage of cities with a higher share of elderly than young people increased from 15.5% to 63% using the SORS definition, and from 9% to 73% using the CS definition. In other words, the tempo at which the urban population in cities is becoming demographically older is rapid.

SORS and CS definitions

According to the CS definition of cities, there are five times fewer cities than according to the SORS definition (23:122), and they embrace only the largest urban settlements that are the most common and the strongest gravitation zones for immigrants. For this reason, the growth of the urban population in CS cities is almost 60% larger than in SORS

5 According to the demographic age classification shown in "Stanovništvo – pol i starost" / "Population – Gender and Age" (SORS, 2003).

cities. The difference in definition also influences how the results are interpreted when it comes to comparison between the urban and rural populations. Thus, the size of the urban population exceeded the size of the rural population between 1981 and 1991, as defined by the SORS definition; in contrast, the urban population defined by CS has still not exceeded the size of the rural population, although the trend shows that this is certainly going to happen in the near future.

Population loss due to vital events (the difference between births and deaths) is basically doubled when towns, as smaller urban settlements, are taken in account together with cities, and accordingly, the population loss is 50% lower in large cities. Another particularity of large cities is that females become mothers later than in smaller cities, although they have more children.

A comparison of the population age structure using the two definitions shows that the urban population in smaller cities (towns) used to be demographically more vital, but that this has changed in the last decade: the population is younger in large cities now. This indicates that the demographic capacity of Serbia will reduce only to large (or the largest!?) settlements and that their number will progressively decrease if the trends continue.

The choice of definition greatly influences the results for regions such as the Belgrade Region (the same territory as the City of Belgrade and Beogradska District). It is a unique case among the cities in Serbia because it is surrounded with a number of smaller urban settlements specific in terms of their demographic characteristics, size and functions, and which greatly change the demographic structures of the city population observed at the level of the entire administrative territory of the city. Thus, by including the population of all the urban settlements within the administrative territory, Belgrade is significantly more demographically stable than the settlement of Belgrade alone.

Regions

The region that has recorded a population decrease for over 20 years is also the region with the lowest population increase over the past 60 years – the South and East Serbia region. Expectedly, the number of children per mother was the lowest compared to other regions, but the analysis also indicates that this part of Serbia is very clearly an emigration area.

When comparing districts, some districts in west and central Serbia have higher population growth, while the north and east districts lag behind. The situation is the result of both the natural growth rate and the number of children per mother: Belgrade, Novi Sad and the Raška District are positive examples, regardless of the definition used and the year observed, while the Zaječarska and Jablanička Districts are ranked the lowest. The Zlatiborska District records population growth, but it also has undesirable natural growth values, which indicates that the population growth is induced by immigration.

Regarding the average age, the most prominent cities with the lowest average age are undoubtedly Novi Pazar and Tutin, followed by the largest cities, while towns have the

oldest populations; hence, towns have the most impaired demographic capacity for the future. Large cities are “oldest” in the Šumadija and West Serbia region and the South and East Serbia region, while smaller cities have the oldest age structure in the Vojvodina region. When observing the population as a whole and regardless of the demographic size, the “oldest” urban population is concentrated in the Vojvodina region.

Future expectations

According to projections (SORS, 2014c), the total population of Serbia will keep shrinking through the entire projection period – from 2011 to 2041. The only region with an increasing number of inhabitants is the Belgrade region (10.2%), while the largest decrease is expected in the South and East Serbia region (28.1%). The data refer to the total population in the regions, which indicates that the values could be slightly more optimistic for cities and towns only. However, even the most optimistic projection scenario shows that the regions should expect population decrease.

Based on the same projections, population aging will continue through the entire period. The Belgrade region is expected to be the least affected, but the South and East Serbia region the most. Life expectancy at birth at the beginning and end of the projection period in the Šumadija and West Serbia region is the highest and in the Vojvodina region it is expected to be the lowest. Hence, it can be expected that population pyramid for the Šumadija and West Serbia region will be expanded at the top section.

Annual net migration by region at the beginning of the projection period (2011-2016) is negative, namely, the number of emigrants was expected to be higher than number of immigrants, except in the Belgrade region. For the end of the projection period (2036-2041) the overwhelmingly optimistic projection predicts that the annual number of immigrants will be between 1,867 and 14,867 higher than number of emigrants, depending on the region (Ibid.).

CONCLUSIONS

It can be said that the population size in Serbia has grown, but only when observed over a long-time span (more than 60 years). Actually, it has been almost 40 years since it began decreasing. The aforementioned growth occurred in cities and towns, primarily due to immigration in urban areas and emigration from rural ones. In fact, the analysis confirms that the greatest demographic capacity lies within large cities, which record almost a 60% increase compared to cities and towns together. Rural areas used to be the major natal resource of Serbia, but nowadays they have been so depopulated that the role has shifted to larger settlements (Spasić and Petrić, 2006; Beker et al., 2017), in spite of the fact that women in large cities postpone their decision to become a mother. The rate of natural population increase in cities and towns has been negative for the last few decades, but numbers also show that large cities are better ranked. This also indicates that the repercussions of long-term internal population movement are that cities with the strongest gravitational influence have gained most of the demographic resources.

Demographic age analysis shows that the age of the population in Serbia grows from year to year. The problem behind the fact is that the birth-rate, fertility rate and other components of natural population increase are recording small or even negative values. In comparison to the total population, the age structure in towns is more favourable, but still best rated in cities. As internal migrations usually involve the young population of reproductive age, particularly young women, who are drawn by larger gravitational zones (Bobić *et al.*, 2016), the result is a younger age structure in cities than in towns. However, since 2002 the age structure in the cities of Serbia has shown a progressive negative pattern. If the aging trend continues (2-3 years in 10 years) it could lead to serious consequences for the reproductive and general demographic capacity.

With regard to the regional level, the Belgrade region has the strongest gravitational power and demographic capacity, while the South and East Serbia region represents a depopulation area where, mostly due to emigration, the reproductive capacity has been weakened the most. The reproductive capacity of the Vojvodina region is the most evenly distributed in comparison to other regions, because it is not concentrated only in the largest cities, but also in towns. The youngest population is in the district with the highest birth-rates – the Raška District and the City of Novi Pazar. Analysis of the age structure also indicates that the demographic capital of the City of Belgrade does not lie in the core of the city (settlement of Belgrade), but in its outskirts. The difference between the centre and the peripheral municipalities comes from the fact that Belgrade is one of the youngest cities when all of its municipalities are taken into account, but in contrast, if only the settlement of Belgrade is considered, then it is the oldest.

In general, demographic trends in most of the cities and towns in Serbia are heading in an undesirable direction. It appears that there is a positive correlation between the size of a settlement and its demographic capacity, whereby larger cities have better prospects and chances of mitigating the existing trends. Territorial imbalance comes from the exaggerated concentration of populations in the largest cities, and continued intense emigration from rural areas. In addition, the urban population in the Belgrade region and the south-west of Serbia, with few exceptions, has been continuously growing, while in the east and north it has been shrinking.

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SPATIAL CONFIGURATION OF DWELLING UNITS IN MULTI-STOREY RESIDENTIAL BUILDINGS: THE CASE OF APARTMENTS BUILT IN SARAJEVO 2008 - 2018

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This paper is based on the premise that it is not the building as a structure that truly matters, but the spaces within the structure. Consequently, this paper takes into consideration usable space as its main substance and, by analysis and description of dwelling unit concepts in Sarajevo, it evaluates 116 apartments in 16 multi-storey residential buildings built between 2008 and 2018. All the data related to the apartments in Sarajevo is primary data, collected by means of observations and measurements, evaluated through qualitative and quantitative analysis, and set in the frame of an explanatory and comparative multiple case study. The results indicate that, in terms of their functional configuration, the apartments are mostly configured as atypical and unstandardized. The areas of use within the apartments were planned to be interrelated without any clear intentions, which has resulted in static plan types with no or only minor potential for variation in the spatial adaptability or flexibility.

Key words: dwelling, spatial logic, configuration, areas of use, plan type.

INTRODUCTION

When it comes to living spaces and the interests of their users, Vasilski (2016) claims that without experiencing architectural space, architecture cannot be understood. It can be stated that finished architectural spaces are positioned in between two sides of interest (influenced by two parties (Suvanajata, 2001)): architects on one side and users on the other. In addition to the aforementioned parties, a third party of interest is the building and financial sectors, which serve as the dominant force in the contemporary world. The setup of the building sector and its financial interest is an influential power in the form of so-called "market-machineries" which consistently influence the quality and quantity of production of the built living environment (Deilmann *et al.*, 1979) and are, in the cases of Western countries, directed and governed by urbanistic, constructional and architectural technical norms and guidelines. Towards the end of the global transition processes of social and economic transformations in Europe (in the 1990s), the former Socialist Republic of Bosnia and Herzegovina (which existed as part of the former Socialist Federal Republic of Yugoslavia (SFRY)) faced a war, which ended with the Dayton Agreement, signed on November 1995

by all conflicting parties, according to which the constitution and the governmental system of post-war Bosnia and Herzegovina was formed. The post-war period was marked by corruption, the black market, political privatizations and misappropriation, which were encouraged by the very newly established complex internal state structure and state organization (Gavrić *et al.*, 2009). The state structure consisted of numerous levels which, in practice, meant a lack of both centralized coordination and mutual harmony. These coordination inconsistencies rapidly increased the inequalities among the regions and the people on a scale not even similar to the inequalities that already existed in the period of former SFR Yugoslavia (Ernst *et al.*, 2003). During the initial period after the war, the newly formed entities and districts faced massive emigration, devastation, and large-scale displacement. Sarajevo, as the capital city of the post-war country, administratively belongs to the Sarajevo Canton within the Federation of Bosnia and Herzegovina, and it consists of six municipalities: Stari Grad, Centar, Novi Grad, Novo Sarajevo, Ilidža and Vogošća. Within these conditions, in a complex administrative structure, post-war Sarajevo was challenged to deal with tripartite transitional processes (Englund, 2015): (a) *from war to peace*, (b) *from a one-party system to a multi-party system*, (c) *the transition to a new economic system*.

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With the rising housing challenges, pre-war Sarajevo managed to provide and develop the relevant strategies, keeping the integrity of planning during the 1980s (until the war), and in 1985 the City of Sarajevo introduced the "Long-term Social Plan for the City of Sarajevo for the period 1986-2000". Collective residential housing constructed before 1991 could be considered as relatively 'new' since the most intensive construction was evident during the period 1965-1991, and in its time this part of housing stock represented some sort of high standard of living. Implementation of the aforementioned plan for the City of Sarajevo was affected by the post-war conditions – the legacy of the war (damage and destruction of dwelling units in all parts of the city that resulted in 57.5% of residential buildings being damaged), which forced the City to start developing strategies of reconstruction and recovery (The City of Sarajevo – City Planning Institute, 1995). The application of any standard related to housing stock was left as the responsibility of each municipality, and in the post-war period, no new conditions or norms for housing design were created as unified strategies on the city level, due to which, municipalities were expected to develop regulatory plans throughout their planning services which did not offer, in the sense of guidelines, anything more than zones for construction, construction lines, and floor height regulations. All other formal regulations that govern general construction processes were, indeed still are, regulated by the Entity law (Law on Construction, 2001), and the potential standards and guidelines that were supposed to regulate the qualities of the spatial configuration of apartments are not covered either by the mentioned city units or by the law. The existing gap in legislative and relevant guidelines means that besides the floor heights and construction line marking, everything related to the functional content of dwelling units and their configurations (apartment size, use areas, plan types, ratio of usable space per user, etc.) has been left to the private sector and to the investors' own conceptions of living values, which might not be best for the contemporary spatial dwelling needs of the inhabitants (users) of dwelling units in Sarajevo.

ASPIRATIONS IN THE PLANNING AND CONFIGURATION OF DWELLING UNITS IN SFR YUGOSLAVIA AND ABROAD DURING THE PERIOD 1948 TO 1979

From the aspect of architecture, in the second decade after the end of World War II, within the whole territory of SFR Yugoslavia (including Sarajevo), there was a dominant tendency of maximum "packing" of dwelling units up to the limits of acceptable living minimums for the users, as well as the tendency to create a more humane living environment (Čanak, 2014; Mekanov, 2015). Aligned with economic growth, based on the research of architectural solutions and values, the residential architecture in SFR Yugoslavia developed during the period 1948 to 1970 could be referred as "experimental architecture". The dominant design approaches used in dwelling units were based on a tendency to minimize the surface areas of apartments, which resulted in overcrowded apartments with numerous inconveniences from the aspect of the users (Dobrovojević, 2012). Despite progressive tendencies and numerous changes in residential politics by the government, in the middle of the 1960s SFR

Yugoslavia was still bottom of the list according to the number of dwelling units constructed per 1000 residents in Europe (Vujović, 1990; Ginić, 1967). Even then, the solution was "found" in the illegal and uncontrolled construction of housing – mainly by the working population. According to Alfirević and Simonović Alfirević (2018), as a result of housing research aims in the 1960s and 1970s, which was the period of the most significant expansion of residential architecture in SFR Yugoslavia, the main concepts for the configuration of apartments could be classified in to four different groups (apartments with: a – extended circulation areas, b – central sanitary units, c – a circular connection, and d – enfilades/extended vistas) that differed according to the approach applied to the configuration of the access areas, circulation areas, sanitary areas, etc. This, in essence, contributed to the variation in the spatial flexibility from numerous aspects. Finci (1962) stated that, during the period of SFR Yugoslavia, Sarajevo noted significant progress in the building of dwellings from the aspect of disposition, internal architecture, structure and equipment, and the internal dispositions/floor plans of dwellings were designed as "inside towards the outside". In other words, apartments were the reflection of their internal disposition and the life within the dwelling units.

More dwelling units were built in England during the decades of "experimental architecture" in SFR Yugoslavia than at any other time in its history (the 1960s and 1970s were the decades of prefabrication, productivity and planning) (NHBC Foundation Expert Panel, 2015). These decades were also marked in the USA and in other European countries (including France and Sweden (Colquhoun, 2002)) by the most significant expansion of the promotion, planning, and construction of high-rise living facilities, like skyscrapers and other multi-storey residential blocks. According to Deilman *et al.* (1979), possible innovatory changes in residential architecture depend mainly on social, economic and technological factors, in accordance with which, as the consequences of economic development in some industrialized countries, a slight increase in the size of dwelling units was detected. In a study conducted by Harold Deilmann, Jorg C. Kirschenmann and Herbert Pfeiffer (1979) documenting modern architecture called "Wohnungsbau / The Dwelling / L'habitat", 65 different dwelling units in multi-storey residential buildings (constructed during the period 1962-1972) located in 15 different countries were evaluated in order to systematically obtain information regarding the effects of different features of the arrangement, rooms access, and the possible use of rooms, and to detect the possible consequences of the design decisions used, from the aspects of variability (adaptability of the plans) and flexibility (use – neutrality of the plans) (Table 1).

