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# STUDIES ENVIRONMENTAL PROBLEMS AND CHALLENGES IN URBAN AREAS

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**ABSTRACT:**

Business, science, manufacturing, and culture all thrive in urban settings. These are regarded to be consumption centres rather than production centres. People are drawn to towns and cities by employment, prosperity, and a better quality of life. Two-thirds of the world's population is anticipated to reside in cities by 2050. This has negative consequences for the environment, such as pollution of the air, land, and water. Population expansion, a lack of facilities, greenhouse gas emissions, urban smog, congestion, noise, substandard housing, and other issues plague metropolitan regions around the world. The purpose of this paper is to provide an overview of urban environmental issues and to propose some solutions. In the Iraqi context, this study looked into stakeholders' perceptions of urban environmental concerns, as well as their importance and priority. A 25-item structured questionnaire was used to collect respondents' opinions on a 5-point Likert-type scale, as well as demographic data, in a countrywide poll (n=643). The association between perceptions of urban environmental issues and demographic characteristics was investigated using principal component analysis (PCA) and statistical testing. Water, waste, and materials; environmental effect; natural hazard; personal mobility; and transportation were identified as the five main components. According to the findings, the most critical urban environmental concern is 'water conservation,' which was followed by 'increased variety of transportation modes.' 'Effective infrastructure and utilities' was placed third by 67.2 percent of respondents as a very significant factor. With the exception of geography, all demographic factors exhibited statistically significant differences in perception.

***Keywords:*** *Environmental implications, Population growth, urban areas.*

## INTRODUCTION

When thinking about the future of the urban domain, particularly in the European and EU contexts, one of the most important strategic issues is sustainability, or the systemic interplay of environmental/ecological, economic, and socio-cultural (also referred to as "green") aspects (in the sustainability context). Climate change, water availability, and natural resource flows, including waste streams and their uses, are all concerns in this field. When examining "green" concerns in relation to urban challenges, one place to start is with the urban space's sustainability challenges. However, there are also highly relevant considerations concerning what urban development means for other activities distributed in geographical space, as mirrored, for

example, by urban-rural connections in the form of the connection between urban space and its natural resources supporting "hinterland." Thus, the impacts of urban activities on the surrounding world are at the forefront - in all of their various ecological dimensions, such as water quality and quantity, biodiversity erosion, and the implications of chemical impact on the ecological systems of the hinterland - as well as in terms of land use competition among various functions.

The urban-rural link is not always "negative" in nature, and urban space is not always a "intruder," "eroder," or "destroyer." Instead, there is frequently an intricate interplay between functions in the urban environment and those directly connected to the rural region that benefits both parties, for example, in terms of the distribution of functional implementation duties. The two distinct areas may thus become symbiotically linked and mutually reinforcing, not least in terms of both spaces' vitality for survival. This is not to say that the urban zone does not leave an ecological footprint on the global "hinterland." Furthermore, social aspects of urban life (such as demographics, value orientation, preferences, and issues related to well-being and human satisfaction) frequently have "green" connotations, such as how a climate change-induced new water availability situation can have a significant impact on social life, and thus point to the issue of how societal priorities are allocated in such a situation. Desert towns have provided dramatic illustrations of these types of events in the past.

Many "green" concerns, such as climate change, are global occurrences (sometimes planetary in scope) that aren't always related to metropolitan space. Their broad and generic characteristics provide no insight into their specific impacts on urban phenomena. Examining a variety of such broad "great problems" must so reveal more exactly how such causal ties to urban circumstances should be viewed in terms of what has already occurred, as well as what might occur in the future. To accomplish so, it's necessary to first sketch out the broad terrain of many "great problems" that act as "drivers" of change in a variety of systems, including urban ones. This text will try a two-step summary of those relationships, in a format that will emphasise a number of such phenomena and their probable nature. All of this contributes to a greater ability to investigate various future options, such as how to design criteria for the types of possible actions that may be involved, and to make recommendations for inclusion in various policy packages at the local, regional, national, and EU levels.

The current political climate in the EU includes numerous features, some of which are recent and others which are older. The Lisbon agreements undoubtedly have a strong influence on knowledge production. The urban components of EU "green" concerns are divided into numerous strands, the majority of which are not directly related to urban challenges.

