

## Investigating Citizens' Perceptions about the Status of Health, Safety and Environment in the City of Yazd (District 2)

Maryam Jafari Najafabadi and Mohammad Reza Elmi\*

Department of Environmental Engineering, Yazd University, Yazd, Iran  
✉ Melmi@yazd.ac.ir

*Received August 6, 2017; revised and accepted March 1, 2018*

**Abstract:** Rapid population growth and its focus on cities have affected the lives of people; and poverty, environmental degradation, pollution, lack of utilities, the decline of existing infrastructure, and lack of access to land and adequate shelter are the crises related to this issue. Cities as a centralization of people's activities and human's life do not have any choice except to accept the structure and function of system of health to ensure their sustainability; so the system of health, safety and the environment will be effective as an integrated system to manage urban. The aim of this study is to survey and determine people's point of view about health, safety and environment issues of cities they live in. Ultimately the results are used for favourable urban management and improving health, safety and environment criteria of the second district in Yazd city.

Therefore, after determining the factors affecting health, safety and environment of the city through library studies and previous activities carried out, to get the citizens' opinion the questionnaire was used and the results were analyzed by SPSS. Results show that people's point of view about desirable criterion environmental indices is 64%, about desirable criterion health indices is 66.4% and about desirable criterion safety indices is 67.4%.

**Key words:** Health, safety, environment, citizens' opinion, Yazd.

### Introduction

Environment is one of the pillars of sustainable development in each country. Without noticing environment problems natural resources and human activities will diminish and will influence the planet and human societies by unpleasant consequences.

One of the crucial aims of most of the countries are industrial development and expansion, economic and social expansion. HSE management system is based on efficient education, appropriate equipment, frequent evolution and understanding national and regional culture. So it can be used to achieving the above goals. HSE management system has been used for controlling

and improving health, safety and environment in all development plans in recent years (Taghdisi, 2006). HSE management system with simulation review of the health factor, safety and environment make a good position for implementation of environmental management standard (ISO 14001) and occupational health and safety standard (OHSAS 18001) (Young, 2003). This system can be used as the sustainable management of urban places and spaces (Barbosa, 2007) and the rate of accident and their level of consequences can be reduced to the minimum (Taghizade, 2009).

Urbanization spread rapidly and this causes lots of changes in several aspects of man's life like economic, education, housing, public health, increasing pollution

\*Corresponding Author

and destroying environment, in recent century (Abedinlo et al., 2015). Healthy, safety and environment management system by creating cultural and creative new approach and systematically, explain the interaction of health, safety and the environment; so through this way, events and problems are evaluated systematically which offer methods to do preventative measures (Taghdisi, 2006).

Health, safety and environment problems of places and urban spaces is increased with population growth; accordingly the health of citizens is threatened (Rainham, 2007). Expansion of cities and growth of population cause development in industrial and generative units. But in the process of expansion and development some kind of problems like environmental pollution, proliferation of uncontrolled urban population, increasing the rate of crime and social disorders, have influenced the reduction of citizens' safety and health (Takano, 2007).

Noticing that increasing the level of health, safety and environment in urban places plays an important role in order to response the citizens, health, safety and environment management system can be used for managing the scientific matters (Arjmandi et al., 2008).

Health, safety and environment (HSE) management is an integrated system, which is used to create a healthy, joyful environment without negative incidents by the convergence and synergistic arrangement of human resources, facilities and equipment (Khademi, 2010). History and theoretical background issues relating to the considerations of health, safety and environment in urban areas have been evaluated by adopting the theories of ecological city, which consist of two main sub-theories: sustainable urban development and healthy city. The sustainable urban development theory, resulting from the discussions of urban environmentalists, revolves around the problems associated with urban environments, which has been globally proposed by the United Nations to protect the environment, improve the quality of life, control the environment and promote economic development (Newman, 1999). It is also noteworthy that the growing movement of "Healthy City", with the aim of creating healthy cities, seeks to establish a relationship between urban living conditions and the health and safety of the citizens. This movement was first introduced by the World Health Organization (WHO) as an experimental programme in 1986 in Europe, which is looking at different communities today (WHO, 1997).