In the study by Deilmann *et al.*, an analysis of the apartment plans was accomplished by representing different types of dwelling units in the form of diagrams in order to present the diversity of their multifarious characteristics while focusing on two particular characteristics: space coordination (the arrangement and access of rooms) and the use of space (the proposed "possible" uses of rooms). Their study was mainly based on the configurational theory of space, according to which, by understanding the spatial logic of a setting, it is

Table 1. Examples of dwelling unit types in multi-storey residential housing solutions worldwide

Evaluation and classification of plan types for 65 different dwelling units that belong to projects located in 15 different countries (Germany, France, Finland, Australia, England, Japan, Spain, Canada, Italy, Israel, Switzerland, Kuwait, FAS Puerto Rico, U.S.A., and Austria)		
Group types represented by diagrams as a means of plan-types		Technical description of the diagrams that represent the plan types in accordance with the <u>access areas</u> and the possible <u>inconveniences</u> and <u>advantages</u> of the plans.
E – Entrance areas C – Communication areas K – Kitchen areas S – Sanitation areas I – Individual areas		
Group 1 		Flexible dwelling types, Equal sized rooms and neutral access, Wasteful of area (space) and not very economical. The flexibility of the plan is so restricted that such plan types only seem meaningful for small dwellings.
Group 2 		
Group 3 		
Group 4 		In these groups (4, 5 and 6), the plan types are shown with almost complete separation of the communication and individual areas. These groups are distinguished by their method of access. In groups 4 and 5 the individual area is reached through a neutral lobby. In general, these types have certain flexibility in the use of the rooms (in the case of group 5). Group 6 - Individual rooms are associated with the communication area, which reveals possible flexible use with some liability to inconvenience. The functions in the plan types in group 6 are more firmly fixed by the method of access. The advantage of these plan types lies in a possible saving in access areas. The possible inconveniences of these plan types can be reduced by subdividing the communication areas, and from case to case, the separable part of the communication area can be used in various ways.
Group 5 		
Group 6 		
Group 7 		The plan types in groups 7 and 8 differ from those in groups 4-6 primarily in the relation between the toilet facilities and both areas. In groups 4-6 these are related exclusively to the individual area, while in groups 7 and 8 they are associated with both the individual zone and the communication areas. The two areas can be used separately and possible inconveniences are almost excluded.
Group 8 		
Group 9 		
Group 10 		Division of the individual area into two separately usable zones: a self-contained functionally workable individual area and separately usable individual rooms connected with toilet facilities at the entrance to the dwelling. (These individual rooms associated with the dwelling's entrance are more flexible in their uses than rooms in a separate individual area. (Flexibility is enhanced by the possibility of choosing between a room associated with the individual area and the dwelling's entrance). Such solutions are particularly applicable to large dwellings.
Group 11 		
Group 12 		
Group 13 		<i>Extrinsic variability:</i> This concept of dwelling offers the capacity for change in the scope of the dwelling, i.e. the size of the home and inherent adaptability to altering needs. This particular concept of dwelling is associated with the potential demand for space and change of floor areas which correspond to the periodic changes in close human relationships. There are several stages of extrinsic variability: <ul style="list-style-type: none">- the combination of two adjoining dwelling units into one large dwelling (fusion)- the enlargement of one dwelling at the cost of another (expansion and reduction)- maximum adaptability is achieved by total variability of the dwelling shell, the internal partition walls and supply services (this is the presence of possibilities for intrinsic variability) Intercalary cells (affected by the opening and closing of gaps in partition walls) are the simplest degree of extrinsic variability.
Group 14 		
Group 15 		
Group 16 		<i>Intrinsic variability:</i> Unlike dwelling flexibility, in which changes of use are possible without changing the system – on the basis of the functional neutrality of the rooms and neutrality of their access – variability presupposes a change of system. Adaptability to changing needs by variable internal walls and installations inside the dwelling units with fixed bounding lines is referred to as 'intrinsic variability'. There are several stages of intrinsic variability: <ul style="list-style-type: none">- Changes of character (in spatial availability and spatial structure) that are feasible through subdivision of rooms (disjunction), by combination (fusion), by joining together (conjunction) and by substitution (changes of use).- It assumes the reduction to a minimum number of structural and service-related delimiting factors and possible spatial freedom for changes.- Maximum adaptability to different conceptions of living and functional demands is offered within a fixed service core and a diagonally lighted rectangular plan. It includes the locational changeability of service elements.
Group 17 		
Group 18 		
Group 19 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
Group 20 		
Group 21 		
Group 22 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
Group 23 		
Group 24 		
Group 25 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
Group 26 		
Group 27 		
Group 28 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
Group 29 		
Group 30 		
Group 31 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
Group 32 		
Group 33 		
Group 34 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
Group 35 		
Group 36 		
Group 37 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
Group 38 		
Group 39 		
Group 40 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
Group 41 		
Group 42 		
Group 43 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
Group 44 		
Group 45 		
Group 46 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
Group 47 		
Group 48 		
Group 49 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
Group 50 		
Group 51 		
Group 52 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
Group 53 		
Group 54 		
Group 55 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
Group 56 		
Group 57 		
Group 58 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
Group 59 		
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Group 61 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
Group 62 		
Group 63 		
Group 64 		This concept represents the major urban structures that have no fixed elements, which can be flexibly adapted to social and economic changes and, by means of which, proliferating chaos and mechanical monotony are avoided. (Concentration and interlinking of all urban functions, combinations of private and public, sheltered, individual, adaptable dwellings with terrace gardens, better rationalization of land resources, undisturbed spatial handling of closely related functions, trouble-free intrinsic flexibility and extrinsic variability reflecting the changing needs of individual users or the whole town, and higher quality and cheaper constructions).
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Table 2. List of multi-story residential buildings to which the 116 evaluated dwelling units belong

No.	Project / Location	Year	No.	Project	Year
1.	Be – Ha – Stan, Ilidža	2008	9.	Panamera Apartments, Ilidža	2015
2.	Bosmal Apartments / Bosmal City Center, Novo Sarajevo	2008	10.	Izvor Apartments, Stup - Ilidža	2016
3.	Residential Building, Stup - Ilidža	2008	11.	Residential Building, Unipromet d.o.o., Otoka	2016
4.	Residential Building, Lužani - Ilidža	2009	12.	Naselje Miljacka, Otoka – Novi Grad	2016 – 2017
5.	Residential and Commercial Building, H1-H2 Block, Dobrinja	2011	13.	Nova Otoka, Otoka - Novi Grad	2017 – 2018...
6.	Residential Building – Domoinvest do.o.o.	2014	14.	Ilidža River Apartments, Ilidža	2017
7.	Residential – Commercial Building, B.P., Dobrinja	2014	15.	Sarajevo Towers, Ilidža	2017
8.	Residential – Commercial Building, E2, E3, E4, Dobrinja	2014	16.	Sarajevo Waves, Otes - Ilidža	2017 – 2018...

possible to gain insight into how collectives and individuals function or live (Hillier, 2003). Le Corbusier (1923) describes the home as a “*machine for living in*” (Hillier, 2007) in which the term “machine” is a synonym for a system of areas and volumes of use that make living possible inside them. This study aims to establish an insight into the dominant spatial logic related to the *relationship between different areas of use* (plan types) according to which the apartments in Sarajevo were planned and constructed, by comparing them with the architectural standards and practices abroad.

This paper intends to investigate the design aspirations regarding the following:

- Apartment size (in line with contemporary architectural standards); and
- The types of areas of use (in relation to the international examples).

The paper makes a comparison between the case of Sarajevo and the spatial aspirations in dwelling units from the period of SFR Yugoslavia and cases from abroad (Table 1), and it examines the contextual circumstances of the contemporary conditions which the city is dealing with.

As such, this study was undertaken with the purpose of evaluating the contemporary practice of the spatial configuration of dwelling units in Sarajevo in order to detect whether the spatial logic according to which the dwelling units were organized is dominantly the result of:

- Designs in which planners tried to keep the plans as adaptable as possible to the varying situations related to the changing needs of the user; or
- Designs which resulted in plan configurations of dwelling units that lack adaptability and variability (static plans types – incompatible with change (Deilman *et al.*, 1979)).

METHODOLOGY OF THE STUDY

In order to achieve the above, the methodology of analysis used in the study by Deilman *et al.* (1979) was adopted as the main method of analysis in this paper, within the framework of which 116 dwelling units/apartments in 16 multi-storey residential buildings were examined (Table 2). Using an explanatory comparative multiple case study, this paper is focused on identifying and discovering the real conditions of spatial logic in the functional organization of

dwelling units in Sarajevo in order to provide illustrative insight into the eventual spatial organization patterns and aspirations of the specific design/configuration logic which the users/residents are experiencing.



All of the data is primary data that was collected through observations and measurements, and then analyzed using qualitative and quantitative analysis. From the aspect of qualitative analysis, the *areas of use* were detected/recognized and noted for all of the dwelling unit layouts, after which they were measured quantitatively. As the last part of the analysis, within the framework of qualitative analysis methodology, the *plan type* was classified and represented in the form of diagrams that in their essence describe at least two characteristics, namely: the logic of space coordination and use of space. The methodology was performed with the main purpose of understanding the spatial logic in the configuration of living spaces according to which all 116 apartments were constructed (Table 2) during the period 2008-2018.

The selected buildings are mostly located in the Ilidža and Novi Grad municipalities (Table 2), where the city of Sarajevo's highest urban expansion and construction of multi-storey residential buildings have been recorded within the last decade. The layouts were considered and evaluated independently from the multi-storey residential buildings. Only the apartment layout samples of each floor from each of the multi-storey residential buildings were included in the evaluation process. Under the status of the characteristic dwelling unit, the study considered and drafted all apartments that differ in functional organization (from the aspect of the spatial logic of configuration and according to the number of additional rooms, parents' rooms and children's rooms). If two apartment layouts were identical or highly similar, only one of them was included in the research. The method used to detect the *areas of use* was to examine the functional content of each apartment's layout (Table 1), in order to present the planned nature of the room/space.

RESULTS OF THE STUDY AND DISCUSSION

After evaluating 116 dwelling units from 16 different multi-storey residential buildings, the results were disaggregated as follows:

Table 3. Illustration of the set of analysis methods applied to 116 dwelling units

Legend / Key for plan types and dwelling plans				Example of analysis applied to an apartment layout			
Code	Area or Zone	No	Nature of room / space	Detected and marked areas of use	Size (m ²) of areas of use	Plan type diagram	
E	Entrance areas	1	Hall / landing, porch, lobby, cloakroom / closet		1a	3.05 m ²	
C	Communication areas	2	Eating space		1b	1.84 m ²	
		3	Living space		2	4.93 m ²	
		4	Play space		3	12.37 m ²	
K	Kitchen areas	5	Kitchen		5	6.08 m ²	
		6	Household – maintenance space		7	4.05 m ²	
S	Sanitation / toilet facilities	7	WC – bath – shower		8	5.77 m ²	
I	Individual areas	8	Children's room, work room		9	10.17 m ²	
		9	Parents' room		(A) Area	48.26 m ²	
		10	Storage / store rooms		3a	10.06 m ²	
				E/A	10.13 %		
				C/A	35.85 %		
				K/A	12.60 %		
				S/A	8.39 %		
				I/A	33.03 %		

- Results related to the classification of dwelling units according to the number of additional rooms (I – Individual areas) (Table 4);
- Results related to the detected *areas of use* (*nature of room/space* (Table 1)); and
- Results of the plan type analysis (Tables 8-10).

Classification of dwelling units according to the number of additional rooms (I – Individual areas)

The results confirmed that 113 apartments were configured as single storey dwelling units, while only 3 cases of two storey apartments were detected (all three were loft apartments). In accordance with the methodology in this paper, the additional individual rooms (parents' rooms and children's rooms) are referred to as Individual areas (I) (Table 4). The results demonstrate that when it comes to the number of existing additional rooms within apartments (parents' room and children's room(s)) there are 5 different types of apartments (Table 5). The number of additional rooms indicates the potential capacity of each dwelling unit, which is of essential importance from the aspects of the users/inhabitants and their changing living needs. Types of apartments without any additional individual areas or additional rooms are referred to as studio apartments. The results related to the classification of dwelling units (apartments) according to the number of additional individual areas or rooms are as follows:

Despite the claim by Rakočević (2003) that studio apartments are the *typical basic unit* of the architectural setting for living space, and that they are supposed to accommodate human individuals and satisfy their needs, the results indicate the presence of only 12.07 % of this type of apartment, which is simply not a satisfactory rate, whether from the aspect of quantity, or the spatial logic according to which these apartments were constructed (Table 7). With atypical plan schemes, the average size of *studio apartments* (33.60 m²) corresponds with the standard studio apartment size, which is between 25 m² and 33 m² (Buxton and Littlefield, 2008), but it is still unclear how advantageous the areas of use

are to the inhabitants since almost half of the examples are irregular layouts that differ from typical studio apartments (Table 7).

1 room apartments (Table 4) are the second most common dwelling units. Their average size is equal to the minimum standard requirement of 48.50 m² (Buxton and Littlefield, 2008). 1 room apartments consist of only one additional room as an individual area, and as such, this type of apartment might correspond to the initial needs of young couples without children.

The most common type of apartment is the *2 room apartment*. These apartments in Sarajevo (68.54 m² on average) are significantly smaller than the examples of the same apartments abroad (97.63 m²), while the average area of 3 room apartments in Sarajevo (99.45 m²) corresponds to the size of those abroad that were evaluated in the study by Deilmann *et al.* (1979).

