

Why Hazards Science? (A New Approach to Hazard Perception)

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Introduction

When we study living environment and stories of communities and their perception of hazards, we learn that perceiving hazard was not a mere conceptual domain. It rather showed human ability to turn thoughts into action [1].

The way people and governments interpret hazards and respond to it, showed the quality of their perception. This depends in the first place on the type of hazard and in the second place, on individual and social psychology, cultural and economic components and most importantly, learning and teaching and this is not necessarily the same in all societies. Some communities are more aware of a particular type of hazard and completely unaware of the other types. Do you know the communities that belong to one of these two groups? The present paper deals with the question of what are the perceptions of the components of a community, government or government and, generally speaking, a nation. What do Iranian citizens, managers and the government perceive of the hazards? The process of perception is a delicate process. External stimuli received by a person require organization, learning and action in order to recognize and perceive a phenomenon. Perception of hazards comes from certain previous and new regular learning systems and practical experience to reduce it. Immunization against fire or earthquakes to reduce hazard, for example, is realized through education and learning from the most basic level to excellent levels (the power of perception) and participating in appropriate action (the power of action). What do the government and people perceive of hazard and what measures do they take to reduce it? Studying the perception of individuals and communities can bring significant benefits to development and living policies based on hazard reduction. [3]

Perception quality

Hazard perception is a delicate and selective process and is prior to action and happens differently in ordinary and expert people. The way ordinary people perceive hazard should be different from that of an expert who uses scientific methods [2]. The recognition of hazards increases gradually due to diligent research of many scholars. However, responding to hazard through practical

actions doesn't show a high level of awareness. In Iran, excess of developing unsustainable constructions, action without purpose, blind imitation, disregard to local science and research, lust for wealth and pure materialism are among the signs of poor perception of hazards [4]. This is just a perspective of Iran. There are other signs of poor perception of hazards in other countries such as USA. What is the solution? Providing an organizational mechanism or equipment for crisis management is not the most important strategy to reduce hazards in Iran! Reinforcing hazard perception is. I recall the day that the Geoscience Planning Committee held its annual meeting in Tabriz in 2014, I was given an opportunity to meet with a few members of Tabriz city council and the Mayor, research deputy of Tabriz University and members of the Iranian Society of Hazard Research. At this meeting, we suggested that Tabriz not imitate Tehran's behavior in management and urban development and develop a brainstorm room for its own in order to reduce hazards. Stop constructing new buildings in alleys narrower than 12 m. Given the seismicity of Tabriz and its geomorphic structure, stop constructing high rise buildings and focus on reinforcing, proper construction and stabilizing. This is a mere qualitative perception to reduce hazards in Tabriz that should be executed. Is there any action in this area? I ask my scientist friends in Tabriz that if there is an action. In Tehran, it is permitted to build several storage buildings in 4 and 6 meters alleys! If you pay a visit to areas such as Darvaze Doolab, Shoosh, Molavi, Nazi Abad, Azari, Nezam Abad and Imam Hossein, you will observe the results of decisions made based on poor perception of hazards by urban managers over the last decades. If you look at the tall, compact, and intermittent order of buildings in Imam Zade Hashim, Tajrish, you understand that how sustainable and beautiful natural landscape has changed to unsustainable dense urban zones for at least the next 100 years. The people behind these phenomena have any perception of hazards? Based on what urban engineering or service system such decisions have been taken? Is this for the benefits of the owners? Is this for the benefits of urban development? Is this helps urban sustainability? When lust overcomes conscience, the consequence would be increase of hazards and this suggests that decision makers and policy makers don't have a clear perception of hazards. And the community and people will pay for it. However, individuals and communities usually pay for the cost of hazards gradually, and not simultaneously or collectively. People who are exposed to noise and dust pollution due to uncontrolled construction or air pollution, they pay for it gradually with their lives. What is the solution? Exploring the perception of hazard represents the fact that each person has a unique background and tends to show different reactions to hazards. They do not respond the same way and they also need specific stimuli [5]. Therefore, identifying the characteristics of individuals and communities that determine the quality of perception of hazards and the appropriate action to reduce it can be a very important and complex task.

General and higher education materials, socioeconomic and political status, family sustainability, occupational status, religion, cultural and ethnic background, past experience of natural, human, technological or chemical hazards, mental health, and most importantly, the individual's and society's worldview can be among the indicators for this assessment.