During the last half of 20<sup>th</sup> century, great efforts were made to enhance the physical, social and psychological

health of different urban groups not only to eliminate illnesses, but to realize health in its general sense (Dinarvandi et al., 2013). Health and human security converge in definitions as the adequate access to healthcare resources grounded, mental health access and equity (Bencko and Quinn, 2013). For example mental stress is a non-specific response that people may have when confronting with pressures (Kord et al., 2015; Saley, 1980). The features of environmental stimuli cause disturbance and tension (Kord et al., 2015; Cox, 1993).

Healthy, safety and environment management system encompasses seven general principles, as follows:

- **Leadership and Commitment:** Determining and documenting goals by the final responsibility of the system and assuring that these goals are worthy of attention on all organizational levels, while they are also applicable in reducing health, safety and environmental risks.
- **Organizing, References and Documentation:** This aspect of health, safety and environment management emphasizes on various domains, including designing an appropriate organizational chart, selecting the management representatives and defining their responsibilities, adequate resources allocation, determining the level of competence in the system's employees and their recruitment based on the criteria set, and formulating executive procedures.
- **Monitoring the performance of contractors to increase/decrease their wages based on their adherence to the rules and regulations of the system** requires proper communication and information exchange with the employees, managers and popular groups to benefit from their opinions. Another important aspect of this HSE element is interaction with relief groups and providing system documentation, such as a manual, executive procedures, work instructions, forms and records.
- **Assessment and Risk Management:** This aspect of health, safety and environment focuses on the training of all the staff members, as well as identifying and evaluating the health, safety and environmental risks using identification and risk assessment technologies. Such examples are incorporation analysis and its effects, and environmental impact assessment, as well as developing procedures for risk registration, performance standards at different levels and procedures for implementing the necessary measures to reduce risks.

- **Planning:** This aspect of HSE concerns the proper planning to achieve goals and take the actions required for the implementation of health, safety and environment disciplines, developing procedures to adapt the existing equipment and materials to the health, safety and environment criteria, planning and controlling the changes in the organization, emergency identification, and programming to deal with emergencies effectively.
- **Running and Monitoring:** This principle of health, safety and environment mainly focuses on developing the necessary procedures to monitor the organization's performance with established requirements, such as the goals and the performance criteria of the organization's performance based on these requirements. Such examples are the goals and performance criteria of the system, recording the progress of the organization's performance on the stated goals, registering the records and cases of non-compliance with the requirements of the system and necessary measures to eliminate non-conformities.
- **Audit and Review:** The main objective of this health, safety and environment principle is to establish effective methods for conducting the audits of all the activities undertaken in the system in order to ensure their consistency with the planned operations and revise the system at certain intervals to examine its effectiveness and integrity (Arjmandi et al., 2008).

## Methodology

### Data Collection

Yazd district 2, located in the central of Yazd province, is 2479 square kilometre with 526,276 population. To carry out the current research, the following steps were implemented:

### Compilation and Completion of the Questionnaires

In this stage, a questionnaire was developed based on the data obtained in the previous stage in order to examine the status of health, safety and environment in the study area from the viewpoint of various individuals. The questionnaire consisted of four health indicators, nine safety indicators and seven environmental indicators. It should also be mentioned that the individuals were selected randomly, regardless of their social status, from different age and sex groups. Questionnaires were distributed at different times of the day and various locations in two of the cities in Yazd province (Iran).

### Conclusion and Analysis of the Questionnaires

Statistical population of the study included all the citizens, and the sample size was calculated using the Cochran formula. In total, 100 questionnaires were completed by the selected citizens, and the data were analyzed using non-parametric Mann-Whitney and Kruskal-Wallis tests. After determining the indicators, they were evaluated based on the viewpoint of the citizens. Questionnaires were scored, as follows: very good (score 5), good (score 4), medium (score 3), poor (score 2), and very poor (score 1).

Validity and reliability are two important parameters in determining the quality of a questionnaire (Izadi, 2012). To confirm validity, the completed questionnaires were investigated by experts in the field of research, and in order to measure the reliability of the questionnaire, we used the Cronbach's alpha coefficient. If the Cronbach's alpha coefficient was  $\geq 0.7$ , the reliability of the questionnaire was favourable. In the present study (Momeni and Ghayoumi, 2011), the Cronbach's alpha of the questionnaire was calculated to be 0.78 using SPSS, which confirmed its validity.

Data analysis was performed within the frameworks of age group, gender, marital status, education status and employment status of the citizens, and the obtained results were analyzed.