Areas of use detected in dwelling units in Sarajevo

Since dwelling units are used for many different human activities within the planned areas, making an inventory of every single activity is something that would be time-consuming and in some sense even impossible (Leupen and Mooij, 2011). This paper therefore focuses on detecting *areas of use* that were readable from the layouts as the main purpose of specific areas/spaces in the dwelling units. The *areas of use* within the dwelling units in Sarajevo (Table 5) are identical to the examples abroad in terms of their type (Table 3), but the presence of all types of areas of use varies among the domestic apartments. Numerous dwelling units lacked some areas of use (Table 5), mainly *play areas* and *storage spaces* in kitchen areas. Play areas/spaces were detected in only 19 smaller apartments (apartments with 1 or 2 additional rooms), while in the apartments with 3 additional rooms (larger apartments) no play areas were detected. The existence of storage areas/spaces were detected only in 8 cases out of the 116 apartments evaluated, which proves the aspiration of keeping the size of apartments stable in the range of the minimum number of areas of use,

but at the cost of access and circulation areas (possible play areas) and storage in kitchen areas, which affects mainly the inhabitants and their differing needs. Consequently, it is possible to state that the residents of most of the apartments in the examples in Sarajevo do not have adequate facilities to store their groceries, non-seasonal clothes or maintenance equipment (vacuum cleaner, cleaning equipment, etc.) due to the lack of adequate storage areas within almost three-quarters of the apartments evaluated.

The quantity and distribution range of use areas within different types of dwelling units is presented in Table 6. The results suggest that an increase in the number of additional rooms (I) in the case of 3 room apartments was done by reducing the Communication (C) and Kitchen (K) areas.

Regarding the plan types of dwelling units in Sarajevo, the space in the city and the spatial structure of the area with its own contextual meaning influences the spatial structures of any dwelling unit (Kuntscher *et al.*, 2009). Since the evaluation of the sub-systems (dwelling units/apartments) of the built environment offers a set of

opportunities for understanding the aspects and features of dwelling and its meanings (Coolen, 2008), Rapoport's (1990) emphasis on the importance of the meaning of the built environment from the users' perspective is the main focus of this paper. Different plan types, detected in a plan-type analysis, are represented in the form of diagrams that mainly describe the space coordination and use of space in the apartment layouts evaluated. The different types of layout configurations among all that were evaluated are represented with at least three examples of diagrams which illustrate the specific logic of the configuration and use of space (Table 7, Table 8, Table 9 and Table 10).

In comparison with the plan types of apartments abroad (Table 1) the results show a lack of variety despite their size according to the number of additional rooms. In the case of the examples abroad (Table 1), the results show much wider spatial aspirations in the dwelling units that would be more suitable for the changing cycles and changing needs of users (14 different types of plan-type logic were detected). In the cases evaluated in Sarajevo, the dwelling units showed a lack of spatial potential for significant variations in spatial

Table 4. Classification of dwelling units according to the number of additional rooms (I – Individual areas)

Type of apartment according to the number of additional rooms (I)	Classification of dwelling units according to the number of additional rooms (I – individual areas)		
	Number of detected dwelling units	% among 116 evaluated	Average size (m ²)
Studio apartments	14	12.07 %	33.60 m ²
1 Room apartments	33	28.45 %	47.79 m ²
2 Room apartments	44	37.93 %	68.54 m ²
3 Room apartments	24	20.69 %	99.45 m ²
4 Room apartments	1	0.86 %	129.85 m ²

Table 5. Types of areas of use in the case of the apartments in Sarajevo

Area / zone	Types of areas of use within the dwelling units (among 116 dwelling units) in Sarajevo	
E – Entrance areas	Entrance halls	
	Corridors	
C – Communication areas	Eating spaces	
	Living spaces	
	Play spaces	19 cases detected in 1 room and 2 room apartments
K – Kitchen areas	Kitchens	
	Households	8 cases detected in 1 room, 2 room and 3 room apartments
S – Sanitary areas	Toilets	
	Bathrooms	
I – Individual areas	Children's room	
	Parents' room	
	Storage room	4 cases detected in 1 room apartments 6 cases detected in 2 room apartments 15 cases detected in 3 room apartments)

Table 6. The average correspondence of areas of use within all apartments

Type of apartment according to the number of additional rooms (individual areas)	Areas of use						
	E/A (%)	C/A (%)	K/A (%)	S/A (%)	I/A (%)	C/A+I/A (%)	(C+K+I)/A (%)
	Entrance areas – Average size in %	Communication areas – Average size in %	Kitchen areas – Average size in %	Sanitation / toilet facilities – Average size in %	Individual areas – Average size in %	Communication areas + Individual areas – Average size in %	All together as a single space; Communication areas + Kitchen areas + Individual areas – Average size in %
Studio apartments	14.81	Separated communication area(s) not detected	15.33	13.31	19.32	49.87	77.03
1 Room apartments	13.02	39.57	12.76	10.15	24.50	not detected	not detected
2 Room apartments	13.27	33.41	10.31	9.83	33.18	not detected	not detected
3 Room apartments	13.37	29.09	8.25	11.07	38.22	not detected	not detected

Table 7. Plan type data related to studio apartments

Studio Apartments		Number of samples	Plan type diagrams				
Configuration of the layout			E – Entrance areas C – communication areas K – Kitchen areas S – Sanitary areas I – Individual areas				
a	Regular studio apartments	8					
b	Studio apartments with additional functional areas	3					
c	Transitional studio apartments	3					
Total		14 apartments					

Table 8. Plan type data related to 1 room apartments

1 Room Apartments		Number of samples	Plan type diagrams				
Configuration of the layout			E – Entrance areas C – communication areas K – Kitchen areas S – Sanitary areas I – Individual areas				
a	Semi-open access areas	5					
b	Enclosed access areas	10					
c	Ramified access areas	8					
d	Regular access areas, individual areas connected with communication areas	7					
e	Semi- zoning and complete zoning: Separation of Individual areas	3					
Total		33 apartments					

Table 9. Plan type data related to 2 room apartments

2 Room Apartments		Number of samples	Plan type diagrams				
Configuration of the layout			E – Entrance areas C – communication areas K – Kitchen areas S – Sanitary areas I – Individual areas				
a	Access Areas connected with communication areas	7					
b	Enclosed access areas	12					
c	Ramified access areas	20					
d	Complete separation of individual areas	5					
Total		44 apartments					

Table 10. Plan type data related to 3 room apartments

3 Room Apartments		Plan type diagrams				
Configuration of the layout	Number of samples	E – Entrance areas C – communication areas K – Kitchen areas S – Sanitary areas I – Individual areas				
a Semi-opened and enclosed access areas	2					
b Ramified access areas	8					
c Semi zoning: Separation of individual areas	9					
d Complete separation of individual areas	5					
Total	24 apartments					

adaptabilities and flexibilities compared with examples evaluated abroad (Table 1). The results related to the plan types (in the cases evaluated in Sarajevo) can be summed up into the following characteristic aspects:

- Semi-open and enclosed access areas/access areas connected with communication areas;
- Ramified access areas (zigzag corridors);
- Semi-zoning: Separation of individual areas; and
- Complete separation of individual areas (Grouping of individual areas – zoning).

On the other hand, in the cases of dwelling units/apartments that were constructed during the SFR Yugoslavia the following characteristic design tendencies were detected (Alfirević and Simonović-Alfirević, 2018): turning the entrance areas into spaces where guests could be received, forming of everyday areas where children could play and learn; separation of children's activities from their parents' or guests' activities (a spatial dimension that is required for larger families (Hall, 1990)); design experimentations regarding the circulation areas within the apartments with the purpose of creating the feeling of a wider space for inhabitants.

In comparison with the aspirations in planning dwelling units in SFR Yugoslavia, for the cases evaluated in Sarajevo (built in the period of 2008-2018) it is possible to state that the results did not show any deliberate design tendency/approach regarding the treatment of entrance areas and play areas (lack of play areas – Table 5). Aspects related to the tendencies to separate children's activities from their parents' or guests' activities were not detected, despite the fact that the results did reveal the existence of semi-zoning (separation of individual areas) together with cases of the complete separation of individual areas. It was not possible to correlate any zoning tendencies among the apartments in Sarajevo with the intentional separation of different

activities (characteristic for apartments built in the period of SFR Yugoslavia) due to the fact that the differences detected among the examples could not be linked (they were too case-specific). Even without these tendencies, it is expected that circulation areas should be as clear, unobstructed, and direct as possible (Neufert, 2012), but the results of the cases in contemporary Sarajevo, with their detected ramified access areas (zigzag corridors), show a range of mistreatment of circulation areas (access areas). This finding points out the post-war reality of Sarajevo, in which architectural tendencies related to the configuration of dwelling units seem to be disconnected from the positive aspects of the pre-war tendencies, which suggests that they might be leading towards superficial architectural actions that satisfy investor interest more than the users' living requirements

CONCLUSION

The paper concludes by arguing that contemporary Sarajevo is still facing ongoing complex post-war transitional circumstances (Zagora and Šamić, 2014) in which there is a lack of institutionally organized aspirations towards innovation and research that would result in proper architectural guidelines. These conditions have resulted in uniform dwelling units that are the products of design configurations without the significant potential for spatial adaptability and variability. From the aspect of the spatial logic according to which the examples were designed and constructed, it is possible to conclude that the dwelling units evaluated was configured as inflexible spatial systems – static plans that might be useful for the residents for some uncertain amount of time within their changing life stages. This logic and practice in the configuration of apartments in Sarajevo is stimulating an increase in the construction of more apartments than actually needed due to the fact that the static plan types described do not show any adaptability to the changing needs of their users. Since dwelling units,

as subsystems, describe tangible spatial meanings, in accordance with Norberg-Shultz's statement (1985), human individuals feel at "home" only when their environment is meaningful – useful. How often the apartments in Sarajevo are considered "home" for their users, and how often they are simply shelters, are some of the questions that arise, the answers to which are suggested in the results of this research.

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THE IMPLEMENTATION OF AN URBAN PLAN - MONITORING AND EVALUATION IN THE CASE STUDY OF THE DETAILED REGULATION PLAN FOR THE RECONSTRUCTION OF FOUR URBAN BLOCKS IN VRAČAR

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Regulation plans have been implemented in Serbia over the past twenty years as the main operational instrument of planning. However, a general, systemic investigation of the effects of their implementation has failed. Because the elements of regulation and the rules for development and construction applied significantly affect the character of an urban space, the intention is to point out the need to establish procedures and criteria for regular evaluation of the built environment and the need to continuously re-examine planning attitudes. The input data for redefining the scope and shape of regulation can be obtained by analyzing the planning process and evaluating its results. The chosen case study encompasses the plan for four urban blocks in Vračar and includes the 15-year period since its adoption. The extent to which the Plan has met the set objectives from the point of view of urban planning and conservation will be investigated through an analysis of the results obtained in practice, while failures and possible improvements will be pointed out.

Key words: urban renewal, heritage protection, context, monitoring, implementation.

INTRODUCTION

The key elements of planning sustainable urban development (Dias *et al.*, 2018) include evaluating and monitoring the progress of planning and implementation. Through regular observation and comparison of the planned and achieved objectives, it is possible to identify problems and their causes (Greed and Roberts, 2014). This also contributes to noticing and understanding what benefits were achieved, what was done well, and in what way we can learn from good and bad practice (Marošek *et al.*, 2012). Evaluation of the results (Guyadeen and Seasons, 2016) in the field of urbanism should in no way be reduced to checking the efficiency of drawing up plans and issuing

building permits over a certain time period, without quantitatively and qualitatively checking the results of their implementation. Starting from 1995 and with the adoption of the the Law on Planning and Arrangement of Space and Settlements, regulation plans have become the basic instrument of planning in Serbia. Hence, regulation plans, after plenty of professional debate and years of criticizing the previous way of planning, have replaced detailed urban plans, which were inflexible, too prescriptive, and not responsive to the market demands. With a change in the legal basis in 2003 (Hirt, 2009), *detailed regulation plans* and *general regulation plans*, were introduced instead of *regulation plans*, but this has not affected the essence of the methodology itself. Since introducing the new planning models, not many general professional debates dedicated to the results of the implementation of urban plans have been organized (Niković *et al.*, 2015). There are no analyses

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of the extent to which the expected results of the new way of planning have been achieved in practice and how the implementation of the new model has affected the quality of urban space (Niković and Manić, 2018). The purpose of this paper is to assess the extent to which objectives have been met and tasks completed through an analysis of the results achieved in the implementation of an urban plan, and to derive conclusions which could help to improve decision making in the future.

Methods used in the research

This paper is based on several methodological steps. The previous theoretical knowledge about the need to monitor and evaluate the implementation of urban plans is used as the basic background for the specific and local conditions. The authors start from the hypothesis that the particular urban plan considered here has obtained a high level of implementation since its adoption, and it can be used as a model for further analyses and practical recommendations. The first step, defining the research subject, is tailored to fit the case study of a particular local plan by analyzing

the physical conditions *in situ* and the socio-political and economic changes that led to improvement in the urban planning process. The methodology of urban planning and heritage protection, as parallel and incorporated processes, is explained. The second step is based on time-distanced in field research and collecting discernible, empirical and measurable records using the methods of observation and comparison followed by final conclusions about deviations from the plan and the mostly external reasons for these deviations.