The economic crisis of 2008-10 revealed the necessity for a variety of new approaches to the current economic challenges as well as those that are anticipated at a deeper level in the future. The motto at the heart of the Europe 2020 plan, "smart, sustainable, and inclusive growth," suggests alternative paths for socioeconomic development over the next decade. Longer-term strategies for more profound adjustments will also need to be devised and implemented. This is especially true for urban difficulties in relation to green policy challenges in Europe, such as the need to change to a low-carbon paradigm. This is just one example of the global drivers that Europe is dealing with, which are frequently referred to as "great challenges."

The'smart' component of the solution package, with its connotation of 'knowledge and innovation as drivers of future growth,' is emphasised in the Europe 2020 agenda. To a significant part, the urban area exemplifies this. The necessity to address all of these issues will also bring into focus the requirement for policy coherence and the avoidance of unnecessary overlaps.

**Leading urban environmental challenges India faces**

The following are the major environmental issues in Indian cities:

1. Changes in land use/cover: As the urban population grows, so does the demand for land for diverse urban activities. Forests must be removed, meadows must be ploughed or grazed, wetlands must be drained, and croplands are being encroached upon as cities grow. This is a problem since it diminishes green cover, increases fossil fuel usage and GHG emissions, and causes a rise in surface temperature.
2. Solid trash generation, collection, and management: This is a significant difficulty because a significant amount of solid garbage is left on the side of the road to degrade, posing a significant health risk. Furthermore, there are no adequate processes in place to collect and dispose of the trash generated as a result.
3. Poor sanitation: This is a problem since a considerable part of the population still uses open defecation, which contributes to the pollution of surface and groundwater sources.

**Seriousness Of The Challenges**

- **Changes in land use/land cover:**

There is evidence that the land cover of some cities in the country, such as Bangalore, is steadily eroding. According to Kumar, Mukhopadyay, and Ramachandra (2009), the built-up area of Bangalore increased by 46 percent between 1973 and 2007, resulting in a dramatic drop of 61 percent in water bodies, owing to the strong urbanisation process. They also discovered that, as the city's developed area increased, the proportion of vegetation in the city decreased from 68 percent in 1973 to only 25 percent in 2007. Similar evidence can be found in Delhi. The city is quickly expanding, particularly on the west, south-west, and eastern sides. Because of urban expansion in the periphery areas, agricultural land has decreased by 17% (Rahman et al 2009). Agriculture accounted up 65,114 ha of Delhi's total area of 148,375 hectares in 1992, but this had decreased by 12 percent to 54,153 ha by 2004. The growth in urban area was the primary reason of this exceptional reduction in agricultural land. Because of ongoing illegal tree cutting, quarrying, and construction activities, the ridge region, which is called Delhi's lungs, has decreased significantly from 6.7 percent in 1992 to 5.5 percent in 2004.

- **Solid waste management**

In Indian cities and towns, solid waste is a significant cause of pollution. According to the Energy and Resources Institute (TERI), garbage creation in Indian cities will more than fivefold by 2047, reaching 260 million tonne per year, meaning that present solid waste generation is more than 50 million tonne per year (Asnani 2006). According to a World Bank research from 2006, India's annual municipal solid waste

generation is slightly lower, in the range of 35 to 45 million tonne, or 100,000 to 120,000 metric tonnes per day. According to Asnani (2006), the amount of solid trash produced in India's cities is increasing at a pace of 5% per year. Furthermore, waste disposal practises at open dumping sites for solid waste are woefully inadequate. Poor waste management has resulted in leachate contamination of groundwater and surface water, as well as air pollution from uncontrolled waste burning. The environmental concerns caused by solid waste are exacerbated by unscientific processing and disposal procedures.

