Explaining the Relationship between Demographic Characteristics and Risk Perception (RP) to Reduce the Fire Hazards (Case Study: Office High-rise Buildings in Tehran)

Seyed Yaser Mousavi[1], Shahab Kariminia[1*], Shirin Toghyani[2]

1. Department of Architecture, Najafabad Branch, Islamic Azad University, Najafabad, Iran
2. Department of Urban planning, Najafabad Branch, Islamic Azad University, Najafabad, Iran

(Received 06 January 2018 –Accept 16 March 2018)

Introduction

One of the most important points in designing high-rise buildings is considering the issue of evacuating individuals at hazards. The evacuation of individuals is related to their safety and has direct connection with demographic characteristics (Gender, Age, Noticing fire incident, Familiarity with Exit Signs). The present study has been conducted with the main purpose of achieving functional patterns of demographic characteristics in relation to Risk Perception by the individual trapped in fire in high rise office buildings, in order to reduce the hazards of fire and the increase of individual safety.

Methods

The method of study is of mixed-methods type, and the coefficient of determination (R^2) has been achieved through the analysis SPSS 22 software via independent sample t-test and ANOVA. The scope of the study consists of eight high-rise office buildings, which are exposed to fire during the years 2011-2016 in Tehran, which consists of a population equal to 245 individuals either trapped in the fire or attempted evacuation.

Discussions and Results

The results show that the demographic characteristics in relation to Risk Perception by the individuals trapped in fire has the p-value [sig $\leq$ 0.05] and are predictable.

Conclusion

Finally the study presents that women, age 20-30 years, and individuals who are exactly familiar with exit signs, have the most relation to the Risk Perception. Also, in the fire floor and the whole building, the most relation to the Risk Perception belongs to individuals whose corridor noise has informed them of the

* Corresponding Author, Email: shahab.kariminia.57@gmail.com

fire. Educating individuals and recognizing exit signs, such as signage and siren sound, to residents of high-rise buildings can increase the Risk Perception and safety, thereby reducing the fire hazards.

Keywords: Office high-rise building, Risk Perception (RP), Demographic Characteristics, Fire Hazards.

Comparison and Geographical Analysis of Runoff Risk in Urban Crossings (Case Study: Four-Regions of Kerman City)

Sadegh Karimi[1*], Hossien Ghazanfarpour[2], Najmeh Alimoradipour[3]

1. Assistant Professor of Climatology, Shahid Bahonar University of Kerman, Kerman, Iran
2. Associate Professor of Geography & Urban Planning, Shahid Bahonar University of Kerman, Kerman, Iran
3. MSc of Geography & Urban Planning, Shahid Bahonar University of Kerman, Kerman, Iran

(Received 04 January 2018 –Accept 08 May 2018)

Abstract

City is a complex geographic space where all its components act in a systematic manner, so that the disruption of any of the components of the system causes the whole problem. In addition, the global climate change and urbanization expansion, the frequency and severity of natural disasters, and the resulting damage have grown substantially. The runoff of streets and alleys is one of the natural disasters in many modern cities of Iran, which has caused many challenges due to the intensity and the time for reaction. Prioritizing the different areas of the watershed basin will help in terms of the degree of vulnerability of water pollution to the targeting of urban plans and their effectiveness in sustainable urban development. In this research, using the AHP Fuzzy model based on statistical analysis, the geographic (natural and human) indicators affecting the low and road runoffs of streets and alleys were identified in four districts of Kerman during the years 1391 to 1395. Then, using the ArcCN-Runoff in the ArcGIS environment, risk maps were drawn up in these areas. Finally, the analytical-descriptive form was compared. Spatial distribution map of runoff of sub-basins and determination of runoff of streets and alleys in different regions of Kerman showed that Region 3 has the highest risk of flooded roads in the city.

Introduction

In recent decades, due to the expansion of urbanization and immense physical growth, the acceleration of land use changes, the change of roof coverings of buildings with impenetrable materials in Kerman, urban runoff from atmospheric precipitation has multiplied several times. With increasing peak runoff run, and its occurrence in shorter time, the risk of flooding of passages in the areas of concentration of the watershed of this city has increased. Therefore, this study is to divide the different areas of the watershed of the city of Kerman

* Corresponding Author, Email: karimi.s.climatologist@uk.ac.ir

into smaller hydrological units, which can be studied accurately in the complex manufacturing process, runoff concentrations, and the identification of the spatial and geographical distribution of the flood risk of road flood in the four different districts of the city. The results of this study will help to better manage the city and improve urban life. The following is a brief overview of some of the most important researches in this area.

Materials and Methods

All information layers of the factors and complications of the standard maps for four regions of the city of Kerman were projected based on the UTM image system of the northern zone 40, and the reference elliptical base of WGS1984. For this purpose, at the beginning of the work, the boundary of the research domain (Kerman city) was considered based on country divisions. Given the availability of Landsat7 images (with a resolution of 15 and 30 meters), these images were used to update some layers needed for maps 1: 25,000. By specifying a set of criteria, each criterion is to be represented as a layer of the map in ArcGIS. The layers that represent the urban planning criteria affecting surface runoff are named as criteria maps. Once the criteria are specified, the map of each of the criteria is processed and prepared in the ArcGIS environment.