CHOOSING A CASE STUDY

The Detailed Regulation Plan for Four Urban Blocks between Streets: Krunska, Kursulina, Njegoševa and Knežinje Zorke – Vračar Municipality, from 2004, was chosen as the case study because it deals with space that has an inherited parcellation and the quality of the physical structure is different in terms of its cultural, historical, architectural and urban values. Its adoption was followed by fast and almost complete realization, making it possible to analyze and directly check

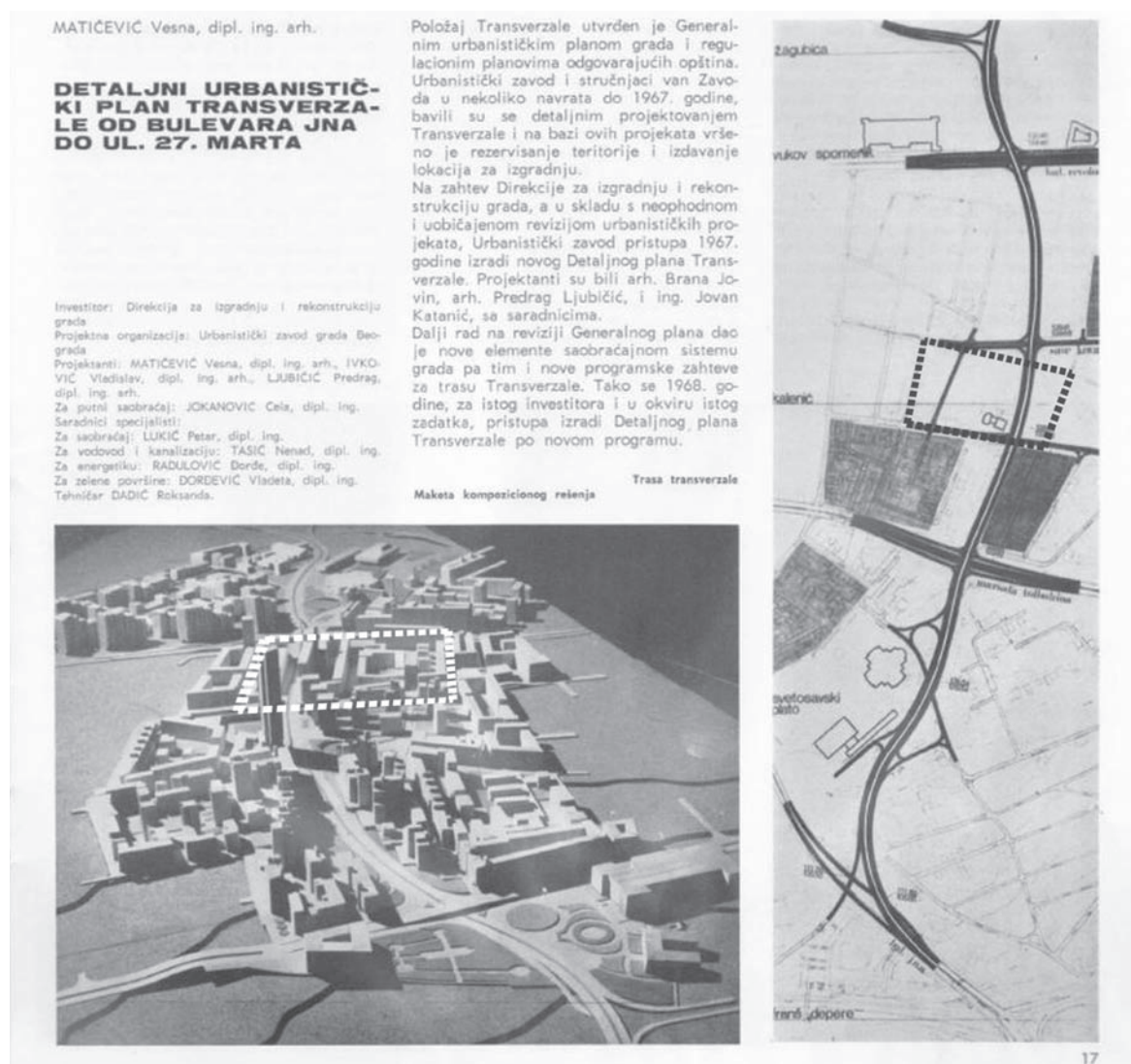


Figure 1. Scale model of the Vračar transversal road with a delineated area of 4 blocks (Source: Urbanizam Beograda 2 (1969), p. 17. <http://urbel.com/publikacije/casopis-urbanizam-beograda/page/6/>)



Figure 2. The 1988 Detailed Urban Plan for the Reconstruction of Four Blocks in the Territory of Vračar Municipality between Alekse Nenadovića, Proleterskih brigade, Koče Kapetana and Njegoševa streets, with a delineated area of 4 blocks

the planned solutions in terms of their morphology, the economy and the environment. In drawing up the Plan, intensive cooperation was achieved between experts from the Urban Planning Institute of Belgrade, Belgrade Land Development Agency and the Cultural Heritage Preservation Institute of Belgrade. According to the Master Plan of Belgrade 2021, the area belongs to the central zone and is earmarked for housing. The previously developed Spatial and Programmatic Concept of the Regulation Plan for the Central Zone – the Spatial Entity of Vračar Municipality, was used as a concept, so that urban planning parameters, rules of construction and the principle of garaging vehicles were taken from it, with some corrections.

The necessity for urban renewal and reconstruction

The purpose of drawing up a plan for this area (urban blocks 31, 37, 38 and 39) included the urban reconstruction of an attractive location along with defining public interest (Danilović Hristić and Stefanović, 2018), as well as re-examination of the construction capacity, solving the parking issue and protecting historical heritage (Zan *et al.*, 2016; Nummi, 2018).

Two previous plans: the 1970 Detailed Urban Plan (DUP) for a new road from 27. marta Street to the motorway and the 1988 DUP for the reconstruction of four blocks in the territory of Vračar Municipality between Alekse Nenadovića, Proleterskih brigade, Koče Kapetana and Njegoševa streets, generated a *status quo ante*, because what was planned was not implemented. Both plans were produced during the time of the socialist system, when building was in the sole competence of large state-owned companies. The plans disregarded the existing parcelling while garaging and greenery were planned in the space inside the urban blocks, under laws then in force which enabled the expropriation of land not only for public use, but also for the construction of new residential buildings (Dimitrijević Marković, 2017). The new road, with a planned width of 50m (a so-called transversal road), was routed through the city's urban

fabric, crudely negating existing parcelling and requiring extensive demolition. Although construction of the road was given up in later amendments and supplements to the Master Plan of Belgrade 1985, it was neither replaced nor put out of force, due to which the infrastructure and building stock deteriorated without the possibility of being replaced or renewed. With the adoption of the Law on Expropriation in 1995, the possibility of expropriation in order to arrange the space between blocks or construct new residential buildings was abolished, thus making implementation of the planned solutions impossible (Danilović, 2003). At the same time, the legitimate beneficiaries of the parcels also acquired a right of pre-emption to build, and so the number of potential holders of the right to build considerably increased (Dimitrijević Marković, 2015). All these reasons, along with plenty of requests by citizens, led to a new plan which would put out of force the old DUPs and create the conditions for new construction in line with the new legal basis and market circumstances.

Characteristics of the space in the case study

The Plan covers a spatial entity of 4.95 ha, situated on the edge of the central city zone. The area is characterized by clearly defined blocks of a closed type with a prevailing edge construction. The blocks are an elongated quadrilateral shape and are surrounded by streets of between 7 and 18m in width. The lots are of different width and depth, and in some cases the depth is up to two times greater than the width. The existing diversity of the building stock is evident – from high-rise buildings to ground floor houses from various periods and of different morphological and stylistic characteristics and quality. The parts of the street characterized by a uniform height regulation contain buildings with different numbers of floors, which is a direct result of different floor heights applied in different time periods (Dimitrijević Marković, 2012, 2017). The lack of green areas and parking space is noticeable.

METHODOLOGICAL APPROACH TO DEFINING THE MEASURES AND REQUIREMENTS FOR PROTECTION

Most of the area covered by the Plan has the status of prior protection, meaning that the Cultural Heritage Preservation Institute as a relevant institution has set out the Study "Requirements for the Protection, Maintenance and Use of Cultural Properties and Properties under Prior Protection". The purpose of these requirements is to draw conclusions through a historical analysis of the emergence and valorization of individual buildings and the area as a whole, and to determine the general conservation measures which would serve urban planners. In addition, the aim of the requirements is to single out a certain number of buildings which have particularly marked the development in this area in order to put them under adequate urban protection. These buildings stand out by their cultural and historical and/or architectural and urban characteristics which give character and identity to the area, but which have not been determined as individual cultural properties. For this reason, the entire building stock was valorized and divided into five groups:

- Cultural monuments;
- Significant architectural achievements;
- Buildings of ambience value;
- Buildings of a wider interest for preservation; and
- Buildings without cultural and historical, architectural and ambience values.

The division was made on the basis of the following valorization criteria:

- Cultural monuments: building entered into the Registry of Cultural Monuments;
- Significant architectural achievements: buildings of cultural and historical value and/or architectural and urban value, with at least one of the following characteristics:
 - a) antiquity;
 - b) a significant work of a famous author(s);
 - c) a representative of a style or type; and
 - d) an important function and/or event is linked to the building or a famous figure has stayed in it.
- Ambience values:
 - a) a work of famous author(s);
 - b) the architecture is typical for the time;
 - c) well-executed craftwork;
 - d) a striking angular building; and
 - e) part of a larger spatial entity (stretch of the street, square);
- Buildings of wider interest: that more or less fit into the ambience, but have no outstanding value, or they do not fit, but have good value; and
- Buildings without any architectural value: having neither cultural and historical nor architectural value and replacing them is desirable.

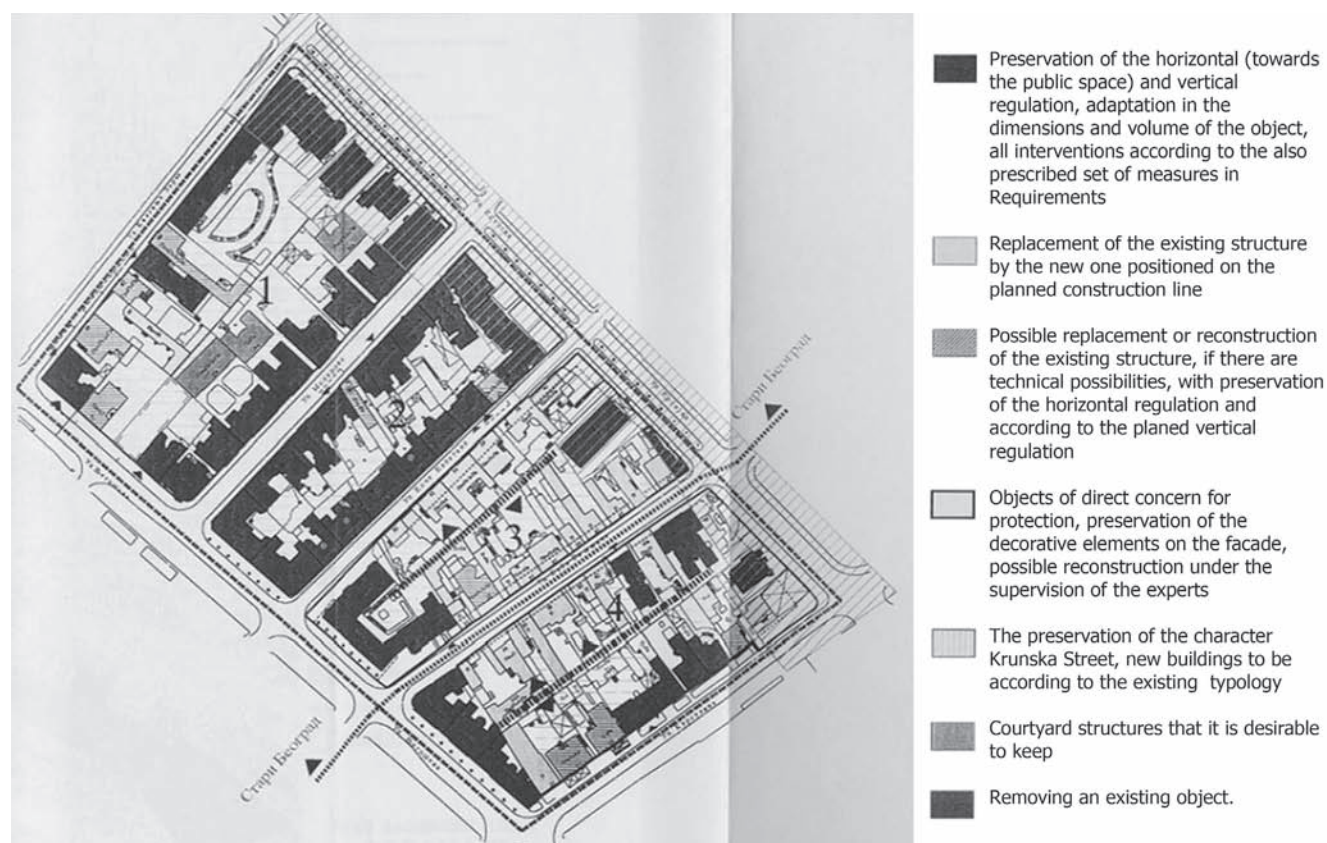


Figure 3. Four blocks in Vračar – the Map of Requirements. Source: *The Requirements for the Protection, Preservation and Use of Cultural Properties and Properties under the Prior Protection*, Cultural Heritage Preservation Institute of Belgrade

[illegible]

architectural expression along with use of contemporary building materials. In order to harmonize the simultaneous design and construction at a larger number of locations by different investors, it was recommended that urban planners prescribe a certain number of common elements, such as: the level of ground floors and eaves, the relationship between the curtain wall and openings in the façade, the proportions of openings and a single colour which would be represented on each building. An analysis of the materials, colours and other details present in the area, which would assist the urban planner when defining the requirements for new construction in context, was missing. The requirements also prescribe the entrances of underground garages to be provided via service roads in the space inside blocks to avoid the frequent perforation of the ground floor from the street side, which could be used for shops.

- ## CHARACTERISTICS OF THE PLAN AND NOVELTIES IN THE APPROACH

For adding floors, building height benchmarks are also specified. The study gives recommendations for the architectural shaping of new buildings and interventions on existing ones. In accordance with the conservation requirements, new buildings should have a modern

A particularly interesting rule in the Plan is laid down for shaping the top floor and fifth façade which could be in the form of a floor, setback floor or attic, with a maximum eave height of 15m and a maximum ridge height of 18m, adjusted in line with the neighbouring buildings with a tolerable deviation only in cases when this provides a higher-quality of architectural expression. Thus the conservation requirements are upgraded with the corresponding rules of urban planning, at the same time giving architects a certain freedom. Elements such as bay windows, canopies, balconies and terraces may appear on an angular section, at one end or in the middle section of a building. For new buildings in front of which the pavement is less than 2m it is obligatory for the ground floor to be set back a minimum of 2m, forming a colonnade. For buildings on which previous interventions have greatly devastated their form, the Plan prescribes the possibility of remodelling with the aim of finding a more appropriate architectural solution, which can be considered as another innovation and contribution. In order to assess the economic viability of the planned construction, each individual lot was analyzed in order to harmonize the parameters (number of floors, lot coverage and floor area ratio). The result was a ratio of 1:4 between

the existing planned buildings. The Plan also provides parameters to stimulate certain lots and exemptions from the rules to stimulate future development or to improve the visual identity of certain parts.

