Colonization of urban futures in the Global South: lessons from the case of Isfahan 2040

Ali Zackery, Mohsen Taheri Demneh and Maryam Ebadi Nejad

Abstract

Purpose – *Due to the limitations of conventional urban planning, it is essential to develop novel techniques of urban futruing. This paper aimed to use the scenario technique to create four plausible narratives of the future of Isfahan. Also, the authors described the problems of city foresight in the Global South.*

Design/methodology/approach – *This paper chronicles the Schwartzian steps taken to build explorative scenarios of Isfahan City in Iran in 2040. After using a STEEPV (Social, Technological, Environmental, Economic, Political, Value) analysis, the authors prioritized the collected variables by combining influence diagrams, the iceberg metaphor and an expert-based survey. Once the key uncertainties were derived, four scenarios were developed and discussed.*

Findings – *Through thematic analysis of the official visions of Isfahan's future and the juxtaposition of these narratives with insight yielded in the scenario-development process, the paper concludes that the Northernness of the prevailing urban imaginaries, uncritical mimetic benchmarking, depoliticization of urban futures and the decorative reductionistic visions colonize urban futures in Isfahan/Iran. Critical/deconstructive city foresight and application of discomfort/ignorance criteria in the generation of scenarios can improve the rigor and quality of city foresight in the Global South.*

Originality/value – *The application of city foresight in the Global South has been limited. The paper is a step toward bridging this gap and providing some recommendations on how city foresight in the Global South might differ from its counterparts in the Global North.*

Keywords *City foresight, The Global South, Scenario development, Future colonization, Scenario-development*

Paper type *Research paper*

Ali Zackery and Mohsen Taheri Demneh are both based at the Department of Industrial Engineering and Futures Studies, University of Isfahan, Isfahan, Iran. Maryam Ebadi Nejad is Graduate student at the Department of Industrial Engineering and Futures studies, Faculty of Engineering, University of Isfahan, Isfahan, Iran.

Introduction

Through combining the forces of agglomeration and industrialization, cities have grown to be the most dominant form of civilization in today's world (Dixon and Tewdwr-Jones, 2021). According to the United Nations' estimates, by 2050, 66% of the world's population will live in "urban settlements" (UN, Department of Economic and Social Affairs, Population Division, 2015) which will lead to economic, social and environmental challenges such as air pollution, environmental contamination, population congestion, resource limitation, socio-economic disparity, traffic and mobility challenges, waste management and health-related issues (OECD, 2012). To illustrate, in an Anthropocene – a new human-dominated geological epoch (Lewis and Maslin, 2015) – cities have an important role in fighting against climate change as the existential risk threatening the future of humanity on this planet because they consume 75% of the total energy and generate 80% of carbon emissions (Ratti, 2016; Inayatullah, 2011); hence, cities urgently need to develop sustainable solutions to tackle the challenges ahead of them. In this regard, the United Nations (UN, Department of Economic and Social Affairs, Population Division, 2016) and the European

Received 7 January 2023
Revised 7 June 2023
Accepted 21 June 2023

Union (Commission, 2014) have determined some goals as the vision of urban futures to beat the challenges of urbanization (Ahvenniemi *et al.*, 2017).

Isfahan as a historical city in the center of Iran with UNESCO-registered World Heritage – like other cities in the Global South (Andres *et al.*, 2021) – is no stranger to these urban challenges. The main reason for which we decided to conduct this research is that due to the expanding and deepening problems of Isfahan, the political instability and turmoil in the Middle East and Iran along with the arrival of disruptive technologies and imported development paradigms, the city faces many uncertainties about its possible futures. The main problem with conventional urban planning methods is that these uncertainties are usually ignored due to methodological limitations. Due to the absence of the "centrally orchestrated" city-regionalism (Harrison, 2008) in the Greater Isfahan Metropolitan Area and Suburbs, the city of Isfahan was chosen as the unit of our analysis. Our main research questions can be summarized as follows:

RQ1. What are the most important drives of change which can affect the future of Isfahan?

RQ2. What are the plausible scenarios of Isfahan in 2040?

RQ3. How can we deconstruct conventional urban planning approaches in the Global South?

To address these questions, exploratory scenario-building was conducted to create four narratives for the future of Isfahan in 2040. First, we created an inventory of variables affecting the futures of Isfahan. In the next step, a survey was conducted to determine the key uncertainties related to the future of Isfahan. Consequently, four deductive scenarios were crafted. "In the face of urgent need for urban transformation and growing uncertainty about the future"(Goodspeed, 2020b), scenarios as future micro-worlds can create plausible narratives of the future, promote consensus, galvanize action and thus improve the effectiveness of urban planning. This study can contribute both to theoretical considerations and practical know-how of city foresight in the Global South. Furthermore, this "Global South" case study is a small step to addressing the geopolitical divide in the relevance and application of city foresight (Dixon *et al.*, 2022). The remainder of this paper is structured as follows. First, we provide a short review of the city foresight approach and some case studies around the globe. Next, detailed documentation of the applied research method is presented. The results and findings of each research step are then given. The final section draws some conclusions on how urban futures might be colonized in the Global South while techniques of futuring are used.

Foresight and urban planning

The ultimate purpose of planning is to "prepare for a future activity" and construct the future (Myers and Kitsuse, 2000). Traditional urban planning, though, is burdened with short-sightedness, neglect of the future, lack of stakeholder engagement and overreliance on the "project-then-plan" approach (Ratcliffe and Krawczyk, 2011; Myers and Kitsuse, 2000). Considering the major complexities and externalities associated with urban planning, the need to plan for longer horizons and the fragmented essence of urban governance, a critical reflection on the traditional style of urban planning is essential; one possible way to address these challenges is to deploy "city foresight" methods (Dixon *et al.*, 2022). Foresight practices can generally be applied in four ways to urban futures (Mäntysalo *et al.*, 2022; Goodspeed, 2020a, Chakraborty and McMillan, 2015):

1. projecting probable urban futures mainly through quantitative/simulation-based methods;
2. exploring alternative urban futures primarily achieved by scenario-building;
3. outlining preferable urban futures generally created by vision-crafting methods; and

4. designing actionable steps to materialize urban visions by drawing on performative techniques such as backcasting and roadmapping (Dixon *et al.*, 2014).

Against this backdrop, foresight has been incorporated into city-region planning for different purposes such as land use-transportation (Bartholomew, 2007; Lyons *et al.*, 2021; Mäntysalo *et al.*, 2022), energy transitions (Dixon *et al.*, 2014; Tatar *et al.*, 2020), urban ecosystem services (Liu and Wu, 2022), climate change (Carter, 2018), engaging the community in the interim reuse of urban derelicts (Costa *et al.*, 2021) and aging society (Gudowsky *et al.*, 2017), to mention but a few.

On the ontological level of (city) foresight, a few assumptions are taken for granted. First, the features of candidate alternative futures will not be completely dissimilar to today's realities. Second, these futures are multilayered and multifaceted realities built by the complex and non-linear interplay of political, economic, social, technological, legal and ecological factors. Third, the very act of city foresight means that we have a varying degree of control over future eventualities (Walton, 2008).

On the epistemic level of city foresight – especially for the visionary planning tradition – the focal question is "whose future are we talking about?" (Perry and Smit, 2022)? Due to the far-reaching consequences of policies derived from the city foresight practices, besides methodological rigor, the epistemic quality and normative legitimacy of such practices depend on the participation and engagement of all stakeholders (Baard, 2021; Amini *et al.*, 2021). Therefore, citizens should not be involved to merely rubber-stamp the official decisions but should be proactively engaged in the city foresight process (Bartholomew, 2007; Goodspeed and Hackel, 2017). Used as a conversational tool (Hopkins and Zapata, 2007) or a critical thinking tool (Smith, 2007) with multi-stakeholder participation, city foresight can play a role in navigating the strategic orientation of urban settlements toward collectively desirable futures (Eames *et al.*, 2013; Sokolov *et al.*, 2019). This kind of transdisciplinary approach which combines different modes of knowing can be of greater significance in city-regions where the weight of history cannot be easily overcome (Tötzer *et al.*, 2011).

On the methodological level, explorative and normative scenario planning has gained widespread popularity in urban planning (Zapata and Kaza, 2015). But what are scenarios? Based on the appraisal of 77 different definitions of scenarios, Spaniol and Rowland (2019) define scenarios as follows:

> scenarios primarily have a temporal property rooted in the future and reference external forces in that context; scenarios should also be possible and internally plausible while taking the proper form of a story or narrative description; scenarios seem to exist in sets and the scenarios that inhabit those sets are systematically prepared to co-exist as meaningfully different alternatives to one another.

Scenarios – as an interactive medium – can "help practitioners identify new challenges, creatively engage the future, and shape regional agencies" (Sherman and Chakraborty, 2022). They can act as a rhetorical guide for action (Myers and Kitsuse, 2000) provided that a good level of institutional coordination is facilitated (Van Leemput, 2010; Childs, 2020). Moreover, the inherent multiplicity of scenario-planning can accommodate critical uncertainties, counteract the value-neutrality of traditional approaches and help city planners "imagineer" city futures (Chakraborty and McMillan, 2015; Ratcliffe and Krawczyk, 2011; Van der Heijden, 1996).

