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An analysis of key factors affecting New Town Planning with a human-centred approach

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Abstract. Since new towns are to meet the needs of the metropolitan population, it is required to acquaint the populations with the new scientific-technical methods and take one more step towards civilisation. Given that the New Town seeks to provide the latest facilities for citizens, a human-oriented approach can be proposed. New Urbanism with a humanistic approach requires coherent and dynamic planning. New structures and the various needs of the New Towns require comprehensive and integrated planning to utilise recent facilities to lead New Towns toward a human-centred attitude.

Therefore, the main purpose of this study is to analyse the key factors affecting the planning of New Towns with a humanistic approach. The method in this research is a descriptive-analytical survey. In the first step of the research, a list of primary factors involved in planning new cities was identified as research variables, using documentary sources and previous research. Then the research variables were analysed based on the Delphi method. Accordingly, 34 variables were provided in five domains for 50 experts in urban planning issues in the form of questionnaires to be analysed in matrices.

The findings of the study are demonstrated in five aspects: cultural-social, physical-spatial, economic, environmental, and governance topics, with 34 components. The results show that citizenship rights, social capital, transparency, accountability, law, participation, consensus, quality of performance and managerial effectiveness, efficiency, economic welfare, sustainable active economy, meeting economic needs, quality of texture, and spirituality have the highest impact and the lowest affectedness on the realisation of human-centred New Urbanism. The results can be useful and effective by establishing integrity and fundamental theoretical principles in planning, implementation and strategic control of New Towns.

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1. Introduction

Over the past three decades rapid urban population growth in developing countries has resulted in numerous problems such as congestion, pollution, homelessness, housing shortages, and insufficient public services. To control urban growth and its related problems, different countries have focused on multiple policies such as family planning, rural development, controlling rural–urban migration, restricting large-scale urban growth, medium-sized city development, and new urban development. The main aim of the new urban development policy was to alleviate population pressure in large urban areas (Atash & Beheshtiha, 1998). The demand for New Towns has emerged largely out of the need for the protection and fulfilment of an exclusive lifestyle that has been able to sell an image of the New Town as a sign of modernity due to its creative nature (Hrehorowicz-Gaber, 2013; Mierzejewska & Parysek, 2014).

New Towns are praised as a strategy for managing urban growth for a number of reasons. Most commonly, they are promoted as a mechanism for relieving population pressure on existing cities, where rapid growth and subsequent congestion degrades conditions across the built and natural environments (Keeton & Nijhuis, 2019). New Towns are also attractive to city and state governments because they are frequently developed through public–private partnerships (PPP), reducing the short- and long-term budget implications for city and state governments. Because New Towns are built from scratch with modern infrastructure and amenities, they often provide global living and working standards at lower costs than does upgrading core urban areas (Wang, 2010). Planned communities have also been an opportunity to showcase the latest architecture, planning and design technologies. New Towns in most of the world are a key feature of the current urban growth strategies. Usually, New Towns or planned communities are founded on undeveloped or barren lands where there was no city before (Reiche, 2010).

New Towns are resurgent as a planning strategy in many countries in Asia, Africa, and Latin America (Szymańska, 1993; Firman, 2004). In the last 50 years, a struggle has been witnessed for modern urbanism. The social transitions taking place in all quarters due to the rapidly growing *per-capita* income and the immense influx of immigrants at both national and international levels has been likely to leave some lasting changes, emphasising the need to identify new planning and design criteria for the physical development of the cities. Alongside the growing popularity of New Towns has been an emerging literature that is critical of the projects and their socio-spatial impacts. A common critique is that New Towns contribute to an accelerated idea that the city splits into spaces for the wealthy and spaces for the poor (Linnekamp, Koedam, & Baud, 2011). New urban growth can increase spatial inequalities in three ways; first, middle and upper income classes have been segregated, resulting in dispersed clusters of exclusive residential areas. Second, the upper middle and high class occupied exclusively designed areas with the highest possible security within the New Towns themselves. Third,

the urban development management has been carried out by developers rather than by the city in several New Towns (Firman, 2004).

At the beginning of the twentieth century, the status of New Towns reduced compared to the other cities in the world (1). The main reasons could be associated with the absence of a definite form and a cultural reference. In many parts, the substituted global modern planning has not been compatible with the culture, conditions and community of the inhabitants of these New Towns. Thus, each settlement has become not only a concentration of houses, streets, people, walls, and so on, but also a visual manifestation of the settlement processes. Therefore, a city or settlement should not only be viewed with respect to its physical dimensions, but also as an indication of an evolved process.

Thus, the present paper seeks to develop an innovative analytical approach for planning New Towns in which the physical and spiritual needs of the human are met. This goal has been intended to be approached by using a descriptive-analytical method in which interactive factors are considered in five main domains with 34 components. Questionnaires and matrices are used for deep analysis of 50 experts` views, utilising MicMac software to specify the influence and affectedness of each variable (components). The results have indicated significant domains and variables for the effective planning of human-centric New Towns.