In Baba Višnjina Street, with the highest level of interventions to replace existing ground-floor houses, the regulation was symmetrically widened from 10 to 14m to enable the construction of the buildings with GF+4F/5F and to satisfy the distance between opposite buildings, traffic elements and the distance between corridors of infrastructure lines. In addition to a roadway of 5m, the planned regulation also includes 2m wide pavements on both sides, with a line of trees and a group of parking spaces that are alternatively organized on the left and right sides, thus achieving the effect of traffic calming. The novelty in the Plan lies in the possibility of widening the regulation through phases in its implementation, after completion of the buildings on the planned setback regulation and building lines. Due to the same depths of the lots, the urban planner insisted on equal treatment of the owners and widening both sides of the street. Such an approach is more complicated because the process of expropriation involves many more individuals, and the competent **agency** must firstly specify the street

Table 1. An excerpt from the tabular presentation of the level of implementation

Address	Realized / unrealized buildings	Plan	Respect of the terms of plan	Deviation from the Plan	Consent of Belgrade City Institute for the Protection of Cultural Monuments	Notes
1/31 Knjeginje Zorke 58, parcel 533 Vračar	Yes	Zone B1	No	Realized G+4+A (with semi-circular roof as attic), permitted by plan G+4	+	Established visual connection with the object in Knjeginje Zorke 60, Design by "A2", architect V. Nikolić
2/31 Knjeginje Zorke 60, parcel 534 Vračar	Yes	Zone B1	No	Realized G+4+A, permitted by plan G+4	+	Established visual connection with the object in Knjeginje Zorke 58. Extreme depth of the structure toward the inner court. Design by "A2", architect V. Nikolić.
3/31 Knjeginje Zorke 62	No	Zone B1	No			
4/31 Knjeginje Zorke 66	Yes	Zone B1	No	Realized G+4+A, permitted by plan G+4		
5/31 Njegoševa 55	Yes	Zone A2	No	Realized G+6+2A, permitted by plan G+5		
6/31 Njegoševa 57	Yes	Zone A2	No	Realized G+5+A, permitted by plan G+5	+	A setback floor has a sloped cover, the height of the cornish and the balcony fence according to the plan is 18m, but on site it is 20.6m, the permitted height of the top of the roof is 21m, on site it is 24m.

Table 2. Summarized results of the implementation of the Plan

Urban block	The number of implemented structures/interventions	Unrealized building sites	Respected the terms of plan	Did not respect the terms of plan	Deviations noticed
31	5	1	0	5	All deviations in the completed buildings relate to having a setback floor or attic higher than planned
37	2	2	2	0	The completed structures comply with the terms of the plan
38	11	7	1	10	Deviations from the plan are mainly in the formation of setback floors or a semi-circular roof with an attic above the permitted height. Three buildings were completed without collaboration with Belgrade City Institute for the Protection of Cultural Monuments, and one exceeded the construction line given by the plan
39	10	3	3	7	In this urban block there are deviations in terms of the height regulation, and buildings have mainly one floor higher than the legal limit, and one structure even has two floors above the maximum
Summ	68.3%	31.7%	21.43%	78.7%	

regulation. Therefore, the Plan makes implementation in stages possible, whereby the first stage includes the positioning of new buildings on the planned building line. The utility infrastructure lines are already in the existing regulation, which enables their reconstruction. The second stage is to be carried out only after building is completed and it includes reconstruction of the roadway with all of its planned elements and replacement of the utility infrastructure lines, as well as equalization of the regulation line with the building line.

The other novelty lies in planning the above-ground parking garages on other land, the capacity of which would solve the problem of a lack of parking in a wider area, taking into consideration the nearby Kalenić Green Market and Vračar Municipality. The garage was planned to be built on three lots with inadequate conditions, where it was very narrow, and there was uncertainty as to when the lots would be consolidated, or one of them could remain without the possibility of agreement or realization.

IMPLEMENTATION AND ANALYSIS OF THE RESULTS

The level of implementation is directly connected with how the plan was drawn up, as well as with the determination of the plan, its clarity and the decision to make implementation simple and unambiguous (Graovac *et al.*, 2017). It is interesting that the assumption to have so-called "soft" and "hard" locations has been proven correct in practice. Namely, soft locations are those which can be completed more quickly and easily than other locations that have certain limitations (e.g. the mandatory consolidation of sub-standard lots, good value of existing buildings, etc.). This paper analyses the implementation of the Plan according to whether the given possibilities were implemented, whether the requirements were met, and whether there

were noticeable deviations from the rules. The elements of the urban plan were compared with the requirements of preservation in combination with work in the field in May 2018. The result is a tabular presentation with comments and conclusions, showing the summarized results.

The planned construction of new buildings and addition of floors to existing ones was carried out on 28 out of 41 lots, or on 68.3% of them. Given that two buildings are currently under construction, this percentage will soon increase to 73.2%. A significant characteristic of the newly constructed buildings is use of the maximum allowed parameters, particularly in lot coverage. Almost all of the buildings were constructed on the existing cadastral lots and extended to the inner building lines prescribed at 5m from the boundary of the lot. The new construction is also characterized by ground floors often perforated by entrances for residents and vehicles. Also, the average width of the lots of approximately 12m in the subject area means that building depth is considerably greater than the front façade. Another characteristic is that lot coverage in the zone of underground floors for garages is 100% for almost all new buildings.

The lots were consolidated for the purpose of a new construction in block 38, without taking into account the mandatory consolidation of cadastral lots for building above-ground parking garages in block 39, as specified by the Plan. On the other hand, a new construction which was supposed to be formed by combining two cadastral lots was not built, although stimulative parameters were given. Namely, the lot along Krunska Street did not have adequate conditions for construction, and the principle of setting the front building line back 3m from the regulation line in order to form a continuous front garden along the street as a motif, made it completely "useless". The proposal by the urban planner for this to be a public green space was

not supported by the Land Development Agency, so the lot was added to an adjacent one which would otherwise be suitable for construction. This made implementation difficult because interest in reaching an agreement was obviously not strong enough. On the other hand, the urban planner was not supported in making the parcellation, in order to obtain a better solution, so this was left to market mechanisms. Thus, the space between two buildings in Koče Kapetana Street, an existing and a newly constructed building, remains undefined and unarranged, as a result of the shape of the cadastral lot and the fact that the building was not built on a sloping boundary, because the unsuitable triangle section remained "trapped".

The public works did not keep up with the completion of the blocks, and the planned reconstruction of the streets has not yet been completed. The possibility of implementation in stages led to the speedy completion of new buildings on the majority of lots, but not to the completion of public works, regardless of fact that the Plan did not forbid public space being developed prior to construction of all buildings on the setback building line.

Defining the zoning in accordance with conservation requirements, and the height regulations for new buildings in accordance with the proposed building height benchmarks enabled the interpolated buildings to fit into the existing rows of buildings, resulting in a visual harmony. However, even though the buildings were mostly built using contemporary materials and had a contemporary appearance (Cousins, 2009) in accordance with requirements for architectural shaping, a visual connection between the buildings is very rare. Visual harmonization was achieved (CABE, 2000a, 2000b) in cases in which the construction of several buildings in a row was carried out by the same investor,

or when the requirements for architectural shaping were compulsory for all lots, such as the mandatory formation of a colonnade along the even side of Koče Kapetana Street.

The summarized results of the implementation of the Plan show that the majority of deviations in relation it relate to the non-observance of vertical regulations, i.e. adding an additional setback floor or attic. The horizontal regulation was only disregarded in the building at 29 Baba Višnjina Street, which exceeded the specified regulation line by approximately 25cm, which is now visible, in addition to which the balconies on the upper floors were glazed, which particularly spoiled the appearance of the building and made it look disharmonious. It is particularly noticeable that several buildings within the area under prior protection were built without anyone finding out the requirements from the Preservation Institute, in spite of the mandatory cooperation prescribed during the procedure for issuance of a building permit. Also, some of the more recently constructed buildings have, according to the authors' criteria, applied eclectic elements and elements of kitsch instead of the contemporary architectural expression stated in the rules in the Plan. Violation of the requirements specified by the Plan already occurred in a number of cases during the procedure for issuance of conditions for construction at the location, when certain requirements for construction were omitted, while other violations occurred during construction, because of which investors had to follow the legalization procedure later.

To summarize this discussion, it can be underlined that the plan really made an effort to facilitate the implementation phase, even to "guess" which limitations and obstacles should be eased and possibly eliminated or stimulated, for example building parameters, public utilities, parking,



Figure 5. Photo documentation from the field

etc. The shortcoming of the plan is the absence of an even more detailed set of rules that would provide a unique, harmonious and well-matched ambience. The result of the excessive depth of the buildings and the over-built blocks is unsatisfactory ecological residential conditions, indicating the necessity for reviewing the existing elements in the regulation. Namely, instead of the degree and index calculated on the plot unit, it is better to define the internal building line, parallel to the street regulation line, and if necessary, it should be established for each parcel separately. The position of the internal building line, instead of the usual 5m, should be a result of a detailed check of the existing land division, but also take into account daylighting and insolation in terms of the space inside the building, as well as the space inside the urban block. In addition, an innovative and experimental approach needs to be shown by the professionals involved in the planning process in order to evaluate, over a period of time, the level of implementation, and also to measure any deviations and discuss difficulty in putting theory into practice, from what is planned to what actually happens. The goal of this paper is to point out the weakest link in the whole process and give some recommendations for improvements and advancement.

CONCLUSIONS

The subject of this research includes a case study, with a planning history over several decades, followed by an analysis of the level of implementation of the last adopted regulation plan for that case study, which enabled urban reconstruction within a contemporary regulatory and planning framework. By choosing this plan, which was mostly executed on site, it was possible to check not only the quantitative efficiency, but also the qualitative results and all deviations from the plan rules. The plan represents an innovative and recent shift in planning with regard to economic aspects, public works, garaging, rules regarding zones, specific locations and the design of façades and elements such as the ground and top floor, etc. The impression is that the plan could have been even more precise and detailed in its rules, measures and recommendations, although it was made with the goal of not being too prescriptive, but rather to allow some creativity in the design phase. Even more importantly, a plan should be concise and transparently represent a planned vision of space, with an additional handbook that would suggest what is desirable and what is not, so as to be explicit for all users, especially investors, citizens and those who have to implement the plan later. Only in this way is it possible to prevent abuse. The difficulties that this plan has faced during its implementation have often come from spheres other than planning, mostly regarding chasing profits, and omissions in issuing permits such as the lack of consent, as well as a lack of supervision by the inspectorate in the case of illegally overstepping the rules of the plan. It seems that the premises, borrowed from the theory of management, that “even a bad plan is better than no plan” and “even the best plan can do no good until it is effectively executed” are true.

However, to fully understand the purpose and reasons for developing the Plan, it is necessary to understand the social

context in which the decision had to be made for drawing up the new plan. This has contributed to fact that the cadastral lot has become the basic unit of planning, around which everything has to be solved: the urban reconstruction of attractive locations along with defining the public interest, re-examining the construction capacity, solving parking issues and protecting historical heritage. The investigation of previous planning solutions showed that they were not carried out, primarily because of the obligation to acquire land through the expropriation procedure and then to carry out complex undertakings resulting in the high financial cost of displacing residents, demolishing and constructing both primary transport infrastructure and the blocks themselves, with free space and an area for garaging inside the urban blocks. Due to changes that occurred in wider social spheres, which affected both the method of managing urban land and the urban planning system, the solutions became inadequate, inadapted to the new social and economic circumstances and practically non-implementable, which resulted in an absurd situation in which plans became an obstacle and not a support to urban development for many years. In this sense, establishing regular monitoring and evaluation would contribute to avoiding such situations in the future.

The implementation of the new regulation plan oriented towards market mechanisms has been fast and successful from the aspect of completing planned housing and commercial contents. In this sense, the planning solution has satisfied the requirement to be economically stimulative for private investors. Maximizing profit has led to the maximum planned capacities being utilized, which was expected, given that this is a zone in the inner town centre where the demand for real estate is great. What could be the subject of further intensive investigation is the issue of the potential diversification of demand and the development of mechanisms which would lead to different interpretations of the maximum use of the Plan. However, the infrastructure was not completed to the same extent as the plan and this raises the issue of setting a time period for the planned development of public land, the dynamics of which could also be monitored.

The solutions which have not been implemented primarily include the harmonization of several interests – private interests in the case of consolidating the lots of different owners and public/private interests in the case of land for public and other uses. In both cases, it has been concluded that it is necessary to develop new instruments which would stimulate realization, but also expand the number of possible solutions for “hard” locations, which is, in given frameworks, reduced to the dilemma between expropriation and mandatory parcellation (along with a capacity increase). On the other hand, a specific theme which actually calls into question the successfulness of the implementation itself includes certain requirements and the disregard of planning solutions. Given that excess mostly refers to an increase in the construction capacity, it can be concluded that the main reason lies in an increase in profit. However, further research which could also be carried out on a wider sample could answer the question of which factors cause the non-observance of a plan’s requirements, such as incompetency, corruption or legalization procedures. The

Plan's requirements associated with architecture and the construction of buildings, as well as the visual integration of buildings has occurred only in cases when buildings were built by the same investor. This fact leads to the conclusion that rules in the domain of architectural shaping should be even more precisely defined and in more detail, and it also opens the very significant issue of establishing and controlling standards.

Good cooperation amongst the experts in drawing up the Plan and a persistent search for compromise in which different interests would be satisfied, as well as the preservation of ambience values and monumental values and at the same time commercial effect and market conditions, have resulted in the plan being a successful compromise of harmonized requirements. However, the priority of economic viability, leading to its secure implementation, has enabled construction to take place with high urban parameters. All new buildings were built using the maximum capacities allowed, which reflected unfavourably on the functional, environmental, the social and aesthetic aspects of space – the organization of apartments, exposure of rooms to sunlight, traffic flow, and the lack of free and green space inside the blocks, thus decreasing the attractiveness and value of the ground floors of buildings and public space on the street. Can, and should, a city be developed if left only to market forces, with the cadastral lot as a basic unit of undertaking? The approach to urban planning, which has experienced changing from an extremely centralized to a considerably liberal one, was analyzed using the case study of the Vračar blocks. The change has led to their completion, but the question of how to achieve results of higher quality arises, as well as what the actual price of the successful implementation of the plan is.

