

## ORIGINAL PAPER

# Biophilic planning new approach in sustainability (Proposing conceptual model of livable city)

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**ABSTRACT:** Urban environment is deteriorating even more rapidly unless people adopt eco-friendly policies. Livable city has long been a concept but it has not yet been universally applied in practice. One of the problems of our cities is away from nature. Biophilia is a term that stems from Greek roots meaning 'love of life'. The concept of Biophilic planning can be associated some of the design strategies included in this pattern are potted plants, flowerbeds, courtyard gardens, green walls and green roofs. Biophilic planning is new approach focuses on healthy community and healthy individual outcomes. It seems Biophilic design and planning led to achieving livable cities.

The purpose of research is to explore components livability and Biophilic planning. The relationship between dependent and independent variables was also analyzed.

So, the research method is "descriptive-analytical". On the other hand, qualitative research methods have been used. So, the Livability and Biophilic components have been concluded based on professional theories and interview. At finally, concept model of livability based on Biophilic planning has been proposed.

**Keywords:** Biophilic planning, Livability, Sustainability .

## INTRODUCTION

To transition from the sanitary city of the twentieth century to the sustainable city of the twenty-first, new knowledge needs to be developed and applied to understanding the role of nature in cities (Vitousek, *et al.*, 1997).

Because of the size and impact of cities, there has been increasing attention to the potential for cities to remediate some of their own environmental impacts and reduce far-flung resource imports, using ecosystem services such as tree canopy cover, and developing heretofore underutilized or undeveloped autochthonous resources such as water (Beatley, 2010); (Platt, 1994), (McPherson, *et al.*, 2005), (Pataki, *et al.*, 2011); (Pincetl, *et al.*,

Interest in the remediative role of nature in the city has had a slow and steady history since the rise of the industrial city, including some of the early designs of Fredrick Law Olmsted using water features in urban parks to remediate water pollution, and his advocacy of parks as "lungs" to counter pollution. Ebenezer Howard's Garden Cities, LeCorbusier's "Contemporary City," and Frank Lloyd Wright's Broad Acre City plan reflected ideas of the importance of urban nature as well and urban designers and ecologists such as Ian (McHarg, 1971)(Design With Nature, 1971) and (Spirm, 1984), planners such as Rutherford (Platt, 1994), and open space advocates like Charles (Little, 1992), took up the refrain in the second half of the 20th century. These latter thinkers advocated that nature should be considered

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both in designing new urban development (watersheds and their functions, for example), and in the disposition of buildings in cities to enhance natural elements such as cooling winds in hot summers, or increasing the availability of sunlight in the winter. In the 2000s there was an explosion of interest in the distribution of parks and open space relative to the equitable provision of ecosystem services (Boone, et al., 2009) (Heynen, et al., 2006) (Wolch, et al., 2005) (Pincetl, 2010).

A Biophilic city is a green city, a city with abundant nature and natural systems that are visible and accessible to urbanites. It is certainly about physical conditions and urban design—parks, green features, urban wildlife, walkable environments—but it is also about the spirit of a place, its emotional commitment and concern about nature and other forms of life, its interest in and curiosity about nature, which can be expressed in the budget priorities of a local government as well as in the lifestyles and life patterns of its citizens. On the other hand, A Biophilic city is at its heart a Biodiversity city, a city full of nature, a place where in the normal course of work and play and life residents feel, see, and experience rich nature—plants, trees, animals (Timothy and Beatley, 2011).

## RESEARCH METHODOLOGY

### materials and methods

In this paper qualitative research methods have been used. So content analysis was used due to exploring BIOPHILIC and livability components. Also, the relationships between components were analyzed. In this section, finally concept model of “livable city” based on “BIOPHILIC planning” approach has been proposed. The research method process is:

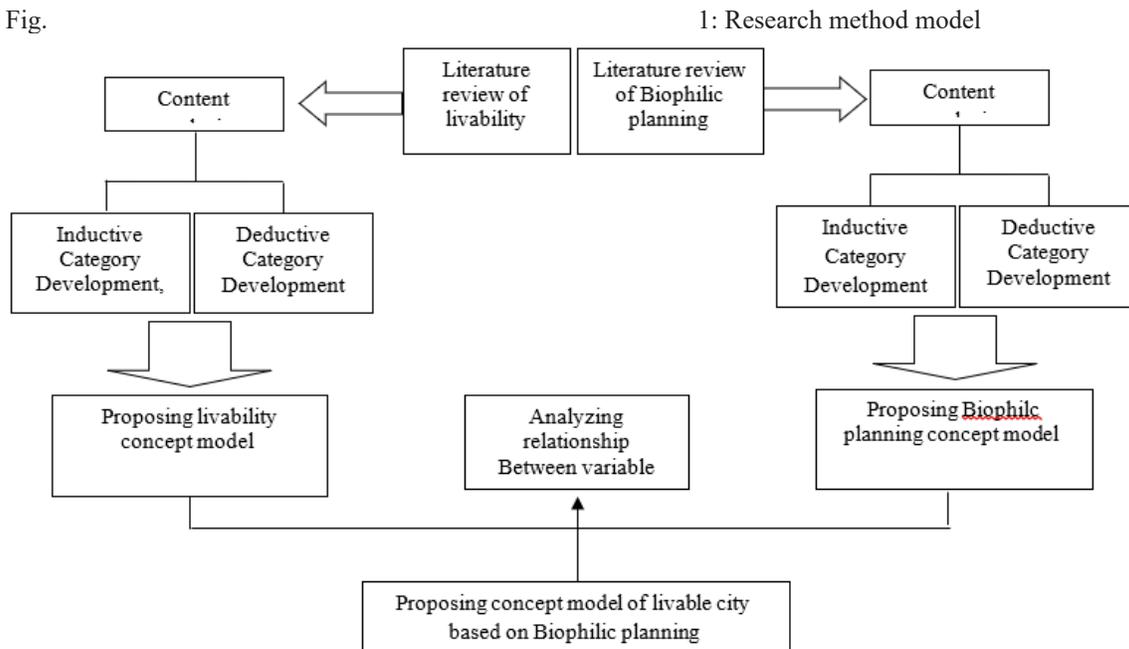
- 1- Review livable and Biophilic literature
- 2- Using qualitative research methods (content analysis, Selective coding)
- 3- Proposing concept models
- 4- Presenting concept model of livable city based on Biophilic planning approach. Figure 1 shows the research method diagram.