2. Background

In the early twentieth century urban sprawl intensified worldwide (2). In fact, horizontal growth has become popular due to the model of separation of land uses, based on the idea of zoning modernisation. Due to the increasing need for housing, residential suburbs were created around the cities, which completely separated the residential area from other commercial, industrial and administrative parts (Izadi, Vardanjani, & Varesi, 2021). This attitude was common for almost 50 years during the twentieth century. On the other hand, this land-use planning approach couldn't attract the attention of citizens (Stuart, Schewe, & McDermott, 2012).

The lack of vibrant urban centres, increased air pollution, lack of human scale, traffic congestion in the communication networks, and the segregation of the land use were considered to be the main issues. In the late 1980s and early 1990s, this discontent led to the emergence of the New Urbanistic evolution. This New Urbanism became one of the new planning approaches in cities, constituting a widespread attempt to solve the problem of suburbs. The American Planning Association defines urbanism thus: "Urbanism is the process of integrating the components of the present-day living, housing, work, shopping, and recreation into compact, pedestrianised and complex neighborhoods through public transportation networks." (Hamstead, Kremer, Larondelle, McPhearson, & Haase, 2016; Wright, 1973).

So far, most efforts of New Urbanism have occurred in the USA, but important projects have been carried out in European countries too. In particular, a smart growth pattern arose on the East Coast and Western Europe, which was based on American New Urbanism, but the main idea was more similar to European views (British and Swedish land-use planning particularly). By comparing the plans and results in the USA and Europe, the differences between the New Urbanism Evolution can be observed. American New Urbanism focuses on the details in the architectural quality and design, but in European New Urbanism it is important to plan based on the necessary density and user-friendly public transport (Talen, 2005).

In general, New Urbanism recommends a pattern of compact, small-scale human settlements instead of the sporadic development and indiscriminate construction in a pristine natural area. AThe fast and efficient public transport network connects these dense settlements (Tweed & Sutherland, 2007). The New Urbanism concept revived the idea that planning is not just about the process. It should be mainly based on the principles of the long-term prospects to guide the city. Some of the advantages and disadvantages of the applying of the principles of New Urbanism are provided in Fig. 1, while some principles, goals, and approaches of New Urbanism are also proposed:

Nowadays, New Urbanism requires thatnece-ssitates to pay attention be paid to human requirements as well as the environmental considerations;