Studies in this paper were done in three levels. At first, urban planning criteria affecting runoff were determined and weighted; then, at the level of four areas of the city of Kerman, maps of spatial distribution of flood risk maps were mapped, and finally compared and ranked.

This research is applied in terms of purpose, and is based on analytical-statistical and analytical-descriptive methods. In order to collect information from the present research, documentary studies, libraries, fields, reference to the municipality database and meteorological organization statistics are available in the ending sheets and related articles; therefore, the tools used in this research is: Viewing and Fixing. In this research, the Matlab software for the weighting of the effective parameters in the creation of runoff, SMADA software for estimating the rainfall return period, and finally, ArcGIS software to show the spatial distribution of runoff flooding at the quadratic level Kerman city were used.

In several studies, SCS model based the C & CN was used for planning and management of urban runoff, indicating the performance of these models to estimate runoff altitude in urban areas. The reason for choosing the CN model in this study was its dependence on the SCS model, the simplicity and precision of its results, the conditions of the watershed of Kerman, and the quantity and quality of available meteorological statistics. This model is commonly used for small metropolitan basins, natural basins and for basins where there are no measurement data from Dubai (as in the scope of this research); in addition, the curve number is a model predictor that it records well environmental environments and is an approved method widely accepted in the United States and other countries.

Discus and Results

Finally, using ArcGIS, permeability maps and applications were prepared and using SCS relationships, a runoff height map was developed for sub-basins in district 1 of Kerman. As seen from the runoff height map of Kerman area (1), sub regions 11, 4 and 7 of this area with a runoff height of 71 mm are considered as the most problematic sub-basins for the highest risk of runoff, while the sub-basin 2 and 5, respectively, with a height of 48 and 45 mm runoff at the lowest runoff risk in this area.

Finally, using ArcGIS, permeability maps and applications were prepared and using the SCS relationships, a runoff height map for the sub-basins of Region 1 was prepared. As seen from the runoff height map of Kerman 1, sub regions 10, 11 and 7 of the urban area with the highest runoff rates of 81, 79 and 78 mm are considered to be the most problematic sub-basins for the highest risk of runoff. Sub-basins 2 and 6, respectively, with a height of runoff of 48 and 53 mm, are at the lowest risk of runoff in the area, respectively.

Finally, using ArcGIS, permeability maps and applications were prepared and using the SCS relationships, a runoff height map for the sub-basins of Region 1 was prepared. As seen from the runoff elevation map of Kerman area 3, sub regions 20, 11, and 18 of this area, with a rate of 83, 82 and 81 mm runoff, are considered as the most problematic sub-basins for the highest risk of runoff. Sub-basins 14 and 5, respectively, with a runoff height of 55 and 58 mm, are at the lowest risk of surface runoff.

Finally, using ArcGIS, permeability maps and applications were prepared and using the SCS relationships, a runoff height map for the sub-basins in Region 4 was prepared. As seen from the runoff elevation map of the 4th district of Kerman, sub regions 3 and 12 of the urban area with a runoff height of 82 and 81 mm, respectively, are the most problematic sub-basins for the highest risk of runoff, and sub basins 8 and 9, respectively, with a runoff rate of 55 and 56 mm, is considered to be at the lowest risk of surface runoff.

Conclusion

The results of the study indicate that Region 3 has the highest risk of urban flood congestion. The results of this study indicate that the most problematic runoffs in the streets of area 1 are: Mahmood Akhlaghi streets, Piranshahr martyrs, Shahid Rajaie, Danesbaz 6 boulevard, Khond Khordouh Blvd, Abbaspour Blvd, Firoozabadi 4, 11, 20 and 18 Shahid Bahonar, Bastani Parizi 3, Shohada, Mirzazadeh Kermani, Fath Ali Shahi, Imam Khomeini, Dadbin 2 and 3, Mahdieh 48 and 58, Sayedi Blvd, Managing Director 37, Shahid Nazarizadeh, Palestine 11, and Firoozeh 13.

Keywords: Flood (Runoff), Urban Watershed, Kerman City, Fuzzy AHP.

Identification of Location, Activity Time and Intensity of the Unknown Pollutant Source in River

Akram Dahmardan[1], Mehdi Mazaheri[2*], Jamal Mohammad Vali Samani[3]

1. Master of Science, Department of Water Structures, Tarbiat Modares University
2. Assistant Professor, Department of Water Structures, Tarbiat Modares University
3. Professor, Department of Water Structures, Tarbiat Modares University

(Received 19 December 2017 –Accept 14 May 2018)

