

PUBLIC PERCEPTIONS OF URBAN SUSTAINABLE CHALLENGES IN DEVELOPING COUNTRIES

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ABSTRACT

Sustainable urban development is facing major challenges in developing countries, due to rapid urbanisation, lack of environmental strategies, energy consumption, transport congestion, and insufficient infrastructure. The degradation of public services and utilities has also been significant, particularly in politically unstable countries such as Iraq, whose cities have suffered from destruction, leading to severe damage to infrastructure and causing economic deterioration. In many of these countries, rebuilding projects are currently in progress and being planned, but the public are not being involved in the decision-making process. This study investigates public perceptions of sustainable urban challenges and their priorities for the Iraqi capital city of Baghdad; it also investigates social awareness of urban sustainability within the local Iraqi context. A national questionnaire (n=750) was conducted and participants' views were gathered on a 5-point Likert-type scale. The findings revealed that 81% of the participants considered 'providing green areas and parks' as the most important goal in urban development. This was followed by 'waste recycling and separation' (74%) and 'mitigation of traffic congestion' (70.5%). The 'minimisation of energy consumption' was poorly rated, as only 37.7% of the respondents voted this as the least important item. The results reflect the key important factors related to the services and utilities, coinciding with an actual need to raise the public services, in order to provide the required indicators with a level of importance focuses on the local context. Therefore, these urban challenge indicators can play a vital role to provide effective public's indicators for decision-makers, in order to improve the existing applications and the future urban projects to achieve quality of life.

Keywords: urban sustainable development, urban development challenges, public perceptions.

1 INTRODUCTION

Due to rapid urbanisation, population-inflation, lack of governance for tackling environmental problems, and increased demand for energy and transportation, the problem of providing sustainable urban development has become a widespread challenge in developing countries [1]. In particular, the development of cities is the most significant factor that must be tackled in solving urban sustainability challenges [2]. Solving these challenges is key to tackling the undesirable effects on our environment caused by pollution from conventional power generation, which is a particular issue in countries that are dependent on burning fossil fuels [2]. Despite various efforts to minimise energy use in cities and encourage the use of renewable resources, these technologies are still only in used in a limited way in developing regions. In our case study, Iraq, the population size in the capital city, Baghdad, is predicted to double by 2030 [3]. Challenges in this case study include minimising energy consumption, separation of waste and recycling, mitigating transportation problems, reducing pollution and providing green areas [4]. Past studies that focused on urban sustainability challenges are normally restricted to planners, designers and policy makers, without wider public participation. Therefore, there is an essential need to identify solutions to customise suitably sustainable development challenges that investigate public perceptions, in order to find acceptable solutions that can be adopted to achieve a balance between citizen happiness and well-being, and the priorities of government [1]. Thus, an understanding of locality-specific factors can be acquired from multiple viewpoints, in order to investigate



their importance challenges and level a standard of living. This is important for overcoming urban sustainability challenges, in a given region rather than depending on global indicators that are commonly unsuitable for developing regions [5]. In particular, Iraq has undergone a rapid transition from being a country where the majority of the population live in rural areas to one where the majority of the population live in urban areas (as shown in Fig. 1). In addition, approximately one-quarter of Iraq's population now live in the capital, Baghdad [6].

The rest of this paper is structured as follows; firstly, the urban development challenges in Iraq and similar developing economies are discussed, creating a list of key urban sustainable indicators on which the public perceptions are gathered. Secondly, the development processes of the questionnaire used in this study is described. Finally, the results and discussion are detailed, followed by an explanation of the findings. The paper then concludes by discussing the local and development priorities for urban sustainability challenges in Iraq.

2 BACKGROUND

Many countries in the world pose individual challenges when considering the implementation of sustainability in urban development context. One particular country that is unique in this way is Iraq. Iraq has been faced with difficult conditions, with its cities suffering from the destruction of infrastructure and the deterioration of public services and utilities, particularly the capital, Baghdad [3]. Thanks to intensive national and international efforts followed by several post-war programmes to rebuild and renew cities, a number of new urban projects are underway and at the planning stage, but the public are not being involved in the planning process.

Therefore, there is an urgent challenge to adopt effective solutions for new urban development areas as well as the existing urban applications to counter the effects of pollution and climate change, and to find an acceptable balance between multi-dimensions of sustainable development [2].