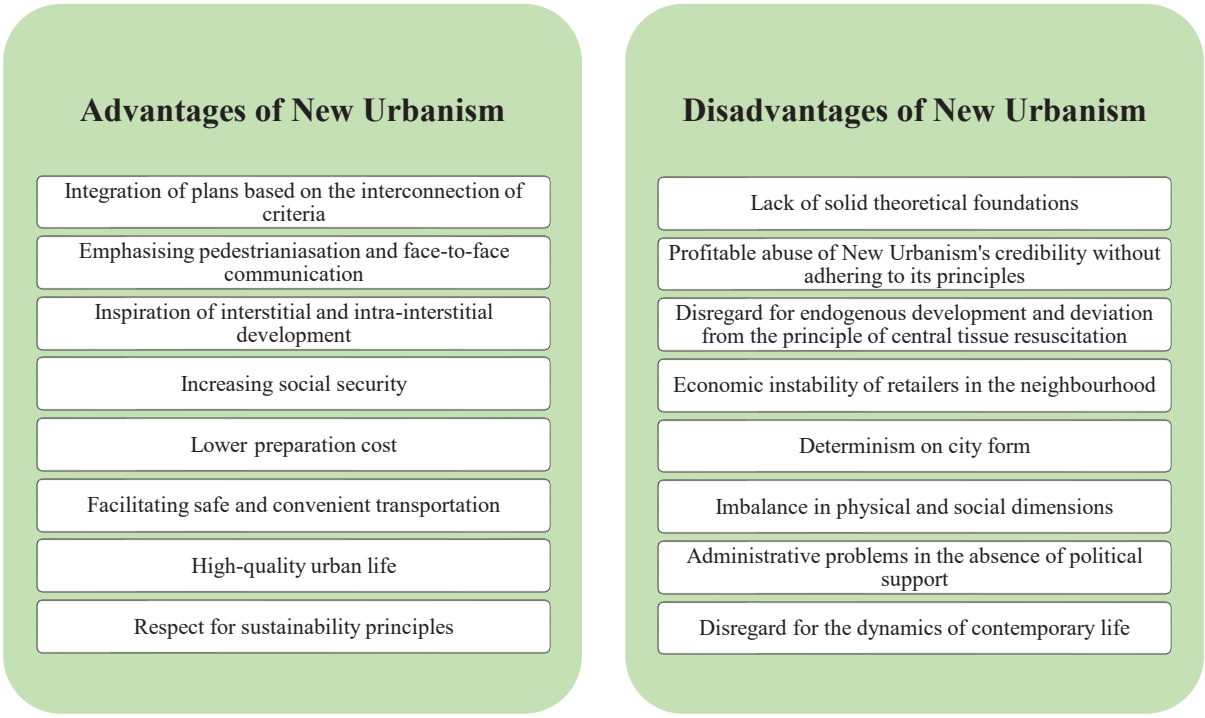

Fig. 1. Advantages and disadvantages of New Urbanism

thus, it becomes important to change some of the rules and principles of the policies in New Urbanism, and this will require a change in the way planners and officials view the city.

2.1. New Urbanism

The most important document that describes the theoretical content of the New Urbanism movement is the New Urbanism charter. This charter, which was presented in 1996 as the theoretical charter of New Urbanism after the fourth annual meeting of the New Urbanism Association, can be considered as a statement against the Athens Charter, in which the modernist view of urban planning and architecture was proposed by the International Congress of Modern Architects. This charter examines all levels in relation to human communities including blocks, streets and buildings, neighbourhoods, districts and urban areas, regions, metropolises, cities and towns, while it does not reject any of them (Leccese et al., 2000). In the 1980s many American architects and urban planners complained about the deterioration of urban centres and the growing number of local communities that were scattered far from urban centres (Szymańska, 1993). In the late 1980s and early 1990s this dissatisfaction led to the emergence of the New Urbanistic movement (Grant, 2005).

New Urbanism seeks to create a diverse residential use ranging from apartments to single-family homes with varying income levels while protecting vital habitats and natural environments through intensive development (Hikichi, 2003). In fact, the theory of New Urbanism is the principle of planning that creates liveable and walkable neighbourhoods in a favourable walking environment.

The New Urbanism movement is a response to urban sprawl and an effective way to deal with car-dependent communities. Although this movement has emerged in the context of the new housing developments, it has always emphasised intra-context developments and the improvement of existing ones, and opposes over-expansion and the consequent loss of land (Nozzi, 2005). In this regard, the proponents of the New Urbanism movement have considered principles (Table 1) that clearly implement the goals stated in the New Urbanism charter in order to modify said charter.

Table 1. Principles of New Urbanism Evolution (Jepson Jr & Edwards, 2010; Talen, 2008)

Principles of New Urbanism
• Maintaining traditional structures • Reduction of unnecessary commuting • Increasing density • Consideration of historically valuable forms and improving the quality of design and architecture • Complex land use • Diversity of housing types • Pedestrianisation • Interconnected street network • Participation of residents • Maintenance and development of public green spaces • Development of public transportation • Security improvement in urban places

2.2. Humanistic doctrine in New Urbanism

In recent years, the humanistic doctrine has attempted to move from the mere identification of places to the recognition of social forces shaping places, or of the places that shape human culture. (Flint, 2006). In fact, people or simply citizens play a key role in the urban planning. Humanistic urbanism respects the physiological and psychological characteristics of humans in the city in contrast to pure machinism. This theory is a reaction to the industrialisation process and its adverse effects on the human. Attention to nature and culture is an important principle in this view. Thus, the humanistic doctrine creates an environment that is both ecologically and culturally adaptable to people and their rights, habits and beliefs. In the early 1960s there was an evolution in American psychology known as "humanistic psychology" or the "Third Force". As the term "third force" may imply, humanistic psychology sought to replace the two major forces of psychology, namely behaviourism and psychoanalysis. The humanistic doctrine believes in the desires and importance of the human more than anything else. In this doctrine, human behaviour is meaningful and is caused by many physical, psychological, social, cultural and complex factors.

The emergence of humanism in geography during the second half of the twentieth century may have been described as the freedom of several aspects of the thoughts and practices – different ideas that emerged and were later ignored or suppressed. The humanistic approach can best be evaluated in terms of the fundamental change and the status of the functions in various educational, analytical, applied and critical aspects.

It is important to respect physical and spiritual requirements in New Urbanism. Spiritual needs are usually considered to be the basis of the main needs which are usually ignored in New Towns. The current attitude of planners to attend to the physical human aspects, and to neglect innate human needs, is the most important poverty in the cities. It seems it is not plausible to recognise human needs and establish cities without enough knowledge about every aspect of human nature. Thus, there is not a certain approach for recognising physical and spiritual human needs in New Towns.

New Towns should provide the opportunity to move toward absolute perfection and the realisation of true peace and ultimate human happiness. The principles of the human in the New Town that are mentioned in the humanistic doctrine are depicted in Fig. 2.