Abstract

In recent years, with increasing population and growing industry, most of the world's water sources, including rivers, lakes and ground water, have been infected. This has caused health problems for humans and other living organisms. If this situation continues, Humans face water shortage and irreparable risks. Pollutant source control continuously prevents water contamination by implementing pre-occurrence measures aimed at reducing environmental hazards, it can drastically reduce the costs imposed and manage the crisis. The most important way to maintain the quality of water resources and control it, is to editing rules, and appropriate and rigorous standards, and plan for its proper implementation. The water quality of rivers should be monitored continuously, because some industries often enter the river suddenly due to its limitations. Determine the time and place of the pollutant that has been abandoned in the past, can be of great help in protecting rivers. The main objective of this research is to identify the location of the pollutant in the river without any prior information from the source in the entire mathematical framework. The strength point of the proposed inverse model is that only by taking the concentration-time curve from two upstream and downstream points of pollution can the source location be obtained with highest accuracy. After obtaining the source location, the intensity of the source of the pollutant is restored. In this study, the error was entered into the flow parameters to observe the error in the location identification, and recovery of the source pollution intensity. The result showed that this model is not sensitive to parameter error. Verification between the exact state and the results of the inverse model with acceptable accuracy was acceptable.

Introduction

In several areas of applied sciences, inverse problems are playing a crucial role in estimating unknown causes using some observed consequences. Estimations of inaccessible parameters are usually the missing bits of information that may lead to a better understanding of the occurring phenomena, and even prevent

* Corresponding Author, Email: m.mazaheri@modares.ac.ir

worse consequences. In this paper, we are interested in studying an inverse source problem. A motivation of our study is an environmental application that consists of the identification of pollution sources in surface water. In fact, when toxic substances enter lakes, streams, rivers, oceans, and other water bodies, they get dissolved or lie suspended in the water or get deposited on the bed.

In the field of reverse solving, the research projects that have been done so far are mostly associated with underground water environment and less attention has been given to surface water. In this research, using the techniques in the science of the inverse problem, it is attempted to identify the source of contamination quickly. The proposed model can identify the location, and the intensity of the source of the pollutant quickly and accurately.

Materials and methods

In this paper, the river is considered to have only one source of pollutants in it, the location and intensity of the pollutant source in this river is unknown, and no prior information from the source of contamination in the river is available. Two observation points should be selected so that one is located upstream (a) of the pollutant source, and another is downstream (b) of the pollutant source. Given that in the inverse solution of the advection-dispersion equation, a forward solution is needed, forward solving is done at the end. The river of the length of l is shown below.

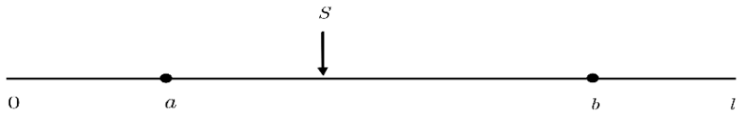

Fig. 1. Hypothetical river, and locating the polluting source, and measuring stations of concentration-time curves

The advection-dispersion equation in the above river is shown below:

$$\frac{\partial c}{\partial t} + V\frac{\partial c}{\partial x} - D\frac{\partial^2 c}{\partial x^2} + Rc = w(t)\delta(x - S) \tag{1}$$

$$c(x, 0) = 0 \tag{2}$$

$$c(0, t) = 0 \tag{3}$$

$$\left.\frac{\partial c}{\partial x}\right|_{x=l} = 0 \tag{4}$$

In the above equations, c is the pollutant concentration, D is the dispersion coefficient, V is the stream velocity, $w(\mathrm{t})$ is the pollution source intensity function, $\delta()$ is the Dirac delta function and S is the source location.

Inverse model in the river

The application of the inverse model is to identify the location, and intensity of the pollutant source by measuring the spatial distribution, and the time of concentration in the solution range. In this research, concentrations are measured by concentration measurement at two points upstream and downstream of the river. Then, the proposed model provides the location and intensity of the source of the pollutant. In the next step, the location and intensity of the source of the pollutant are obtained.

a. Identification of the location of the pollutant source in the river

At this stage, after providing numerous mathematical formulas, the source location formula has been extracted.

b. Identification of the intensity of the pollutant source in the river

Once the location is identified, the source intensity can be extracted.

Forward model in the river

Concentration-time curves must be specified on the river in order to identify the source of the unknown pollutants in the river. This is done by solving a direct dispersion equation. For this purpose, the advection-dispersion equation, forward can be solved.

Results and discussion

This section verifies the reversal of the location and intensity of the pollutant source, and examines the results of the model. The method of verification is initially considered to be a hypothetical function in a specific river location. By implementing the direct model, the concentration-time curves are extracted in the upstream and downstream of the pollutant source, the extraction curves of the direct model apply errors, this data is then returned to the inverse model with different error values, and the results of the inverse model are evaluated with a precise state. This model is done for two hypothetical examples. Then the proposed model is implemented for the actual conditions of the Karun River. In this section, the coefficients of flow, which include the coefficient of speed and dispersion, add different values of the error and reduce the effect of these errors in the results.

Conclusion

In the present study, using the concentration-time curve measurement at two points of the river, location, activity time and intensity function of the unknown

source of contamination in the river are obtained. This is done in the river without any prior information from the source. This model was evaluated by two hypothetical examples and a real example in the Karun River. In this study, an error has been found in the flow coefficients to observe the resulting error in the results. The result showed that this model is not sensitive to coefficient error. According to the results, it can be concluded that this model is capable of well identifying the source of the unknown pollutant in the river. It also works well in real river conditions.