## LITERATURE REVIEW

### Biophilia concept

Biophilia is a term that stems from Greek roots meaning ‘love of life’. It was coined by the social psychologist Erich Fromm and popularized in the 1980s as Edward O. Wilson pioneered a new school of thought focused on this concept, which he defined as “the urge to affiliate with other forms of life”. Wilson’s Biophilia Hypothesis asserts that people need

Fig.



to contact with nature and with the complex geometry of natural forms, just as much as they require nutrients and air for metabolism (Kellert, 2005) In William Rees, 1995, coauthor of Our Ecological Footprint: Reducing Human Impact on the Earth (1996), (Boone and Modarres, 2007)(and others subsequently) suggested that it is in cities that the greatest opportunities to make the changes necessary for general sustainability can be found. Planners such as (Campbell, 1996)included environmental thinking as part of sustainable thinking for cities, including bioregionalism as a guiding principle (1996) as did (Beatley, et al., 1997)among others.

That we need daily contact with nature to be healthy, productive individuals, and indeed have coevolved with nature, is a critical insight of Harvard myrmecologist and conservationist E. O. Wilson. Wilson popularized the term “Biophilia” two decades ago to describe the extent to which humans are hardwired to need connection with nature and other forms of life. More specifically, Wilson describes it this way: “Biophilia . . . is the innately emotional affiliation of human beings to other living organisms. Innate means hereditary and hence part of ultimate human nature.” (Paul Gruchow, 1995) .To Wilson, Biophilia is really a “complex of learning rules” developed over thousands of years of evolution and human–environment interaction: “For more than 99 percent of human history people have lived in hunter–gatherer bands totally and intimately involved with other organisms. During this period of deep history, and still further back they depended on an exact learned knowledge of crucial aspects of natural history. . . . In short, the brain evolved in a bio-centric world, not a machine-regulated world. It would be therefore quite extraordinary to find that all learning rules related to that world have been erased in a few thousand years, even in the tiny minority of peoples who have existed for more than one or two generations in wholly urban environments.(Wilson, 1993) .

The successful application of Biophilic design necessitates consistently adhering to certain basic principles. These principles represent fundamental conditions for the effective practice of Biophilic design. They include:

- 1- Biophilic design requires repeated and sustained engagement with nature.
- 2- **Biophilic design focuses on human adaptations to the natural world that over evolution-**

**ary time have advanced people’s health, fitness and wellbeing.**

- 3- Biophilic design encourages an emotional attachment to particular settings and places.
- 4- **Biophilic design promotes positive interactions between people and nature that encourage an expanded sense of relationship and responsibility for the human and natural communities.**
- 5- Biophilic design encourages mutual reinforcing, interconnected, and integrated architectural solutions (Kellert, 2012).

Biophilic design further seeks to sustain the productivity, functioning and resilience of natural systems over time. Alterations of natural systems inevitably occur as a result of major building construction and development. Moreover, all biological organisms transform the natural environment in the process of inhabiting it. Based on studied related theories, Fig. 2 shows Biophilic planning features. On the other hand Fig. 3, propose concept model of Biophilic planning in new town in Iran.