Therefore, New Urbanism can be defined in the anthropological approach as the effect of human life in specific geographical areas. These geographical areas are usually identified by human presence, activities and relationships. New Towns are one of the most complex habitats in which a wide range of citizens' relationships with the environment is formed. Therefore, New Towns are required to meet the physical and spiritual needs of the citizens. New

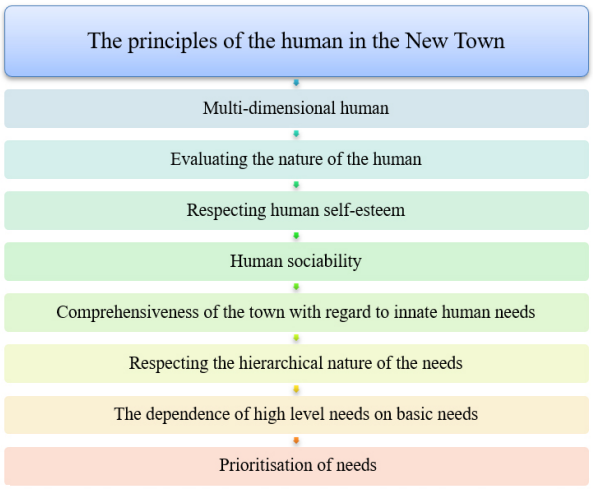

Fig. 2. Principles of the human-centred New Town in the humanistic doctrine

Urbanism as a living environment of the human must be capable of creating a sense of identity, belonging and aesthetic perception in order to provide peace, security and pleasure in citizens. In fact, one cannot feel a sense of belonging to a town without a sense of identity in urban spaces, and consequently it is not possible to achieve a sense of beauty and visual pleasure without the sense of belonging. A comparison has been performed for the New Town planning with and without human-centric principles in Table 2.

3. Methodology

The New Urbanism development policy had four key purposes. The first purpose was the redistribution of spill-over population in designated areas of large cities. The second was the decentralisation and transfer of services to New Towns to mediate between smaller and larger cities. The third was to reduce the population density of large cities in order to improve their residents' quality of life and service delivery. And the fourth and final aim was to prevent the rampant increase in land and house prices, the formation of squatter

Table 2. Comparison between human-oriented and contemporary approaches to New Town planning

New Town planning	
Without human-centric principles	**With human-centric principles**
• Centralised planning	• Decentralised planning
• External development	• Intra-city development
• Macro-scale construction	• Sustainability of culture-based land use
• Physical needs	• Spiritual and physical human needs
• Respecting the form	• Respecting the process and form
• Planning based on personal ideas and interests	• Planning based on public profit and sustainable values
• Individualism	• Empiricism
• Machine-scale	• Human-scale
• Traditional performance	• Human performance based on spiritual and mental needs
• Modern development	• Culture-based development regarding human behaviour
• Participation of political authorities	• Participation of citizens
• Subject-based method	• Troubleshooting method
• Spatial inequality	• Spatial justice
• Urban space establishment for specific groups	• Urban space establishment for publicity
• Meeting physical requirements based on environmental issues	• Meeting spiritual and material requirements based on environmental issues
• Personally innovated town	• Socially innovated town

settlements, and sprawl across metropolitan areas. To achieve these goals and to promote self-reliance, present and future New Towns were envisioned as having upgraded infrastructure and amenities. Furthermore, New Towns were considered to be located at a reasonable distance from the main city. A new legislation stated that New Towns outside the main city should serve as the means to supervise the further development of agricultural lands within and outside metropolitan areas. Compared to the large cities, and to comply with social and environmental standards, new urbanistic areas were expected to offer their residents sufficient services. Regarding the challenges and opportunities facing New Towns in different countries, including developing countries, it is required to take a humanistic view for new urbanistic planning, which is emphasised here.

The research method in this study is interaction analysis. The present research is an applied, descriptive-analytical and exploratory study that has been done using a combination of quantitative and qualitative models. The data collection method is library research. Qualitative data were prepared by designing a questionnaire for measuring interaction (Excel matrix) together with interviews. Quantitative data used in this study were obtained numerically using Delphi questionnaire weighting. At the first stage of the research, a literature review was performed systematically and structurally in the field of anthropology and new cities. Indices and variables were extracted based on the Delphi method and theories in this stage. In the second stage, analysis was performed in MicMac software based on the interaction analysis. In this regard the opinions of 50 experts in the field were used. In this method, participants were asked to submit their views and judgments about the expected significant developments. They were also asked to judge the suggestions of other members.

In the qualitative section, verified scientific principles and literature were used to extract the factors affecting New Towns. In this section, 30 experts were chosen who are familiar with comparative studies, scientific and specialised terms, and futures studies knowledge.