As for the normative scenarios, i.e. vision-crafting, in the course of history, the concept of the "ideal city" has influenced the Western world both as a regulative model and a source of inspiration (Rosenau, 2013). By the same token, in the "urban age," recent urban imaginaries – originally developed in the Global North – aim at proposing an all-encompassing destination for the highly sought urban transformation (Khan and Zaman, 2018): resilient city (Jabareen, 2013), creative city (Landry, 2012), compact city (Burton *et al.*, 2003), zero

carbon city (Urrutia-Azcona *et al.*, 2019; Ravetz *et al.*, 2021), sharing city (Agyeman and McLaren, 2017), smart sustainable cities (Bibri, 2018), "Smart with a Heart" (Menny *et al.*, 2018), Ecocity (Wong and Yuen, 2011), smart city 2.0 (Trencher, 2019), gender-equal cities (Sandberg and Rönnblom, 2016), age-friendly cities (Buffel *et al.*, 2012), car-free cities (Inayatullah, 2011), etc. Nonetheless, recent scholarship in urban imaginaries has tried to problematize urbanism beyond the predominately gendered Western narrative and argue in favor of context-specific approaches to urban futures. (Dibazar *et al.*, 2013).

Another important issue related to visions, in general, is the social processes and practices which provide imagined futures with social performativity; in other words, how do visions become social realities (Oomen *et al.*, 2021)?

Table 1 summarizes some of the peer-reviewed articles published on the application of normative and explorative scenarios in cities around the world. To plot these case studies, the typology of scenario planning projects suggested by Chakraborty and McMillan (2015) was used. Most case studies are multimethod, visionary and feature a city from the Global North. Also, the foresight nomenclature varies in the articles from synergy foresight (Ravetz and Miles, 2016; Ravetz *et al.*, 2021), urban retrofitting (Dixon *et al.*, 2014) and sustainability visioning (Iwaniec and Wiek, 2014), to participatory foresight (Kitagawa and Vidmar, 2022; Gudowsky *et al.*, 2017), multi-layered foresight (Dufva *et al.*, 2015) and city foresight (Dixon *et al.*, 2022; Mahmud, 2011).

The table suggests that the time horizon of city foresight projects is almost always more than 10 years. As for methodology, most projects are multi-method, and scenario-planning and vision-crafting are the most frequently used methods. Case studies from the Global South are scarce; these case studies generally intend to follow or prescribe used futures of cities from the Global North. Therefore, this Global South case study is a small step to addressing the geopolitical divide in the relevance and application of city foresight (Dixon *et al.*, 2022) which tries to deploy and simultaneously deconstruct predominately western city-foresight procedures.

The research aims and objectives

The purpose of this study is to present a case study on how established methods of futures/foresight studies can be used in practice as city foresight (Dixon *et al.*, 2022). Isfahan faces many uncertainties about its futures. Among others, the antagonistic tension between universalization and the local identity of the city, alarming levels of air pollution (Jokar *et al.*, 2020), inorganic modernization schemes (Karimi and Motamed, 2003), problems related to urban spirit and heritage conservation (Assari and Assari, 2012), high rates of inflation and above all else severe drought and the disappearance of Zayanderud are among the most important forces of change. In this study, our focal question was to identify the most important drives of change which can affect the future of Isfahan by using a combination of city foresight techniques in tandem, and explore the possible futures of this city in 2040. The next section provides background and context to Isfahan as a case study.

Isfahan: background and context to the research case study

With a population of around two million, Isfahan is located 435 kilometers South of Tehran and is the third largest city in Iran; the city is famous for its Perso–Islamic architecture. Isfahan experienced golden periods once in the 11th–12th century and the second time in the 16th–17th century. During the second era under the Persian Ṣafavid dynasty, Isfahan was transformed to be one of the best and most beautiful cities in the world and earned the city the reputation of *half-of-the-world*. Isfahan has experienced several rises and falls during its history. It was in the 1920s that industrialization and the renaissance of Isfahan began. Unlike the 17th-century organic development, during the 20th century, Isfahan has been hit by the ravages of modernization (Karimi and Motamed, 2003). Isfahan city-region is called Greater Isfahan Metropolitan Area and Suburbs which covers approximately 3.5 million inhabitants

Table 1 Case studies of the application of foresight to cities around the world

Authors	*Scenario purpose/Main tool(s)*	*City/Time horizon*	*General public participation/Scope*	*A synopsis of the case study*
Ravetz *et al.* (2021)	Exploratory and normative/ Scenario development and backcasting	Greater Manchester, UK/2030–2075	No/Single issue	A synergistic scenario planning framework is designed to support and facilitate the system transformation to carbon-neutrality
Gudowsky *et al.* (2017)	Normative/ Foresight workshops and newsletters from the future	Vienna, Austria/2050	Yes/Single issue	A transdisciplinary foresight approach was used to provide a direction for the long-range planning of aging societies. The article concludes that human factors will gain importance along the technological innovation to address the challenges of aging
Ogilvy and Smith (2004)	Exploratory/ GBN[a] scenarios	Great Central Valley, California, USA/2025	Yes/Comprehensive	After presenting the case study, the article concludes that "scenario planning in the public domain demands greater clarity of client attention to different constituencies" compared to private domains
Tatar *et al.* (2020)	Exploratory and Normative/ Cities4ZERO framework	Five small and mid-sized European cities/2030+	Yes/Single issue	A framework was developed and tested at the municipal level of pilot cities to facilitate their decarbonization transition
Barbanente *et al.* (2007)	Exploratory/ Scenario development and Foresight workshop	Rabat/Casablanca, Morocco/-	No/Comprehensive	Having discussed the antagonistic relationship between globalization and regional transformation, three scenarios about the regional transformation of Rabat/Casablanca are presented
Fernández-Guell *et al.* (2016)	Exploratory and normative/ Multimethod	Spanish cities/2030	No/Comprehensive	A systemic foresight approach was developed to engage local stakeholders, enrich smart city initiatives and create a holistic city vision
Certoma (2022)	Explorative/ Scenario development	Ghent, Belgium/2035	No/Single issue	The socio-political implications of digital social innovation in urban governance are explored
Kantamaturapoj *et al.* (2022)	Exploratory and normative/ Multimethod	Bangkok, Thailand/2050	Yes/Single issue	Practice-oriented policy development and participatory futuring are integrated to facilitate sustainable urban food policy-making

(*continued*)

Table 1

Authors	*Scenario purpose/Main tool(s)*	*City/Time horizon*	*General public participation/Scope*	*A synopsis of the case study*
Dufva *et al.* (2015)	Normative/ Foresight workshops	Antofagasta, Chile/2040	No/Single issue	A multi-layered foresight approach consisting of four layers of landscape, system, organization and individual is developed and used for water management in Antofagasta in Chile
Eames *et al.* (2013)	Normative/ Scenario development and backcasting	UK city-regions/2050	No/Comprehensive	Three archetypal visions of retrofit for the UK city regions are developed and the urban transition toward them is explored across multiple socio-technical regimens, scales and domains
Wuijts *et al.* (2022)	Exploratory and normative/ Multimethod	Five European cities/ 2040	No/Single issue	One trend scenario and two normative scenarios for each city are developed to investigate how healthy blue spaces can help cities confront their emerging challenges
Dixon *et al.* (2014)	Normative/ Roadmapping	UK city-regions/2050	No/Comprehensive	After crafting urban visions for the UK city-regions, horizon scanning and performative foresight techniques were combined to depict a transition path toward the visions
Mahmud (2011)	Exploratory and normative/ Scenario development	Bulungan, Indonesia/ 2027	No/Comprehensive	Having formulated the graphic and narrative scenarios of Bulungan, a vision was developed in a foresight workshop. Scenario-planning is suggested to be a powerful integrated regional development tool
von Wirth *et al.* (2014)	Exploratory/ Formative scenario analysis	Limmattal region, Switzerland/2030	No/Comprehensive	A functional structure for science-practice collaboration and prioritization of regional system dynamic loops are used to build four scenarios
Iwaniec and Wiek (2014)	Normative/ SPARC[b] visioning	Phoenix, USA/ 2050	Yes/Comprehensive	In a multi-phase procedure, a vision of Phoenix 2050 is built. The importance of public engagement, capacity building and social learning are highlighted

Notes: [a]Global Business Network; [b]Systemic, Participatory, Action-oriented, Relevant, Coherent
Source: Created by authors

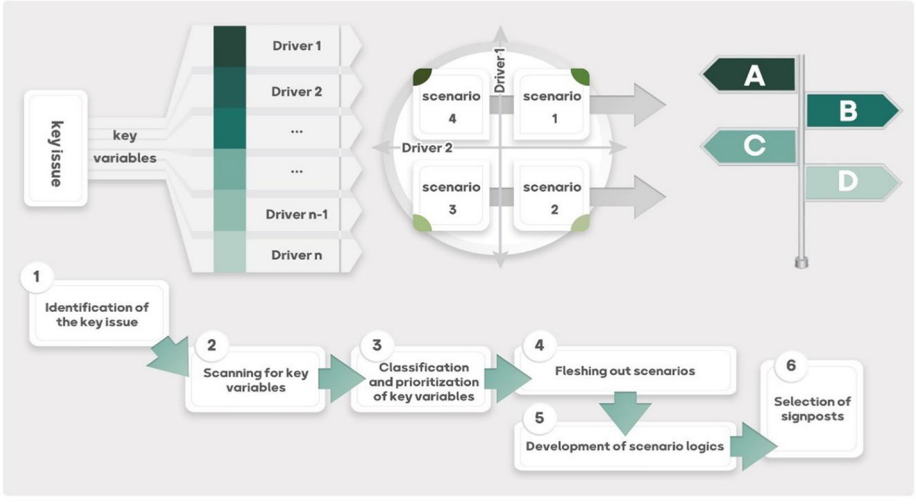
including 15 municipalities in Isfahan and 20 other cities stretched along Zayanderud. As for the governance and management of Isfahan, on the province level, Planning and Budget Organization is the territorial-administrative unit responsible for planning the development of the Isfahan Province. They have written a Spatial Planning Document/Vision with a time horizon of 2045 in a top-down approach and strong cooperation with the academia. This document is the subset of the National Spatial Planning Document/Vision. On the city-region level, there is no "hard" planning space because despite being the second largest metropolitan region in Iran, it does not have an official designation yet and each municipality has separate strategic plans in accordance with the Spatial Planning Document/Vision. For Isfahan City, two long-term plans have been written. Isfahan 2026 strategic plan was crafted by Isfahan municipality in 2020 by investigating the flaws of previous strategic plans, combining the knowledge and expertise of different municipal departments and benefiting from the consultation of various academicians and members of the City Council. The first bottom-up participatory vision of Isfahan for 2031 was also created in 2020. This vision was led by a committee including governmental and nongovernmental stakeholders. Unlike its predecessors, it was written using "civic epistemologies" by holding several rounds of citizen panels. Due to the absence of the "centrally orchestrated" city-regionalism (Harrison, 2008) in the Greater Isfahan Metropolitan Area and Suburbs, the city of Isfahan was chosen as the unit of our analysis.