Hazard perception has a duality nature, i.e. believing that addressing the reduction of hazards hinders progress and development. We may not pay attention to the difference in opinion about the importance of hazard perception. In other words, never think about and call them "evil invasion" [1]. However, we should be provident. Development and progress is not necessarily good. Communities and people who move toward development and progress without having a reasonable hazard perception, lead to no good. The devil uses lust to drive us into rapid, blind, and imitative development. This is not what we need. Unsustainable land, distorting the natural landscape, increasing distrust among citizens, increasing pollution in cities, increasing social harm and, in general, creating citizens with several crippling diseases are among the results of obeying lust?

In an ideal situation, a person or a community exposed to hazards, assess the level of hazard, study a range of alternative reducing measures, evaluate the consequences of each particular options and choose the action or a range of actions that are best suited to it. This means hazard perception and taking action to reduce them. Do world leaders at different levels have such an ideal situation? Does a mayor of a city enjoy such ideal situation? If no, they have no perception of hazards, or they have but there is no action. Imagine that a person who has no perception of the hazard of facing a reptile such as snake or scorpion and he takes no measure to eliminate the hazard. Therefore, no systematic action to reduce the hazard of snakes is seen from such a person. Enhancing the perception, observation and action to reduce the risks will bring good results. This is a desirable and scientific strategy for reducing hazards.

Inherent conservatism and resistance against new ideas might result in distortion of new achievements about perception of hazards roots and depth by authorities. This include for example, interpreting events mainly by luck.

Wisely and operative helplessness

One of the worst conditions for perceiving hazard is "wisely helplessness", where enough knowledge is available but do not contribute to hazard decrease. Therefore, people stop trying. A large part of the content of perception of hazards and its reduction in the context of humanities should be analyzed. Here's a fundamental question: has humanities contributed to enhancing perceptions of hazard and taking measures to reduce it, or has forgotten about it? All sciences

contribute to the perception of hazard and to reduce it. Despite the fact that Iran ranks 16th worldwide for generation of science, it ranks poorly in reducing hazards. The second condition is “Cognitive contradiction”, where a person or a mayor knows that the environment in which they live is dangerous, yet continue living there and perform hazardous behavior. This can lead to explicit denial of the existence of a threat. Researchers of earthquake perception have warned many times about conglomeration, compaction and non-retrofitting of the buildings in Tehran. However, city planning and municipalities do not pay attention to it. This is a cognitive contradiction. The scientist has a perception and the agent has another perception. The result of this contradiction is producing earthquake-vulnerable structures. According to an official, 80 percent of buildings in Tehran do not have the necessary earthquake resistance. Is it not time to ask ourselves, what kind of perception of hazards leads in such results? Cognitive contradiction can be seen in constructions and resource use and their effects on people and environment. When the results indicate an increase of hazard, it means that the policymaker and agent have no perception of hazard. A good perception of hazard is necessary for the scientist and agent as a balance in all processes of political, economic, technical, social and cultural development. The cognitive contradiction is that the agent pays no attention to the scientist. The former believes that he has no needs of the latter. An editorial from Hamshahri (15 Feb. 2017) titled Tehran suffers from the government’s ineffectiveness, argues that “We are not like the university professor who is theoretician. We act. We ask whether what you have done, has resulted in hazard decrease in Tehran.” How could we solve this cognitive contradiction?

People may believe in taking precautions. However it is unlikely to work well. On the other hand, it seems that the negative aspects of perceiving hazards and dangers are more significant than the positive aspects. Many people have no interest in perceiving hazards and expose themselves and many others to many hazards. They see hazard reduction and perception as an obstacle to their acts. If there was a reasonable perception of the hazard of dehydression in Iran’s water and soil resources management, Lake Urmia would have not dried. Gavkhooni Wetland would have not dried. Parishan Lake would have not dried. Haze would have not swallow Khuzestan. If there was a true perception of hazards, Gotvand salt dam would have not been there. The increasing losses of river and urban flood indicate that the agents have no reasonable perception of hazards. However, the positive aspects of hazard perception should be highlighted and expanded. We should accept the fact that scientists’ and agents’ good perception of hazard is a necessity as a strategy to reduce hazards.