Accordingly, a questionnaire for expert views was used to collect information in the field. This questionnaire was prepared based on previous studies and the viewpoints of a few experts in the field. Since there is no explicit rule on the number of experts, the number of participants is usually estimated between 30 and 50 people, depending on the scope, time of data collection, available resources, and the Delphi goal (Windle, 2004). As mentioned above, consequently, 50 available experts familiar with anthropology and new cities have participated in this study. Table 3 shows the characteristics of the experts present in this study.

According to Table 3, of the 50 respondents, 42% were female and 58% were male. In terms of age, the biggest number of experts were 25 to 30 years old (36%). Based on education level, people with a master's degree or higher make up 48% of the sample size. In terms of the field of study, most of the experts have studied urban management and planning. Also, the workplace of 40% of the experts was stated to be a university.

The information collected in the questionnaire using the interaction analysis method and MicMac software (Talebian, Molaei, & Gharari, 2007) wasere used to identify the factors affecting the planning of New townNew Towns with emphasis on the human-centric city. Thus, the effect of the primary factors on each other has been evaluated in the form of responses to the experta questionnaire for experts. Respondents were asked to rate the influence of the factors on each other in the range of zero to three. Therefore, the experts were asked to apply their judgments based on the standard of the effect weighting among the variables.

3.1. Interaction analysis

To identify the main key factors on the human-centred city, a system model (interaction analysis) was used to analyse the research findings. Interaction analysis has been performed as a practical model for identifying key factors using MicMac. MicMac software has been designed to perform heavy calculations on interactive-effect matrix. The important variables were firstly identified in the desired field. Then these variables were inputted in the effect analysis matrix and the extent of the

Table 3. Descriptive statistics of respondents' status

Domain	Subcategory	Count	Percentage
Gender	Female	29	58
	Male	21	42
Education level	B.S.	18	36
	M.S.	24	48
	Ph.D.	8	16
Field of study	Urban management and planning	17	34
	Social sciences	5	10
	Urban development studies	12	24
	Environmental science	9	18
	Law	7	14
Age	25 – 30	18	36
	31 – 35	7	14
	36 – 40	5	10
	41 – 45	10	20
	46 – 50	7	14
	Older than 51	3	6
Workplace	Provincial Government Office	8	16
	Provincial roads and urban development department	7	14
	Municipality	11	22
	Department of Environment	4	8
	University	20	40

The answers are provided by experts from different countries including Iran, Turkey, Austria, USA, Australia, UK, Malaysia, Italy and Germany.

influential relationship between these variables was recognised by the experts in terms of the relevant field. According to the Delphi method, 34 effective factors in the human-oriented planning of New Towns were identified by experts and these factors were included in the analysis of the matrix. Then the effect of factors on future conditions of the system were weighed by experts. The effect was measured by numbers between zero and three. The number zero means "no effect", the number one means "weak effect", the number two means "intermediate effect", and the number three means "heavy effect". The variables in the rows affect the variables in the columns. The sum of the scores of the real variables in the rows shows the reduction rate and the scores of the real variables in the columns show the effect of the variables. After determining the effect of the factors on each other using the interaction analysis method in MicMac software, the key factors affecting the future status of the system were extracted and analysed. Based on the number of factors, the obtained dimension of the matrix was 34 × 34.

4. Results

The results of the experts' judgment were obtained for inputting into the MacMac software after being collected as an Excel file. The results were extracted statistically and graphically. Finally, 34 components in five domains (physical-spatial, environmental, sociocultural, economic and governance) were extracted, which can be seen in Table 4, in which the reliability of the questionnaire was evaluated.

The initial matrix based on the statistical indices with three data rotations has had 100% optimizisation, which indicates the high reliability of the questionnaire (Table 5).

The results of interaction analysis are presented in Table 6 and Table 7.

5. Discussion

According to the results obtained for the direction influence of factors in interaction analysis (Table 6), the filling rate of the matrix was 97.06%, which indicates the considerable interaction between factors. Out of 1,122 evaluable relations in the matrix, 34 cases were zero (no effect), 364 were one (weak effect), 339 were two (intermediate effect) and

Table 4. Reliability of Expert Questionnaire

Domain		Components	Cronbach's alpha
Sociocultural		S1 Meeting socio-cultural needs S2 Citizenship rights S3 Social capital S4 Historical, cultural and educational events S5 Social life	0.897
Environmental		En1 Environmental quality and health En2 Natural environment quality En3 Urban Biological Quality	0.924
Governance		G1 Transparency G2 Accountability G3 Law G4 Participation G5 Justice G6 Accountability G7 Consensus G8 Quality of performance and managerial effectiveness	0.943
Economic		Ec1 Performance Ec2 Economic Welfare Ec3 Sustainable active economy Ec4 Meeting economic needs	0.869
Physical-Spatial	Objective	O1 Quality of form O2 Quality of public spaces O3 Quality of housing O4 Accessibility	0.912
	Mental	M1 Spirituality M2 Identity and Authenticity M3 Sense of place M4 Vitality M5 Comfort and convenience M6 Cognition	
	Functional	F1 Uses and activities F2 Quantity of facilities and services F3 Process F4 Civil Engineering and Infrastructure	