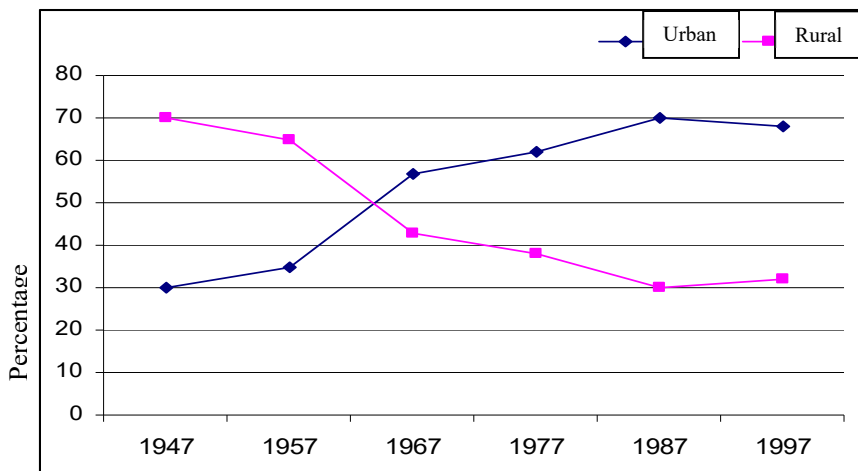


Figure 1: Population Distribution Trends (Urban and Rural), IRAQ. (Source: Listing & Numbering Report, Central Statistical Organization, Ministry of Planning, Iraq, 2014.)

New urban development has emerged in recent years in order to tackle the existing local problems; a comprehensive understanding of the climatic regions, local priorities and social awareness is also required before sustainable development can be initiated [4]. Several past studies have claimed that the local assessment tools for urban areas are insufficient for evaluating individual buildings, but require a wide view of a city's components, including neighbourhoods, public services and utilities, transportation, infrastructure, and energy usage. These components represent the major factors that need to be considered in order to meet urban sustainable challenges [5]. Globally, neighbourhood planning has been accepted as a basis of planning for the development and redevelopment of urban areas. A neighbourhood planning unit is the basic utilities, services and community facilities required by the residents and which provides a physical form suitable for the full development of individual life, family activities and community well-being.

In Iraq, according to the urban housing standard, a neighbourhood is the basic building block of a city; subsequently, by grouping together four neighbourhoods, a sector is formed – what is known as a 'Housing Sector' [6]. Moreover, over time, a number of researchers have tried to address the global guidelines and frameworks to expand evaluations of these tool so that they are suitable for developing countries [7]. In this context, the significance of global urban development factors that have impacted directly in the context of Iraq during the past and present – represented by public services and utilities, infrastructure, energy usage, water consumption and environmental challenges – can be investigated through the views of local people and their priorities through a nationwide questionnaire [8]. There are also societal aspirations for developing the standard of living in order to ensure the well-being of the individual, especially after the economic prosperity that was witnessed in the country after 2003 [2]. In response to this, a new framework for urban development can be created based on incorporating stakeholders' perceptions towards evaluating the key elements of global frameworks for the existing regions, or those which are under planning or construction can be adopted in various regions of developing countries [4]. While a few studies have focused on adopting global frameworks used in developed countries such as Europe, Japan, the USA and the UK, which were created by the various organisations including the European Commission, Japan Green Build Council, US Green Build Council and BRE/UK, these frameworks are not suited for developing regions [5]. Therefore, this study adopts a unique approach to recreating a sustainable development framework for developing countries, by investigating the local context and identifying the priorities of urban sustainable challenges through gathering stakeholders' views via a nationwide questionnaire [6]. On the other hand, several national and international reports have claimed that there is a need to adopt sustainable development practices. One of them, the 'Iraq Human Development Report-UNDP 2014', has investigated Iraq's traditional context and youth issues under the concept of sustainable development. Also, this report illustrated key factors on urban development challenges that need to be prioritised; these include: air, water, energy pollution; shortage of energy production; minimising energy consumption; use of separation and waste recycling; mitigating traffic congestion, and insufficient infrastructure [7]. Hence, gathering the views of the people who live at this city level can enable local needs and requirements to be prioritised in urban sustainable design [10].

This paper aims to customise a new practical and theoretical framework under the concept of sustainability with wide participation from the public by asking for their perceptions on urban development challenges that prioritise the Iraqi context, focusing on various places in Baghdad city including municipalities and urban and rural regions. This questionnaire was investigated the public perceptions on urban development challenges, in order to identify their importance and priorities.





Figure 2: Case study region and new urban development. (Source: COST, 2016.)