A set of recommendations for the improvement of the urban planning process and later implementation could be:

- An integrated approach, inter alia to define the needs, potentials and values of the site and establish cooperation between experts regarding topics of designed matrix and the planned appearance of the space, protection of heritage, organization and distribution of public land, etc.;
- More participation and involvement of all stakeholders in order to recognize their intentions;
- Modeling and calculating the economic effects and benefits, but setting a limit that cannot be exceeded, especially taking in account the density and proportions;
- Giving clear rules about building space, accompanied by additional descriptive sketches and a proposed lists of materials, colors, shapes of elements, etc. For the areas of urban renewal, use of urban codes in the form of a handbook or manual would probably be the best solution;
- Enabling completion in phases, but defining correlations and conditionality between them (if, then, when);
- In order to obtain higher quality space the share of public investment in the implementation phase should be re-examined, as well as commitment to the plot unit as the only measure; and

- And the most important, but probably in local conditions the most difficult factor, to treat an urban plan as inviolable, to follow its set of rules, to strictly monitor implementation and sanction all deviations.

The analysis justifies the starting premise that it is necessary to establish a regular evaluation of the implementation of plans in order to improve the overall process of urban planning.

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A STUDY ON THE CAUSES OF THE FAILURE TO IMPLEMENT THE CONSTANTINE METROPOLIS URBAN PROJECT

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This paper explores the reasons why the implementation of the Constantine urban project failed, with a focus on management processes, using the cause and effect method. Pioneering urban projects in Algeria have been very difficult to implement. Our findings reflect enduring dilemmas concerning project management that is not backed by consistent political support, based on the case of the Constantine urban project. Data were collected using a number of tools including active observation, content analysis of project documents, two surveys intended for the project administration and Constantine's residents, and interviews with elected representatives and professionals directly involved in the project's development. Using a causes tree and an Ishikawa diagram in the data analysis, we identify the factors that have affected the implementation of the Constantine urban project. The findings of this research demonstrate that the factors with the greatest influence on the project fall within the areas of project management, stakeholder management, policy support, the democratic participatory process and regulation. These factors are the reason for the critical failure of the urban project in Constantine.

Key words: urban project, Algeria, Constantine, causes and effects, governance, management.

INTRODUCTION

A metropolis is an entity that dominates a surrounding territory, characterized by: economy (attractiveness, investments, wealth production), society (social composition and organization, metropolitan culture) (Merlin and Choay, 2010) and morphology (urban shape, demography) (Bourdin, 2014). The demographic dimension is formulated in terms of demographic attractiveness rather than the demographic load, since a Chinese agglomeration of roughly ten million inhabitants now qualifies as an average city.

In Algeria, a country that is rapidly developing in several areas, including urbanism, a metropolis is defined differently. It is "an urban area whose population totals at least 300,000 inhabitants and is intended for the development of international functions, in addition to regional and national functions" (3rd Article of Law 01/20, Journal officiel N°77, 15/12/2001, p. 16). According to this definition, Constantine is classified as a metropolis, and it is the legal capital of eastern Algeria. This city of 488,000 inhabitants enjoys

regional importance due to the presence of regional offices (economic and academic institutions, health equipment). Wanting to add to its value as a great metropolis, the city has attempted to renew its planning mechanisms through the Constantine Metropolis Modernization Project (PMMC) adopted in 2007.

This planning approach falls within the new Algerian urban planning system, which is an attempt to be strategic. Currently, urban planning in Algeria is in a critical phase, and commitment to a new strategic approach has become unavoidable if sustainable urban development is to be achieved. The introduction of this approach is in an embryonic phase, however, some projects, although not mature, are approaching this process and deserve to be explored and displayed as urban projects. The most important urban projects include the Algiers Urban Project, the modernization of Constantine (PMMC), the new cities of Sidi Abdellah, Ali Mendjli and others.

The PMMC is an interesting case study. Despite several strengths, its implementation has exhibited various difficulties. Some of the most serious problems include the non-involvement of inhabitants, difficulties in managing the strategies and visions of the actors, a lack of

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continuity, additional costs and delays in implementation, administrative problems and a failure to satisfy stakeholders.

This paper aims to assess the Algerian PMMC project. It analyzes the roots of the difficulties and failures through a critical and analytical approach which summarizes the project strategy and compares the project's original objectives and actual achievements using a causes tree and an Ishikawa diagram. These tools make it possible to explain the main causes of the failure of the urban project's implementation in the specific context of Algeria.

BACKGROUND

Old versus new: urban planning between the need for a strategic vision and a search for good urban governance

"There's nothing more logical than developing, approving and implementing a plan to make a city into what it should be" (Massiah and Tribillon, 1985). A city is a highly complex and poorly understood organ, and even advanced operational planning instruments, are not able to understand it as a phenomenon. Rigid and inflexible, these planning instruments have led to a regulatory and sterilize urbanism (functional urbanism) that is questioned by the *Neo Urbanism approach* (Ascher, 2001). This approach is intended to be forward-thinking and iterative (Ingallina, 2001), favouring quality rather than quantity and being flexible, responsive, and catered to the diversified needs of individualistic societies (Sidi Boumedine, 2013). Being contextual (Berezowska-Azzag, 2012), it brings together a multitude of skills for greater urban manufacturing (Masbouni, 2001; Hayot, 2000). It is reflexive and seeks to combine the actor's visions through consultation (Verdier, 2009; Claude, 2000), and it manages to strike a balance between the long- and short-term, as well as between public and private interests (Bourdin, 2014).

The strategic urban planning focuses on good urban governance that is defined as "a mode of government organized on the basis of a cooperation, a partnership, or a contract between a plurality of actors as well as public and private actors" (Ruano Borbalan and Wemaëre, 2004). Thus, governance is a system that binds public institutions, social actors and private organizations in a co-decision to make public action effective (Ascher, 2001). With the integration of good urban governance, an urban planning system functions through negotiation and compromise; it favors the contract over the law, and *ad hoc* solutions over the norm. The good urban governance system has been applied in several countries (Italy, France, Spain, Australia and others), using the urban project as an instrument.

The difficulty of the urban project lies in the intervention on the city, which is a complex phenomenon. Its implementation is often difficult and "reality cannot be always as exemplary as the approach which presided its conception" (Avitabile, 2005). According to the related literature (Chadoin *et al.*, 2000; Otaola, 2001; Ormazabal, 2001; Hayer, 2005; Popsu-Lille, 2008; Godier and Tapie, 2008, Firly and Gron, 2013), urban projects worldwide suffer from shared difficulties: the inability to ensure the continuity of political support; blind implementation; difficulties of implementation within the defined deadlines and budgets; the difficulty of acceptance;

involvement of the inhabitants and other actors; and so on. However, the search for reasons for the failure of urban projects must be specific to each context, since each project is unique.

Strategic planning and the urban project in Algeria

Since joining the sustainable development movement in the 1990s, Algeria has formulated a juridical arsenal that supports sustainable development. However, this arsenal, combined with the enormous potential and resources of the country, cannot manage the urbanization crises encountered by Algerian cities (Rahmani, 1998; Berezowska-Azzag, 2012; Sidi Boumedine, 2013). A lack of clarity may appear in this arsenal, especially with regards to a lack of definition in action plans. This reveals incoherence and non-coordination between decision-making structures, operational structures and citizens. Thus, the urban planning instruments based on new planning reforms remain regulatory and conventional, and "they no longer meet the requirements of flexibility, temporal scalability and intersectoral complementarity which govern urban planning and management in a market economy" (Berezowska-Azzag, 2012). This problematic state, that is shared with the international context, calls for the emergence and establishment of non-rigid and strategic planning that is not sectorial but flexible and reversible in the implementation of urban projects.

The urban project is not recognized as an instrument of urban development and planning in Algeria. Indeed, this concept is only cited once in Algerian legislation (Article 37, Law n°90-29: urban planning and development), and since it is neither defined nor referenced, it remains merely a concept in the text.

Berezowska-Azzag (2012) demonstrates through the cases of the Great Urban Project of Algiers (GPU 1997), the Urban Coherence Scheme (SCU) and the Tafelalt city project (Ghardaïa) that urban projects have been introduced in Algeria through aborted attempts, perseverance and repetition. However, Sidi Boumedine (2013) affirms, through the case of the Bab Ezzouar business district project, that urban planning in Algeria is still regulatory since it takes place at the level of the plot and not via urban projects. He thus deduces that the urban project is an operation mode engaged only through globalizing the same approach and associated discourse, whereas the real logic that prevails imposes itself in the notion of *project owner / islet / plot* (Sidi Boumedine, 2013). In confronting these two logics, we must note the very gradual introduction of urban projects in Algeria. Through these examples, the urban project introduces a new logic of organization and urban management. Thus, its role is to create a complete metamorphosis in the fabric of Algerian cities, connecting actors and processes formerly disconnected, thereby working toward sustainable urban development.

The difficulties associated with implementing the urban project approach in Algeria have been identified by several studies (Rahmani, 1998; Saidaoui, 2001; Guerni, 2008; Berezowska-Azzag, 2012; Sidi Boumedine, 2013). In order to establish the local context in Algeria regarding this implementation, we have summarized the causes of these difficulties in the following points:

- The non-adaptation of urban planning tools, such as the urban plan, to the existing complex urban context;
- A lack of clarity and consistency in legal measures. Indeed, every day we hear about new legal projects or laws which complement or question previous laws. This can be confusing and it makes their implementation difficult;
- The undefined and unclear status of cities, metropolises. Indeed, the failed attempt to define the status of the Governorate of Greater Algiers is a blatant example. The city is unstable in its affiliation to a ministry and has no fixed guardianship;
- Centralization in governance and decision-making. The autonomy of cities or metropolises is not certain and remains in a centralized logic through the monopoly of the project owner² and resistance to private initiatives;
- A lack of strategic, conceptual, operational and technical assistance for project management among urban planning stakeholders; and
- A lack of coordination between actors and sectors. There is a fragmented logic in urban planning in Algeria due to a lack of interactivity and communications between different sectors. The compartmentalization of actors, sectors and types of actions is contrary to the urban project approach, which is supposed to be participatory, interactive and horizontal and, as Djaafar Lesbet puts it, "how can we talk about urban planning while we are struck by the organigram syndrome?" (Sidi Boumedine, 2013).

² Project owners in Algeria include ministries, provinces, municipalities and specific structures such as the EPA (public administrative establishment), and EPIC (public industrial and commercial institution) (décret N°14-320).

THE CASE STUDY: THE CONSTANTINE URBAN PROJECT

Constantine: The Metropolis between assets and challenges

Constantine, a city more than 20 centuries old, is the third largest and most rapidly urbanizing metropolis in Algeria. Its population will reach 1,131,859 inhabitants by 2025, according to projections by the National Office of Statistics. The development of satellite cities around Constantine has created "Greater Constantine", which influences an area of over 20 kilometres around it. "Constantine is a metropolis that has a number of properties that allow it to be located at the top of the urban hierarchy of the country" (Cherrad *et al.*, 2007). The city's assets can be presented as follows:

- Strategic location and dominant geographic position (Figure 1);
- a rich and diversified morphology of various cultures and stratified architectures (the city of bridges); and
- Pole of dominance, attractiveness and competitiveness (Figure 2).

This is just one side of reality. Constantine is a metropolis that faces a variety of problems and challenges. Urban studies on this city give an overview of these problems (Table 1), which have remained unchanged since the early 2000s.

In response to this crisis, a modernization project was introduced. Through this project the plan was that "the new dimension that the city must acquire will enable it to consolidate and definitively establish its metropolitan status" (Cherrad *et al.*, 2007).

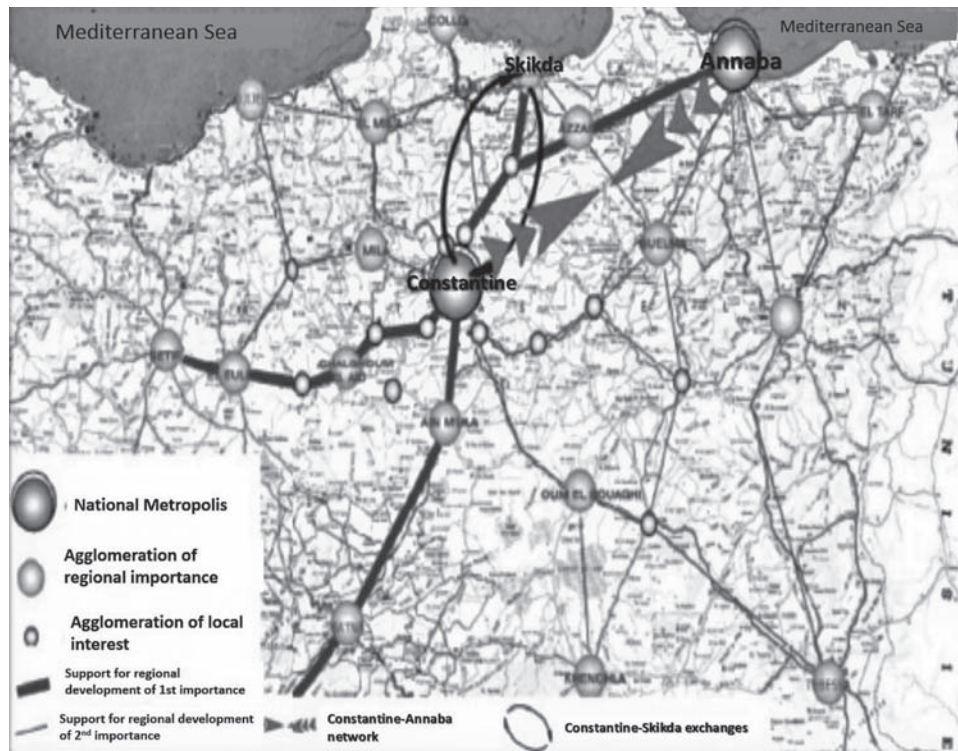


Figure 1. Constantine within the urban framework of eastern Algeria (Source: MATE, 2007: 119)