Table 5. Reliability of interactive effect analysis questionnaire for experts

Rotations	Influence (%)	Affectedness (%)
Rotation 1	101	99
Rotation 2	99	100
Rotation 3	100	100

Table 6. Direct influence matrix

Indicator	Number
Matrix dimensions	34
Number of repetitions	3
Number of zeros (no effect)	34
Number of ones (weak effect)	364
Number of twos (intermediate effect)	339
Number of threes (heavy effect)	419
Total	1122
Filling rate	97.06%

419 were three (high effect). In addition, based on the results of the analysis of the factors interaction in Table 7, the extent of the direct and indirect effects of the factors on the factors affecting the planning of New Towns with emphasis on human-centric city has been obtained. According to the information in Table 7 (extracted from MicMac software), citizenship rights, social life, transparency, accountability, law, participation, central consensus, quality of performance and managerial effectiveness, sustainable active economy, and form quality have the greatest direct effect on the planning of human-centric New Towns. And in terms of the indirect effect, citizenship rights, social life, transparency, accountability, law, participation, consensus, quality of performance and managerial effectiveness, and form quality have obtained the highest scores.

The results are also indicated as MicMac software analysis output (Fig. 3) that depicts the degree of the factor influence in the form of a chart consisting of two axes of influence and affectedness. In this diagram (Fig. 3) five areas are indicated that are further discussed in Table 8.

Table 8 represents the classification of the direct and indirect effect of the factors. The value of the influence and affectedness of the factors defines the significance of it, which might be considered as an indicator, suggesting the factor as a key factor. According to the results of the interaction analysis, it is possible to identify effective and important factors. This is illustrated in Fig. 4, in which the key factors are also extracted consequently at the end of analysis.

Based on the analytical results (Fig. 4), in human-centric planning of the New Towns, governance

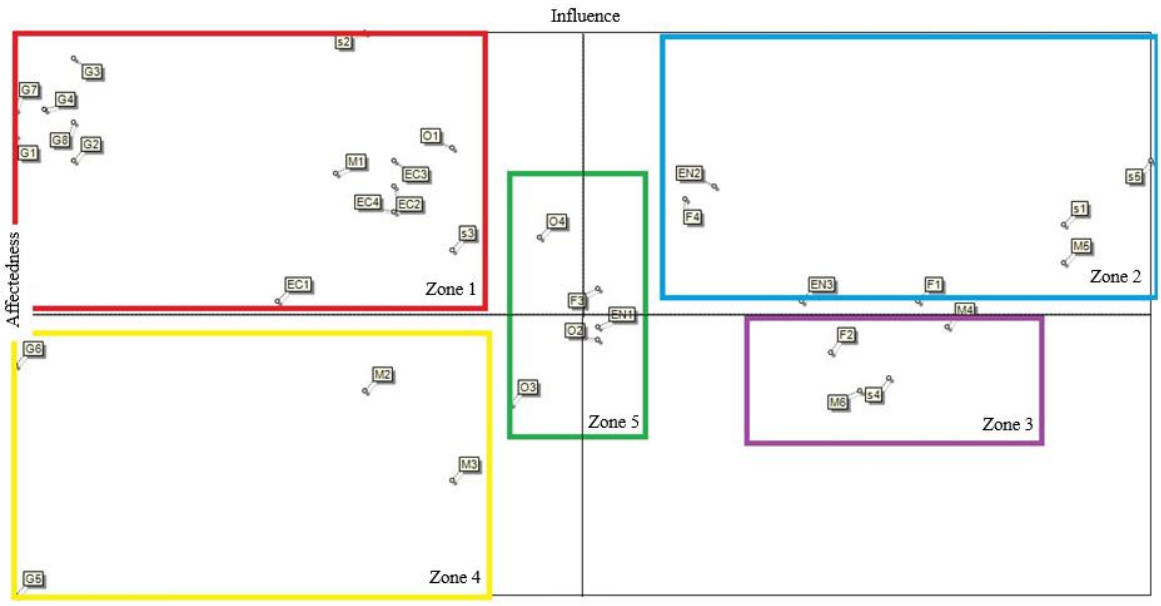

Fig. 3. Position of factors affecting the planning of human-oriented New Towns in the influence-affectedness diagram

