

Why Hazards Knowledge (Is hazardology an inborn characteristics)?

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What is an inborn hazardology?

Hazardology is a science in quest of health; therefore, it cannot be considered separate from other sciences. Hazardology, as a beneficial knowledge, empowers itself by utilizing geography, philosophy, mathematics, economy, psychology and other sciences. It focuses on space order of risky phenomena, the phenomenon itself, human beings, and the living environment. Balancing infrastructure with respect to their spatial pattern to reduce risks follows the inherent balance of individuals and societies. Incremental or decreasing generalization of hazards can result from the level of individuals' and societies' inherent perception. This paper discusses five levels of inherent prosperity to reduce hazards. It seems that there are five different kinds of beliefs that are based on story, narrative, exploration, and logic. All the five ideas has been chosen based on normal human thinking in order to reduce hazards.

The first belief refers the fact of humankind is a superior creature, benefiting from two great powers of intelligence and thinking about various issues, and can use them to reduce the surrounding hazards. According to this, it is expected that life becomes better for people and communities, which leads them to face lower hazards in the future. If that is not the case, the reason is that it is not based on nature. The problem is that human intelligence and power of thinking (at its best) have their own shortcomings and need time to evolve the further. Hence, in the past, human intellectual impairment has occasionally led, for example, to work in places or take actions that have been hazardous. The historical trend of hazard in the human's life indicates rise and fall, but generally, improves with a certain level of complexity. Therefore, one could hope that the 21st century man would not be more at risk than the 2nd century man. This has been the case in the past as well. The theory of human superiority, while having a religious and scientific basis, does not reduce hazards in itself, but using the power of thinking may lead to less hazard. The more intelligent and thoughtful society makes it to face less hazards. Continuous monitoring of his / her own perception of intelligence can continue to reduce risk factors. This is a matter of nature.

The second belief is that human is one of God's creatures, and does not dominate other phenomena. The basis of this belief is spiritual equality. In this, both human beings and natural phenomena are conceived as universal creatures, and God is manifested in all of them. Since any phenomenon is an expression of God, then man as a phenomenon has the same effect and does not dominate other phenomena. Symbols that are less abstract and single, such as this belief that the sun and the moon are sisters, and the perfect man shines like the sun, or the beautiful man is like the moon, the brightness and beauty ratio of the two natural phenomena is considered to measure the brightness and beauty of mankind. Seeing both beautiful, shows the natural alignment of phenomena. Recognizing the nature and its phenomena as an expression of God, and not committing sin in such a nature, is considered a kind of ritual attribute based on phenomena's nature. Hence, man is a phenomenon in a series of other phenomena, not superior to them. On the other hand, human beings evolve on the basis of the inherent acts of other phenomena. If so, it is hoped to reduce hazards; because man views the emergence of risky phenomena as a necessity for his better life and, as a result, protects the nature of the other phenomena.

These two mindsets or attitudes, which are the products of human effort have been born to reduce the hazards so far. The common point of these two opinions is that the origin of both has the same source, and resurrection. Also, the size of both is limited to human thought and intelligence. In the other words, it has been born of human beings. Since human flourishing takes place over time, the degree of flourishing and imagining of his manifestation will gradually be achieved and completed. Such an assumption of reducing risks with a degree of intellectual approach is specific to man of his time. For example, the intellectual approach of human beings of Abraham's period to reduce hazards were different of that of contemporary man. The supposed gods that Abraham destroyed were a product of some kinds of naturalism in order to reduce the hazards. The supposed gods, comparing to the thought and intelligence of a transcendent person, had a superstitious nature and was not compatible with Abraham's belief. He believed in a god who was more intrinsic than the idols, which were made by human hands, and its impact on life is meaningful and positive, who is the almighty, i.e. be capable to reduce hazards and promote human health. Such an idea emanates from his blessed nature.

The third belief is based on human sanctity. Since he is created with the impression of God, and is the master of his mind, he wants to deal with the rest of the world and phenomena godly, including hazardous events. The effectiveness of human beings, its instrumentation, and its obstinacy are realized

in these desires. Whenever he does not manifest god-like powers, ecological hazards arise from human behavior and wherever these dangers have turned into disaster, he has blamed himself and the community. An increase in such a rebuke has led to the involvement of religions, science and reason to reduce hazards. In some religions and societies, the emergence of dangers is considered as a punishment for humankind and his society. This is an example of the decline of individual and collective thinking.