**Impacts Of Urbanization On Various Components Of Environment**

Most of the major environmental challenges of the coming century will very certainly stem from the continuance and escalation of existing issues that are currently receiving insufficient political attention. In many nations, problems are not always spotted, or if they are, nothing is done once the problem has been identified. Climate change, freshwater scarcity, deforestation, freshwater pollution, and population increase are the most pressing challenges. These issues are extremely complicated, and their interactions are difficult to pinpoint. Examining challenges through the social-economic-cultural system is critical. Even while we have a greater understanding of how environmental concerns are linked, how they interact, and what the most effective solutions are, we still lack precise knowledge on how the issues are linked, how they interact, and what the most effective solutions are.

**OBJECTIVES**

The study's goals are as follows::

1. To discuss urban environmental issues and
2. To make recommendations for solutions.
3. To investigate the influence of urbanization on environmental goods in the country's largest cities.

**METHODOLOGY**

Stakeholder perceptions of urban environmental concerns in Iraq were investigated using a nationwide 25-item questionnaire. The questionnaire was chosen as the primary method since it allows for the efficient and coherent collection of a huge number of people's thoughts. It has been used successfully in a number of previous public perception studies on a variety of themes. Balram & Dragievi (2005) investigated views about urban green areas in Montreal, Canada, using a self-administered mail-back questionnaire. Hamilton-Maclaren et al. (2013) and Aldossary et al. (2015) used an online questionnaire to investigate public opinion in the UK and Saudi Arabia on alternative low-carbon wall construction techniques and cultural hurdles to the delivery of low-energy homes, respectively.

**Questionnaire development**

**The questionnaire was developed in five stages:**

First, as described in Section 2, an initial list of urban environmental indicators was established based on a thorough examination of the literature on urban environmental and sustainable development concerns. The applicability of the discovered indicators to the cities and regions of Iraq and the Middle East was considered.

Second, between November and December 2014, one of the writers travelled to four Iraqi governorates in the central and southern regions: Baghdad, Babel, Karbala, and Al-Najaf. Stakeholders from the public, professional, and governmental sectors were contacted by phone, social media, and internal government departments and municipalities.

Finally, based on the two previous rounds, a draught online questionnaire was created. The poll was first created in English and then translated into Arabic to allow a wider range of people to participate, including those who may not be fluent in English. The manuscript was evaluated by two experienced translators to ensure that the information was accurate and clear. In a pilot survey, the questionnaire draught was evaluated for comprehensibility and clarity of the items related to the instrument's psychometric properties. City planners, urban designers, academics, architects, civil engineers, and members of the public were among the 16 participants in the pilot project.

Fourth, the final questionnaire was delivered online, which is both faster and less expensive than a manual survey (Huang, 2006; Weible & Wallace, 1998). The survey was done between December 2014 and April 2015 using Survey Monkey (SurveyMonkey, 2016), which allows the authors to control and monitor the replies as well as perform a preliminary analysis of the results in a short amount of time (Baker et al., 2010).

Fifth, face-to-face interviews were done with the two age groups with the lowest internet usage rates, namely 55-60 years and 61 years and above. During the interviews, one of the researchers went over the questions from the questionnaire and recorded the replies on the SurveyMonkey online tool using an internet-enabled Tablet.

**Survey respondents**

The study included both men and women from various socioeconomic origins, jobs, and educational backgrounds. This study took into account all 18 governorates in Iraq's three regions: northern, central, and southern. The only criteria for participating was that the responders be over the age of 18. Respondents were notified in writing that participation in the survey was entirely voluntary and that the information collected would be kept private.

**Sampling and data collection**

In order to cover a large-scale distribution of the survey over all cities/regions of Iraq, a snowball sampling technique (Dragan & Maniu, 2013) was utilised in this study. As previously documented by Hamilton-Maclaren et al., snowball sampling expands the reach of a questionnaire to include many previously unknown people (2013). The link to the poll was delivered to a group of potential responders across Iraq by email, text messages, and social media messaging once it was released. During the survey period, the same process was performed numerous times until the required number of stratified respondents was reached.

## DATA ANALYSIS

For statistical data analysis, IBM SPSS Statistics for Windows, version 20.0 (Leech et al., 2015) was utilised. On the indicators and scale frequencies, descriptive statistics such as response percentages, means, modes, and standard deviations (SD) were calculated. The demographic data was also descriptively analysed, with frequencies and percentages computed. Cronbach's alpha () coefficient (Cronbach, 1951) was used to examine internal consistency dependability. It gave a single estimate of internal consistency or average correlation of questionnaire questions to quantify the reliability (Webb et al., 2006). Several social studies have suggested that a reliability criterion of = 0.70 is appropriate (Tavakol & Dennick, 2011).