#### *Livable literature*

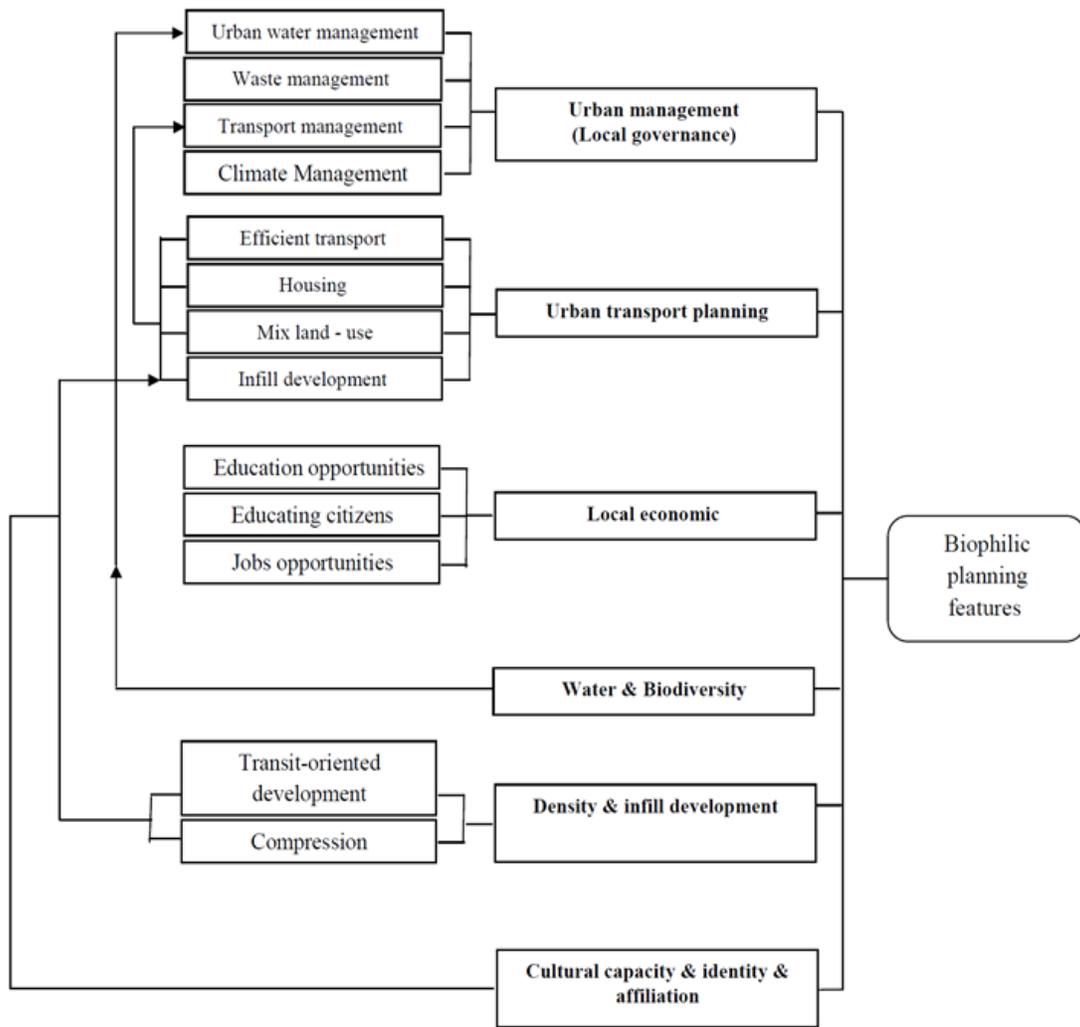
Oxford Dictionary (Oxford Advance Learner Dictionary. (10th ed.), 2010) refers to livability as being “fit for life” It can be said that the first concept of livability as —livable streets was introduced by Donald Appleyard in 1981 (Appleyard, 1981). But Appleyard and Jacobs defined livability as a city where each individual can live their relatively easily and it is the necessary goal of a proper urban environment (Jacobs, and Appleyard, 1987)

Livable City refers to urban system that helps the psychological, social, physical and personal well-being of all residents (Cities PLUS , 2003)and all the inhabitants have the same opportunity to participate in and benefit from economic and political life of the city [33]. Livability means that we experience ourselves as a citizen in the city (Castellati, 1997)

Livable city is a city where you can have a healthy life. It is an attractive, valuable, safe city for children and seniors (Hahlweg,1997) . These cities pay attention to creating architecture, street views and public spaces which facilitates the presence of city habitants in public area and in form of city. These cities are committed to reduce traffic and solve the safety problems of pollution, noise and using a collection of mechanisms (Crowhurst, et al., 1987)

In 1997, Henry Lenard in the article “principles for livable city” defined some factors for the bases of

Fig. 2: Biophilic features



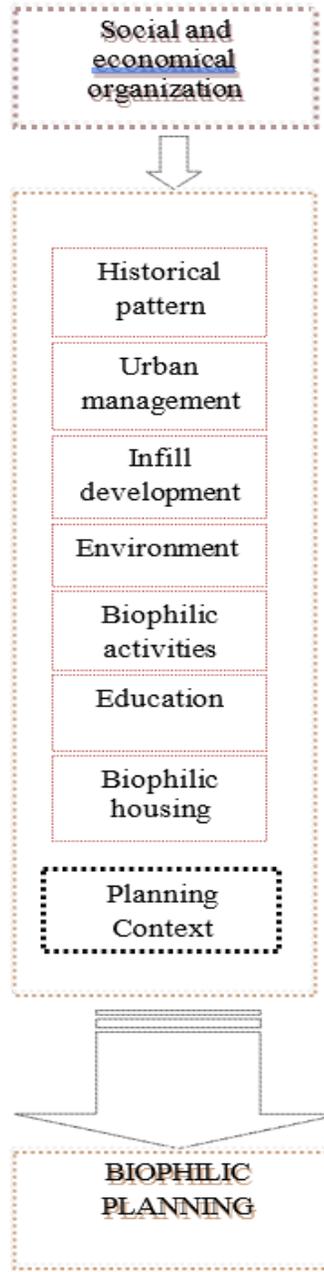
Source: researchers

the city(Lennard, 1997):

In 1997, Lennard defined livable city as a living organism. However, the metaphor of the city as an organism can act as a powerful conceptual framework. This framework allows different components to be tested and at the same time focus on the interdependence of components, and the natural environment (Timmer, et al., 2005). Mercer Institute (2014) stated index of living quality as political and social environment, cultural and social environment, economic environment, fun, products, habitats, clinical consideration, schools and teaching, public services and transportation (Mercer, 2014) Economist institute (Economic Intelligence Unit, 2013) defined variable of life quality as income,

health, political and security stability, family life, social life, climate and geography, job security, political freedom and sexual equality (Economic Intelligence Unit, 2013), Since 2008, the economist journal published its report about livability index in big cities of the world. The aim of these series of reports which are analyzed by the experts and city services is to obtain the statistics of livability quality or capability of life based on standards of great cities. In this section were studied different theories of livable components.