Research design

This paper is an example of applied research which uses mixed methods to study the possible futures of Isfahan and inform both policymakers and academicians about the nuances of city foresight in the Global South. Peter Schwartz's approach to scenario development was modified to be used as a city foresight technique in the public sphere (Schwartz, 1991). Figure 1 illustrates the typical steps of this process.

To develop the scenarios, first, all the visions, strategic documents and archival records at the level of the municipality of Isfahan, the province of Isfahan and Iran were thematically analyzed to create a holistic picture of the official narrative of the future. In the next step, we combined environmental scanning and horizon scanning with desk research and Web

Figure 1 Steps of scenario development



Source: Created by authors

research methods to identify the key variables and emerging issues that can potentially affect the future of Isfahan. While environmental scanning is defined as the systematic search for the persistent forces of the change in the environment (Chermack, 2011), horizon scanning is described as the methodical search at the margins of the known environment for "weak signals" which can disrupt the forces of change (Loveridge, 2008). Therefore, environmental scanning and horizontal scanning are complementary and provide the building blocks of scenarios.

For the scanning, STEEPV [1] analysis was used. At the global level, firstly, a scanning was conducted for articles, reports and documents published about futures of cities. At the local level, a systematic literature review of both English documents published on Scopus, WoS and Google Scholar as well as Persian documents on Scientific Information Database was conducted. Furthermore, to widen the results of the scanning and to find weak signals of change and emerging issues related to the futures of Isfahan, the grey literature, newspaper outlets, social networks and reports by independent thank tanks – as various signal sources – were also scanned. Together, these systematic searches gave us an assessment of Isfahan's current situation as well as the initial building blocks of scenarios of Isfahan in 2040 at internal and external levels.

In any city foresight project, the collected forces of change during the explorative divergent phase cannot and should not be treated equally. Therefore, a convergent process of prioritization of forces of change based on their causal centrality, impact, predictability and importance ensued. This process systematizes a large amount of seemingly heterogeneous data, recognizes cues for causality and detects the dynamics shaping the future (Van der Heijden, 1996). This was done by combining:

- the iceberg model;
- influence diagrams; and
- a survey.

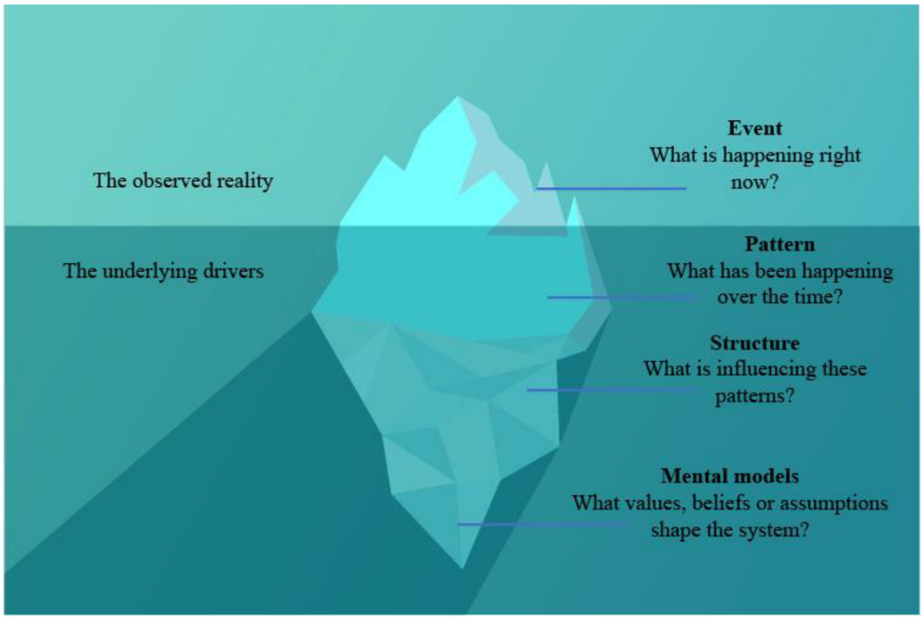
The iceberg model – Figure 2 – categorizes knowledge into the visible events "above the waterline" and underlying drivers; similarly, influence diagrams help scenario planners to explore the interdependencies among the initial list of variables/events in various clusters, reorganize sectorally differentiated factors and dig deeper to find the driving forces (Van der Heijden, 1996; Diffenbach, 1982).

Once a short list of driving forces was made, an online Likert scale survey was designed to rank them based on their uncertainty and importance. The resultant uncertainty/importance matrix detects the binary critical uncertainties which become the major dimensions of scenarios. Figure 3 shows the demographic features of the 30 experts who answered the questionnaires. The original questionnaire can be accessed here. But how were the experts chosen? As we were conducting the initial literature review, we made a list of experts who conducted research or published articles on various issues concerning Isfahan. They were later invited to participate in the follow-up survey. These experts included experts on categories of STEEPV analysis, city planners who were engaged in crafting visions of Isfahan and other stakeholders we found through snowballing and co-nomination (Andersen *et al.*, 2021).

Results and findings

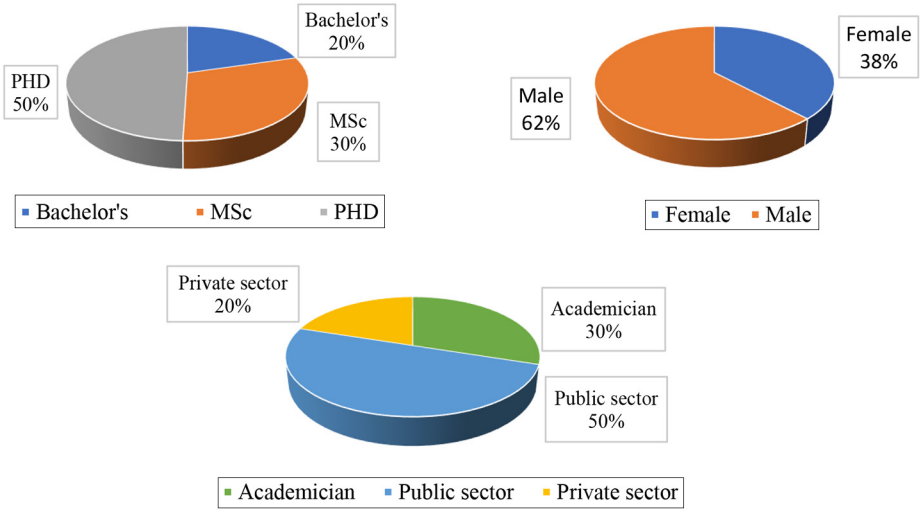
In what follows, we will give a detailed description of the Schwartzian steps taken to create alternative scenarios of Isfahan in 2040. The divergent identification phase of the scenario-generating process resulted in 646 results including mega-trends, trends, events, trend breaks and weak signals. Figure 4 shows a world collage of some of them. It was made by using the

Figure 2 Iceberg model



Source: Goodman (2002)

Figure 3 Demographic characteristics of the experts



Source: Created by authors

"wordclouds.com" website and the size of the words is indicative of their importance based on the result of the environmental scanning.

It should be noted that the titles in the word cloud only show the generic titles of the STEEPV analysis. During the scanning phase, sufficient evidence was gathered to

Figure 4 Word collage of some of the forces of change

Source: Created by authors

support this analysis. In Table 2, a fragment of the 30-page table created during the scanning process can be seen.

In the convergent assessment phase through iterative panel discussions, we combined the iceberg model and the influence diagrams to identify the driving forces *behind* the initial long list of factors. Two examples of this convergent assessment can be seen in Table 3 and Figure 5. Table 3 uses the iceberg model which hierarchically and systematically categorizes some of the findings of the STEEPV analysis about population dynamics to find the root causes. Similarly, Figure 5 is an influence diagram about the drought crisis in Isfahan trying to find causal relationships among STEEPV components, map interconnectivities among them and decipher the scope and intricacies of the drought crisis.

The convergent phase resulted in a list of 24 driving forces (Table 4). These are the forces driving future change.

In the follow-up survey, the experts were asked to rank these driving forces in terms of their degree of uncertainty and level of importance for the time horizon of this study. For each driving force, the aggregate scores of uncertainty were plotted against the aggregate scores of importance. Figure 6 shows the uncertainty/importance matrix.