## Results

In terms of the age, the respondents were divided into the age groups of 15-25, 25-45 and more than 45 years; among the participants, 39% were aged 15-25 years, 53% were aged 25-45 years and only 8% were aged over 45 years. As for gender, 48% of the citizens were male, and 52% were female (Table 1). To examine the effect of gender on the three health, safety and environment criteria, the Mann-Whitney test was used.

According to the information in Table 2, there were no significant differences in terms of gender and health, safety and environment criteria ( $P$ -Value  $> 0.01$ ).

As presented in Table 3, the Kruskal-Wallis test was used to evaluate the effect of age on the status of the three healthy, safety and environment criteria based on the classification of the participants into the mentioned age groups. The results showed the different age groups and the three criteria of health, safety and environment had variable views toward the questions raised in these three subject related section; for example the citizens aged  $\geq 45$  years had lower satisfaction compared to the other two age groups regarding the level of safety in the city ( $P$ -Value  $> 0.01$ ).

**Table 1: Descriptive statistical data indicating age and gender**

<i>Gender \ Age (Year)</i>	<i>15-25 years</i>	<i>25-45 years</i>	<i>&gt;45</i>	<i>Total</i>
Man	18	24	6	48
Woman	21	29	2	52
Total	39	54	8	100

**Table 2: The impact of gender on the three criteria of health, safety and environment**

<i>Characterizes</i>	<i>Gender</i>	<i>Number</i>	<i>Mean-Rank</i>	<i>Asymp.sig (2-tail)</i>
Health criteria	Man	48	42.81	0.05 <sup>ns</sup>
	Woman	52	57.60	
Safety criteria	Man	48	46.14	0.147 <sup>ns</sup>
	Woman	52	54.53	
Environment criteria	Man	48	43.94	0.08 <sup>ns</sup>
	Woman	52	56.56	

**Table 3: The effect of age on three criteria of health, safety and environment**

<i>Characterizes</i>	<i>Group analyzing</i>	<i>Number</i>	<i>Mean-Rank</i>	<i>Chi-square</i>	<i>Asymp.sig</i>
Health criteria	15-25 year	39	52.97	9.261	0.010*
	25-45 year	53	55.66		
	45> year	8	31.32		
Safety criteria	15-25 year	39	54.25	12.755	0.002*
	25-45 year	53	55.93		
	45> year	8	27.74		
Environment criteria	15-25 year	39	49.18	8.860	0.012*
	25-45 year	53	57.99		
	45> year	8	33.62		

Kruskal-Wallis test was used to evaluate the effect of education status on the health, safety and environment criteria. To do so, the education status of the respondents was divided into four categories of below diploma, diploma, undergraduate and postgraduate degrees (and higher). According to the results, which are presented in Table 4, the education status of the respondents had no significant effect on the health and safety criteria, while it influenced the environment criteria. In fact, citizens with higher education levels had lower satisfaction with the environmental situation in the study area. As is clearly observed from the rankings, individuals with a higher education background had higher satisfaction with the environmental conditions.

In terms of education status, 62% of the citizens in the statistical population of the study had a bachelor's degree, while only 9% had a master's degree or higher

education, 20% had a diploma, and 9% had a degree of below diploma (P-Value > 0.01).

As shown in Table 5, only 3% of the respondents were housewives, 25% were students, 38% were employees, 26% were self-employed, and about 8% had other jobs. It should also be noted that according to the results of the Kruskal-Wallis test, citizens with different occupations had similar views toward the health, safety and environment in the study area. Given the rankings, housewives and employees were more satisfied with the three health, safety and environment criteria of the city, whereas the students and self-employed individuals were less satisfied, considering that they spend more time in the city for living, recreation and daily activities (P-Value > 0.01). Pourahmad et al. (2009) also achieved a similar results in their research.