Fig. 3: Biophilic planning concept



Source: researcher

Key elements of a healthy and livable city are municipal infrastructure, excellent and continuous and without gaps public transport, good urban governance, excellent public service, fair limits for pollutants in the environment. Common framework defined livability is founded by a partnership between Sustainable Communities and was formed in 2009. The partnership between the Department of Transportation, the Environmental Protection Agency and United States Department

of Housing, determined the six principles of livability: Provide more transportation choices, promote equitable, affordable housing, and increase economic competitiveness, support communities, coordination of investment policies and value of pyramids to communities and districts (Sanford, 2013) . Fig 1 has been considered various theorize about livability.

Finally after studying various ideas about livability, concept model of livable city has been proposed. Finally livable city concept model was proposed.

## DISCUSSION

### *Introducing variables*

According to concept models dependent and independent variables has been explored. Livability is includes 6components which are in natural context. They are Resilience, vitality, affiliation, identity, accessibility, participation. According to different proposed theories, researchers believe 6 components in natural context leads to livable city. On the other hand, the components of Biophilic planning have been analyzed. So they are 7 components. They are Biophilic activities, environment, historical pattern, infill development, urban management, Biophilic housing, education. Thus, researchers believe mentioned components in planning context lead to Biophilic planning. Fig. 7 shows the relationships between dependent and independent variables.

### *Analyzing relation between variables*

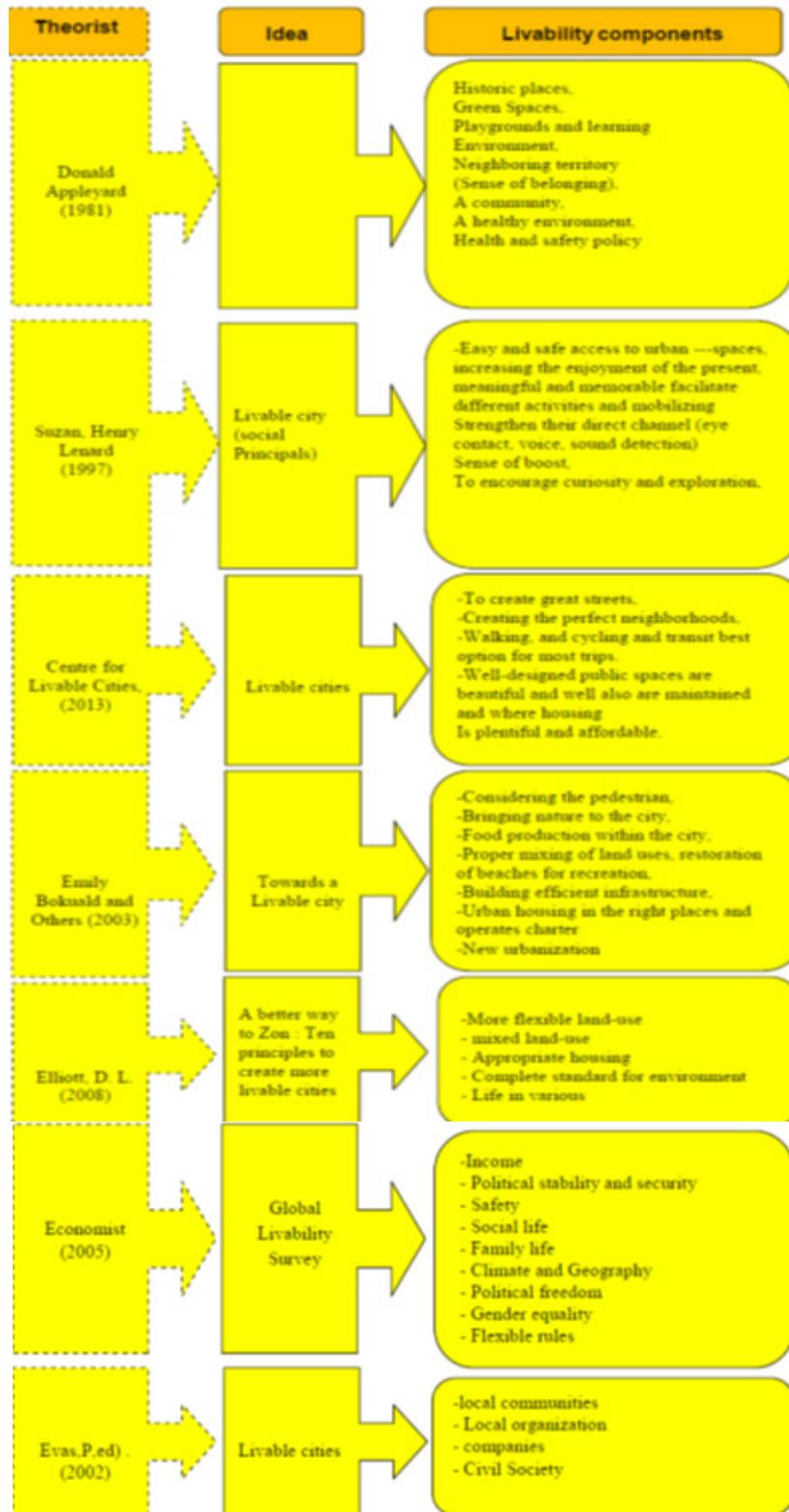
In section, in separated diagram relations between dependent and independent variables has been analyzed. So, key words in order to presenting concept model have been concluded.