Keywords: Recovery of intensity of a point pollutant source, Solve the inverse, Identification of location of a point pollutant source, Pollution source control.

Faithful Encountering God in Response to the Existential Hazards

Hossein Saberi Varzaneh[1*], Ghorban Elmi[2]

1. Assistant Professor of University of Tehran
2. Associate Professor of University of Tehran

(Received 20 January 2018 –Accept 08 May 2018)

Abstract

Men are encountered many hazards in their life, including –beside environmental- internal, existential and emotional ones. Such hazards are basic causes of psychological suffering, which mainly psychologists, philosophers, and mystics were busy by them, and have made different responses for it. Mowlana, the muslim mystic and Kierkegaard the Christian theologist in their deep reflections, have paid attention to the internal and existential crisis of men. So, in this article we have tried to explain their views about the essence of men's existential hazard, and have analyzed their treatment for this problem. In each part, we have said some points about their unity and distinction in thought. Our method in this investigation is descriptive-analytic with comparative approach. We have showed that both Mowlana and Kierkegaard believe that the men's essential hazard is their souls distance from infinite aspect of Being and say that the only way for freedom is faithful and true encountering God. Also, both of them have discussed about the types of encountering God and by criticizing the wrong ones, finally have chosen the passionate, individual, subjective and risky faith in response to the problem.

Mowlana believes that the soul has experienced the sense of unity with spiritual aspect of Being, before his Being created in this material form. So this distinction that is the main origin of suffering must be vanished by reconstructing the lost existential unity. To do this, human being must encounter God faithfully. But, this encountering can take several form and some of them are surely nonsufficient, so he tries to introduce the true and sufficient one. In his view, imitative faith that is based on speech can't be enough for the aforesaid end. Furthermore, philosophical and ascetic encounter aren't responsible. The good one is inward faith that has three aspect: 1- annihilation of self and selfishness, 2- using innate and essential knowledge and 3- expanding the true love. In this state, the aforesaid distinction will be disappeared, and the suffering will be finished. In his view, environmental hazards have their origin in wrath of God and not natural causes, and this wrath is because of the selfishness and sins of human beings. So the good faith can be the treatment of both existential and environmental hazards.

Kierkegaard -in some aspects like Mowlana- believes that human beings

* Corresponding Author, Email: h_saberi_v@ut.ac.ir

because of original sin, are in the state of distinction between their finite aspect of soul and the infinite God. The reconciliation of these aspects has been possible by the incarnation of God in Jesus. So, the Christians can treat this distinction by true faithful encountering God. Kierkegaard like Mowlana knows that this encountering can take several forms that some of them aren't sufficient for the reconciliation. In his view, imitative and philosophical encountering the truth of Christianity can't be enough and functional. The historical approach to this truth is also imperfect, because of its lack of true certainty. So he introduce the subjective encountering that includes some aspects: 1- the subjective and not objective encountering God, 2- passionate longing to God as our final happiness, and 3- abandoning the finitude to receive both of infinite aspect of Being and finite aspect of soul together. By this faith, the distinction will be disappeared. Kierkegaard, unlike Mowlana, has no discussion about environmental hazards, but because of his Christian heritage and tradition, he sees this sort of being in this world as the result of original sin, although he will accept the scientists' views about the near causes of natural accidents and hazards.

Keywords: Mowlavi, Kierkegaard, Existential and Environmental Hazards, Faith, God.

Analysis of the Resilience of Rural Settlements with Emphasis on Earthquake (Case Study: Homeh District Lamerd Sub-Province)

Fazel Hajizadeh[1*], Mostafa Istgaldi[2]

1. Master of Geography and Urban Planning, University of Sistan and Baluchestan, Zahedan, Iran
2. Assistant Professor of Geography and Urban Planning, Zabol University, Zabol, Iran

(Received 06 May 2017 –Accept 13 May 2018)

Abstract

The occurrence of natural hazards such as floods and earthquakes in human settlements causes irreparable damage. Hence, in order to reduce its effects, attention has been paid to the resilience approach. In this regard, the present study seeks to measure and assess the resilience of rural settlements in the suburbs of Lamerd County in four dimensions of economic, infrastructural, social, and institutional management. The research method was descriptive-analytic, which was done in both documents, and field (questionnaire). The statistical population of the study was rural villages in the suburbs of Lamerd city, with 14 villages having 20 households as samples, and the unit for analyzing the supervisors of households living in sample villages. Based on Cochran method, 355 supervisors were selected, and randomly assigned to the proportion of households in rural areas that was distributed and completed. The results of one-sample t-test indicate that the resilience of the studied villages is low, so that the social index with the mean of 3.8 was the highest. The economic, infrastructural and managerial-institutional indicators were respectively 2.79, 58 / 2 and 30/2 are lower than the average of the test (number 3). In the next step, using the path analysis model, the effect of each of the four indicators on the resilience of the settlements was investigated. Economic and institutional-managerial indices with the coefficient of 361/0 and 282/0 respectively, were the most and the least coefficient of influence. At the end of the research, strategies for re-stabilizing villages are presented in accordance with the research findings.