**Table 4: The effect of education on three criteria of health, safety and environment**

<i>Characterizes</i>	<i>Group analyzing</i>	<i>Number</i>	<i>Mean-Rank</i>	<i>Chi-square</i>	<i>Asymp.sig</i>
Health criteria	High school Diploma	9	70.22	8.473	0.057 <sup>ns</sup>
	Diploma	20	48.93		
	Bachelor	62	50.99		
	PhD	9	30.89		
Safety criteria	High school Diploma	9	76.78	9.728	0.051 <sup>ns</sup>
	Diploma	20	47.95		
	Bachelor	62	49.52		
	PhD	9	36.61		
Environment criteria	High school Diploma	9	80.56	13.443	0.004*
	Diploma	20	54.58		
	Bachelor	62	53.33		
	PhD	9	47.02		

**Table 5: The effect of jobs on three criteria of health, safety and environment**

<i>Characterizes</i>	<i>Group analyzing</i>	<i>Number</i>	<i>Mean-Rank</i>	<i>Chi-square</i>	<i>Asymp.sig</i>
Health criteria	Self-employment	26	42.77	7.317	0.120 <sup>ns</sup>
	Employee	38	59.25		
	Housewife	3	65.17		
	Student	25	44.68		
	Other jobs	8	46.75		
Safety criteria	Self-employment	26	47.37	7.807	0.937 <sup>ns</sup>
	Employee	38	52.71		
	Housewife	3	58.83		
	Student	25	49.84		
	Other jobs	8	49.13		
Environment criteria	Self-employment	26	43.75	7.824	0.098 <sup>ns</sup>
	Employee	38	60		
	Housewife	3	62.5		
	Student	25	43.22		
	other jobs	8	45.56		

As depicted in Figure 1, the safety criteria was more desirable in the viewpoint of the participants with a mean of 67.4%, compared to the other two indicators of health with a mean of 66.4% and environment with a mean of 64%. Overall, the status of health, safety and environment standards in the study area was considered favourable, and the selected citizens enjoyed relatively high satisfaction.

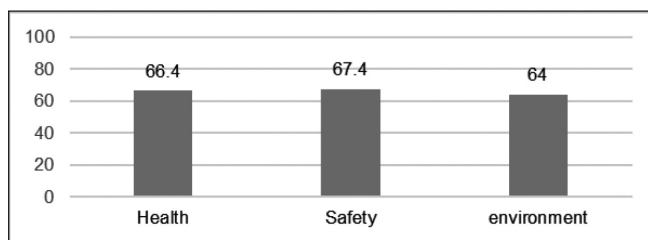
Figure 2 shows the status of the health standards. Public health and public buildings, with an average

of 70.4%, suggested the high satisfaction of the citizens regarding this issue. Timely collection and mechanization of waste, cleaning and general health at the city, with a roughly similar mean of 62%, indicate the relative utility of these items in the city because the municipality of the second district in Yazd city deals with the systematic planning, and workers regularly pay attention to the cleanliness and health of the city.

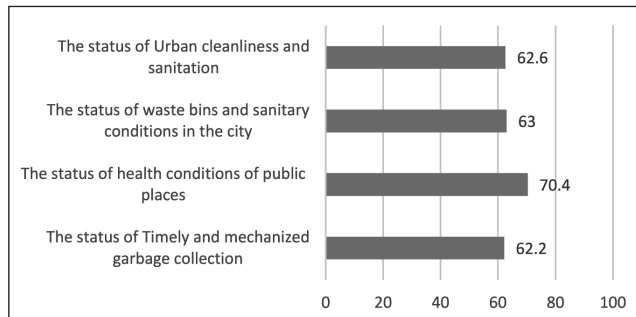
Figure 3 shows the status of the safety standards. With a mean of 52% among the nine examined



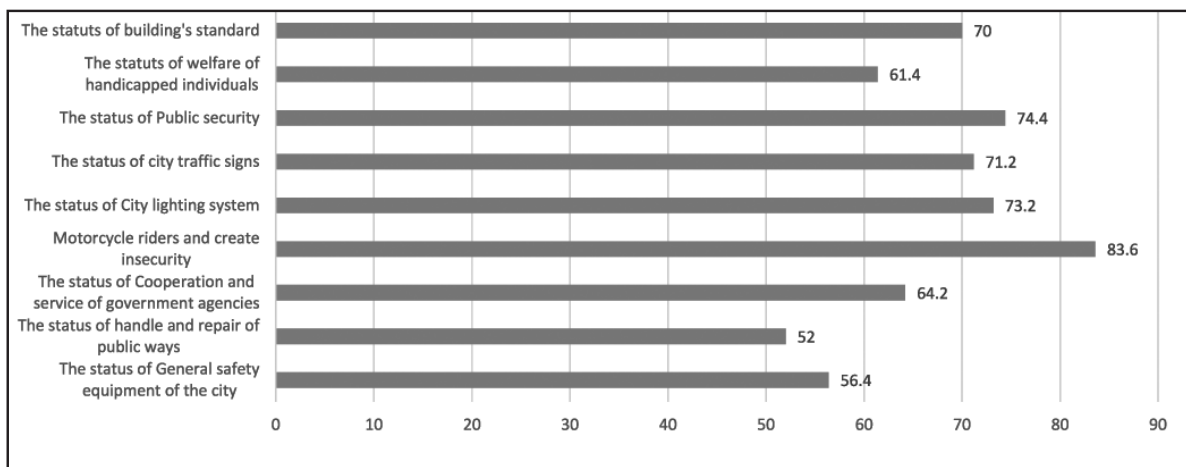
criteria, treatment status and restoration of the city's paths (pedestrians and riders) showed the lowest satisfaction rate. In this regard, 83.6% of the citizens believed that motorcyclists were among the main causes of insecurity in the city. Furthermore, lacking a special route for disabled and handicapped individuals due to the unfavourable conditions of the city-wide traffic routes caused satisfaction to be estimated at approximately 61% of the respondents since the welfare of handicapped individuals had to be provided with better services. Sobhani et al. (2012) attended the disadvantaged services for disabled people in the third