After analyzing relations between indicators, final concept model are proposed. Also, mentioned concept model based on concluded key words from their relations.

## CONCLUSION

Biophilic planning appears to have potential as a way of providing an indication of the sustainability impacts of urban environment. In particular, it is innovative as it provides a way to connect with nature. Also, benefits from Biophilic cities, there are many ways in which access to nature will make individuals, families and communities healthier and happier and will help to forge new social connec-

Fig 4: different ideas about livability



Source: researchers

tions and friendships, that should make such cities more resilient. Healthier, more socially-connected individuals, families and communities will increase the likelihood of successful adaptation to this dynamic future.

According to qualitative methods concept model of livable city has been proposed. Based on figure 13 there are factors as joint between two systems (physical and spatial). They are Transportation, Density, Compression, Mixed land use, Measures management, Green architecture, Historical background, Values, Vacant lands. Researcher believed there is possible livable city by using Biophilic ap-

proach. On other hand, Biophilic design and planning is new approach in sustainability literature. So it seems it is possible sustainable city according to Biophilic approach.

Fig 6: Livable city concept model

Fig 5: concluded livable components

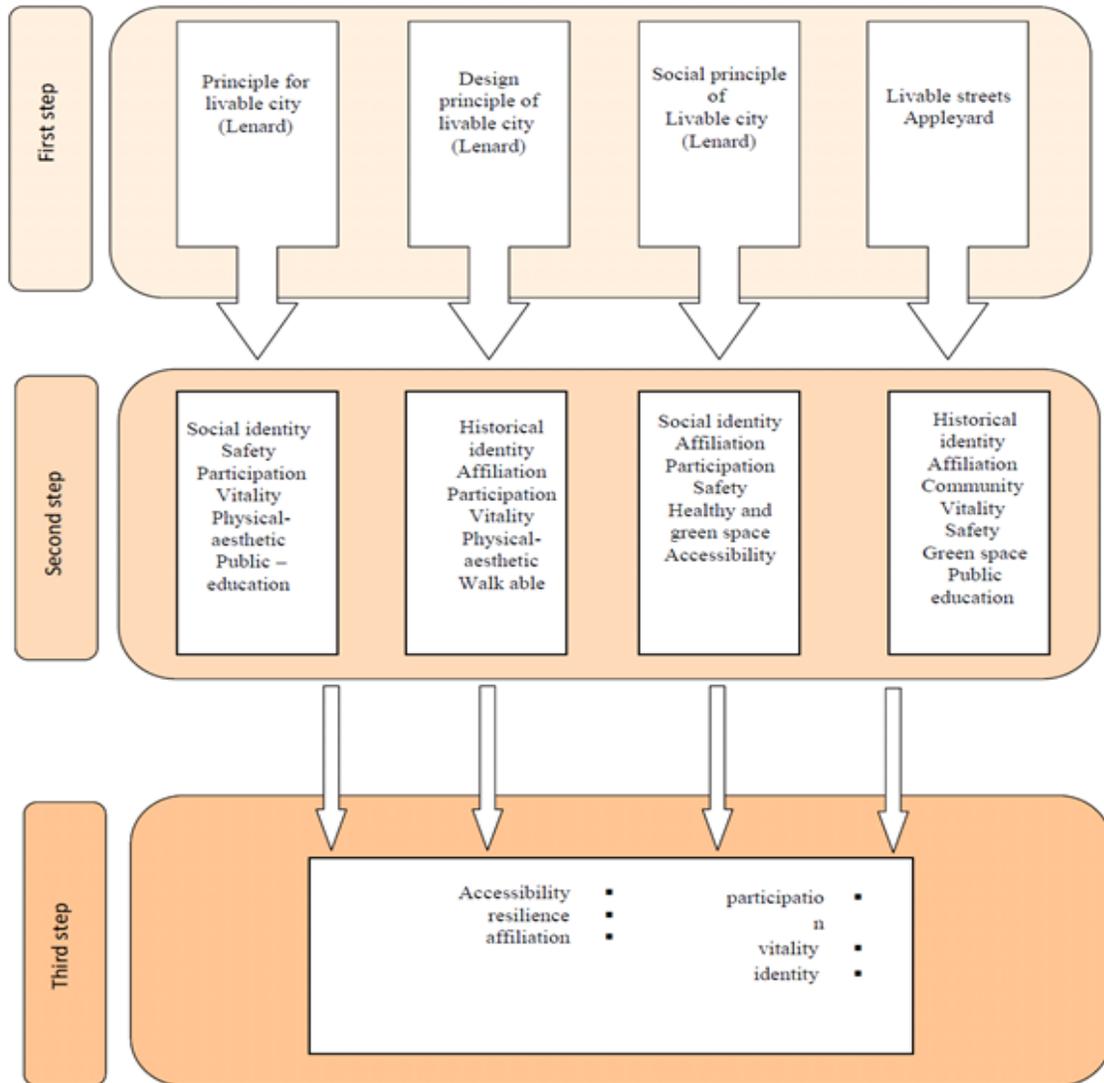
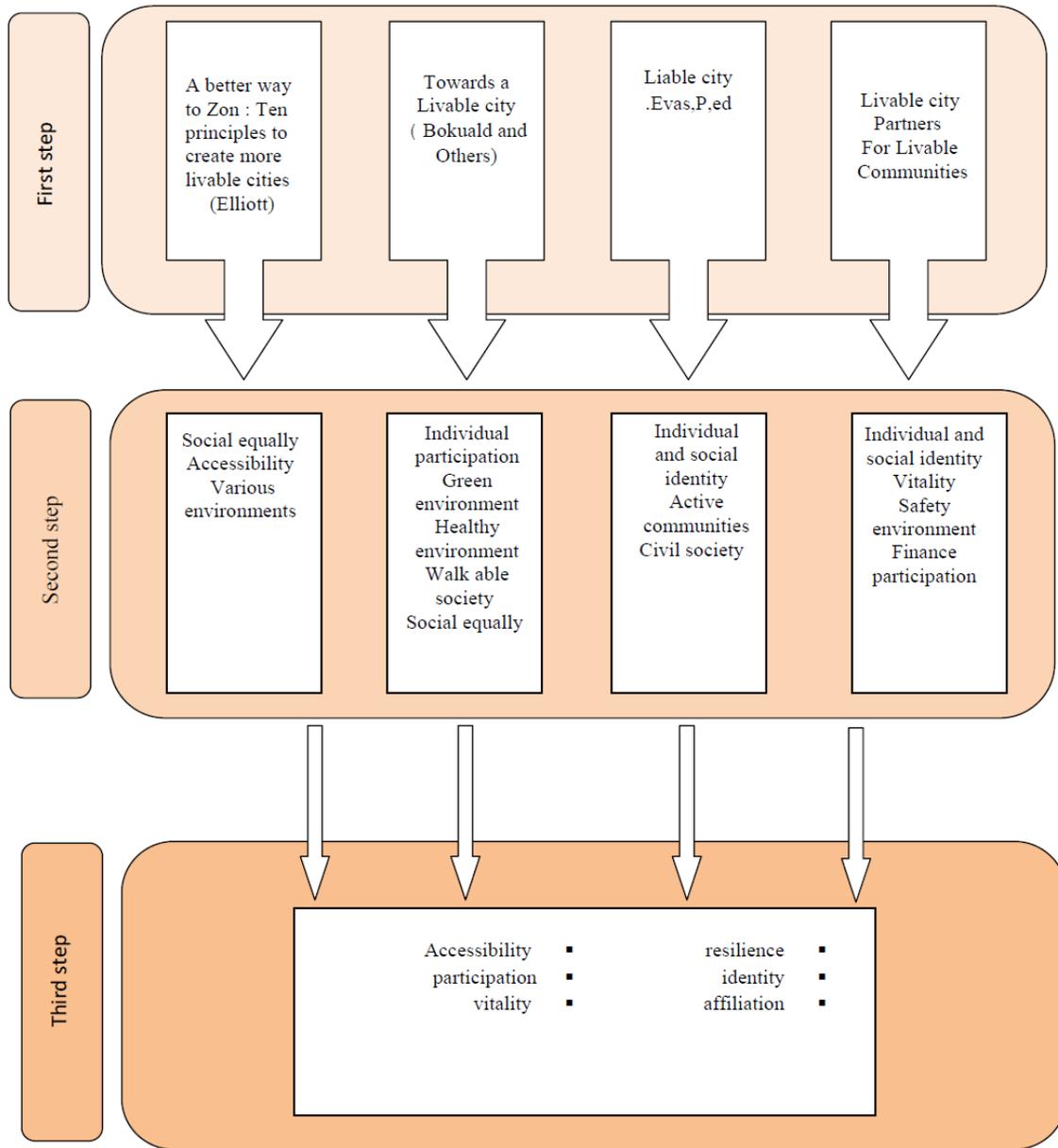
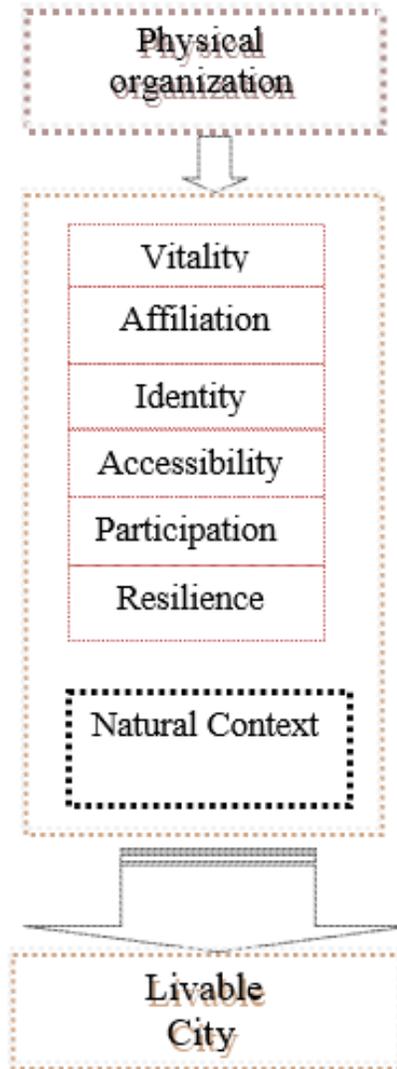