Pantheism and Monotheism were practiced among ancient Greeks and the Native Americans and old Europeans, respectively. In such beliefs, the secret of the health of the interior within an ecology was the result of natural phenomena. The destruction of these ideas from Prophet Ibrahim and then Judaism, Christianity, and Islam did not merely depend on the focus on a single power. While, it depends to the fact that many of the hazards that human beings have faced, have been the same among human societies and the whole of humanity; that is the same pain that requires the same treatment. It is, however, inferred that there is a meaningful relationship between God, man and hazards. The powerful, and rebellious human needs a kind of super-power management, whether intrinsically or in terms of credit. For this reason, such a god must own all the land belonging to himself and make humans a guest [3]. Human is a stranger or passenger on the Earth and He (God) is immortal. This belief is still there. All human assets are only available to him as long as he is alive. For example, one owns a land of 300 m. which after his death becomes another person's property.

On the other hand, man does not consider himself lower than any other creatures or phenomena, and he has a high opinion of himself. Even if there was no religious argument on this issue, the intelligence and power of thinking caused him not to consider himself to be lower. You may know about the trial of Galileo by the Christian Church in the Middle Ages. He was ordered to say that the Earth does not revolves around the Sun. He said 'even if I say it does not move, albeit it does move'.

It can be said that what is past is past, and as more time passes, the duration of the past will be longer. In this process of prolongation, there are ups and downs, some of which are considered as golden age. The reason that it is called golden is that in this era human intelligence promotes to improve the quality of his life and reduce its hazards.

The fourth belief is based on humans' free will. The growing wave of interest in humans and societies into the environment, nature, God, and the reduction of hazards, stems from his self-interest. He loves himself and

consequently loves the environment. He loves himself and based on that, loves the God. He loves himself and therefore does not want to face hazards. He desires the highest level of security and health. He does not want to be alien to the Earth because he sees himself flourishing on the Earth.

These 'I want to' and 'I do not want to' and dual behavior that has led to his rise and fall, i.e. sometimes hazardous and sometimes healthy. This indicates that human and society have free will, and they are free to choose the path that leads to more/less hazards. This choice is based on the idea that humans and communities have their own soul. They are free to choose either good or evil, increase of hazards or decrease the hazards. However, the vision and insight says to choose the good. Therefore, he choose the path that leads to decrease in hazards. The fact that human is the master of his own self, and has free will to choose, gives him a kind of superiority to other phenomena and societies. The best of creators [1], according to an interpretation, it is probably based on the basis of self-ownership.

Humans' ownership and free will to choose requires to be understood by human itself. Since the nature of self-ownership and choice is gradually revealed to humans and societies, whatever he chooses, there would be some errors, i.e. he progresses towards more hazards. Since the recognition of the nature of ownership on the soul and the nature of choice evolves over time, there is a hope that human reduces its hazards in the future by acquiring more knowledge, when he understands that ownership is not him; he will be gone and left everything.

At the moment, this ownership and selection are interpretable in two stages. The first stage is the possession of the soul, which is an intrinsic property of human, is the identity of human, his potential or primary ownership. The second stage is the operational ownership. This ownership and choice is based on rational, scientific, religious, and emotional foundations, and is manifested more in the society and moves toward perfection. In the other words, there is a secondary ownership; human being enjoys this ownership based on his own efforts and his wisdom, knowledge, religious beliefs and feelings. He becomes the owner of home and land, becomes the urban man, illuminates the dark night, moves varieties of mines, reproduce himself, and becomes 'an artisan, etc. Afterward, when the ownership of each of these is compromised, he sees himself in danger. This ownership is also flourishing over time and somehow leads to perfect ownership. The wiser, more knowledgeable, and more religious individual and society are, the perfect ownership would be more flourished, and consequently there would be fewer hazards. The opposite is also true. Imam Ali says in his prayers "you the Lord are the owner and I'm owned, and will anyone

expects the owner to be merciful to me?" This prayer implies that the human property is loaned, contractual, and fleeting. According to Quran, human has a dual nature, a mixture of good and evil [1] and society is the same. Therefore, when human and society take measures to reduce hazards, that is, they act in accordance with natural laws; that is, human will have a healthy mind. If they act or behave contrary to that, they are against natural laws; that is abnormalities; that is hazards increase. To answer the question why people sometimes have hazardous behavior and sometime non-hazardous, *hazardology* has been born. Answering this question is not easy. It's enough to know that thoughtful and insightful people and societies are struggling to reduce hazards, i.e. to increase goodness.