**Figure 1: Citizen satisfaction from healthy, safety and environment criteria.**



**Figure 2: The status of health criteria examined in the study area.**



**Figure 3: The status of safety criteria examined in the study area.**

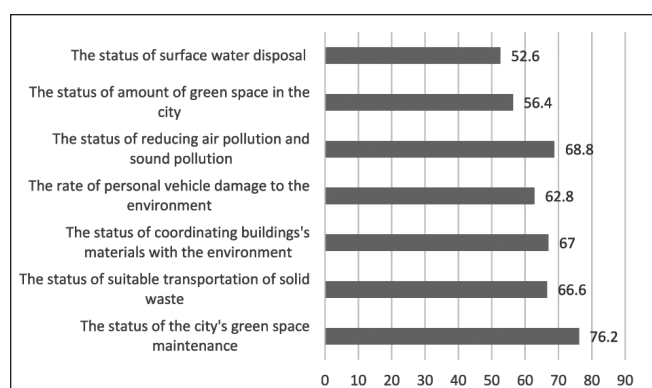
district urban parks of Sanandaj city (Iran).

Figure 4 shows the status of the environment standards. According to the findings of the current research, citizens had less satisfaction regarding the status of surface water disposal and the subsequent avoidance of water waste in the city, compared to the other six environmental criteria. This is due to the fact that in the city, the sewage disposal system and management of the sewage network is very basic, and also, there is lack of surface water disposal and its utilization.

In the present study, 76.2% of the citizens' satisfaction was toward the state of the city's green space maintenance. Fortunately, in recent years, great efforts have been made in this regard by the official organizations. As such, the citizens felt that the quantity status of the city's green space was acceptable, while according to the climate of Yazd province and importance of the green space in humidifying the air and people's peace of mind, they demanded an increase in the per capita of the city's green space.

## Discussion

Due to the urban sprawl and also type of modern life, certainly the implementation and the need to observe the three indicators of health, safety and environment (HSE) in the city is necessary, so improving these indicators is very important because of rising in this index, bring high satisfaction to different groups of people and citizens, resulting in a more dynamic society and will be happier. The purpose of completing the questionnaire was to provide citizens with an opportunity to express their



**Figure 4: The status of environment criteria examined in the study area.**

views freely on the three criteria of health, safety and the environment of their city of residence. The results of the survey of the status of three health, safety and environment criteria of the study area show that the desirable of health criteria is 66.4%, the desirable of safety criteria is 67.4% and the desirable of environment criteria is 64%. The status of all three criteria was desirable and satisfactory.

Considering the importance of health, safety and environmental issues in the city and in order to achieve its better performance, the establishment and development of a comprehensive HSE, in order to improve the status of city level can be an effective step for solving problems, and city officials and planners can make better decisions about this. In this regard, it should not ignore the role of popular participation, because by empowering people, it can prevent people from working parallel and wasting resources by attracting people (Abedinlo et al., 2015).

### Conclusion

To achieve the ideal state of health, safety and the environment, the following is recommended:

- Raising awareness of officials and experts and urban planners on issues of health, safety and the urban environment.
- Scientific management of various parts of the city, including public places and urban buildings.
- Creating an efficient way to monitor logically to the performance of development contractors for health, safety and the environment.
- Make periodic inspections and monitoring of the health, safety and environment in the city.
- Appropriate budget allocation to achieve the goals of health, safety and urban environmental

management.