Fig 5: concluded livable (continue from Fig. 6)



Source: researchers



Source: researchers

Fig 7: relationships between variables

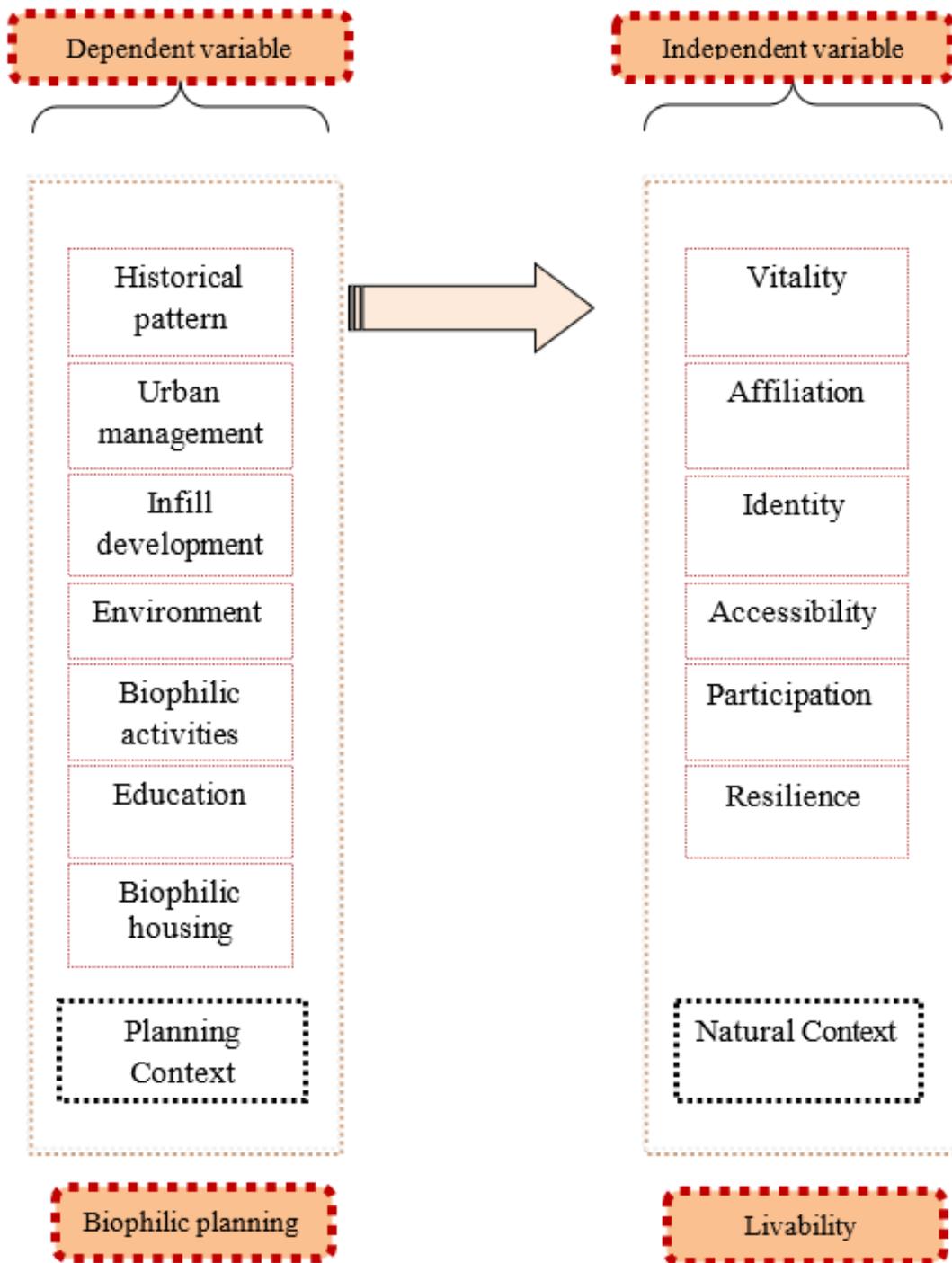




Fig 12: the relations between indicators (resilience and Biophilic components)