3 MOTIVATION

Globally, the establishment of new urban projects is based on identifying designs, planning, selecting the site, topography, and services and utilities. Key urban planning decisions are generally made by policy makers such as politicians, engineers, designers, etc., without widespread public consultation on urban construction projects, particularly in developing economies.

Our case study of Iraq has been selected, because the problem of sustainable urban development has, in recent years, become a key issue in this country. Iraqi cities themselves have suffered from harsh conditions for many years, caused by severe damage to services, utilities and infrastructure, and economic deterioration after past wars. Therefore, intensive efforts have been adopted to rehabilitate the country's cities, particularly its capital, Baghdad. However, despite many projects and attempts to upgrade cities' services and infrastructure, more intensive programmes, systematic governance and creativity are still required in order to meet the current and future challenges. For these reasons, urban sustainable development has become a significant issue in tackling environmental problems, rapid urbanisation, increased transport and energy demand, and a decline in the quality of life.

All these issues have form the incentive to adopt a new framework based on the goals of urban sustainable development, but it would be inefficient to adopt such a framework without the participation from the local opinions to assess the current and future challenges facing sustainability with a wide participate from the public perceptions on urban development challenges. In fact, conventional frameworks for urban projects focus on the competent authorities in the target locale, to act as the policy makers in order to execute urban projects, whilst not consulting the public to find their priorities, standard of living requirements, cultural concerns and future ambitions [3].

This creates a problem; as, there is still a wide gap between decision-makers and public's ambitions [1]. Therefore, adding the latter's perceptions to create a sustainable framework is the key factor for improving the current and future quality of life. Global frameworks and national criteria focus on the scientific viewpoint, the government's view and the professional viewpoint. Identifying the views of a cities' occupants can bring multiple benefits, e.g., by illustrating more effective factors, because the local context is being implicitly highlighted. In addition, knowledge of the goals of the sustainable development can also be raised through a widespread survey across various regions in the area that communicates with and considers the views of the respondents.

The vision of this paper is to ascertain the local public's perceptions on sustainable urban development challenges, reflecting respondents' views including the level of importance of different aspects, acceptable solutions and social awareness indicators.

4 RESULTS AND DISCUSSION

4.1 Results and analysis

In order to find indicators impacting on urban sustainable challenges in Iraq and find out the local viewpoints, a national questionnaire has been conducted. This paper, initially, recognised the relevant urban challenges and then demonstrated a comprehensive understanding of public perceptions on their priorities and standard of living in the Iraqi's context. The study methodology has been structured as follows:

- Identify significant items of urban development challenges for the questionnaire based on a critical review of past studies in order to identify the challenges of urban development to be assessed by Iraqi citizens. This aims to investigate; (a) their priorities and the most important factors to illustrate effective indicators, and, (b) the goals of urban development challenges to provide designers with effective indicators for improving the existing applications and new urban projects under the concept of sustainability in Iraq. The nationwide questionnaire was conducted and published between March 29th, 2017 and May 20th, 2017; it was spread across various places in Baghdad city.
- The questionnaire was conducted using the Bristol Online Survey (www.onlinesurveys.ac.uk). This questionnaire contained open-ended questions to motivate respondents to express their opinions of other variables relating to urban challenges. Demographic factors including gender, age group, occupation, qualification, location and region have been included in the survey, in addition to investigate the public's view on urban development challenges through conducted 5-point Likert-Scale.

4.1.1 Survey respondents

The public perceptions and their views are significant variables in identifying the important indicators for urban development challenges. People's experiences are formed based on their daily experiences – their daily life, job, knowledge and social activities. In terms of the local context, the public face daily problems that occur as a result of suffering from the difficult conditions. In this paper, 18-items of urban development challenges in city have been investigated, through their inclusion in the questionnaire, which were gathered from a critical review search into the social aspects.

4.1.2 The respondents' demographic characteristics

The questionnaire received a total of 750 responses; 75% of the participants completed all parts of the survey questions. Table 1 presents the demographic factors of the completed survey across various regions in the Iraqi capita Baghdad are summarise demographic factors of the participants, which are explained below.

4.2 Discussion

Understanding public views and perceptions are important in order to achieve successful urban development. The public's perceptions, priorities and ambitions reflect their experience of daily activities, standard of living and work, in addition to their views on current urban challenges. From analysing the responses to the questionnaire, these urban sustainable challenges, the 18-items investigated have been ranked in terms of their priority and importance to respondents statistically by the mean value of the recorded high-ranking



Table 1: Demographic factors and frequency.