Introduction

Every year, millions of people all over the world die out of the natural and abnormal events of the year. The problem of natural hazards has long been a human being, and has always been a part of the history of human life. In the meantime, hazardous, devastating earthquakes are responsible for the largest number of human and financial losses, and the number of human casualties in

* Corresponding Author, Email: sayf737@gmail.com

developing countries is several times higher in developed countries. Given the seismic state of our country and the vulnerability of cities to earthquakes, today one of the most important approaches of urban planners to address this phenomenon is addressing the issue of urban immunization and preventive measures to reduce the damage caused by earthquake. In this regard, the role of resiliency is considered as one of the preventive approaches to reduce the damage caused by the earthquake. This concept, with its development in engineering science and then in the social sciences, has created a new approach to crisis management that manages crisis management from passive reaction and planning to reduce vulnerabilities to empowering communities in confronting crisis and their capacity to restore their conditions. In general, there are two types of natural disaster strategies that include prediction strategies and resiliency strategies; the first is to deal with known problems, and the latter to deal with unknown problems. In the meantime, resiliency means improving the community's ability to plan, prepare for absorption and improvement, and more success in coping with the unplanned consequences of accidents, and repairing and improving the socially, economically, ecologically, and physically damaged community.

Methodology

Among the residential places in this village, 14 villages have 20 households and more (Zanganeh, Ghaleh Mozaffar, Lashkhun, Noorabad, Hassan Abad, Tarman, Qala Ali Baba, Kachalha, Lashkhareh, Navbandi, Khalifeha, Sabkhi, Qala of Ghulam Abdullah, Mirhassani) are selected as sample villages. Regarding 958 households in these fourteen villages, using the Cochran sampling formula, the sample size was determined by 242 people, who were selected as the statistical sample to achieve more accurate results to 355 (headed households), and the questionnaire was selected in a simple random manner, which was distributed to rural households in proportion to households. To obtain a general picture of the level of resilience of rural settlements in the four indicators, one sample T-test was used. In the second stage, using the path analysis model, the relationship between each of the four indicators with the index of the stabilization of the settlements was studied, so that the indicator of settlements stabilization in a separate process as a dependent variable and four indicators of research were considered as independent variables.

Discussion

The results of one-sample t-test indicate that the social index with an average of 3.8 is the highest, and the economic, institutional, and institutional indicators are lower than the test hypothesis. In analyzing the relationship among the four indicators (economic, social, infrastructural, and institutional-managerial) with the indicator of the stabilization of settlements, economic and institutional-

managerial factors with the coefficient of 361/0 and 282/0 have the highest and lowest coefficients of influence. Therefore, in the path analysis of the factors, the economic factor was considered as the dependent variable and other factors as independent variables. The result of the analysis shows that the independent variables have a significant effect on the dependent variable.

Conclusion

In this research, based on the theoretical and experimental bases of natural disaster resilience (earthquake) in relation to the selection of suitable indicators for measuring the resilience of rural settlements in the rural districts of Lamerd city, the four dimensions (economic, social, infrastructural, and institutional-managerial) were used. The results of one-sample t-test indicate that the overall resilience of the rural settlements of Lamerd city is in the lower reaches, so that the social index with the highest average of 3.8, and the economic indicators, infrastructures, and institutional-managerial with an average of 2.79, 2.58 and 2.30, respectively, are lower than the expected assay. Therefore, the results of this study are consistent with the results of Ghaffari et al (2017), Rousta et al. (2017), Moazami and Rahimi (2016), and confirm the results of previous research. In the next step, using the path analysis model, the effect of each of the four indicators on the resettlement of the settlements was studied. Economic and institutional-managerial indices with the highest and lowest coefficients were 361 and 282/0 respectively, had influence coefficient on the resilience of the settlements.

Keywords: Natural hazards, Resilience, earthquake, Lamerd city.

Assessment of Rural Systems Sustainability Response to Drought Hazard With Wind Processes Intensification Approach (Villages in Kashan, Iran, and Bidgol District)

Bahram Imani[1*], Saeed Rahimi Harabadi[2], Neda Majidi Rad[3]

1. Assistant Professor of Geography and Rural Planning, University of Mohaghegh Ardabili
2. Ph. D. Student of Geomorphology and Environmental Management, Kharazmi University
3. Ph.D. Student of Climate Change, Kharazmi University

(Received 31 December 2017 –Accept 14 May 2018)

Introduction

The occurrence of intermittent droughts is one of the most prominent features of the climate in Kashan, Aran and Bidgol, Noshabad, and its surrounding areas, which is of particular importance due to the proximity of these areas to sandy hills (Bandarig). In this study, we investigate the relationship between the occurrence of drought and the sand dangers of sandy sandstones in the region, in order to investigate the response of the rural settlements system to drought and sandstorm. Therefore, the sand dunes of the Rig dome, which dominate the urban and rural areas of the study area affected by the drought, are more intense in the stability or instability of the rural settlements system. It is necessary to study the risks of wind erosion, and the relation with that drought phenomenon in the elaboration of this study. Therefore, understanding the relationship between drought, and the dangers of displacement of sand dunes has been done using statistical analyzes and drought indicators. In the next step, the responses of rural systems in different dimensions were studied.