Table 7. Direct and indirect effect of factors

Factor		Component	Direct influence		Indirect influence	
			Influence rate	Affectedness rate	Influence rate	Affectedness rate
Sociocultural		S1 Meeting socio-cultural needs	70	87	21400000	26000000
		S2 Citizenship rights	85	63	25800000	19300000
		S3 Social capital	68	66	21000000	20200000
		S4 Historical, cultural and educational events	58	81	17800000	24600000
		S5 Social life	75	90	22800000	27000000
Environmental		En1 Environmental quality and health	62	71	19200000	21000000
		En2 Natural environment quality	73	75	22300000	22300000
		En3 Urban Biological Quality	64	78	19500000	23400000
Governance		G1 Transparency	77	51	23300000	16300000
		G2 Accountability	75	53	22900000	16800000
		G3 Law	83	53	25200000	16800000
		G4 Participation	79	52	24000000	16500000
		G5 Justice	41	51	12900000	16300000
		G6 Responsibility	59	51	17800000	16300000
		G7 Consensus	79	51	23900000	16300000
		G8 Quality of performance and managerial effectiveness	78	53	23500000	16700000
Economic		Ec1 Performance	64	60	19200000	18200000
		Ec2 Economic Welfare	73	64	22200000	19500000
		Ec3 Sustainable active economy	75	64	22600000	19500000
		Ec4 Meeting economic needs	71	64	21200000	19500000
Physical -Spatial	Objective	O1 Quality of form	76	66	23000000	20100000
		O2 Quality of public spaces	61	71	18700000	21400000
		O3 Quality of housing	56	68	17300000	20500000
		O4 Accessibility	69	69	21000000	20900000
	Mental	M1 Spirituality	74	62	22400000	19000000
		M2 Identity and Authenticity	57	63	17400000	19200000
		M3 Sense of place	50	66	15300000	20200000
		M4 Vitality	62	83	19000000	25200000
		M5 Comfort and convenience	67	87	20500000	26200000
		M6 Cognition	57	80	17700000	24200000
	Functional	F1 Uses and activities	64	82	19700000	24500000
		F2 Quantity of facilities and services	60	79	18400000	23600000
		F3 Process	65	71	19700000	21200000
		F4 Civil Engineering and Infrastructure	72	74	21900000	22200000

Table 8. Classification of the influence and affectedness of factors

Classification	Factor	Quantity
Influential factors (Zone 1)	S2	14
	S3	
	G1	
	G2	
	G3	
	G4	
	G7	
	G8	
	Ec1	
	Ec2	
	Ec3	
	Ec4	
	O1	
	M1	
Bilateral factors (Zone 2)	S1	7
	S5	
	En2	
	En3	
	M5	
	F1	
	F4	
Affected factors (Zone 3)	S4	4
	M4	
	M6	
	F2	
Independent factors (Zone 4)	G5	4
	G6	
	M2	
	M3	
Floating factors (Zone 5)	En1	5
	O2	
	O3	
	O4	
	F3	

and social dimensions including citizenship rights, social life, transparency, accountability, law, citizen participation, consensus, the quality of performance and managerial effectiveness, and the quality of form have been considered to be the most influential factors. According to these key factors, it can be said that citizens are considered the basis of governance and decisions are made fundamentally according to their needs and opinions. Thus, the emphasis in establishing New Towns with a human approach has been on paying more attention to the factors mentioned in this study. Therefore human-centricity in planning has been considered to be the basis for providing a healthy, prosperous, peaceful and recognisable geographical space. This type of planning involves human impact on geographical space from a local to national scale. Therefore, human-centric planning is an ideal method and