People and societies should not use their free will to choose addiction, crime, betrayal of their rights and of mankind, or an unstable land as home. The addicted person and society have been free to choose and they chose addiction. They are still free to quit addiction. This depends on the quality of the ownership.

Accordingly, the subject of hazardology is so immense that requires deep thinking from human beings and societies. It is however difficult in practice. Those who understand the subject, must have worked hard to believe it. Being the owner of their souls, humans need a specific level of health. The health of human societies is in our control, while this is not true in other societies. Bees' society, for example, is an automatic society.

In the creation of any phenomenon with all its preconditions, there is a mode of automation. Hazardous natural phenomena are automatic by nature, which cause them to be melted in natural law.

Believing that in an entirely automated world, there is a creature with free will, that is he chooses to be or not to be, is very important.

This gives greatness to the humans and their societies. If we discard freedom and liberty from human beings, we have graded him down. People and societies face disastrous phenomena because they have graded themselves down. When human becomes a one-time-use tool, when he has no dignity, he will face more hazards too.

The fifth belief is the sum of the four above mentioned ideas to reduce hazards. In the other words, the beautiful flower that manifests its beauty in the nature, is not there for the sake of human beings. It is there and it is beautiful, because of its nature. An earthquake, in spite of destroying parts of human life and assets, make him more powerful and resistant. What do you think?

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Capabilities of Social Media for Crowdsourcing of Earthquake Hazards Management

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Abstract

The aim of this research was to study the capabilities of social media for crowdsourcing of earthquake hazards management. The capabilities were identified in the three stages of pre-earthquake stage, acute-earthquake stage (the first 24 hours), and post-earthquake stage. The research method was Delphi. The study populations were managers and experts in the field of crisis and social media, which 22 people from this community were chosen as sample. In the first phase of Delphi, interviews were conducted with experts. Then the interviews were analyzed and coded. In the second phase, a questionnaire based on the findings of the first phase was sent to the experts and their responses were analyzed. The process was repeated in the third and fourth phases. The experts reached a consensus on some of the capabilities of social media, which is characterized as follows: Pre-earthquake stage (“Seeking ideas and opinions”, “Warning”, “Rescue”, “Monitoring the performance of managers” and “Training before the crisis”), Acute-earthquake stage (“Warning”, “Rescue”, “Documentation”, “Public Participation stuff” and “Monitoring the performance of managers”), and Post-earthquake stage (“Rescue”, “Monitoring the performance of managers”, “Public Participation stuff”, “Crisis map”, “Estimated damage”, “Shortages announcement”, “The identification of the original inhabitants of the earthquake area”, “Collecting information on the dead, missing, wounded, etc”).

Keywords: Crowdsourcing, Natural Hazards, Earthquake, Hazard Management, Social Media.

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Investigation of the Impact of High-rise Buildings Shapes on their Structural Stability in order to Reduce Seismic Hazards (Case Study: The Effect of Shape of Plan)

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Abstract

Prevention from hazard is always a better option than its management and treatment. Our country, due to its geographical and natural position, is among 10 countries exposing to natural disasters. Earthquake, as the most considerable hazard, has caused significant damages yet due to existing several active faults in Iran. Hence, predicting earthquakes, and considering preparations to mitigate the vulnerability of building structures, is a top priority for designers, builders and regulators. Particularly, high-rise buildings are very important to reduce such vulnerabilities because of their high occupation area, population, effects on the environment, and special structural characteristics. In this paper, we enumerate various architectural and structural parameters that affect the optimization and stability of tall buildings against loads. We then investigate the effect of architectural form on increasing structural efficiency and stability against seismic loads. The research is quantitative, and applies modeling and simulation techniques. To assess the effect of parameters accurately, reliable architectural (Rhinoceros) and structural (SAP2000) software were used. Although, based on the results, the effect of the number of plan sides is less clear in some parameters such as inter-story drift, and maximum displacement, it reveals more obvious differences, and explicit relation between the number of sides and material weight in structural fundamental period, and structural weight per unit area. Generally, structural plans containing more sides model optimized forms due to have less weight, and present less stiffened, and more flexible behavior.