The importance-uncertainty grid categorizes the driving forces into four quadrants: pivotal uncertainties, potential jokers, context shapers and significant trends (Kosow and Gaßner, 2008). According to this diagram, international relations and environmental status were chosen as the critical uncertainties around which four distinct scenarios were articulated. Figure 7 shows these scenarios, their names and colors. The names of the scenarios should encapsulate the reality of the alternative micro-world. The first scenario is named based on the Persian proverb *Isfahan half of the world* which became popular during the golden era of the city. For the second scenario, ProspeRuin is coined by combing "prosperity" and "ruin"; The Persian equivalent has a long history in Persian poetry. The third scenario is called *Shahr-e Sukhteh* (The Burnt City).

Table 2 Fragment of the STEEPV table

The STEEPV component	*Level of analysis*	*Key variable*	*Supportive evidence*
Technological/economic/social/environmental	Global	Smart city paradigm	■ Widespread application of smart city indicators in urban development (Ahvenniemi *et al.*, 2017) ■ The proliferation of smart-technology based solutions for urban management (Albino *et al.*, 2015) ■ What-if features of future smart cities (Batty *et al.*, 2012)
Social/political/economic	Local	Systemic corruption	■ Transparency International's (2021) Corruption Perception Index ranks Iran in 150th place out of 180 countries scoring only 25 points out of 100 ■ The vicious cycle of corruption and political decay in Iran (Azadi, 2020) ■ Nepotism best captured by colloquial terms of "agha-zadeh-ha" and those with "good genes" ■ The culture of fear preventing any systematic investigation of corruption in Iran

Source: Created by authors

Table 3 Iceberg model applied to the population issue in Iran

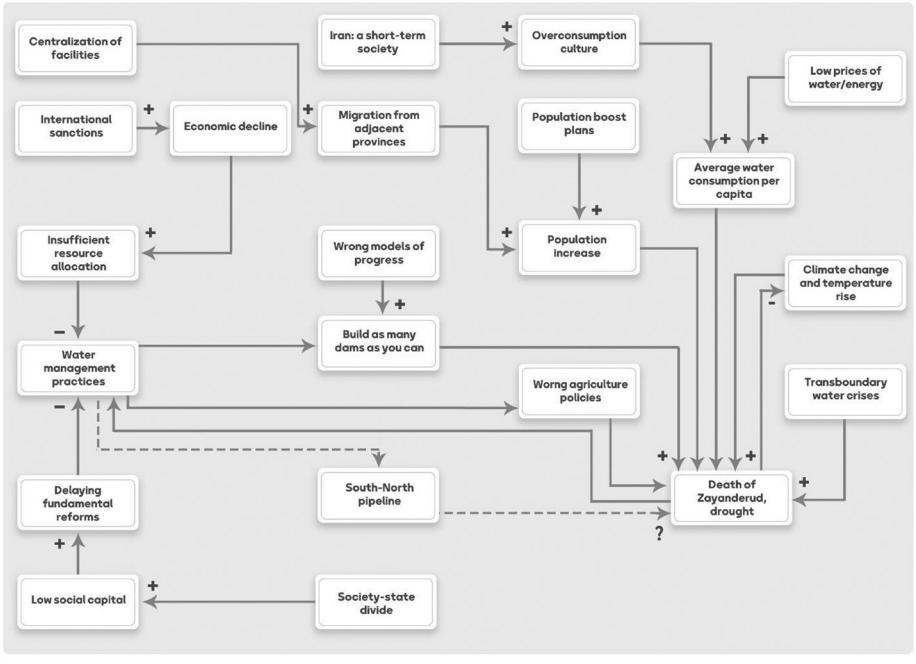
Levels	*Examples*
Events	A demographic window of opportunity, Enactment of "rejuvenation of the population and support of family" law, Prohibition of birth control programs, 150 million population vision
Patterns	The population growth rate dropped from 3.9% to 1.2% since the 1980s, the Fertility rate declined from 6.2 in 1986 to 2.1, the increasing trend of life expectancy from 51 years in 1970 to 75 years in 2015, Projected population for 2050 is 107 million, Increasing Sunni-Shia population ratio (Roudi *et al.*, 2017)
Structures	The rise of urbanization, The rise of the nuclear family, Job security and unemployment, Persistent high inflation rates, Empowerment of women and Access to family planning services, Four radical reversals in governmental policies since 1967 (Roudi *et al.*, 2017)
Mental models	The decline of the "heroine mother" image, The fear of the future and the feeling of futurelessness and The rise of individualism

Source: Created by authors

Shahr-e Sukhteh was an urban settlement of Helmand culture that was abandoned circa 2350 BCE. The fourth name, Isfahan 2.0, implies the incremental continuation of the "base case."

These scenarios are not predictions but provocative and possible futures through which various components of Isfahan can be envisioned. To further develop the scenarios, we tried to think about the comparative features of scenarios abductively. Table 5 illustrates the results of this abductive reasoning. No formal mathematical model was used for the quantitative forecast, but we tried to use the data and predictions of national and international agencies to make educated guesses. These characteristics formed the basis to develop scenarios narratives. Trying to create compelling, infectious and internally consistent stories, it took the foresight team several iterative rounds to construct the narratives of Isfahan 2040. Figure 8 presents a synopsis of these narratives.

Figure 5 Influence diagram of drought in Isfahan



Source: Created by authors

One of the emerging practices in scenario-planning is to "mediate" the scenarios and complement their narrative strength with "visualization techniques, material prototypes, gaming architectures, or facilitated experiences" (Selin, 2015). Following this logic, a professional painter was recruited by the researchers to mediate the scenarios by visualizing some of the focal features of each alternate narrative. Figure 9 is the final result of the mediated scenarios.

As the final step, signposts for each scenario were attributed in the form of newspaper headlines following the evolutionary trajectory of change toward scenarios from 2022 to 2040. A few of these signposts were incorporated into scenario narratives but we have not included them due to space limitations.

Discussion: colonization of urban futures by global and local homogenizing maelstroms

Having discussed the application of city foresight in Isfahan, we, now, want to elaborate on the lessons of this scenario exercise for city foresight in Isfahan and possibly in the Global South. One of our observations was that urban futures in Isfahan are colonized both by global and local homogenizing maelstroms. As the cherry tree metaphor – Figure 1 – illustrates (Chermack, 2011), scenario construction usually starts at the trunk of the tree where you scan for the global megatrends, trends and emerging issues and consider macro scenarios, which are predominately native to the Global North. As you move down the tree toward the branches, you move toward context-specific issues which make alternative indigenous thinking possible.

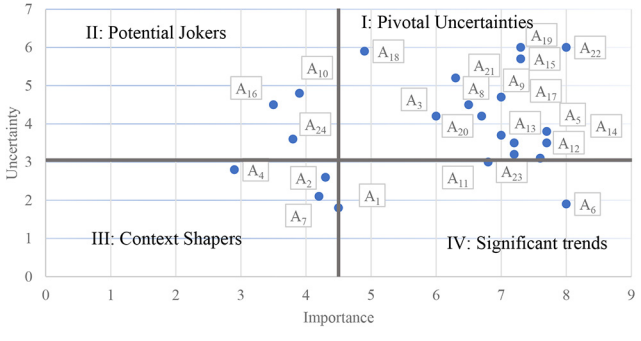
Our thematic analysis of the official vision of Isfahan indicates that this context-specificity and situatedness in time and place is the rarest of rarities in them. The visions merely

Table 4 Final list of driving forces

Driving forces	*STEEPV categorization*	*Coordinates in the importance-uncertainty matrix*
Systemic corruption	Social	A_1 (4.5,1.8)
Adoption of endogenous over exogenous modes of development	Social	A_2 (4.3,2.6)
Women's liberation movements	Social	A_3 (6,4.2)
The illusion of agency in cyberspace	Social	A_4 (2.9,2.8)
Social indifference and a sense of hopelessness	Social	A_5 (7.7,3.8)
Population aging	Social	A_6 (8,1.9)
The generation gap	Cultural/value	A_7 (4.2,2.1)
The polarization of society and propensity for violence	Cultural/value	A_8 (6.5,4.5)
State-society divide	Cultural/value	A_9 (7,4.7)
The rise of an impatient society	Cultural/value	A_{10} (3.9,4.8)
The disrupted chain of science, technology and wealth creation	Technology	A_{11} (6.8,3)
The dominance of the smart city paradigm	Technology	A_{12} (7.6,3.1)
Rising poverty; the shrinking middle class	Economic	A_{13} (7,3.7)
A transition toward a knowledge-based economy	Economic	A_{14} (7.7,3.5)
The tourism wave toward Isfahan	Economic	A_{15} (7.3,5.7)
The onset of the pandemics era	Economic	A_{16} (3.5,4.5)
Single-party politics in Iran	Political	A_{17} (6.7,4.2)
Iran grows to be the production hub of the Middle East	Political	A_{18} (4.9,5.9)
Iran's relationship with the international community	Political	A_{19} (7.3,6)
Shortage of fresh water, electricity, gas and food in Iran	Energy	A_{20} (7.2,3.5)
The renewable energy movement	Energy	A_{21} (6.3,5.2)
The loss of ecological resilience	Environment	A_{22} (8,6)
Universal compulsory environmental regulations	Environment	A_{23} (7.2,3.2)
Development of decentralized urban agriculture	Environment	A_{24} (3.8,3.6)