Methodology

In the methodology process of this study, at first 30-years weather statistics, including climatic elements that are effective in drought occurrence, and calculation of its indicators were obtained from synoptic station in Kashan. Then, using Excel software, the data were sorted, and the drought indices such as precipitation anomaly index, normal rainfall percentage, standardized precipitation index, and Z-Score index were determined to calculate the drought and its type. Then for the changes in the morphology of the sand dunes, the statistics of the fastest winds of the station were collected, arranged, and its annual average was calculated. In the area of zoning of the gravity hazards, the general method based on the spatial analysis method using GIS and its conformance with the evidence of field documentation based on the information

* Corresponding Author, Email: bahram_imani60@yahoo.com

value method was prepared by providing the layers needed for the motion of the sand. Emphasizing the value of information was used to delimit the hazard limits. The value model of information in its implementation model is mainly based on a set of data and digital information from land units, wind patterns, geology, land use, slope, direction of gradient, and the choice of factors and factors that influence the instability of the proposal and analysis. Based on this evaluation model, the weight and share of each of the classes and units of the effective parameter in the formation of the morphology of the citadel is as follows: In the final stage, using drought data and marsh movement hazards, completed questionnaires based on the analysis of the stability of rural settlements, and the responses of rural systems. Finally, along with library studies, the sustainability response of rural systems to drought hazards was studied by the intensification of the motion of the sand.

Discussion

According to the risk maps of the mist storms in the study area, villages around Abu Zaidabad, Noushabad, and surrounding villages such as Hussein Abad, Yazdan, Amin Abad, Mohammad Abad, Fakhra, and others are among the rural settlements currently affected by storm infestations. There are no grains and can be prevented by retrofitting future damage. In managing the thresholds of crisis, strengthening the capacity of adaptation of rural settlements in the region in response to drought hazards, and the movement of sandy sand can be effective in preventing the entry of wind process hazards and mastery of sand floods. Villages around the city of Aran and Bidgol, especially the Desert and Kavirat countryside, with a population of 4001 people and 1056 households, are among the areas that are on the verge of storm floods, which some of these areas are located in a very dangerous area. For this purpose, it is necessary to better understand the behavior of sand storms with the capacities of rural settlements, and promote the attitude of rehabilitation and protection of human structures. Otherwise, the dominance of the hazards of the sand may cause compulsory migration and damage to the region. In the study area, the villages of Aran and Bidgol County have been placed especially in high risk areas. According to the results of the risk zoning map, and field studies of the area, the possible advance of the storm flood could be detected in the near future. Because of the storm of sandstorms, the lives of rural residents will be disturbed. Therefore, with regard to environmental risk management strategies, it is necessary to use the knowledge of local residents of the region. A study was conducted to prevent the occurrence of natural disasters of sandstorm in order to perform financial support and allocation of funds to the public sector, especially in hardware actions such as the construction of obstacles in the influx of sand, and the process of reducing the degree of risk.

Conclusion

Considering the results obtained in the study area, it can be said that there is a significant relationship between drought and the occurrence of rapid winds as a result of displacement and change in the morphology of the sand dunes in intensifying the motion of the sand. Hence, with increasing drought in the region with moderate to severe dryness, the sand dunes have been displaced by drought, and have become a risk in the level of rural settlements in the study area. As a result, we need sustainable management and planning in relation to the development of various environmental management activities and issues in the region. In this regard, in order to stabilize the rural settlements of the study area, the responses of rural systems in Aran, Bidgol, Kashan, and Abu Zaidabad cities were investigated at different levels of balances, crisis thresholds, hazards and natural disasters in the performance of drought-induced sand storms. Each of the above steps was studied in the status of the studied villages, such as the use of indigenous knowledge, awareness and education, village participation, adjustment capacity, and so on. The results of the study indicate that the level of environmental exposure (from environmental sources to environmental hazards) is identified in the studied villages, which requires adopting appropriate strategies that according to the degree of risk of storms, indicate the level of risk in the rural systems of the study area. In this way, some study areas such as the villages of Abu Zaidabad, and Kashan need prevention at the level of the balance, and the threshold of the crisis. While, others such as the villages of Aran and Bidgol are at risk. Altogether, these results have become more and more utilized by indigenous knowledge of the behavior of sand dunes and severe droughts over the years, and finally, the education of rural communities has revealed this process. So that eventually disasters can be avoided at the level of rural systems in the study area.

Keywords: Sustainability of villages, sand dangers, sand dunes, climate drought, Kashan strain, rural systems reactions.