By describing a group of connected variables, Principal Component Analysis (PCA) was performed on all 25 indicators to find the underlying structure. Scree plots and the contribution of each component to total variance (>5%) were used to determine the relevance of each component. The results of the PCA were used to apply Variance Maximization (varimax) as an orthogonal rotational method. The number of factors on which the variables under consideration have large loadings is reduced by rotation, making the analysis easier to comprehend (Mourshed & Zhao, 2012). The inclusion of an item was based on a factor loading greater than 0.40. Significant correlations between items were found using Bartlett's test of sphericity. The Kaiser-Meyer-Olkin (KMO) metric was used to determine sampling adequacy, which was 0.918 in this study. A KMO of more than 0.8 is regarded good, indicating that PCA is effective for these variables (Cerny & Kaiser, 1977).

## Results and findings

### The respondents' characteristics

A total of 643 replies were received, with 411 completing the entire survey. The final analysis will be based on 411 valid responses. The demographic features of the respondents are summarised in Table 2, which are described further below.

- Gender: About two-thirds of the respondents (68.4%) were male, with the balance being female.
- Age: The greatest percentage of participation was 19.2 percent for those aged 25 to 30, followed by 15.8 percent for those aged 41 to 45. The category of those over the age of 61 had the lowest participation rate, at 4.4 percent.
- Occupation: Government employees accounted for 53% of the respondents, owing to the fact that they make up 20% of the workforce (Alwardi, 2015). Unemployed people, students, and stay-at-home moms made up the second-largest category of responders (16.5 percent ). Qualification: An undergraduate degree was the highest qualification had by 49.1 percent of respondents, followed by a post-graduate degree held by 32.8 percent. Only 18 percent had completed secondary school or had no formal education.
- Geographical coverage: The southern region (65.9%) had the highest participation rate, followed by the middle (32.4%) and northern (1.7%) regions.
- Geographical location: the majority of respondents (83%) lived in urban areas, followed by suburban (13.9%) and rural (3.2%) areas.

**Principal component analysis (PCA)**

Table 1 shows the PCA results, factor loadings after rotation, eigenvalues, and percentages. In the range of 0.4–0.8, all questionnaire items demonstrated a significant factor loading. Environmental implications; water, waste, and materials; 10 natural hazards; personal mobility; and transportation were the five summated indices retrieved from the 25 elements. For each component, an initial analysis was performed to determine the eigenvalue above Kaiser's criterion, which is greater than 1.0. The five factors' eigenvalues ranged from 1.044 to 9.549. The results of Bartlett's test of sphericity as a factor solution revealed a substantial correlation between questionnaire items (p 0.000), indicating that all of the variables were related to one another and were eligible for further study. The KMO (0.918) statistic confirmed the sample adequacy, showing that the questionnaire variables were suitable for factor analysis and were of excellent quality (Zhao & Mourshed, 2012). The extracted total variance was 63.72 percent. The first factor, 'environmental effect,' was grouped by 10 items and accounted for the most explained variance (38.19 percent ). Only two items made up the fourth and fifth components, which accounted for 5.4 percent and 4.17 percent of the variance, respectively.