Variable	Scale		
		Frequency	Total
Gender	Male	424	56.5%
	Female	326	43.5%
Age group	18-24	61	8.1%
	25-30	204	27.2%
	31-35	103	13.7%
	36-40	85	11.3%
	41-45	88	11.7%
	46-50	63	8.4%
	51-55	63	8.4%
	56-60	54	7.2%
	Over 61	29	3.9%
Occupation	Government employee	541	72.1%
	Private sector employee	92	12.3%
	Re-tried	32	4.3%
	Other	85	11.3%
Qualification	Post-graduate degree	222	29.6%
	Under-graduate	453	60.4%
	Up to high school	57	7.6%
	No qualification	18	2.4%
Location	Municipalities of the capital	655	87.3%
	Suburban	21	2.8%
	Rural	17	2.3%
	New city outside mayoralty's bounders	57	7.6%

range, from 4.68 to 3.92, top to down, on a 5-point Likert scale (1–5), as shown on the urban challenges items in Table 2.

As presented, there are many factors that hinder urban sustainable development in Iraq. Overall, 81% of the participants selected 'providing green areas and parks' as the most important item for urban sustainable development in Iraq. This factor has been ranked as significant with a mean score (\bar{x} =4.68), and has the lowest SD (σ =0.8). The next most important was 'waste recycling and separation', followed by the indicator 'mitigate traffic congestion', and then 'promote investment' and 'establish a training centre for increasing social awareness'. The participants viewed 'minimise energy consumption' as the least important factor of the identified public aspects, with the lowest mean score (\bar{x} =3.92) and the highest SD (σ =1.80).

The findings indicate that the respondents are widely concerned about the items related to environmental and development aspects including green areas, waste recycling, transport modes, reducing pollution, promoting investment and increasing renewable energy with smart management. The public's views broadly suggested the need for a comprehensive improvement in their standard of living. Seventeen of the investigated 18 indicators had mean scores more than 4 (=important), while only one had a mean rank greater than 3 (=moderately important).



The findings of the statistical analysis focused on the mean, mode and standard deviation, in order to structure the importance indicators, while investigating the priorities in the respondents' views, even though one factor was considered the least important (represented by 'minimise energy consumption') for several reasons. Firstly, Iraq's population has been suffering from electricity power-downs for more than 20 years, and, secondly, it could reflect the respondents' social background and level of social awareness, highlighting their limited knowledge about sustainability development. In terms of 'promote investment', which is the fourth most important factor, intensive efforts from the investment sector to reconstruct areas

Table 2: Urban development challenges.

Urban Challenges Items	Responses* (%)					Mean	Mode	SD
	1	2	3	4	5			
Providing parks and green spaces	16	11	31	84	608	4.68	5	0.8
Separating and waste recycling	18	16	53	108	555	4.55	5	0.90
Mitigating traffic congestion	17	18	47	139	529	4.53	5	0.89
Promoting investment	18	20	56	131	525	4.50	5	0.92
Establishing a training centre for increasing social awareness	17	12	63	159	499	4.48	5	0.89
Reducing pollution	19	24	53	138	516	4.48	5	0.94
Using renewable energy resources	20	16	76	127	511	4.46	5	0.95
Utilizing smart energy management	20	13	70	147	500	4.46	5	0.93
Improving public services	17	15	64	163	491	4.46	5	0.90
Increasing educational activities	15	25	67	176	467	4.41	5	0.93
Providing jobs within the urban projects	18	30	74	167	461	4.36	5	0.98
Using public transport	21	25	79	170	455	4.35	5	0.99
Using alternative materials	19	12	91	217	411	4.32	5	0.93
Utilizing walking and bike as transport means	16	11	31	84	608	4.27	5	0.98
Increasing cultural activities	20	26	98	197	409	4.27	5	0.99
Maximizing the use of insulation	27	36	96	194	397	4.20	5	1.07
Utilizing grey water	49	28	95	176	402	4.14	5	1.18
Minimizing energy consumption	29	41	175	222	283	3.92	5	1.08
Notes* 1=Unimportant 2= Of little importance 3= Moderately important 4= Important 5= Very important								