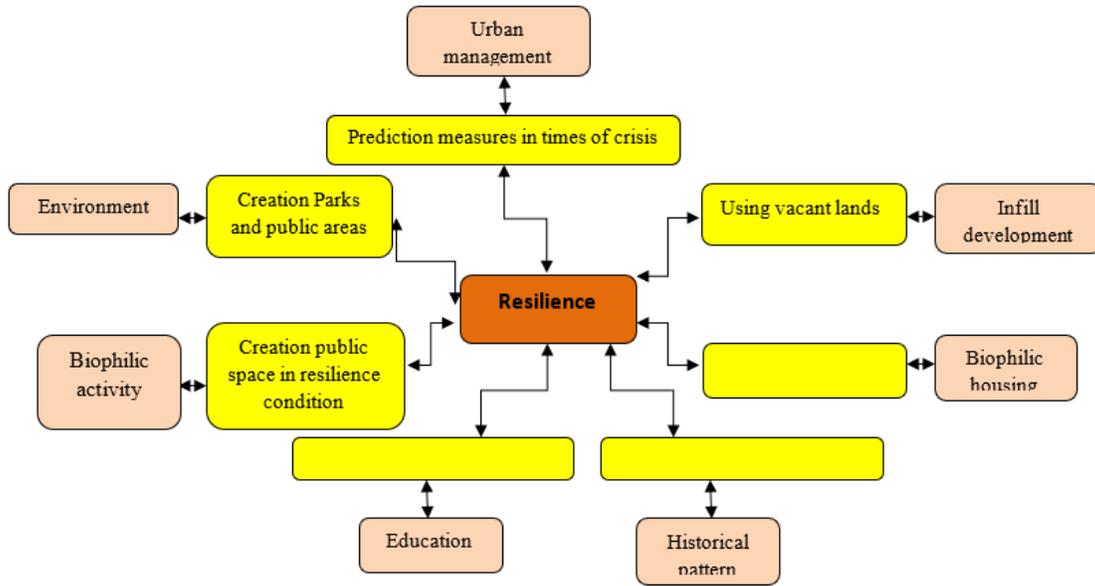
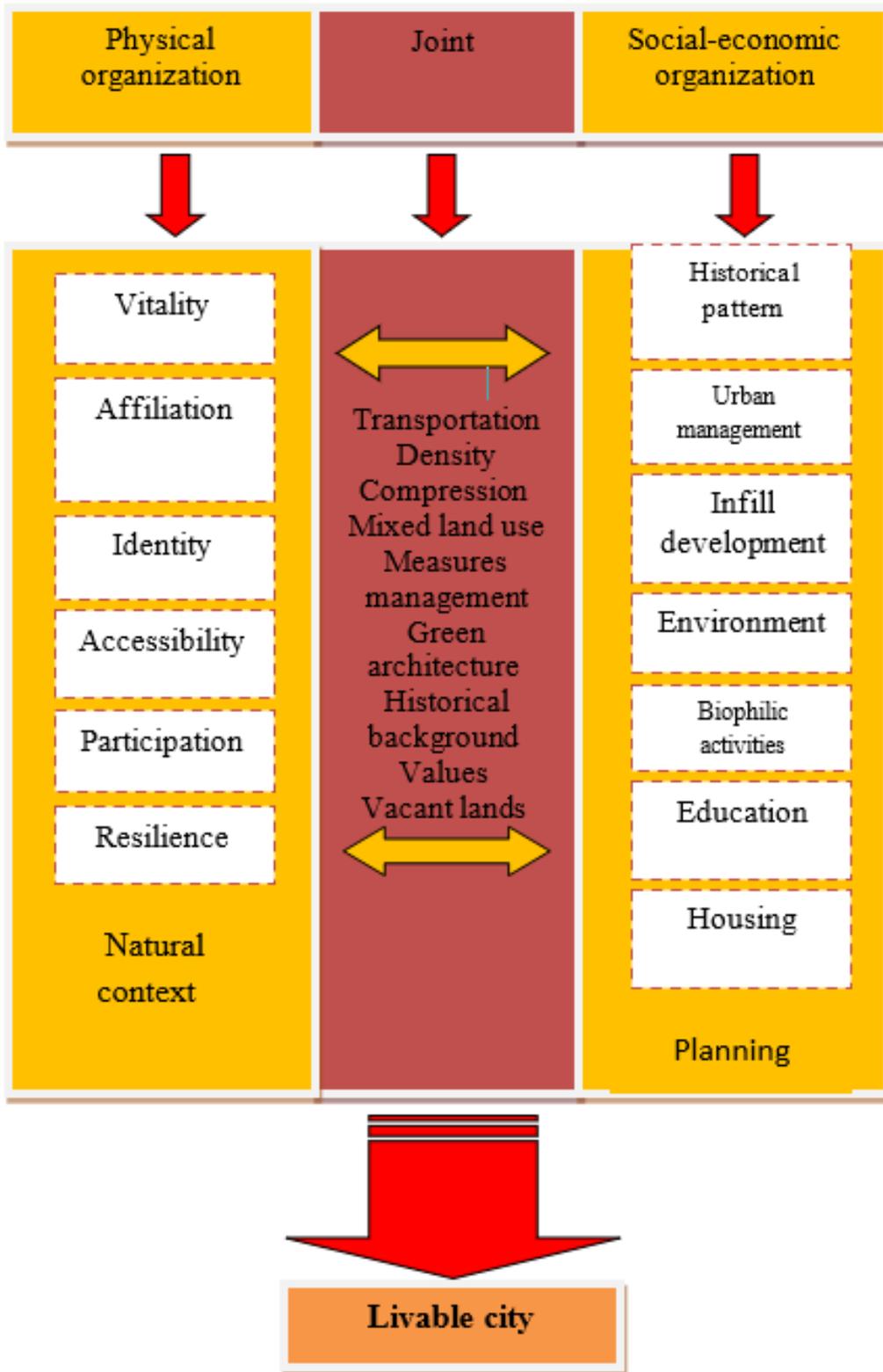


Fig. 13: concept model of livable city based on Biophilic approach



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