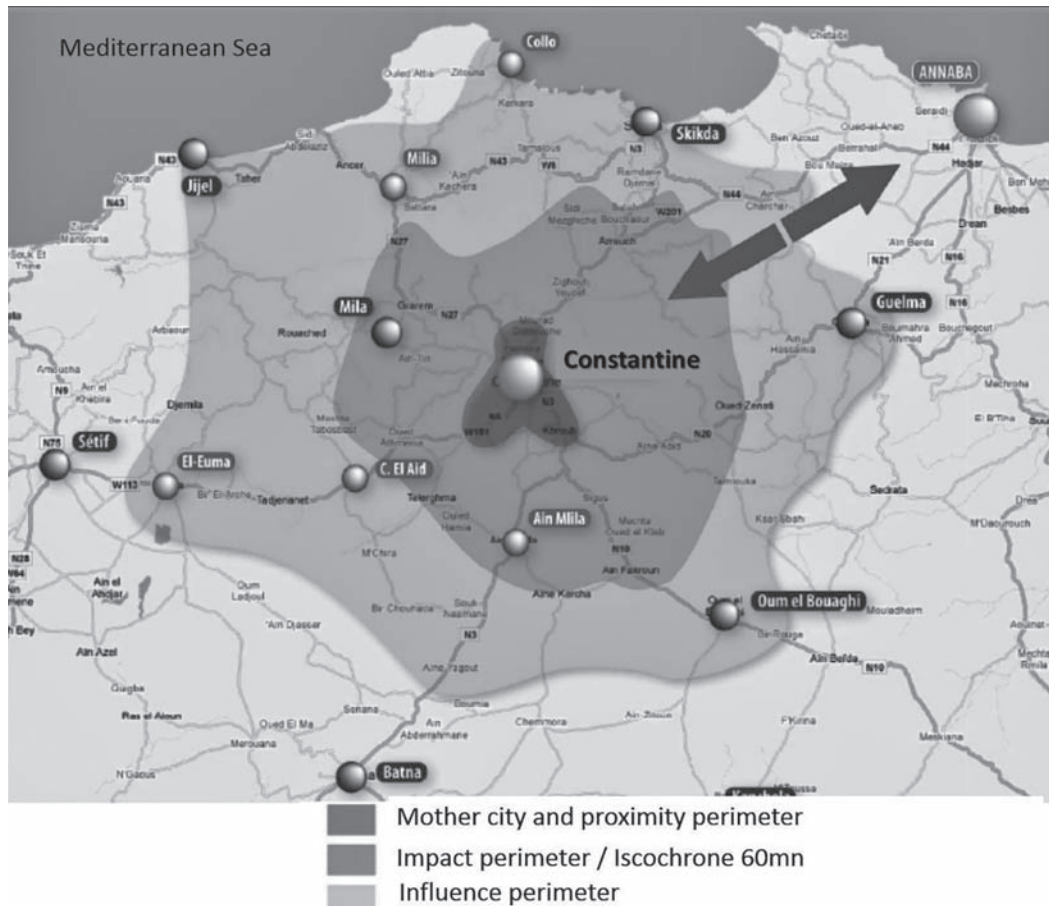


Figure 2. Constantine metropolitan area (Source: URBACO and EDR, 2008)

Table 1. The Constantine crises (Source: Lahlouh, 2012; Cherrad et al., 2007)

Social	Economic	Environmental	Urban
Social segregation and a lower standard of living Insecurity and delinquency unemployment	Loss of economic metropolis status Economic crisis	Environmental Pollution A lack of green spaces	Massive urbanization of agricultural land Spatial disparities A congested and extensive urban centre Illegal settlements Degradation of the living and built environment Privatization of public spaces Landslide risks Transportation crises

The Project for the Modernization of the Metropolis of Constantine (PMMC)

Presentation

The Constantine Metropolis Modernization Project (PMMC) is a strategy to redefine the city, with the aim of it being recognized it as a metropolis with all the relevant attributes. It enforces consistency and coordination between various city structuring projects while providing visibility that enables strategic planning.

The PMMC actions will impact the entire metropolitan area (Figure 3) with a variety of projects including: a cable car, tramway, the Transhumel Bridge, the Bardo Viva City, luxury hotels, Pole University, rehabilitation of the old town, The Zenith and others. Its objectives are:

- Improving living conditions;
- Revitalizing economic development and boosting competitiveness;
- Revalorizing Constantine's image (attractiveness);
- Modernization through equipment;
- Social equity and participation of citizens;
- Meeting economic and social needs and resolving urban crises; and
- Consistency between specific actions.

The PMMC implicitly and explicitly upholds the following principles:

- Long-term strategic goals that will be realized gradually and progressively;

- Consistency between internal and external actions;
- Good governance with involvement, participation and interaction between all actors; and
- Local, national and international partnership.

The current state of the PMMC: a problematic situation

The PMMC is characterized by:

- Ambiguities in the programme itself: various changes and hesitation surrounding the project types;
- Delays in its realization;
- Disappearance of the initial project strategy;
- A loss of political support following the end of the mandate of the wali initiator of the project, resulting in the project becoming an orphan (Mr. Boussof, Vice-President of the Popular Assembly of Wilaya, interviewed on 07/05/2014); and
- Non-adherence of stakeholders to the project.

The project strategy was intended to be the solution to the crisis affecting the metropolis. However, the gap between the great strategic ambitions leading to the project's formation and the project's fate upon its implementation reveals a failure to achieve the set objectives. It is necessary to ask why this occurred. We thus investigate the causes of this failure.

METHOD

In project management, we often anticipate, prevent, plan and monitor, but we also search for solutions to problems. Several research methods are considered, including a causes study, which not only helps reveal solutions but also facilitates future risk prevention. The cause and effect method is used

in several domains to understand the sources of a problem (De Saeger, 2015). This method is applied more often in the fields of computer science, medicine, and security. However, as an approach widely used in the industrial world, its use in town planning has been rare. Indeed, we chose this method based on an increase in the transposition of practices between management studies and urban management, but also due to its simplicity and efficiency as a decision-making tool. Knowing that the research of causes is the main objective of our study, this method does not contribute to the question of reliability. It is more about the internal validity of the findings related to the question of causality (Bryman, 2012). The external validity of the findings regarding their generalization beyond the specific research context remains a research perspective. This cause-and-effect method uses a number of tools, of which the best known include the causes tree and the Ishikawa diagram.

Our cause analysis began with an observation of facts consolidated with several techniques and synthesized through individual reflection and brainstorming; the techniques are:

- Content analysis of project documents, contracts, programme reviews, and the press (local and national newspapers). Quantitative and qualitative data were collected in order to better retrace the phasing and interactions of the facts, knowing that some documents (contract, programme review, press and project reports) describe the causes of the failure;
- A survey in the departments in charge of implementing PMMC. This survey allowed us to ask questions about the causes on the non-achievement of the project objectives in order to go back to the origin of the failure;

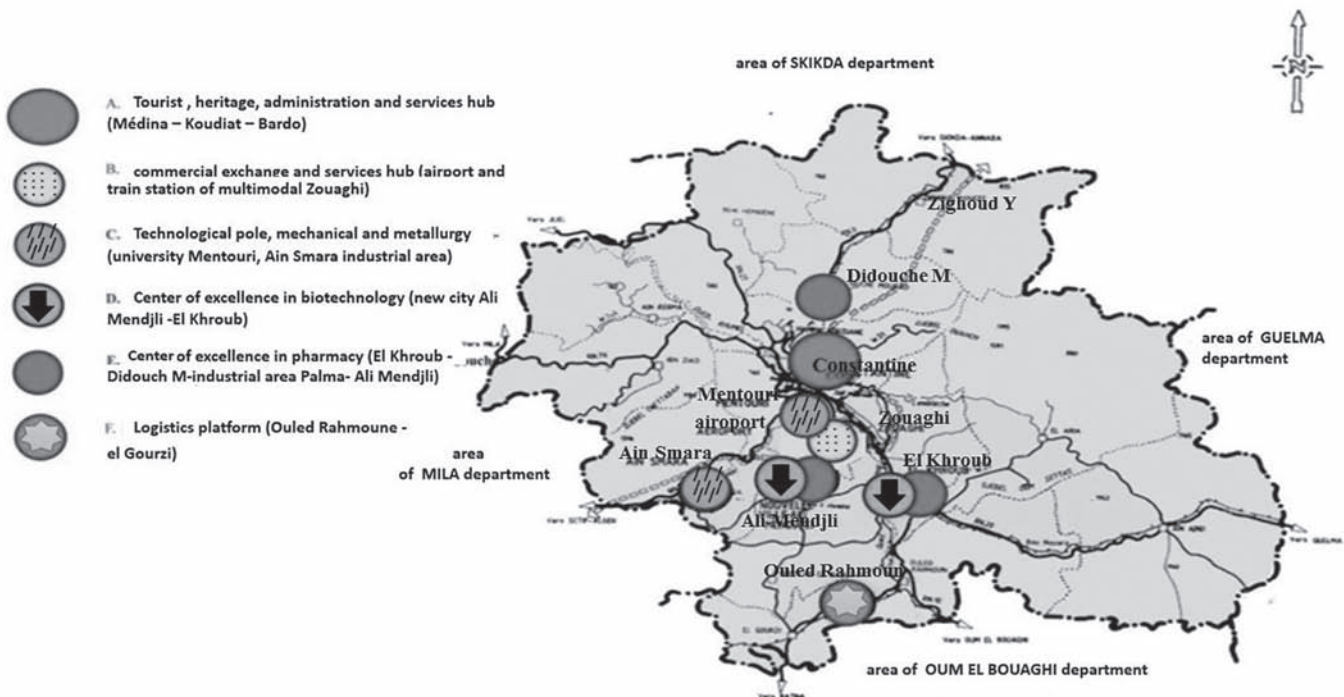


Figure 3. Geographic positioning of PMMC elements (Source: Wilaya de Constantine, 2011. with the author's translation and modifications)

- A survey, delivered as a self-administered field questionnaire, of 300 inhabitants regarding their involvement in the PMMC and their satisfaction with regard to its objectives and achievements. These inhabitants belong to different age classes and statuses, thus we can measure satisfaction at various levels to detect the causes of their dissatisfaction; and
- Interviews with elected representatives and professional experts in urbanism directly involved in project development. They were asked about the causes of the failure, in order to benefit from their experience and expertise and see their logic compared to the other results obtained.

The causes tree: it is imperative to reconstruct a causal chain to understand a problem, because “a problem rarely has a single cause, it is frequently the result of a chain of causality” (Terrier, 2012). A causes tree is a chronological visualization tool of malfunctions and causality. Thus, for the development of the causes tree in our case of study, we reconstructed a causal chain going back to the origins of each cause.

The Ishikawa diagram: Unlike the causes tree, which focuses on the concatenation of causes, the Ishikawa diagram shows possible causes of a problem while defining their effects. In turn, it identifies ways to address a problem (Terrier, 2012). Once identified, the causes are analyzed in light of the law of 5 M (material, labour, equipment (machinery or equipment), the method, and environment (context)). They were extended to 6 M to 7 M; which involves the management and financial environments (Innovation Information, 2003).

RESULTS: THE PMMC ACCORDING TO THE CAUSES TREE AND ISHIKAWA DIAGRAM

The definition of the central problem

To elaborate the causes tree and an Ishikawa diagram, we must first define the central problem and the most obvious first causes that constitute the first level in the construction of the causes tree.

The first level causes are detailed as follows:

Central problem	First level causes
Current state of PMMC (defined previously)	Non-achievement of objectives Actor disappointment and dissatisfaction Additional costs and delayed results Disappearance of project strategies

Non-achievement of objectives: The PMMC objective to make Constantine a nationally and internationally ranked modern city has not fully been met (except the transportation sector that has evolved via three projects: Cable car, tramway, the Transrhmel Bridge, improvements in the attractiveness of hotels and the eradication of shantytowns³).

³ Based on an interview with Ms. M.H. Meggueddem, the President of the Investment Committee and Employment Opportunities APW held in December of 2015.

The following economic, social, and environmental issues have been neglected:

- Conflicts resulting from achievements (struggles to relocate the citizens, protests against disorganized projects);
- Living conditions remaining the same, especially in regard to the built environment;
- The decline of Constantine demographic development (the city's average annual growth rate was 4.06% from 1966-1977, 2.8% in 1987 and 0.41% in 1998, arriving at a negative rate of 0.7% in 2008) (Cherrad, 2005) and a loss of attractiveness⁴;
- The inconsistency of certain actions and an unclear vision for the city's development;
- The non-realization of social fairness due to hasty and unplanned relocations; and
- The non-realization of citizen participation at every level. According to the survey on 300 citizens, the inhabitants remain as uninformed spectators (Figure 4). Indeed, 76.7% (230 people out of 300) did not know about the PMMC and its content. In addition, the survey confirms that the inhabitants were not involved in the project (Figure 5), even if they showed their willingness to be involved (Figure 6).

Actor disappointment and dissatisfaction characterized by indifference and occasional anger or protests, derives mainly from feelings of exclusion (Mouhoubi and Sassi Boudemagh, 2015), but also from delays in achievement and disorganized construction site nuisances.

In this context, according to the surveys, the majority (90%) of respondents are not satisfied with the results of the PMMC (Figure 7), and only 6.7 % show their satisfaction with the achievements reached in the transportation sector. The results of the interviews with elected officials and experts also support this finding. Indeed, they believe that the PMMC has not achieved its objectives.

Another result was noted by the analysis of the qualitative results during the survey, namely that the trust between the elected officials and the citizens is very weak. The citizens do not believe that their opinion is valued, for them, “*they are only inhabitants*”. The inhabitants are therefore unaware of their importance and potential as instruments of change in the city.

Additional costs and delayed results that characterize Constantine's projects: The most popular expressions in the national press are “Constantine dreams of obtaining its projects” (La Nouvelle République 09/03/2010), “the city of suspended projects” (l'Expression 28/07/2010) and others.

Indeed, the majority of PMMC projects have delays in implementation:

- The tramway was to be operational in 2010, but it was commissioned in July 2013;
- The multimodal station, which was to be ready at the same time as the tram, is also under construction;

⁴ Based on an interview with Ms. M.H. Meggueddem.