Hazard perception could be considered based on three factors: fear, recognition, and exposure. Low level of exposure to hazard, decrease the overall attention to hazards. It’s not likely for example that Russians have any concerns

about earthquake since their exposure to earthquake is very low. However, earthquakes vulnerable countries could be the same. Iran and Turkey experience several destructive earthquakes each year. It seems that the high level of exposure to earthquake in Iran and Turkey has decreased the attention to the danger, whereas it should increase it. Frequent experience with a hazard should increase the level of knowledge and sensitivity. Studying hazard perception without considering the conflicting demands of people and authorities is a mistake. The scale and precision of hazard perception may depend on the degree of continuity of demand and resources at risk and the causes of social or political problems in societies. Experience has shown that if people demand it, officials will pay attention to it. Personal experience of people (for example, when they have experienced a hazard) and visual and media education and academic education in different levels may contribute to hazard perception by people and therefore their demand for hazard reduction.

Perception of hazard should be studied in its cultural context.

action about hazards is a result of total impressions and actions and social environment as well as historical events that bring the long and lasting cultural shadows to the present and future.

Even the simplest hazards are analyzed in local cultures and leads to predictable interpretation and reactions. Hence, we need a “culture of hazard perception” which is a model of individual and collective reaction to hazards. It may have roots in religion, politics, society or even science which indicates a form of consensus on reducing hazard in society. However, since societies are not monotonous entities, it is possible that we identify “sub-culture of hazard” as groups that adopt common views, but they are not necessarily homogeneous in practice.

References

- [1].Alexander David, *Confronting catastrophe, New perspectives on natural disasters*, university of Massachusetts, Oxford, 2000.
- [2].Alexander, D, E, 2002.*Priniples of emergency, planning and management*, Oxford University press, New York.
- [3].Bobrowesky. Peter. T., 2013. *Encyclopedia of natural hazards*, Springer. New York, ISBN 978-90-481-8699-0.
- [4].Moghimi Ebrahim, 2014, *Hazards science*, University of Tehran Press.
- [5].Preston, Richard, 2002. *The Demon in the freezer, a true story*, ISBN O-375-50856-2.

A Geostatistical Exploratory of Spatiotemporal Variation of Kerman's Haloxylon and its Hazardous Effect in Formation of Dust Centers

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Abstract

Dust and smooth-sands which rise up from aerosols resources have always extreme environmental and economic damages. Since 1961, development of artificial forest (Haloxylon species) has stabilized dust formation in the critical center of south and south east of Kerman. Some reports from vegetation degradation, prompted researchers to use integrative methods for monitoring and modeling the possible changes of the vegetation index. This research has used remotely sensed data (bands: 3 and 4, TM/ETM, Landsat) to obtain Normalized Difference Vegetation Index (NDVI) and studied spatiotemporal density changes of the artificial forest (according to Moran spatial autocorrelation index during the years 1987, 2000, 2005, 2009 and 2014). Meanwhile, for assessment of the role of drought effects in Haloxylon forest degradation, daily precipitation dataset of Kerman has been analyzed by using Effective Drought Index (EDI) during 1980 to 2013. While, results show that the local average of NDVI has a meaningful decrease during the mentioned years, and the Moran index was increased and expanded the cluster patterns intensively. These changes represent some disorders in the initial linear structures of planted region as well as spotted Haloxylon trees. Expansion of droughts in association with human intervention increases the intense forest degradation in the borders of Tehran and Joopar roads. Indeed, the continuation of this process is hazardous, and considered as serious threat for developing the national plans such as Haftbagh-e-Alavi (east of region2).

Key words: Moran Index, Spatial Autocorrelation, Effective Drought Index, Kerman.

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Designing a Comprehensive Model of the the Local and National Radio and TV stations role in Natural Hazards Management in Iran

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Abstract

Due to our country's high vulnerability on natural hazards and the precious and important role of local and national media in managing the hazards, this study has been conducted to achieve a native model on the role of local and national media in managing natural hazards in Iran. To design this model, we collected data, using in-depth interview, from three different groups, including victims survived in Varzaqan and Ahar, Eastern Azerbaijan province, earthquake; Sahand local broadcasting company staffs and directors, and media and crisis experts. Analyzing the data collected from the victims through Grounded Theory method, we succeeded in identifying their media needs which include: the need for information, the need for media attention, the need for education and the need to have a representative. The media needs turned into the base for the local and national media role model in managing natural hazards; a model which was designed based on opinion of Sahand local TV and radio directors and was ultimately approved by the field's experts and specialists. Based on the model, local and national broadcasting media will take the responsibility of the four roles of educating and culture-building, informing and making communication, monitoring and demanding as well as winning public participation and creating national unity whenever natural hazards occur. Using this model, local and national media, may cooperate and manage natural hazards purposefully and cohesively.