Source: Created by authors

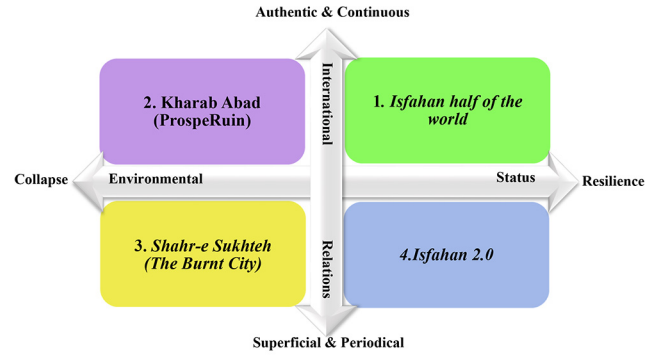
Figure 6 Importance-uncertainty matrix



Source: Created by authors

consider "the trunk" and can be described as a "catch-up roadmap," at best. Using the iceberg model, on the trunk, the virile allure of the prevailing urban imaginaries – regardless of their time and place-basedness – results in a perpetual comparison of the social and material realities of the city – the branch – with the stereotypical features or the emerging

Figure 7 Explorative scenarios of Isfahan 2040



Source: Created by authors

attributes of a couple of modern cities. Put differently, the trunk is populated by certain cities as stereotypes, archetypes and prototypes acting as homogenizing maelstroms; historically these "superlatives" have been authorized to conceptualize the urban (Robinson, 2013). The premature conclusion of these "developmental hierarchies" is a sense of "backwardness," expectations of innovation and a sense of being in urgent need of a specific version of development that every country, region and locality should promote (Dibazar *et al.*, 2013; Pike *et al.*, 2013). The core logic of the so-called visions, therefore, is to imitate "superlatives" from the Global North through Rostovian linear stages. The false consciousness of city planners results in misinterpretation of the used futures of other cities as transformative visions (Inayatullah, 2011). The Los Angelization and the blind modernization of Isfahan since 1990 are the consequence of such mimetic benchmarking. This crude imitation of the West has a long history in Iran and dates back to the initial attempts of modernization notoriously encapsulated in 1920 by an intellectual nationalist where he uncompromisingly – based on a Whig reading of the Enlightenment progress – calls for Iran "to become outwardly and inwardly, materially and spiritually European" (Ansari, 2016).

In Iran, one of the ramifications of this "catch-up" model of physical development has been the unchallenged supremacy of "(reverse) engineering logic" and the linear mindset of technical problem-solving. To illustrate, this logic can be vividly traced in the proliferation of dam construction since 1979, under the guise of development and self-sufficiency, turning Iran into the third dam constructor in the world in 2012; this official meta-narrative of development did not sufficiently contemplate the impact of dams on the local communities, local aquatic ecosystems and the broader environment (Hoominfar and Radel, 2020). As we have illustrated in Figure 10, the same mindset, now, endorses the South–North water pipeline – the Hope Pipeline – as the panacea of the water crisis which is directly addressing one of the critical uncertainties of Isfahan's future. The thorough investigation of arguments raised by the opponents and proponents of this project falls out of the scope of this manuscript but this project cannot be reduced to a technical issue; The socio-ecological complexities and the "techno-politics" of this pipeline should be completely investigated. It is worth considering the likelihood – regardless of how slim one might think it is – that the Hope Pipeline can increase the thirst for water, increase water demand and trigger a spiral of unsustainability and despair instead of sustainably tackling the water crisis. Such engineering-heavy megaprojects ignore the anthropogenic drivers of the water crisis, "privilege concrete over management," "prioritize investment in technology and infrastructure over reforms

Table 5 Comparative characteristics of scenarios

Characteristics of scenarios	*Scenario 1* *Isfahan half the world*	*Scenario 2* *ProspeRuin*	*Scenario 3* *The burnt city*	*Scenario 4* *Isfahan 2.0*
Key dynamics	Innovation, deterritorialization	Egocentrism	Survival	Stagnation
The government	The ecosystem architect, big-data-driven, Politics 4.0	A regulator	A stateless society, a chiefdom	The guardian of the bureaucracy/interventionist
Citizen	Preactive citizens/hyperactive sensors	Reactive opportunity seekers	Tribe members	Obedient and occasionally reactive
Population	Low growth 2.5 million	Moderate decline 1.3 million	Sharp decline Less than one million	Low growth 2.5–3 million
Immigration	From the Global North: Substantial expat community	Emigration waves to the North and West of Iran	Nomadic temporary populations	To the Global North: Brain Drain, from the Shia Crescent
Urban planning	Long-term and visionary	Technocratic	Community management of the commons	Short-term and directionless
Transportation	Public, smart and green: the 10-min city	Automated trains, Dual-mode vehicles, Tesla SUVs, drones	Decaying public transportation, decrepit trucks, camels	Multimodal mobility: private cars + public transportation (upgrade and maintenance)
Technology	The determinant of the city, average degrees of technological somnambulism	Savior, high degrees of technological somnambulism	Mayhem, back to basics	Imported and coveted
Energy	Hybrid	Hybrid, expensive	No central public utilities, occasionally available	Mainly fossil fuels, rationed and expensive
Residential spatial configurations	Self-sufficient green skyscrapers, gentrification	Off-the-grid mansions, skyscrapers, ghettoization	High-density districts, windcatchers, oases	Apartments, slumization, socio-spatial segregation
Economics	Market-oriented, driven by start-ups and unicorns	Monopolistic	Hyperinflation, barter system	Dutch disease, rentier state and the resource curse
Tourism	One of the main drivers of the economy, over-reliance on tourism, the commodification of the local culture, sex tourism	Moderate, luxurious package holidays	Occasional adventurers	Moderate, independent culture vultures

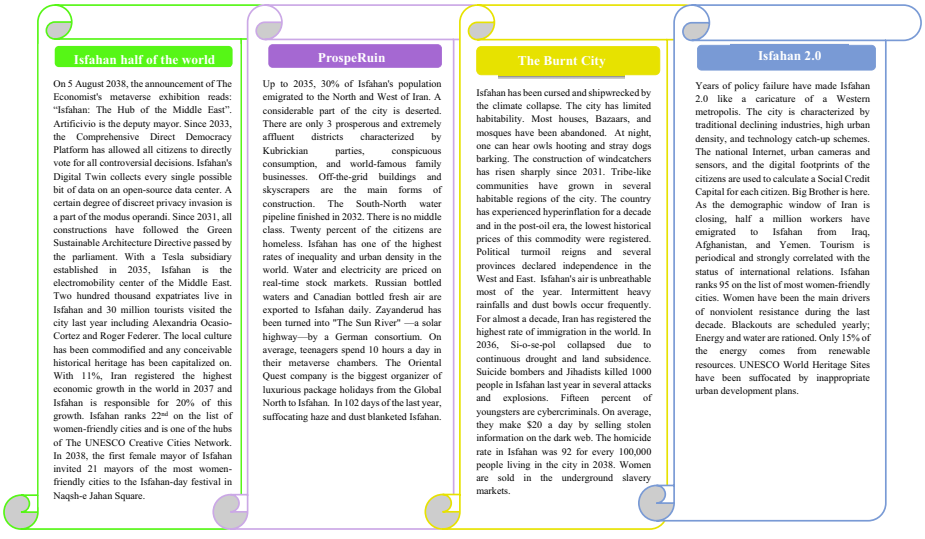
(*continued*)

Table 5

Characteristics of scenarios	*Scenario 1* *Isfahan half the world*	*Scenario 2* *ProspeRuin*	*Scenario 3* *The burnt city*	*Scenario 4* *Isfahan 2.0*
Employment	– Dominated by freelancers, The ratio between CEO and worker wage is 110	Merchants, digital nomads	Unpaid work, essential workforce, post-modern hunter-gatherers	Cognitive routine jobs, minim-wage jobs, high rates of unemployment
Women's rights	Improving the gender equality index	–Average gender equality index, objectification of women	Cultural misogyny, hidden slavery	Low gender equality index
Society's values	Multiculturalism/conspicuous consumption	Avant-garde individualism	Repression and violence	A mosaic of contradictory values