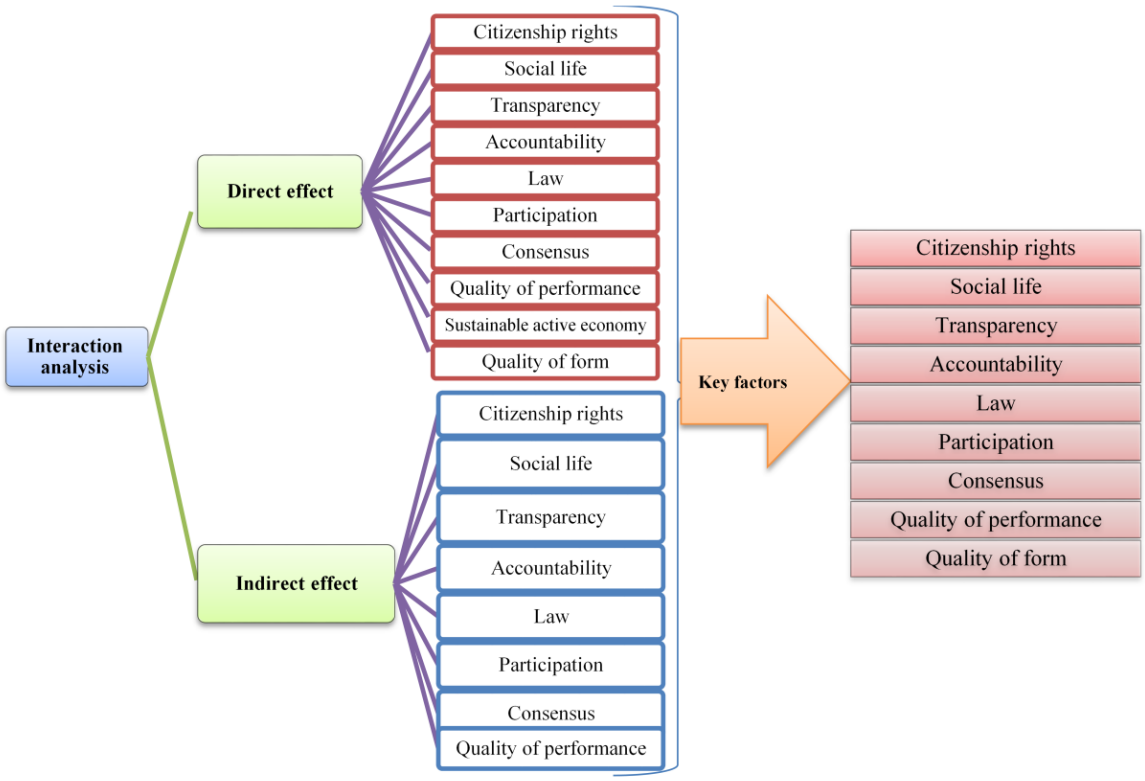

Fig. 4. . Influential (key) factors in human-centric New Urbanism

a fundamental requirement for New Towns. This is an approach to keep towns away from current crises, including lack of identity, poverty, inequality, injustice, etc., in order to create a decent life for human beings. In fact, the basis of this type of planning is to build a suitable and desirable New Town with the main characteristics of security, tranquillity, human-centric development, welfare, justice and happiness, freedom to choose one's lifestyle, perfection and kindness.

6. Conclusion

Overall, the human-centric New Town is a platform for respecting human rights. It is believed that human-oriented New Urbanistic principles are currently not well worked and implemented in many countries. Therefore, it is required to include all the analysed factors of the humanistic view in strategic plans to approach global standards. What is currently implemented in developing countries has been particularly the physical aspects of the humanistic approach whereas the other factors have actually been considered less. Therefore, human-orientation is necessary in a New Town to establish a desirable and appropriate space for all the citizens. In this study, by examining most of the effective factors with direct and indirect effect on planning a human-centric New Town, using the interaction method, key factors have been extracted. The results of the interaction analysis of the 34 factors of the five studied main domains are as follows:

- Determinants and influential variables: the first area indicates the influential factors that have the most impact and the least affectedness. Citizenship rights, social capital, transparency, accountability, law, participation, consensus, quality of performance and managerial effectiveness, efficiency, economic welfare, sustainable active economy, meeting economic needs, quality of texture and spirituality have been found to be in this area.
- Two-sided variables: the second area shows the two-sided factors. These variables have two common characteristics of high impact and high affectedness. Any action on the variable in

this area will change other variables too. There are seven variables in this area: meeting socio-cultural needs, social life, quality of urban life, comfort and convenience, uses and activities, civil engineering and infrastructure, and natural environment quality.

- Affected variables or system results: the third area indicates the output variables or the result. In this area, factors that have a low impact and high affectedness can be seen. Four variables are found in this area: historical, cultural and educational events, vitality, quantity of facilities and services, and cognition.
- System independent variables: the fourth area shows the variables that can be ignored due to low impact and affectedness. Therefore, these variables can be called independent variables. There are four variables of justice, responsibility, identity and originality, and sense of place in this area.
- Floating variables: the fifth zone includes variables located in the centre of four zones, and the system doesn't make a definite decision about them due to the strong potential of these variable in joining to the other zones in the future. Five variables are found in this area: quality of environment and health, quality of public spaces, quality of housing, quality of access, and process.

Notes

(1) The major New Town movement took place in 1946 after World War II in eastern Europe and specifically Britain (Hall & Ward, 1998), while it occurred during the 1950s in the USA. However, in the former USSR, more than 800 New Towns were founded after the 1917 Revolution, but their growth was not constrained by specific limits (Osborn & Whittick, 1963).

(2) The term "urban sprawl" appeared in the 1950s, whereas the actual phenomenon of urban sprawl has emerged in different periods of time in different countries. According to the National Resources Inventory (NRI), about 180,000 km^2 of land in the United States was developed between 1982 and 2017, while there was an expansion of sprawl between 1970 and 1990 in Amsterdam, the Netherlands; Brussels, Belgium; Copenhagen, Denmark; Frankfurt, Hamburg and Munich, Germany; and Zurich, Switzerland, albeit without the dismantling of infrastructure that occurred in the United States (USDA, 2017).

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