Keywords: Natural Hazards, Crisis Management, Iran, Local and National Media.

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Modelling and Prediction of Precipitation and Drought Trends in North West of Iran with the Purpose of Hazard Mitigation

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Abstract

The prediction of probability of drought occurrence in different years and its mitigation measures are at the peak of drought management decisions. The aim of present research is the prediction of drought by the use of downscaling statistical methods and artificial data creation technique. For getting the work done, a synthetic study was carried out by utilization of meteorological stations data, the outputs of statistical analyses and finally using SPI drought index. First, artificial data was produced through CLIMGEN, then SPI value was predicted. Then Minitab software was used for the calculation and drawing of the trends in selected stations of the North West. For validity approval the model was adapted by observational and produced data. The correlation between artificially created data and observed data was estimated by SPSS software. Results indicated a suitable validity for most of the stations. Accordingly, Ardebil, Jolfa, and Tekab show a smooth precipitation declining and drought increasing trend. Khoy, Mianeh, and Sardasht are among the stations which prove a moderate precipitation and increasing wet conditions, while there were not seen any changes in Tabriz, Urmia, and Parsabad stations.

Keywords: Drought Prediction, CLIMGEN Model, Drought Index, Precipitation, North West Iran.

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Effective Criteria of Building Construction Materials Selection in order to reduce ecological risks

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Abstract

Although, building industry constitutes a vital part of any economy, but also has a significant impact on the environment. The construction, operation, and ultimate demolition of buildings are among the most important factors of direct human impact on the environment (through the materials and energy consumption, pollution and loss caused by it) and indirect ones (through pressure on inefficient infrastructure). Due to the significant harmful influence of the construction industry on environmental hazards (from the point of view of such dangerous effect on ozone layer, greenhouse gases emitting, health risk and diminishing of material efficiency) the importance of creating a sustainable approach has a great potential for development of sustainability principles to manage mentioned environmental hazards. One of the most important measures in this context is to select sustainable materials in construction projects. Materials selection process is complicated and the final choice from among a large number of materials can be determined. Multiple factors are considered by the architects and construction professionals when evaluating the various categories of building materials. Often, such variety of factors present tradeoffs that make decision-making process more complicated. To facilitate the material-selection process, this paper explores one aspect of this topic which deals: Effective factors and variables needed to develop a sustainable approach to effective management of environmental hazards and evaluation model to select building materials. The factors that influence the decision-making process for architects to select materials with sustainable purposes are generated through the abundant data and the results of numerous studies in this field. These criteria could form the basis of an *assessment system* for choosing sustainable building materials with the aim of managing and reducing environmental hazards.

Keywords: decision-making process, building material selection, environmental hazards of materials

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Application of Fuzzy-Object Based Image Analysis Approach for Identifying and Zoning Salt-Dust Storms of Urmia Lake Eastern Plain

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Extended Abstract

Introduction

All recent scientific evidences aware of this fact that the impact of global changes on environmental feature cannot be disavowed and lakes as one of the environmental members, may clearly reflect these changes. Nowadays, satellite and aerial images have an important role in environmental managements, risk assessments and sustainable development, which enable managers and spatial experts to evaluate changes and extract valuable information by using available image processing techniques. In this regard, the most important aspects are detection and analysis of coastline and lakes' changes. Reasons for the lakes' demise have been related to climate change and poor water resource management practices within the lakes' watershed. In this study, Urmia Lake has been chosen because of its unique condition which has been drying up over the past years. Urmia Lake is one of the most important environmental and natural resources in Iran, as well as the region of Azerbaijan, which is known as the residence of many different species. While, recently most of them have been vanished due to catastrophic changes of the lake. This lake is the second largest salt lake in the world and first saturated salt lake in the Middle East region which has been facing destructive threats in recent years. Lake Urmia has lost a devastating amount of water during these recent years.