**Table 1: Rotated Component Matrix of the survey items**

| Items | Component | | | | |
|---|---|---|---|---|---|
| | Environmental impact | Water, waste & materials | Natural hazards | Personal mobility | Transport |
| Reduce environmental pollution | .837 | - | - | - | - |
| Increase vegetation cover | .826 | - | - | - | - |
| Efficient infrastructure and utilities | .816 | - | - | - | - |
| Minimise GHG emissions | .806 | - | - | - | - |
| Minimise water consumption | .763 | - | - | - | - |
| Reduce vehicles on road | .755 | - | - | - | - |
| Minimise energy consumption | .744 | - | - | - | - |
| Increase waste recycling | .719 | - | - | - | - |
| Effective and smart management of energy resources | .506 | - | - | - | - |
| Maximise the use of renewable energy | .458 | - | - | - | - |
| Promote the use of alternative sources of water | - | .711 | - | - | - |
| Use of recycled/ grey water | - | .705 | - | - | - |
| Water recycling | - | .688 | - | - | - |
| Reuse of materials | - | .669 | - | - | - |
| Sewage treatment | - | .667 | - | - | - |
| Waste separation and recycling | - | .633 | - | - | - |
| Rainwater harvesting | - | .632 | - | - | - |
| Water conservation | - | .497 | - | - | - |
| Desertification of lands | - | - | .817 | - | - |
| Drought | - | - | .762 | - | - |
| Sandstorms | - | - | .678 | -- | - |
| Promote the use of the bicycle | - | - | - | .815 | - |
| Walking as a mean of mobility | - | - | - | .803 | - |
| Increase choice of transport modes | - | - | - | - | .659 |
| Promote and provide for the use of public transport | - | - | - | - | .641 |
| Cronbach's alpha coefficient (0.925) | .918 | .866 | .751 | .706 | .657 |
| Eigenvalues | 9.549 | 2.477 | 1.509 | 1.351 | 1.044 |
| Percentage of explained variance (63.721) | 38.194 | 9.910 | 6.036 | 5.404 | 4.177 |

**Personal information and perceptions of environmental difficulty indicators have a relationship.**

To summarise data analysis and interpretation, participants were regrouped and variables were recategorized. The data did not have a normal distribution. As a result, non-parametric tests were performed on all survey questions using a non-normal distribution. On 'gender,' the Mann-Whitney U-test was used, while on 'occupation,' qualification, region, and location,' the Kruskal-Wallis test was used. Table 2 shows that all demographic factors, except geography, revealed statistically significant differences in perception.

**Table 2: Results of non-parametric test**

| PCA | Questionnaire items | Mean | Non-parametric test (p- value*) | | | | | |
|---|---|---|---|---|---|---|---|---|
| | | | Gender† | Age group‡ | Occupation‡ | Qualification‡ | Region‡ | Location ‡ |
| **Minimise environmental impact** | Efficient infrastructure and utilities | 4.45 | .427 | .067 | .877 | .223 | .581 | .324 |
| | Increase vegetation cover | 4.43 | .946 | **.046*** | .798 | .117 | .424 | .430 |
| | Effective and smart management of energy resources | 4.33 | .427 | .067 | .877 | .223 | .581 | .324 |
| | Reduce environmental pollution | 4.30 | .281 | .153 | .273 | .085 | .589 | .882 |
| | Maximise the use of renewable energy | 4.15 | .835 | .295 | .181 | .249 | .696 | .477 |
| | Minimise water consumption | 4.14 | .057 | .095 | .864 | .160 | .784 | .346 |
| | Reduce vehicles on road | 4.12 | .121 | .110 | .935 | .055 | .556 | .898 |
| | Minimise GHG emissions | 4.11 | .405 | **.018*** | .261 | .650 | .263 | .799 |
| | Minimise energy consumption | 4.07 | **.001*** | .575 | .821 | .061 | .845 | .689 |
| | Increase waste recycling | 4.05 | .052 | .062 | .245 | **.033*** | .696 | .534 |
| **Water, waste and materials** | Water conservation | 4.56 | .529 | .058 | .431 | .353 | .943 | .697 |
| | Sewage treatment | 4.29 | .901 | .903 | .135 | .212 | **.047*** | .139 |
| | Waste separation and recycling | 4.24 | .099 | .089 | **.010*** | .108 | .172 | .995 |
| | Water recycling | 4.07 | .810 | .188 | **.018*** | .314 | .263 | .650 |
| | Reuse of materials | 3.90 | .892 | .866 | .087 | .163 | .660 | .592 |
| | Use of greywater | 3.88 | .436 | .186 | **.031*** | .249 | **.002*** | .422 |
| | Promote the use of alternative sources of water | 3.86 | .972 | .059 | .510 | .931 | **.022*** | .548 |
| | Rainwater harvesting | 3.72 | .240 | .361 | .132 | .293 | .832 | .301 |
| **Natural hazard** | Desertification of lands | 4.29 | .480 | .128 | .592 | .838 | .306 | .843 |
| | Sandstorms | 4.22 | .180 | .311 | .271 | .341 | .147 | .235 |
| | Drought | 4.11 | .861 | .144 | .211 | .824 | .057 | .719 |
| **Personal mobility** | Walking as a mean of mobility | 3.95 | .053 | .168 | .356 | .836 | .174 | .701 |
| | Promote the use of the bicycle | 3.40 | **.013*** | .723 | .796 | .241 | .922 | .985 |
| **Transport** | Increase choice of transport modes | 4.46 | .463 | **.004*** | .947 | .716 | .793 | .094 |
| | Promote the use of public transport | 4.36 | .756 | .663 | .416 | .631 | .448 | .982 |