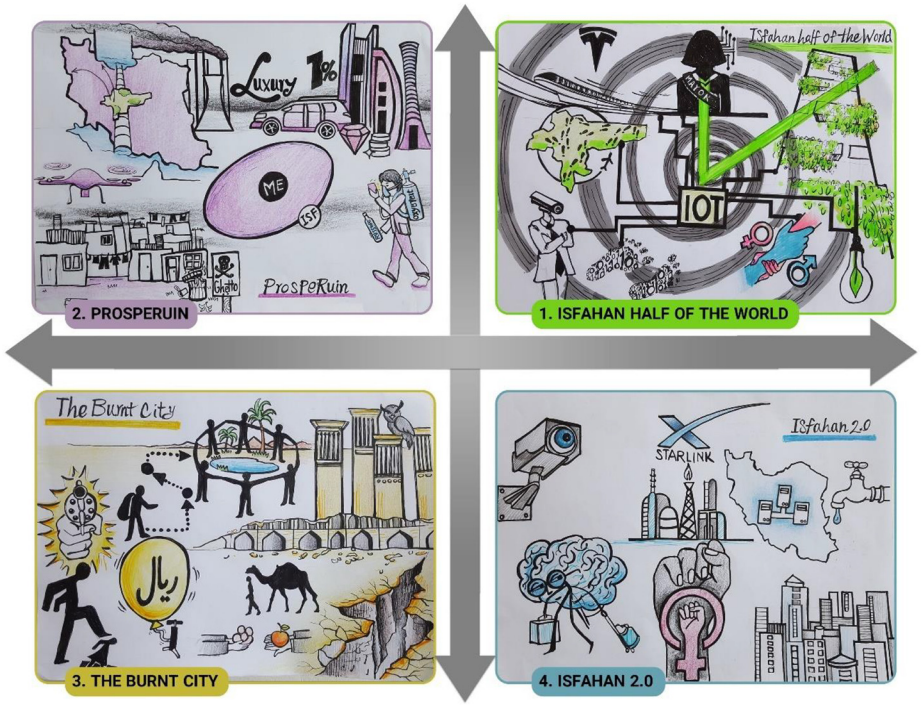
Source: Created by authors

Figure 8 Narratives of scenarios of Isfahan 2040



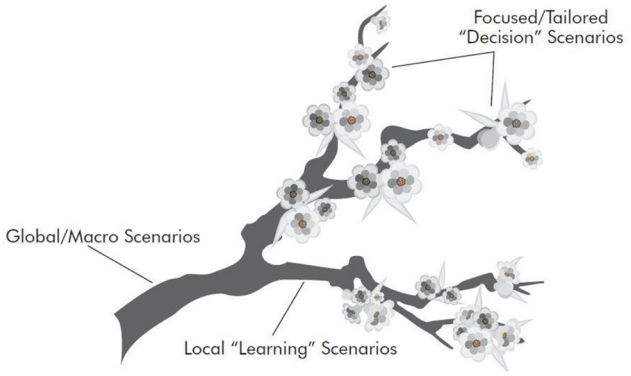
Source: Created by authors

Figure 9 Mediated scenarios of Isfahan 2040



Source: Created by authors

Figure 10 Scenarios are like cheery trees



Source: Chermack (2011), p. 87

to administration and governance" and falsely rely on the insurmountable power of humans to conquer nature (Lin, 2017).

The heavy weight of "the trunk factors" compared to "the branch issues" – the global homogenizing maelstrom – is also reflected in our word collage, drivers of change and explorative scenarios which is symptomatic of the problem we are seeking to address and one of the limitations of our work. We had chosen "A_2: adoption of endogenous over exogenous modes of development" as one of the driving forces of the future of Isfahan. The low degree of certainty attributed to this driving force by the experts can be indicative of the dominance of the imitative/exogenous mode of development and the path dependence it has created. If this driving force was chosen as one of the axes of the scenario matrix, two of the scenarios could set up a stage to envision more indigenous futures. Consequently, the city foresight, particularly in the Global South, should take heed of the cherry tree metaphor because the city foresight can be "locked-in" to this imitative and space-blind benchmarking due to the colonization of the future by the prevailing urban imaginaries. The Northernness of the trunk calls for critical/deconstructive techniques to be incorporated into city foresight, particularly in the Global South. The contradictions between "the trunk factors" and "the branch specifications" during the scenario-generation process can be used as the beacons of alternative thinking. It is wrong to assume that these contradictions should be resolved with an either/or logic. The city either fully embraces the "superlatives" or opts for a reactionary identity-based refusal of them. Instead, these contradictions can provoke differential imaginaries in which a city-region can be global and local simultaneously. Therefore, the city foresight in the Global South where false consciousness of planners and overriding urban imaginaries colonize the future should try to explicitly address the following questions along all the steps of the process:

Q1. How do we define development?

Q2. Whose futures are we discussing?

Q3. Where do emerging urban imaginaries and visions originate from?

Q4. To what extent are urban visions/scenarios innovatively indigenous?

Q5. How do we measure development? Who is in charge of measuring?

At an operational level, participatory city foresight can incorporate brainstorming sessions based on counterfactual history during which a genealogical suspicion at the roots of dominant urban imaginaries is raised. This critical city foresight can inform the emerging

"framing" of planning theory (Watson, 2016) which questions space-blindness and universal applicability of stereotypes, archetypes and prototypes and leads to situated knowledge, and possibly an indigenous roadmap of change.

The explorative scenarios – Figures 8 and 9 – also highlight the contention between official narratives of the future and the desires of citizens and other stakeholders i.e. the others. At the local level, urban futures are colonized by official meta-narratives of the future. As an illustration, we juxtaposed the "base case" scenario (Isfahan 2.0) – see Figures 7–9 – and its constituent elements – see Table 5 – with our thematic analysis of the official "Isfahan 2030" vision. The comparison revealed that the vision admits the unsustainability of the status-quo but colonized the future by *only* removing the undesirable techno-rational components of this scenario through setting goals about climate change, sustainability, food/water security and economic prosperity. Apropos of socio-political issues, the 190-page document is completely dismissive of women's libertarian movements, the opposing views on the underlying structures of the emerging population decline, the growing trend of secularism, the sense of futurelessness, etc. Similarly, the first draft of the Islamic-Iranian Model of Progress which is an overarching vision for 2065 for all aspects of development does not entertain any of these issues or other socio-political fragmentations as legitimate emerging forces which can change the trajectory of the future. In addressing – or perhaps ignoring – the conflicting socio-political matters, these visions replicated the hegemonic dominant ideologies (Gunder, 2005). Through the depoliticization of (urban) futures, these *decorative reductionistic visions* proactively advocate the continuation of the general tendencies of the present into the future and reduce radically alternative futures into *a governable singular* future. In terms of socio-politics, these futures are awkwardly similar to the status-quo; their marked distinction with the status-quo is either a long string of comparative and superlative romanticized adjectives or conspicuously advertisable techno-rational borrowings from the Global North. A multi-perspective city foresight can problematize the epistemic quality and normative legitimacy of such future narratives. Our scanning revealed that women's rights movements, the lifestyle of new generations and counter-narratives held by a considerable subset of the population about the Iran/West dialectic may play a significant role in shaping the futures of Isfahan/Iran; see Figures 9 and 10 and Table 5. Future is an irreducibly political concept and the focal question of "How do women from Generation Z and Alpha imagine the ideal Isfahan in 2040?" cannot be swept under any ideological/political rug. The foresight-based learning should not be expurgated by what Igor Ansoff calls "power filters" (Holopainen and Toivonen, 2012) and "used as mere background material for the justification of a certain long-term vision" (Mäntysalo *et al.*, 2022). Contrarily, city foresight should hear the voice of the voiceless, lead to a transformational strategic dialogue over the neglected emerging and/or chronic issues and eventually democratize future time by removing it from "the officials" to citizens (Inayatullah, 2011).

One pragmatic suggestion for city foresight in situations where local power relations are homogenizing and one ideological voice is deafeningly loud is to replace importance/uncertainty criteria with a discomfort/ignorance map (Ramírez and Selin, 2014) as a yardstick to evaluate the drivers of change/emerging issues and build scenarios. The participatory city foresight can therefore raise questions as follows:

Q1. Which of the forces of change are you most ignorant about?

Q2. Which of the forces of the change makes you extremely uncomfortable?

This change of terminology and the discomfort felt by the officials in the scenario-generating process can challenge their mental schemata, punctuate the status-quo and generate illuminating insight. This category of city foresight as Michael Gunder (2005) argues may help the dominant blocs or networks behind official visions of the future to transverse their fundamental fantasy for *a* secure, harmonious and governable future. It acts as a "reframing device," and moves beyond false consensus toward "affable but agonistic dis-sensus" by

valuing the desires of the others which are growing to be the majority of populations in city-regions. This multi-angle and strife-oriented city foresight "may facilitate totally new unforeseen or even impossible potentials and possibilities for all Others."

Conclusions

Owing to the enormous challenges of urbanization, city-regions need trailblazing approaches to bring about dramatic transformations, beyond the regular remit of city-regional planning. City foresight methods can be considered a viable option to overcome the weakness of conventional city-regional planning. In this regard, to anticipate the combined effect of the drivers of change on the urban futures of Isfahan, an exploratory scenario-building was conducted to create four narratives for the future of Isfahan in 2040. In so doing, firstly, we created an inventory of variables affecting the futures of Isfahan. In the next step, a survey was conducted to determine ecological resilience and international relations as the key uncertainties related to the future of Isfahan. Consequently, four deductive scenarios, namely, *Isfahan Half of the World*, ProspeRuin, The Burnt City and Isfahan 2.0 were articulated. To further tangibalize the scenarios, their features were compared and visualized by a professional painter.

This case study makes noticeable contributions to the existing body of knowledge in city foresight. The juxtaposition of insight obtained in this foresight case study with official visions of Isfahan revealed that urban futures, at the global and local level, are colonized in Isfahan and possibly in the Global South. First, at the global level, the explorative-normative scenario generation can be hindered by dominant urban imaginaries native to the Global North thereby resulting in visions and scenarios which are used futures of "superlatives" from the Global North instead of transformative indigenous narratives. It is wrong to assume that global-local contradictions should be resolved with an either/or logic. The prevalent memetic benchmarking can be countervailed by debunking the space-blindness and universal applicability of imported development paradigms and applying critical-deconstructive techniques of futuring. Second, at the local level, the decorative reductionistic visions crafted by "the officials" ignore the desires of the others and replicate the hegemonic dominant ideologies. They reduce radically alternative futures into *a governable singular* future. Application of discomfort/ignorance criteria in city foresight may help "the officials" behind formal visions to embrace strife thereby leading to envisioning previously unforeseen collective desirable futures.

Our research has potential implications for both academicians and practitioners. As for practitioners and policymakers, the following implications can be mentioned:

- question your assumptions and model of development before any city foresight project;
- be critical of imported models of development;
- widen the breadth of stakeholders; and
- try to go for innovative indigenous models of development.

For the scholars of foresight and city foresight, the implications can be translated into some future research directions: first, a systematic review should be done on public foresight (not necessarily city foresight) practices in the Global South to see how far their results can be from the used futures of the Global North. Second, the methodological contribution should be made concerning the know-how of creating innovative indigenous possible/preferable futures.