Explaining Features and Dimensions of Organizational Resilience in Manufacturing Organizations Facing with Hazards and Challenges

Hamed Mohammadi Shahroodi[1], Fariborz Rahimnia[2*], Gholamreza Malekzade[3], Alireza Khorakian[4]

1. Ph.D. Student of Behavioral Management, Department of Management, Faculty of Administrative and Economic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran
2. Professor of Management Department, Faculty of Administrative and Economic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran
3. Assistant Professor, Department of Management, Faculty of Administrative and Economic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran
4. Associate Professor, Department of Management, Faculty of Administrative and Economic Sciences, Ferdowsi University of Mashhad, Mashhad, Iran

(Received 11 February 2018 –Accept 08 May 2018)

Abstract

The present research attempts to introduce features that organizations can take advantage of them to prepare themselves for challenging situations and hazards. The philosophy of this research is interpretive, which adopts a qualitative approach, and a grounded strategy based on the Glaserian emerging approach. The study population includes companies that manufacture applied products in the construction industry and operate in Mazandaran province, Iran. In this regard, in-depth interviews were conducted with experienced managers and employees who had perceived the processes of resilience, and had enough knowledge about it. The results of the interviews analyses and two stages of coding (actual and theoretical coding) showed that resilience dimensions include shock absorbing, adaptation to change, survival of the organization in the face of hazards, maintaining an acceptable position during the crisis, market leadership in times of crisis, growth experience, adequate financial strength in times of crisis, better recovery ability, increased production diversity in the face of environmental threats, satisfaction of the stakeholders in times of crisis, organizational dynamics, positive thinking, and brand credibility and reputation. Overall, due to the dimensions of organizational resilience in this native research, organizational resilience has characteristics that encourage industry managers to obtain these indicators in response to environmental hazards and external and internal challenges. Therefore, it is necessary that managers pay attention to these features and try to obtain them in order to improve the organization's status in crisis situations.

* Corresponding Author, Email: r-nia@um.ac.ir

Introduction

In the turbulent and risky environments where businesses face with many challenges and opportunities, organizations struggle to achieve their goals by focusing on problems, and using opportunities, they attempt to reach issues beyond their goals. Considering these issues, organizational studies are focused on both using opportunities and solving problems and coping with risks. Problems and difficulties faced by organizations include problems such as stagnation, crises of sales and credibility of the organization, expulsion of employees, strike of workers, lack of raw materials, lack of working capital, non-issuance of necessary licenses and the like. In addition, unexpected events and sudden changes often shock the organization [8]. In this regard, some organizations are not prepared to deal with these problems, causing a reduction in their performance levels. That is, not only they do not grow positively in the face of problems, but also their overall performance may be reduced, and they may even go bankrupt in these situations. Accordingly, it should be noted that any of the problems related to the organization may have a different impact on the organization and the human resources. One resilience expert believes that resilient human resources and organizations are considered as an opportunity. The resilience of organizations is an opportunity because these organizations make less effort to adapt to changes, so they have more (time and financial) potential to improve productivity and quality [9]. That is why organizations should consider resilience in tangible work structures in the short- and long-term [7]. A recent empirical research based on a theoretical framework expresses the extraordinary contribution of human capital to resilience of the company [10]. On the other hand, a number of researchers wrote about the concept of resilience and organizational resilience [5, 6, 14, 12, 13], but they did not agree on several factors: a) definition of organizational resilience; b) key features that individual teams or organizations must provide in order to adapt to change in a resilient way; and (c) the way in which an organization's design and structure supports resilience. These factors indicate that there are still gaps in research on resilience. Therefore, some of the resilience features remain unknown. The construction industry is a significant part of macroeconomics [15] and its resilience is important. According to the most recent statistics of the Statistical Center of Iran in the field of bankruptcy, at least 166,000 industrial workers lost their job in 2014 and 2015 as a result of disruptions of the industry. These statistics suggest that in many industries in the country, there is a resilience problem and organizations have not been able to optimize themselves in this regard, because resilient organizations usually do not go bankrupt or shut down. In recent years, most organizations in the country, especially manufacturing companies of applied products in the construction industry, have faced problems such as expulsion of employees, stagnation, lack of liquidity, job stress, bankruptcy, and so on. Therefore, measuring the resilience components in the

manufacturing industry of construction products is one of the first steps in their resilience management process. Due to the multi-year stagnation, there is almost an agreement that one of the major problems of the organizations in the country - especially the organizations that produce applied products in the construction industry - is the lack of a coherent process of resilience management, especially in defining and identifying resilience components such a way that these components and attributes will be strengthened based on them.

The concept of resilience in literature has been also referred to as balance and adaptation to change. He believes that organizational resilience is the ability of an organization to manage changes [11]. It was also defined as the ability of a system to absorb, or tolerate, a change without losing a specific feature or expected behavior [1].

Some researchers consider the three resonance dimensions as including interpretation, resilience capacity, and actions [6]. Others consider these dimensions as being a two-dimensional structure, including exposure to adversity and positive outcomes. Garmezy's triadic model described the resilience as dynamic interactions among risk and protective factors on three levels (individual, family, and environmental) [6].