of Iraq have essentially been needed to restructure the framework because of weak governance, the lack of security and occasional corruption [12]. 'Provide green areas and parks' is the most important factor, due to respondents' realising the significance of increasing vegetation cover, which has a direct impact on improving climate conditions, and reducing the amount of CO₂ emissions. Green spaces also improve humans' well-being and health, helping them against diseases such as depression, as well as mitigate the effects of dust and sandstorms, particularly in Iraq [10]. This factor was followed by 'waste recycling and separation', which could be because the local inhabitants have been suffering from an increase in waste pollution and therefore they saw this item as more of a challenge than others, and felt that it should be addressed in order to tackle pollution. In response to this, 'reduce pollution' came sixth. Pollution rises with population increases, urbanisation and economic growth, in addition to increased energy and transport demands [9]. In developing economies, pollution has a wide impact, causing severe damage to the quality of life. Iraq has faced several past wars in more than four decades, which has led to widespread chemical pollution and hazardous materials. Moreover, Iraq is one of the leading countries in terms of oil reserves; thus, Iraq is entirely dependent on burning fossil fuels for power generation [11].

The third most significant priority in the eyes of the respondents was 'mitigate traffic congestion, because Baghdad recently faced significant economic prosperity, leading to a large increase in the number of cars as well as rapid urbanisation and population-inflation, because it has the highest growth-rate among many countries. Hence, it has become a more crowded city, and our national experts have forecast that the population will double in size by 2030. Nowadays, the Iraqi government is stressing that effective solutions must be found in order to mitigate the nuisance of traffic congestion. However, in terms of tackling local problems, the challenge of establishing a training centre for increasing social awareness was ranked the fifth most important aspect, because respondents realised that, to address the significant issue of achieving urban sustainable development, there is an essential need to raise Iraqis awareness of the goals of urban challenges. The factors 'maximise the use of renewable energy' and 'smart energy management' are respectively the seventh and eighth most important items in urban development challenges. Today, energy has become the lifeblood of countries, influencing effective energy management. Additionally, minimising dependency on conventional fossil fuel combined with the adoption of renewable energy results in a healthier environment and weather, by reducing CO₂ emissions [10]. Globally, clean energy resources are significantly widespread in developed countries [11]. While there are only limited efforts made to use renewable resources in developing regions, Iraq has a wide potential for clean energy resources like solar, due to its favourable location in the Middle East, an area with rich solar radiation. 'Smart energy management' is targeted at flexible, economic and safe distribution of energy with an increasing combination of renewables [10]. A smart grid system can be adopted in Iraq to implement creative and practical practices in the local context, but this requires an effective investment and policy framework.

The remaining challenges in the urban development variables have been forwarded the following factors, such as: improve public services, increase social activities, improve educational activities, provide jobs inside urban projects, use of public transport, use of alternative materials, use of clean transport mean like bike, maximise the use of insulation, and use grey water. Reportedly, local responses exist to tackle the urban and environmental issues, and also need to look forward on their presents and the future towards well-being of life [12].



5 CONCLUSION

There is a broad agreement on the fact that urban issues are important to all countries, both presently and in the future. It is an essential key challenge to engage public perceptions in investigating urban development challenges for policymaking and effective indicators in order to identify the level of importance challenges in terms of a local context. Respondents' views of the urban development indicators reflected their daily experience in the existing applications, and also their ambitions for the future. A number of these local factors have occurred because of unstable policy in such countries since 1980. This paper approach to provide designers and decision - makers with the most important indicators in terms of urban sustainable. In addition to, these indicators are the most important factors feed into investigate the local views and their priorities under the concept of sustainable development goals for. The following viewpoints as the summary recommendations

- Providing green areas and parks has been identified as the most important challenge to citizens in Iraq. The situation can improve people's standard of living further through acceptable significant investment promoting the use of vegetation cover, which is the first priority in the Iraqi context; therefore, it should be addressed as a priority in existing and new urban projects.
- Promoting the reduction of undesirable pollution and adopting waste recycling and separation of waste, as well as reducing pollution resulting from traffic congestion and burning fossil fuel, and water pollution. All these factors have been found in this paper to be widely important to the Iraqi population. Also, it is an essential requirement to convert various kinds of waste into reusable products. Waste recycling and separation leads to a decline in the consumption of raw materials.
- Maximising the combine of renewable resources and smart energy management of energy infrastructure can meet future environmental sustainability and energy-efficiency policy goals while mitigating the present-day acute electricity shortage.
- The findings of this study to identify the importance priorities, standard of living, cultural background, and social awareness towards implementing the goals of sustainable development in the existing and future urban projects. The new framework can be adopted with a wide participate from the public's opinions, in order to suit the local context and achieve their ambitions towards humans' well-being.

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