Keywords: Earthquake, Natural hazards, Architectural form, Tall building, Plan shape, Optimization

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**Spatial analysis of the urban environmental quality to hazards
reduction by the citizen's perspective
(Case study: District 18, Tehran Metropolitan)**

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Abstract

Nowadays, the quality of the environment is one of the most important concerns of the administrative and planning institutions. It is useful to perform the assessment and evaluation the amount of resident's satisfaction as well as studies over the status of the strengths and weaknesses of the urban environment. There is no doubt that studying the desire of the population to find high quality places to live is one of the main reasons of such researches. This research was aimed to check the quality of the urban environment from the perspective of citizens in different 5 regions of district 18 of Tehran Metropolitan. The method of this research is an analytical- descriptive method. The Case study of the statistical community is the residents of district 18 of Tehran. Afterward, 300 persons of this community were selected using Cochran, and spatial cluster sampling method. Methods, technologies and tools to collect data and information have been based on library studies, observations, discussion, and questionnaire. For the analysis step, different tests such as single test sample, Kolmogorov-Smirnov test-Smirnoff test, Friedman test, regression, and Kruskal output have been used. The quality of the environment in different 5 regions has been performed using GIS based on Kruskal tests output. The results show that the quality of the urban environment of district 18 was 2.45 based on the citizens' views, which is a medium quality. Among the studied criteria, the functional criterion of district 18 is lower than the environmental and aesthetic criteria. The spatial analysis among the 5 areas has shown that: the quality of the environment in area 1 is in the first place, areas 2 and 3 are in the second place, and areas 4 and 5 are in the third place. This result emphasizes that the quality of urban environment is a multidimensional fact. Satisfaction of the quality of environment is happened once the quality of integrated environmental management is realized in all aspects. In addition, the quality of the urban environment isn't just objective, but it has mental aspects. Every citizen has understanding of their environment, and attention to this matter can improve the quality of the environment.

Keyword: Urban Management, Urban Environment quality, Sustainable urban development, District 18.

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Feasibility Study of Tehran Earthquake Early Warning Network Design

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Abstract

Population increasing and irregular Immigration to Tehran, which followed by developing construction, has been increased the hazard exposure of the city of Tehran. In addition, historical urban spreading of Tehran, and surrounding by the important active faults, increase the risk of earthquake consequence. After a destructive earthquake, a capital city such as Tehran encounters to fire, subsidence, water leakage and failure of many services. Earthquake early warning system as a solution of risk reduction has been proposed in recent decades. A limited number of countries such as Japan, America, Mexico, Romania, have almost applied this system and some countries such as Turkey, Korea, China, and Italy are developing EEWS. This paper was conducted for examination of the possibility or impossibility of using the earthquake early warning system of Tehran. Consequently a feasibility study of theoretical network has been investigated. Also sensitivity analysis of some EEWS parameters has been done. Finally, according to the Tehran's active faults, we concluded that it is possible to provide alarm time for many destructive earthquakes.

Keywords: Earthquake early warning system, Tehran, Alarm time, blind zone, hazards reduction.

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The water and wastewater facilities' vulnerability in North of Tehran against Runoff (ABFA region 1)

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Urban runoff is one of the destructive phenomena, which can destroy urban structures. The facilities and equipment of ABFA in region 1 of Tehran are vulnerable for runoff during rainfalls due to the extent of upper field areas, high slope, increase of precipitation compared to other regions of Tehran, ground leveling, and inability of watercourses to surface water control. This study has been done using 10 meters resolution DEM, 1:100000 geologic maps, regional soil maps, statistical and meteorological data of study area between 1972 and 2013, population statistics of 2006, spatial data from aid and service centers, hazardous areas, and land use/land cover information. This research contains different steps. First, effective sub-criteria of vulnerability of the study are have been introduced. Then, they have been weighted using AHP-Fuzzy algorithm, and the impact of each criteria over the vulnerability of these parameters was defined using the TOPSIS algorithm. The results show the following parameters have the most impact over the increase of the vulnerability on northern part of Tehran, which all caused to prevent facilities installation in high depth: density of risk centers (gas stations and power transmission lines), urban decay, slope, relative population density, the facilities and equipment conditions (in terms of diameters and applied depth), and existence of north Tehran watercourses (Darakeh, Darband, Velenjak, Maghsoudbeyk, Jamshidieh, Darabad, and Larak). Furthermore, the results indicate that in case of an emergency in central, and northern part of study area, which have dense water supply installations, there are no specific places to install the emergency water supply structures. Contrariwise, in southern part of study area, having more urban green spaces lead to find more space to install the water supply structures in case of emergency.

Key words: Water and Wastewater, ABFA Region 1 of Tehran, runoff, vulnerability

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