This study is not without its limitations. First of all, because it is based on one single case study, one should be careful about the generalizability and transferability of the results. Second, the dominance of the imitative/exogenous mode of development, the path

dependence it has created and its impact on the mindset of the selected experts did not allow this project to create indigenous scenarios of the future of Isfahan. The inclusion of other stakeholders and referring to civic epistemologies can be a viable option for future research to bridge this gap.

Note

1. Social, technological, economic, environmental, political and values.

References

Agyeman, J. and Mclaren, D. (2017), "Sharing cities", *Environment: Science and Policy for Sustainable Development*, Vol. 59 No. 3, pp. 22-27.

Ahvenniemi, H., Huovila, A., Pinto-SEPPä, I. and Airaksinen, M. (2017), "What are the differences between sustainable and smart cities?", *Cities*, Vol. 60, pp. 234-245.

Albino, V., Berardi, U. and Dangelico, R.M. (2015), "Smart cities: definitions, dimensions, performance, and initiatives", *Journal of Urban Technology*, Vol. 22 No. 1, pp. 3-21.

Amini, H., Jabalameli, M.S. and Ramesht, M.H. (2021), "Development of regional foresight studies between 2000 and 2019: an overview and co-citation analysis", *European Journal of Futures Research*, Vol. 9 No. 1.

Andersen, P.D., Hansen, M. and Selin, C. (2021), "Stakeholder inclusion in scenario planning—a review of European projects", *Technological Forecasting and Social Change*, Vol. 169, p. 120802.

Andres, L., Bakare, H., Bryson, J.R., Khaemba, W., Melgaco, L. and Mwaniki, G.R. (2021), "Planning, temporary urbanism and citizen-led alternative-substitute place-making in the global South", *Regional Studies*, Vol. 55 No. 1, pp. 29-39.

Ansari, A.M. (2016), "Taqizadeh and European civilisation", *Iran*, Vol. 54 No. 1, pp. 47-58.

Assari, A. and Assari, E. (2012), "Urban spirit and heritage conservation problems: case study Isfahan city in Iran", *Journal of American Science*, Vol. 8, pp. 202-109.

Azadi, P. (2020), *The Structure of Corruption in Iran*, Stanford Iran 2040 Project, Stanford University.

Baard, P. (2021), "Knowledge, participation, and the future: epistemic quality in energy scenario construction", *Energy Research & Social Science*, Vol. 75, p. 102019.

Barbanente, A., Camarda, D., Grassini, L. and Khakee, A. (2007), "Visioning the regional future: globalization and regional transformation of rabat/Casablanca", *Technological Forecasting and Social Change*, Vol. 74 No. 6, pp. 763-778.

Bartholomew, K. (2007), "Land use-transportation scenario planning: promise and reality", *Transportation*, Vol. 34 No. 4, pp. 397-412.

Batty, M., Axhausen, K.W., Giannotti, F., Pozdnoukhov, A., Bazzani, A., Wachowicz, M., Ouzounis, G. and Portugali, Y. (2012), "Smart cities of the future", *The European Physical Journal Special Topics*, Vol. 214 No. 1, pp. 481-518.

Bibri, S.E. (2018), "A foundational framework for smart sustainable city development: theoretical, disciplinary, and discursive dimensions and their synergies", *Sustainable Cities and Society*, Vol. 38, pp. 758-794.

Buffel, T., Phillipson, C. and Scharf, T. (2012), "Ageing in urban environments: developing 'age-friendly' cities", *Critical Social Policy*, Vol. 32 No. 4, pp. 597-617.

Burton, E., Jenks, M. and Williams, K. (2003), *The Compact City: A Sustainable Urban Form*?, Routledge.

Carter, J.G. (2018), "Urban climate change adaptation: exploring the implications of future land cover scenarios", *Cities*, Vol. 77, pp. 73-80.

Certoma, C. (2022), "Future scenarios of digital social innovation in urban governance. A collective discussion on the socio-political implications in Ghent", *Cities*, Vol. 122, p. 103542.

Chakraborty, A. and Mcmillan, A. (2015), "Scenario planning for urban planners: toward a practitioner's guide", *Journal of the American Planning Association*, Vol. 81 No. 1, pp. 18-29.

Chermack, T.J. (2011), *Scenario Planning in Organizations: how to Create, Use, and Assess Scenarios*, Berrett-Koehler, San Francisco. CA.

Childs, M.C. (2020), "Urban design foresight", *Journal of Urban Design*, Vol. 25 No. 1, pp. 9-11.

Commission, E. (2014), *Climate and Energy Priorities for Europe: The Way Forward*, In COMMISSION, E. (Ed.).

Costa, P., Brito-Henriques, E. and Cavaco, C. (2021), "Interim reuse in urban derelicts: uncovering the community's attitudes and preferences through scenario-elicitation", *Cities*, Vol. 111, p. 103103.

Dibazar, P., Lindner, C., Meissner, M. and Naeff, J. (2013), "Questioning urban modernity", *European Journal of Cultural Studies*, Vol. 16 No. 6, pp. 643-658.

Diffenbach, J. (1982), "Influence diagrams for complex strategic issues", *Strategic Management Journal*, Vol. 3 No. 2, pp. 133-146.

Dixon, T.J. and Tewdwr-Jones, M. (2021), "Urban futures: planning for city foresight and city visions, policy press".

Dixon, T.J., Karuri-Sebina, G., Ravetz, J. and Tewdwr-Jones, M. (2022), "Re-imagining the future: city-region foresight and visioning in an era of fragmented governance", *Regional Studies*, Vol. 57 No. 4, pp. 1-8.

Dixon, T., Eames, M., Britnell, J., Watson, G.B. and Hunt, M. (2014), "Urban retrofitting: identifying disruptive and sustaining technologies using performative and foresight techniques", *Technological Forecasting and Social Change*, Vol. 89, pp. 131-144.

Dufva, M., KöNNöLä, T. and Koivisto, R. (2015), "Multi-layered foresight: lessons from regional foresight in Chile", *Futures*, Vol. 73, pp. 100-111.

Eames, M., Dixon, T., May, T. and Hunt, M. (2013), "City futures: exploring urban retrofit and sustainable transitions", *Building Research & Information*, Vol. 41 No. 5, pp. 504-516.

FERNáNDEZ-Guell, J.-M., Collado-Lara, M., GUZMáN-ARAñA, S. and FERNáNDEZ-AñEZ, V. (2016), "Incorporating a systemic and foresight approach into smart city initiatives: the case of Spanish cities", *Journal of Urban Technology*, Vol. 23 No. 3, pp. 43-67.

Goodman, M. (2002), *The Iceberg Model*, *Innovation Associates Organizational Learning*, *Hopkinton, MA*.

Goodspeed, R. (2020a), *Scenario Planning for Cities and Regions. Managing and Envisioning Uncertain Futures*, Lincoln Institute of Land Policy.

Goodspeed, R. (2020b), *Scenario Planning for Cities and Regions: Managing and Envisioning Uncertain Futures*, Lincoln Institute of Land Policy.

Goodspeed, R. and Hackel, C. (2017), "Lessons for developing a planning support system infrastructure: the case of Southern California's scenario planning model", *Environment and Planning B: Urban Analytics and City Science*, Vol. 46 No. 4, pp. 777-796.

Gudowsky, N., Sotoudeh, M., Capari, L. and Wilfing, H. (2017), "Transdisciplinary forward-looking agenda setting for age-friendly, human centered cities", *Futures*, Vol. 90, pp. 16-30.

Gunder, M. (2005), "The production of desirous space: mere fantasies of the utopian city?", *Planning Theory*, Vol. 4 No. 2, pp. 173-199.

Harrison, J. (2008), "Stating the production of scales: centrally orchestrated regionalism, regionally orchestrated centralism", *International Journal of Urban and Regional Research*, Vol. 32 No. 4, pp. 922-941.

Holopainen, M. and Toivonen, M. (2012), "Weak signals: Ansoff today", *Futures*, Vol. 44 No. 3, pp. 198-205.

Hoominfar, E. and Radel, C. (2020), "Contested dam development in Iran: a case study of the exercise of state power over local people", *Sustainability*, Vol. 12 No. 13, p. 5476.

Hopkins, L.D. and Zapata, M. (2007), *Engaging the Future: Forecasts, Scenarios, Plans, and Projects*, Lincoln Institute of Land Policy, Cambridge, MA.

Inayatullah, S. (2011), "City futures in transformation: emerging issues and case studies", *Futures*, Vol. 43 No. 7, pp. 654-661.

International, T. (2021), "Corruption perceptions index", available at: www.transparency.org/en/cpi/2021 (accessed 2022-2-1 2022).

Iwaniec, D. and Wiek, A. (2014), "Advancing sustainability visioning practice in planning—the general plan update in phoenix, Arizona", *Planning Practice & Research*, Vol. 29 No. 5, pp. 543-568.

Jabareen, Y. (2013), "Planning the resilient city: concepts and strategies for coping with climate change and environmental risk", *Cities*, Vol. 31, pp. 220-229.

Jokar, M., Razavi, Z. and Moradi, H. (2020), "From environmental knowledge to encouraging pro-environmental behavior for air pollution control in Isfahan: a highly air-polluted city in Central Iran", *SN Applied Sciences*, Vol. 2 No. 12.