**Notes:**
* $p < 0.05$, † Mann-Whitney *U-test*, ‡ Kruskal-Wallis test

Gender has a large impact on perceptions of reducing energy consumption, but age has a substantial impact on perceptions of increasing vegetation cover, reducing GHG emissions, and expanding transportation options. The view of water, waste, and materials, as well as the utilisation of recycled/greywater, water recycling trash separation, and recycling products, is influenced by occupation. The view of water, waste, and materials is influenced by region, which encourages the use of alternate water sources, recycled/grey water, and the necessity for sewage treatment. Finally, certification has a substantial impact on component perception and waste recycling.

## Discussion

The role of stakeholders in attaining urban sustainability is critical. Their perspectives are shaped by their daily lives, places of work, and study, as well as their observations of current urban issues. As indicated in Table 4, the 25 researched items were ordered based on mean scores ranging from 3.40 to 4.56, from lowest to highest, on a Likert-type scale of 1–5.

Water conservation was deemed the most major urban environmental concern for Iraqi cities by almost 70% of respondents. Increased choice of transportation modes received the greatest mean score (x=4.56) and the

lowest SD (=0.759), followed by the highest mean score (x=4.56) and lowest SD (=0.759). Increased vegetation cover and promote the use of public transportation were scored third and fourth, respectively, for the indicator efficient infrastructure and utilities. While respondents ranked bicycle promotion as the least essential part of the study, with the lowest mean score (x=3.40) and highest SD (=1.267), it was followed by rainwater collecting.

The findings imply that Iraqi stakeholders are more worried about broad environmental issues such as water, transportation modes, infrastructure, vegetation cover, and energy management than they are about specific environmental issues. The views of the respondents are mostly in line with previous results of environmental concerns that were discovered throughout the extensive literature research. Only five of the 25 indicators studied had mean values greater than 3 (=moderately important), whereas twenty had mean scores greater than 4 (=important).

## CONCLUSION

Urbanization can be a sign of socioeconomic progress and modernisation, or it can be the source of a variety of difficulties. The city's troubles aren't all brand new. Because of the enormous growth in population in India since 1921, the urban situation had deteriorated. India's urbanisation has been haphazard and generally unplanned. These cities face issues like as rapid population growth, gross lack of infrastructural facilities and services, overcrowding and traffic congestion, crumbling old city centres, neighbourhood degradation, slum expansion, and so on. Our cities are a combination of opulence and destitution. They offer better job prospects, higher income levels, improved education, health, and social services. They are also packed, chaotic, and unsanitary at the same time. Due to urbanisation, we are currently dealing with a variety of issues such as a lack of housing and sanitation, the growth of slums, environmental pollution, urban poverty, a lack of pure drinking water, unemployment, traffic congestion, poor public transportation, improper sewage treatment, uncollected solid waste, and so on. These issues cannot be addressed without the combined efforts of local elected officials and a conscious group of city residents acting through NGOs and other local institutions. Inequality in access to services, housing, land, education, health, and employment opportunities in cities has socioeconomic, environmental, and political consequences, including increased violence, urban unrest, environmental degradation, and underemployment, all of which threaten to erode any gains in income and poverty reduction. In India, the design and execution of urban policies have never gotten the attention they need at the highest policy-making levels.

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