- Identification of risks and prevention of incidents and adverse of health, safety and environmental events in the city.
- Creating grounds for popular engagement about health, safety and environment management.
- Make necessary coordination among the various organizations responsible for urban.
- Establish a unit of health, safety and environmental experts in the municipality of each region.
- Establishing standards and guidelines for health, safety and environmental issues in accordance with international standards.
- Standardization of all health, safety and environmental activities at the city level.
- Development and promotion of environmental culture, safety and health in the urban system through education and research.
- Studies cultural, demographic, economic and appropriate decision according to the results of the studies and the need for citizens.

### References

- Abedinlo, R., Hassanzade, N., Khosravi, Y., Jalilian, H., Majdabadi, S., Farshad, A., Sadeghi, A. and H. Amari (2015). Measurement of Health, Safety, and Environment (HSE) in Tehran. *Tehran University Medical Journal of Health and Safety at Work*, **1**: 25-36.
- Arjmandi, R., Joozi, A., Nouri, J. and A. Afsharnia (2008). Health, Safety and Environment Management in Urban Parks. *Journal of Environmental Science and Technology*, **10**: 75-89.
- Barbosa, O. (2007). Who Benefits from Access to Green Space? A case study from Sheffield, UK. *Landscape and Urban Planning*, **83**: 187-195.
- Bencko, V. and J. Quinn (2013). Environmental Risk and Risk Perception Management in Public Health. *Health*, **5**: 440-444.
- Cox, T.H. (1993). Cultural Diversity in Organization: Theory, Research, and Practice. San Francisco, CA: Berrett-Koehler.
- Dinarvandi, M., Jafari, H., Salehi, E., Yavari, A. and H. Tasa (2013). Healthy, Safety and Environment Management in District 6 of Tehran's Urban. *Journal of Environmental Studies*, **3**: 75-90.
- Izadi, F. (2012). Understanding the Environmental Assessment Villagers in District 6 of Isfahan. M.Sc Thesis, Yazd university, Iran.
- Khademi, M. (2010). Health, Safety and Environment in Industrial Processes. Avaye Ghalam Publisher.

- Kord, H., Damani, F. and A. Parvaresh (2015). The Study of Occupational Stress and its Relationship with Knowledge Management Based on HSE Bodel. Creative Education. *Scientific Research Publishing*, **6**: 1416-1427. <http://www.scirp.org/journal/ce>
- Momeni, M. and F.A. Ghayoumi (2011). Statistical Analysis with SPSS. *Mansour Momeni*. Tehran. Seventh edition.
- Newman, P. (1999). Sustainability and Cities: Extending the Metabolism Model. *Journal of Landscape and Urban Planning*, **44**: 219-226.
- Pourahmad, A., Akbarpour, M. and S. Sotoude (2009). City Green Space Management in District 9 of Tehran. *Journal of Human Geography Research*, **69**: 29-50.
- Rainham, D. (2007). Do Different in Health Make a Difference? A Review for Health Policymakers. *Health Policy*, **84**: 123-132.
- Saley, H. (1980). The stress Concept Today. In: I.L. Kutash et al. (Eds.), *Handbook on Stress and Anxiety*. San Francisco, CA: Jossey-Bass.
- Sobhani, E., Ghasemian, B. and M. Tehrani (2012). Assessing the Safety of Urban Parks in District of Sanandaj. Second Conference Environmental Planning and Management, Tehran, Iran.
- Takano, T. (2007). Health and Environment in the Context of Urbanization. *Environment Health and Preventive Medicine*, **12**: 51-55.
- Taghdisi, M. (2006). Healthy, Safety and Environment: Creative Approach to Sustainable Development. *Iran Occupational Health*, **3**: 1-5.
- Taghizade, M. (2009). Think Green, the Bedrock of Green Area. *Journal of Environmental Science and Technology*, **4**: 2-8.
- WHO (1997). City Planning for Health and Sustainable Development & Health Series, 2, WHO, Geneva. <http://dx.doi.org/10.4236/health.2013.53059>
- Young, J. (2003). Review of Efficiency and Effectiveness of HSEs Corporate Support: The Project and Background Detail. Health and Safety Executive Board Paper.