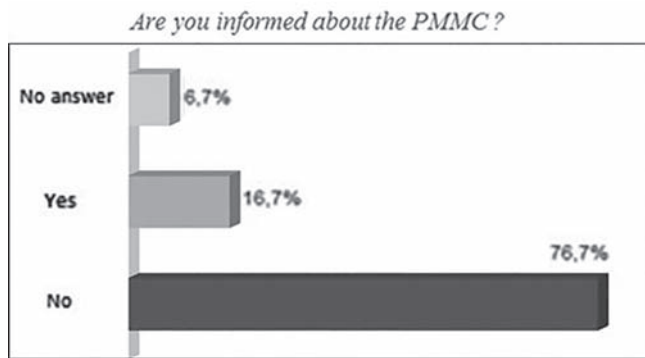


Figure 4. Result of the survey on 300 citizens regarding the project mediatization

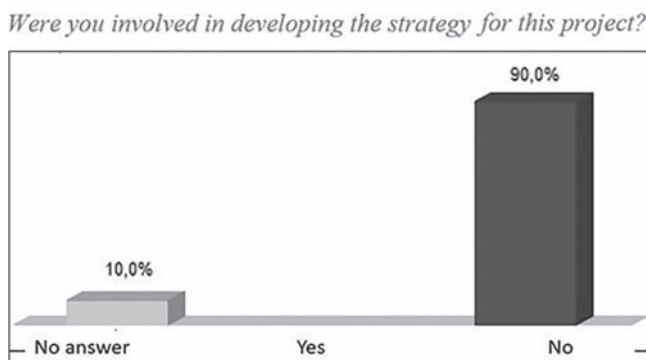


Figure 5. Result of the survey on 300 citizens regarding citizen involvement

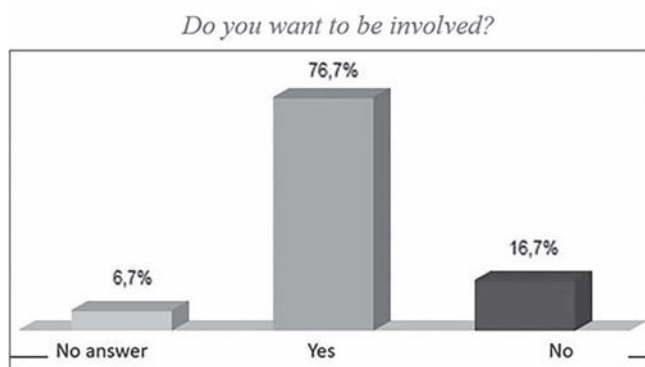


Figure 6. Result of the survey on 300 citizens regarding whether the citizens want to be involved in the project

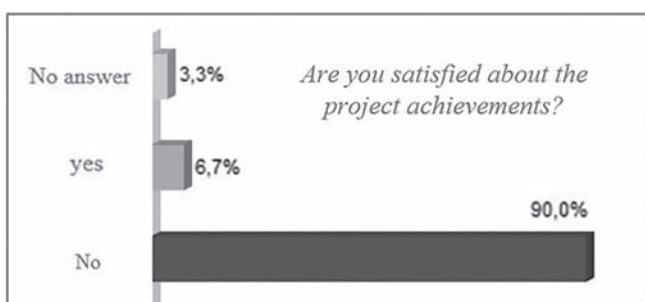


Figure 7. Result of the survey on 300 citizens regarding their satisfaction about the project achievements

- The university campus, which was to be fully open to student in the academic year of 2013/2014, is still under construction;
- Urban improvement operations within the scope of the 2010-2014 programme are not yet completed. Indeed, by 2014 (the end of programme deadline), only 51% of operations had been completed (according to the Committee on Spatial Planning and Urban Planning at the Popular Assembly of the Wilaya of Constantine, April 2014);
- Project Bardo is considered an undefined dream that repeatedly changes shape in Bardo Viva City, little Dubai, US Park. It still has not taken its final form; and
- Regarding the rehabilitation of older buildings, operations have not yet begun, and other projects have been aborted or suspended due to opposition from inhabitants.

Whoever says "delays" also denotes "recosting". Indeed, several PMMC projects (if not all of them) have been re-evaluated financially (e.g., the tram, for which the costs rose from 17.1 to 48.4 billion DA).

Disappearance of project strategies. With the changes that the city of Constantine has undergone, the PMMC strategy is no longer mentioned in its planning policies, and a certain eclipsing of the project is noteworthy. The PMMC is referred to as "a deceased child"⁵.

These results demonstrate that the project is not a success, because it has not fulfilled its objectives in terms of cost, quality, delivery and stakeholder satisfaction that constitute the most critical success factors in a project according to Pinto and Slevin (1988), thereby making it a failure.

From the causes tree to Ishikawa diagram

The causes study begins first by identifying the basic causes for the immediate causes level and then searches for the causes of each element in each level in a tree construction logic. The causes (Figure 8) were mainly identified by observation and reflection, reading and the use of documents, interviews (specifically with experts, politicians and individuals from the local administration who listed some causes) and investigations. The logical sequence of these causes is made by a reflection linking the various levels of cause.

Based on listing the various causes through the construction of the causes tree we ranked them according to the rule of 5M/7M families in order to establish the Ishikawa diagram. We established the causes families according to the causes domains that are on the list and classified them after reflection and analysis. There is no element (cause) that belongs to the family of the Machine, so we eliminated it. This is how we set the following cause families:

- The Manpower and actors family groups all problems relating to a lack of mastery of the implications and interactions between actors and their competence and organization;
- The Material and financial means family groups any problem related to the non-mobilization of resources;

⁵ This expression was borrowed from Professor S.E. Cherrad, during our interview on 23/11/2014.

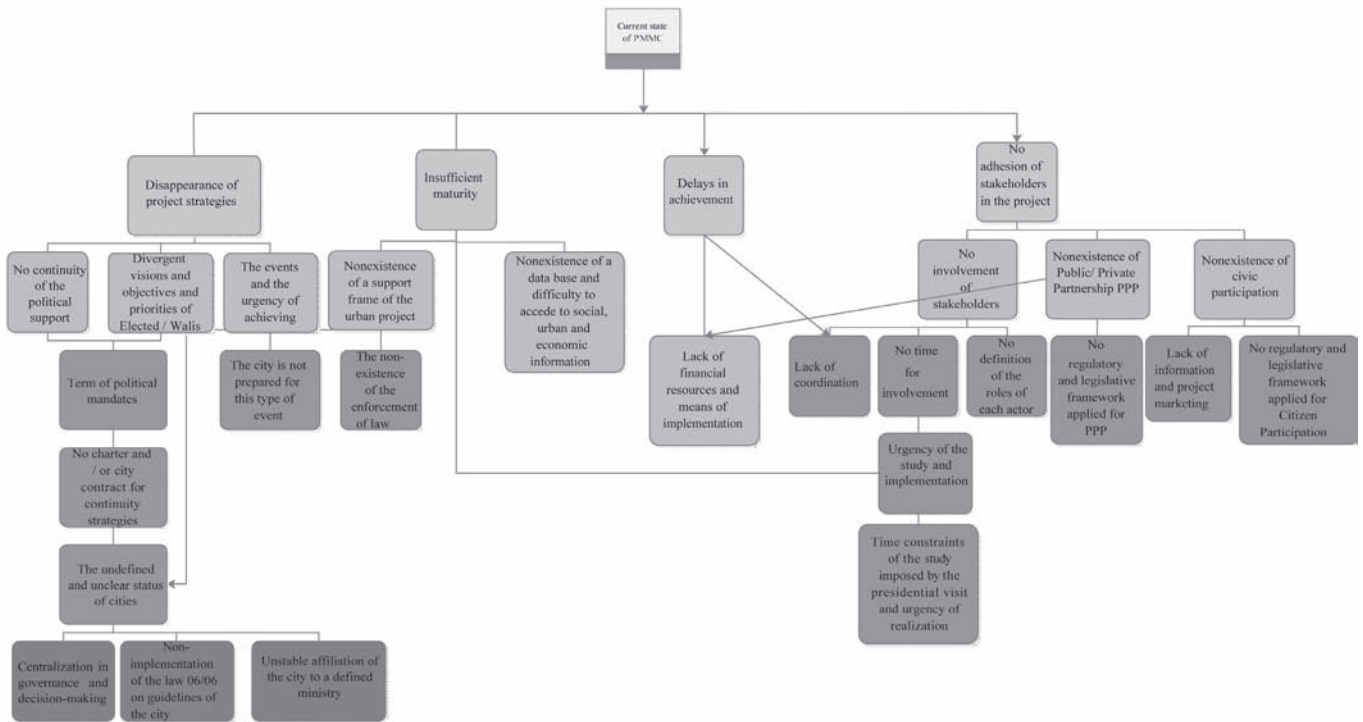


Figure 8. The causes tree for the PMMC (Source: Authors based on content analysis, interviews with experts and surveys)

The Ishikawa Diagram PMMC

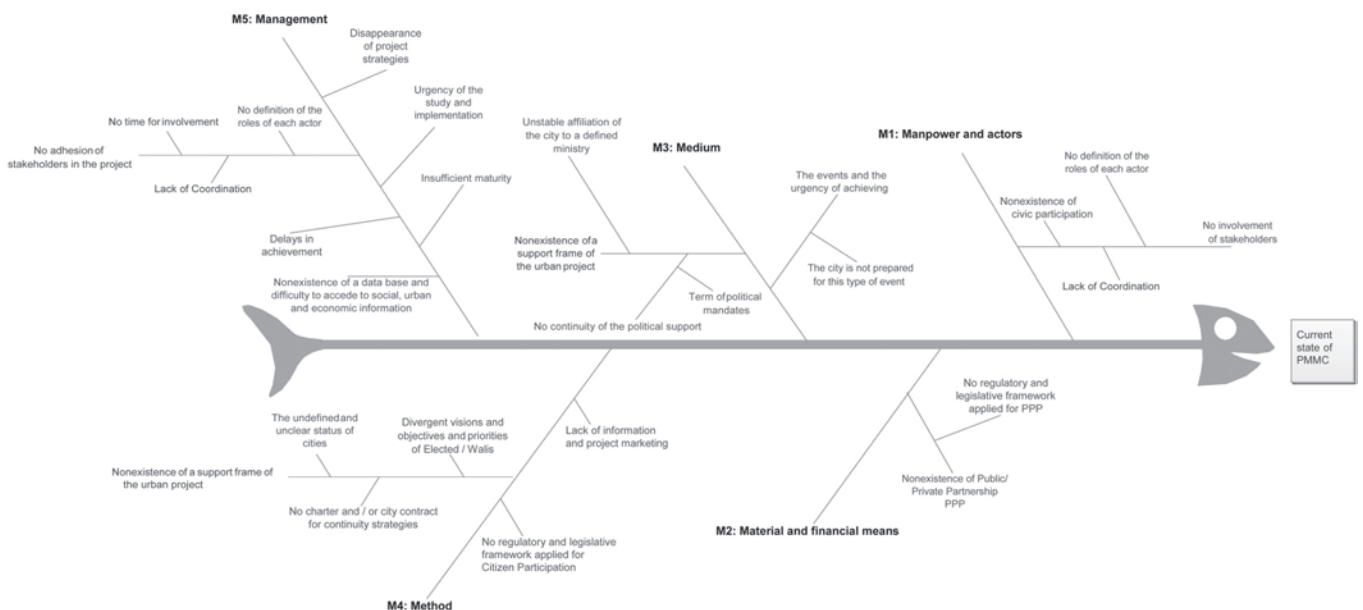


Figure 9. The Ishikawa diagram for the PMMC (Source: Authors)

- As urban projects develop in complex environments (cities), the Medium family groups all problems arising from the environment in which a project is applied;
- Urban project implementation methods differ from one context to another depending on the ways they are managed and the tools applied. Thus, the Method family groups problems related to the methods and procedures used in project implementation; and

- The Management family groups problems arising within the framework of management and their integration into a project's process.

As a result, we created the Ishikawa diagram shown in Figure 9.

Through the two representations of the causes of failure, we deduce that the most influential and numerous causes belong to the Management and Method family, which

consolidated the hypothesis that good management and governance affect the success of the project.

Root causes are more related to the strategic level of the decision making, knowing that in the urban project, actions, actors and decisions are interconnected. Therefore, the treatment of the project failure should deal with those causes and not only the treatment of the first level causes which then becomes a symptomatic treatment rather than a resolution of the problem.

DISCUSSION AND CONCLUSION

Our explanatory approach, based on the context analysis through investigations and interviews, prompted us to go back to various branches of the causes tree. The branches range from the observable facts on the ground to strategic methods applied under legislative regulation and urban management. The main failure causes of the PMMC can be discussed as follows:

Failure to adapt the country's regulatory context to the urban project implementation

Algeria needs to open up to less rigid and more strategic planning methods by reforming its legal arsenal with a view to setting up urban projects.

Failure of PMMC project mastery

The urban project mastery, which is a coalition of project actors working collaboratively toward a common objective (Tsiomis and Ziegler, 2007), was not built and consolidated around the PMMC. This led to a slower rhythm in the procedure's management and failure to mobilize resources. The use of project mastery assistance and upgrading training are then preferred solutions.

Lack of political support and change in the urban vision and strategy

Continuous political support allows for sustainable and refined strategy. The PMMC is characterized by a change in political support that has induced a change of vision and objectives during the realization phase.

In addition, with the advent of the 2015 Constantine Capital of Arab Culture event, the modernization strategy was put aside to make way for urgent preparations for the event. Regarding the international context, at the origins of urban projects are often found in large events (examples: the Lyon urban project with the event of European culture capital in 2004, the modernization of Lyon that came from the video game capital event in 1999 and from the festival of lights of 2006). In the case of Constantine, it is an anachronism. The positive side is that the event served as a driving force for mitigating delays in the PMMC. The example of the Barcelona urban project and the 1992 Olympic Games is very similar.

Insufficient maturity

The project exhibits insufficient maturity due to the urgency of studying and launching the project imposed by urban crisis and by political pressure.

Lack of stakeholder involvement

Urban actors were not involved in the project. From inhabitants to those involved in the advanced stages, the

management of stakeholders was a failure, with neither citizen participation nor partnership being set up.

These discussions lead us to talk about the introduction of management in the field of planning and governance. Here there are several criticisms based on the fact that management models cannot be directly transposed because of the differences between private organizations and public ones (Sager and Sørensen, 2011; Hounounou, 2011). In addition to this is the fact that politics intervenes in public projects, and when politics is involved, we often move away from the rationality of management.

However, our findings and discussions support the fact that management is one of the key factors in the success of urban projects. This management cannot be applied if the strategic vision guided by the authorities is not clearly defined and facilitated by regulation that allows flexibility, implication and coordination, which are elements that constitute the good urban governance. These two dimensions constitute the major failure factors of the urban project approach in Algerian context. Our case study supports this finding. Thus, the search for a real resolution of the problem rather than the establishment of symptomatic treatment related to superficial causes without going plate depth is essential. This requires considerable effort and political support, with interventions at strategic levels to obtain better results at operational levels.

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