Materials and methods

Object-based image analysis (OBIA) approach has applied to analyze digital imagery and research objective. OBIA based rule-set were developed to monitor the salt-zones in eastern plain of Urmia lake. OBIA is known as effective approach for image processing comparing to pixel based approaches. While

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pixel-based image analysis is based on the information in each pixel, object-based image analysis is based on information derived from a set of similar pixels called objects or image objects. In this study for evaluation salt regions changes of lake, Landsat (5, 7, 8) images (acquired from USGS earth explorer) and object-based fuzzy classification method between 2010 and 2016 have been used. Many scales, shape and compactness factors were tried to reach optimum scale for segmentations. Then, some object were chosen randomly as the training data for classification. The indices such as NDVI, SI (salinity index), and BI as well as operators like "AND" and "OR" membership functions were applied based on fuzzy classification.

Result and discussion

The result of this study shows that 3,120 Km² of the lake's water area in 2010 were decreased to 887 Km² in 2014, but in 2016 by increasing in rainfall amount, water area of lake were increased to 2,475 Km², which is equal to 79% of lake water body in 2010. This changes shows the impact of rainfall in lake condition. Result of classifications between 2010 and 2016 shows that salt regions has made great progress in its amount until 2014. Afterward, the result shows a gradual descending in salt region areas to 233 Km² in 2016 and other classes have same trend. While, water trend was positive and shows a great increase in water body amount. Throughout these years, low risk and high dangerous regions faced magnificent changes and other classes like dangerous region and potential regions trends show normal changes compared to water and high dangerous classes. The study showed that southern and southeast parts have seen most of the changes that those regions almost turned to high dangerous lands. While, half northern part of the Lake toward the southern half, as well as the south-north slope direction of lake have not faced many changes.

Conclusion

In this study, object-based fuzzy classification methods and spectral indices have been used for classification. The results showed that object-based and spectral indices have better accuracy toward pixel- based methods. The reason of this high accuracy is the using of other auxiliary information like texture, color, shape and tone in object-oriented method, while, in pixel based methods, the only available information is DN (digital number) of pixel, which doesn't consists any information like shape and texture. Integration both object-based and spectral indices would present the best image classification result by increasing and improvements in spatial and spectral image resolution. All of these results indicate that environment is rapidly changing and affecting our living situation, and also the future is uncertain, vague and complex. Climate change is real and also is happening. There is no doubt that effects of climate

change would manipulate our social-economic situations, and over the time, the effects of this manipulation will be worse, that needs adaptation. But mankind can manage even the worse condition just by analyzing available data and trends. In current century, scenario-based foresight planning has shown its abilities and solutions to manage uncertain future by optimal scenarios. Spatial planners and managers can extract uncertain and vague factors which have leading roles in environmental changes (like temperature, precipitation, migration, social-economic, etc.) by these factors that may change the future of a region, city or national parks, planners can specify most important factors and based on those factors they would present plausible scenarios for the future. At last for managing and improving Urmia Lake situation by mentioned data and solutions, which discussed above, planners and managers can make and provide a better future for Urmia Lake and assist its sustainability.

Keywords: fuzzy object-oriented, Lake Urmia, Remote sensing, satellite image classification, dust storm

The relationship between ethical leadership and empowerment of the employers of the Tehran Fire Department

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Abstract

This study set out to examine the relationship between ethical leadership and empowerment of Tehran Fire Department employers. The research method was descriptive-correlation with the purpose of functionality. The study population encompassed 260 from a pool of both male and female Tehran Fire Department employers. 155 participants were estimated and selected based on Morgan Table and stratified random sampling. For data collection, a research-made questionnaire with regard to the relationship between ethical leadership and empowerment with the use of 5° Likert was implemented. The reliability was, accordingly, measured following the pilot study and the Cronbach's Alpha Coefficient of 86% and 88% of each questionnaire was obtained respectively. In order to analyze the data, T-test, Pearson Correlation Coefficient and Multiple Regression Variable (the stepwise) were used. In accordance with the formulated hypotheses and questions raised in the present study, the results revealed that there was a positively significant relationship between ethical leadership and empowerment. In other words, there will be as the equivalent increase in empowerment of the personnel as the increase in the ethnical leadership and the highest value of Correlation Coefficient was related to common interest.

Keywords: Ethical leadership, empowerment, Tehran Fire Department employers.

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