Materials and methods

The philosophy of this research is interpretive and adopts a qualitative approach and a grounded strategy with an emerging approach. The study population of this research is the organizations that manufacture construction products in Mazandaran province which have been active in this industry since 2007. In general, organizations that firstly encounter different problems, stagnation, crises, or shocks, and secondly resist or grow up against those problems, are appropriate candidates to carry out this research. The qualitative repository of this research includes managers and experts from selected organizations that have theoretical and practical knowledge of the subject matter and have experienced organizational resilience in the incidence of problems. The sample includes 22 people who have at least 8 years of related work experience and full knowledge of the processes of becoming resilient. Theoretical sampling was used for sampling. Since data saturation determines the sample size in the qualitative part, more subjects were interviewed until the data saturated.

Discussion and Results

After an open and selective coding in the emerging approach, axial coding is done. Axial coding refers to the integration of concepts by a communication pattern. The theoretical codes are abstract models which lead to a wide range of mental possibilities and integrate categories into a theory [4]. Like real codes, they are spontaneous [2]. In order to integrate real codes, Glaser first introduced 18 families of coding [2] and then added 9 and 23 families of coding to the

previous family [3, 4]. According to the investigations carried out by the researchers on the relationships between concepts, it seems that in this study, the "Dimensions" family in the apparent approach allows for combining concepts and categories in the best possible way. The model of this research is included in the "dimensions coding family". Organizational resilience includes 13 dimensions. These 13 dimensions include: high impact absorbing, adaptation to change, survival of the organization in risky situations, maintaining an acceptable position in the crisis, experiencing growth in inappropriate conditions, market leadership in times of crisis, adequate financial power when faced with challenges, better recovery ability, high volume of production during threats, satisfaction of stakeholders during the crisis, organizational dynamics, positive thinking, credibility and brand reputation.

Conclusions

The discovery and analysis of many of the indicators and components of organizational resilience was mainly based on very general indicators; for example, resilience in the supply chain, resilience in the production, and so on. These indicators also had limitations. The limitations of the indicators are due to the researchers' different views on organizational resilience, and most indicators have less attention to all organizational issues such as supply, production, marketing, sales, distribution, and so on. However, current research has tried to examine the resilience from an organizational point of view and measure its dimensions. As presented in Figure 1, some dimensions are different from the dimensions of previous researches. But others, such as shock absorption, adaptation to change, survival and better recovery, have been somewhat as what had been mentioned in previous researches. Although many of these dimensions have been observed sporadically in several studies, this study, by taking into account these components together, provided a more comprehensive view. Another noteworthy point is that the new aspects of each of these dimensions appeared in the current research. For example, although the shock absorption has been discovered in previous researches, some of the shock absorption concepts considered in this study are somewhat different from previous studies. Some of these aspects include the ability to replace an expert workforce with outside personnel, access to different distribution centers, no loss when selling a product due to multi-product, low mental vulnerability in personnel, no significant decline in sales compared to new products of the competitors, coverage of vulnerable parts by other parts of the organization, shock absorbing in the supply of raw materials, low vulnerability to employees layoff, low vulnerability to changing customer demands, and low vulnerability to operational processes. Similarly, other dimensions that have been somewhat mentioned in earlier researches also have different aspects in this research. On the other hand, some behavioral, financial, and marketing indicators were also

considered in this study which had been rarely seen in research, such as high volume of production during environmental threats, adequate financial power when faced with challenges, maintaining an acceptable position in the crisis, high shock absorption, adaptation to change, satisfaction of stakeholders during the crisis, positive thinking, credibility and brand reputation, market leadership in times of crisis. Each of these dimensions also has different meanings and implications that are mentioned in the Findings section. In general, the resilience dimensions taken into account in this study are somewhat different from the dimensions and components found in previous studies. On the other hand, some of those dimensions are among the causes of resilience and cannot be considered as its dimensions. For example, management and governance structure, minimizing disturbing thoughts, information and knowledge, leadership, planning strategies and so on, contribute to resilience, which have been considered as components in some researches, and it is best to consider them as a part of the characteristics of resilient organizations rather that organizational resilience. Resilient organizations include features such as the causes and dimensions of a phenomenon, while organizational resilience must include dimensions. On the other hand, when the dimensions of a concept are examined, they should be brought together in order to achieve the desired concept. The dimensions mentioned in this study explain the characteristics of organizational resilience to a large extent. In sum, this research presented a native and novel horizon regarding the dimensions of organizational resilience.

It is recommended that future researches examine resilience in different parts of the Iranian organizations, because despite the limited examination of resilience in foreign studies, domestic studies have not focused on this issue. The discovery of resilience features in the marketing and distribution sectors, the resilience features of supply chain, and the resilience of the logistics and support sector during the crisis are among the recommended topics for future research. On the other hand, the study of the causes of the shock absorption in organizations, adaptation to changes, and other dimensions of resilience are among subjects that can be specifically examined.

Keywords: resilience, organizational resilience, dimensions of resilience, emerging approach.