Kantamaturapoj, K., Mcgreevy, S.R., Thongplew, N., Akitsu, M., Vervoort, J., Mangnus, A., Ota, K., Rupprecht, C.D.D., Tamura, N., Spiegelberg, M., Kobayashi, M., Pongkijvorasin, S. and Wibulpolprasert, S. (2022), "Constructing practice-oriented futures for sustainable urban food policy in Bangkok", *Futures*, Vol. 139, p. 102949.

Karimi, K. and Motamed, N. (2003), "The tale of two cities: urban planning of the city Isfahan in the past and present", *4th International Space Syntax Symposium*, Citeseer, 14-1.

Khan, S. and Zaman, A.U. (2018), "Future cities: conceptualizing the future based on a critical examination of existing notions of cities", *Cities*, Vol. 72, pp. 217-225.

Kitagawa, F. and Vidmar, M. (2022), "Strategic intelligence for the future of places: enabling inclusive economic growth through the opportunity areas analysis tool", *Regional Studies,* Vol. 57 No. 4, pp. 1-14.

Kosow, H. and Gaßner, R. (2008), *Methods of Future and Scenario Analysis: Overview, Assessment. and Selection Criteria*, DIE—Deutsches Institut für Entwicklungspolitik, Bonn, Germany.

Landry, C. (2012), *The Creative City: A Toolkit for Urban Innovators*, Earthscan.

Lewis, S.L. and Maslin, M.A. (2015), "Defining the Anthropocene", *Nature*, Vol. 519 No. 7542, pp. 171-180.

Lin, G.C.S. (2017), "Water, technology, society and the environment: interpreting the technopolitics of China's South–North water transfer project", *Regional Studies*, Vol. 51 No. 3, pp. 383-388.

Liu, L. and Wu, J. (2022), "Scenario analysis in urban ecosystem services research: progress, prospects, and implications for urban planning and management", *Landscape and Urban Planning*, Vol. 224, p. 104433.

Loveridge, D. (2008), *Foresight: The Art and Science of Anticipating the Future*, Routledge, New York, NY and London.

Lyons, G., Rohr, C., Smith, A., Rothnie, A. and Curry, A. (2021), "Scenario planning for transport practitioners", *Transportation Research Interdisciplinary Perspectives*, Vol. 11, p. 100438.

Mahmud, J. (2011), "City foresight and development planning case study: implementation of scenario planning in formulation of the Bulungan development plan", *Futures*, Vol. 43 No. 7, pp. 697-706.

MäNTYSALO, R., Granqvist, K., Duman, O. and Mladenović, M.N. (2022), "From forecasts to scenarios in strategic city-regional land-use and transportation planning", *Regional Studies*, Vol. 57 No. 4, pp. 1-13.

Menny, M., Palgan, Y.V. and Mccormick, K. (2018), "Urban living labs and the role of users in co-creation", *GAIA - Ecological Perspectives for Science and Society*, Vol. 27 No. 1, pp. 68-77.

Myers, D. and Kitsuse, A. (2000), "Constructing the future in planning: a survey of theories and tools", *Journal of Planning Education and Research*, Vol. 19 No. 3, pp. 221-231.

OECD (2012), *OECD Environmental Outlook to 2050: The Consequences of Inaction*, OECD Publishing, Paris, doi: 10.1787/9789264122246-en.

Ogilvy, J. and Smith, E. (2004), "Mapping public and private scenario planning: lessons from regional projects", *Development*, Vol. 47 No. 4, pp. 67-72.

Oomen, J., Hoffman, J. and Hajer, M.A. (2021), "Techniques of futuring: on how imagined futures become socially performative", *European Journal of Social Theory*, Vol. 25 No. 2, pp. 252-270.

Perry, B. and Smit, W. (2022), "Co-producing city-regional intelligence: strategies of intermediation, tactics of unsettling", *Regional Studies,* Vol. 57 No. 4, pp. 1-13.

Pike, A., Rodríguez-Pose, A. and Tomaney, J. (2013), "Local and regional development in the global North and South", *Progress in Development Studies*, Vol. 14 No. 1, pp. 21-30.

Ramírez, R. and Selin, C. (2014), "Plausibility and probability in scenario planning", *Foresight*, Vol. 16 No. 1, pp. 54-74.

Ratcliffe, J. and Krawczyk, E. (2011), "Imagineering city futures: the use of prospective through scenarios in urban planning", *Futures*, Vol. 43 No. 7, pp. 642-653.

Ratti, C. (2016), "These four numbers define the importance of our cities: 2, 50, 75 and 80", available at: www.weforum.org/agenda/2016/12/technology-and-the-future-of-our-cities/(accessed 6/10/2021).

Ravetz, J. and Miles, I.D. (2016), "Foresight in cities: on the possibility of a "strategic urban intelligence"", *foresight*, Vol. 18 No. 5, pp. 469-490.

Ravetz, J., Neuvonen, A. and Mäntysalo, R. (2021), "The new normative: synergistic scenario planning for carbon-neutral cities and regions", *Regional Studies*, Vol. 55 No. 1, pp. 150-163.

Robinson, J. (2013), "The urban now: theorising cities beyond the new", *European Journal of Cultural Studies*, Vol. 16 No. 6, pp. 659-677.

Rosenau, H. (2013), *The Ideal City: Its Architectural Evolution in Europe*, Routledge.

Roudi, F., Azadi, P. and Mesgaran, M. (2017), *Iran's Population Dynamics and Demographic Window of Opportunity*, Stanford Iran 2040 Project, Stanford University.

Sandberg, L. and RöNNBLOM, M. (2016), "Imagining the ideal city, planning the gender-equal city in Umeå, Sweden", *Gender, Place & Culture*, Vol. 23 No. 12, pp. 1750-1762.

Schwartz, P. (1991), *The Art of the Long View: planning for the Future in an Uncertain World*, Doubleday, New York, NY.

Selin, C. (2015), "Merging art and design in foresight: making sense of emerge", *Futures*, Vol. 70, pp. 24-35.

Sherman, S.A. and Chakraborty, A. (2022), "Beyond plans", *Journal of the American Planning Association*, pp. 1-13.

Smith, E. (2007), "Using a scenario approach: from business to regional futures", in Hopkins, L.D. *&* Zapata, M.A. (*Eds.*), *Engaging the Future: Using Forecasts, Scenarios, Plans, and Projects*, pp. 79-101.

Sokolov, A., Veselitskaya, N., Carabias, V. and Yildirim, O. (2019), "Scenario-based identification of key factors for smart cities development policies", *Technological Forecasting and Social Change*, Vol. 148, p. 119729.

Spaniol, M.J. and Rowland, N.J. (2019), "Defining scenario", *Futures & Foresight Science*, Vol. 1 No. 1, p. e3.

Tatar, M., Kalvet, T. and Tiits, M. (2020), "Cities4ZERO approach to foresight for fostering smart energy transition on municipal level", *Energies*, Vol. 13 No. 14, p. 3533.

TöTZER, T., Sedlacek, S. and Knoflacher, M. (2011), "Designing the future – a reflection of a transdisciplinary case study in Austria", *Futures*, Vol. 43 No. 8, pp. 840-852.

Trencher, G. (2019), "Towards the smart city 2.0: empirical evidence of using smartness as a tool for tackling social challenges", *Technological Forecasting and Social Change*, Vol. 142, pp. 117-128.

UN, Department of Economic and Social Affairs, Population Division (2015), "World Population Prospects: The 2015 Revision, Key Findings and Advance Tables", Working Paper No. ESA/P/WP.241.

UN, Department of Economic and Social Affairs, Population Division (2016), *The World's Cities in 2016 – Data Booklet (ST/ESA/ SER.A/392).*

Urrutia-Azcona, K., Stendorf-SøRENSEN, S., Molina-Costa, P. and Flores-Abascal, I. (2019), "Smart zero carbon city: key factors towards smart urban decarbonisation", *DYNA*, Vol. 94, pp. 676-683.

Van der Heijden, K. (1996), *Scenarios: The Art of Strategic Conversation*, John Wiley & Sons, Chichester.

Van Leemput, M. (2010), "Foresight in the Brussels capital region", *Futures*, Vol. 42 No. 4, pp. 370-379.

Von Wirth, T., Wissen Hayek, U., Kunze, A., Neuenschwander, N., Stauffacher, M. and Scholz, R.W. (2014), "Identifying urban transformation dynamics: functional use of scenario techniques to integrate knowledge from science and practice", *Technological Forecasting and Social Change*, Vol. 89, pp. 115-130.

Walton, J.S. (2008), "Scanning beyond the horizon: exploring the ontological and epistemological basis for scenario planning", *Advances in Developing Human Resources*, Vol. 10 No. 2, pp. 147-165.

Watson, V. (2016), "Shifting approaches to planning theory: global North and South", *Urban Planning*, Vol. 1 No. 4, pp. 32-41.

Wong, T.-C. and Yuen, B. (2011), *Eco-City Planning. Policies, Practice and Design*, *Springer Science+ Business Media BV*.

Wuijts, S., DE Vries, M., Zijlema, W., Hin, J., Elliott, L.R., Breemen, L.D.-V., Scoccimarro, E., DE Roda Husman, A.M., Kulvik, M., Frydas, I.S., Grellier, J., Sarigiannis, D., Taylor, T., Gotti, A., Nieuwenhuijsen, M.J. and Hilderink, H. (2022), "The health potential of urban water: future scenarios on local risks and opportunities", *Cities*, Vol. 125, p. 103639.

Zapata, M.A. and Kaza, N. (2015), "Radical uncertainty: scenario planning for futures", *Environment and Planning B: Planning and Design*, Vol. 42 No. 4, pp. 754-770.

Corresponding author

Ali Zackery can be contacted at: a.zackery@ast.ui.ac.ir