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ORIGINAL ARTICLE

THE ROLE OF MORPHOLOGICAL STUDIES IN THE NATURAL HAZARDS OF THE KHOSHABAR BASIN OF REZVANSHAHR

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ABSTRACT: According to geomorphic hazards can be regarded as the group of threats to human resources resulting from the instability of the Earth's surface features. The portance of these features is concentrated on the response of the land- forms to the processes, rather than on their original source. Notwithstanding the lack of the use of the concept geomorphic hazard , geomorphology has an important task to fulfill in terms of natural hazards research. Magni- tude and frequency, as well as temporal and spatial scale, are key geomorphic concepts strongly corer- lated to natural hazards and hard geographical nature of Iran, along with human being, plays an effective role in destruction and providing environmental damages . Overflowing of the rivers arising from mountainous position of the country and the flow of running waters in their mountainous bed, creates enormous destructive power , especially , at the time of heavy precipitation. This study has examined the role of geomorphology studies in the natural hazards of the Khoshabar basin of Rezvanshar, using a descriptive and analytical method , and the main purpose of this research is to identify the geomorphic elements of the basin and the environmental hazards depended on the geomorphologic elements of the investigated region . The main hazards that have affected the Khoshabar watershed and cause this basin to be critical in terms of flooding has been erosion factor which sometimes human performance reinforces this factor. Concerning geomorphology in this basin there are various forms of erosion, sliding, crawling, falling, river and rocky cliffs; and other risks and hazards in the basin of flooding are drought and pests.

Key words: Geomorphology, natural hazards, the Khoshabar basin of Rezvanshahr

INTRODUCTION

Before the appearance of Homo sapiens on Earth, the purely natural system ruled our planet. Many geophysical events such as earthquakes, volcanic eruptions, land sliding, and/or flooding took place threatening only the prevailing flora and fauna. Millions of years later, the human presence transformed Cruden, D. M. (1996) the geophysical events into natural disasters. The transformation of these geophysical events into natural disasters occurred simultaneously with the appearance of the human system, when human beings began to interact with nature, when fire was discovered and tools were made from the offerings of the natural habitats. The evolution of humans left behind the age in which only nature existed . It provided the starting point of the interrelation of the human system with nature. The human system itself was subjected to significant transformations, where the concept of work and hence of social division of work, production relations and economical–political systems appeared. These transformations and their links to the natural system have served as templates of the dynamics of natural hazards and therefore, of natural disasters. Today, considering the increased population and after that developing of cities, human constructions have been increased in various geographical environments so that if a planning is performed without identifying the abilities and limitations of the natural environment, there will be problems Natural hazards are inseparable part of the human environment which dose not discriminate between the people of a society and those of the other societies and generally , any crisis not only depend on the natural factors , but also on the irregular constructions in the limits of faults and in the route of the rivers, unsuitable use of lands, weak management and inappropriate planning , inefficiency in the base map of land use and in the geographical map of hazard dispersion (location map of natural hazards) which all are performed by human being without considering the abilities and potential risks of the region . Natural hazards are considered one of the main obstacles of the sustainable development and their occurrence always is a barrier to economic, social and construction development. The real estate market has collapsed, with some construction projects having been abandoned midstream am, and about 2/3 of the residences remaining vacant. Z ions, the holding bank of the property, conducted a long and futile search for a new

to 37 31 43 degrees north latitude. The Khoshabar basin in Rezvanshar township is one of the main branches of Shafarood River located in the western Guilan which originates from 1828 m Amirkooh heights in the west , the Khalestan mountain in the north west and the Sekoohsar in the south west and with many branches after crossing over various region such as Dashtmian , Chozovil , Khalgovan , Shirvankhan baba and so on and connects to Shafarood River in the Sarak region . Politically, the basin is located at the north of Rezvanshar Township and its direction is south to north and at last, after running in the long course discharges into Caspian Sea . Guilan Province always is considered as a province without problem concerning the climatic conditions and geographical special position , whereas this province has various hazards in itself. The Khoshabar basin of Rezvanshahr is one of the major branches of the Shafarood River located in the western Guilan which originates from 1828 m heights in the west , Khalestan mountain in the northwest and Sekoohsar in the southwest and with many branches after crossing over various regions such as Dashtmian , Chozovil , Khalgovan , Shirvankhan baba , and so on connects to the large Shafarood River in the Sarak region . This basin also like other basin of the Guilan province is facing with natural hazards and is not excepted from this matter . Examining the geomorphology factors and their effects on the natural hazards of the Khoshabar basin will be in direction of optimal planning and decreasing the environmental hazards . seems that identifying the geomorphology factors of the investigated region plays a role in decreasing the environmental hazards of the basin . that the factors of slope and decreased vegetation have the main role in making erosion and environmental hazards of the Khoshbar Basin. basin is among the western basins of Guilan province This basin leads from the north to the Shafarood basin , from the south to the Shanderman and Bargam basin and from the east to Caspian Sea and from the west to the Ardabil basins . This basin is in the political limit of Rezvanshahr township and the most important population centers of this basin are the villages of, banaser , Siahbil , Tango , Bazasht , Luchal , Chozovil , Khalasht , Dashtmian , Khalgvan , Emamzade Shiroche bil and Shiroche bil , Rovol , Ovush and Koltoo.The Khoshabre basin has a main branch named Khoshabar which is one of the minor branches of The Shafarood basin. The lowest part of the basin is located at near Sarak village with 140 m from the sea level and its highest part is located at

investor to take over the d envelopment project (Meyers, 2008). New investors may have been daunted by the prospect of inheriting problems , and the complications of meeting the more specific code s specified in the Draper City Geologic Hazard Ordinal nces (2007), which was enacted in December 2007 (Sanchez , 2009).In June 2009, Zion's bank filed a $25 million lawsuit against the city of Draper for mismanagement t of the site (Smart, 2009). It seems clear that this ba nk-owned “master-planned community” developed on top of one of Utah’s largest landslide deposits faces an unstable and litigious future. Considering the above factors, this study intends to examine the role of geomorphology studies in the natural hazards of the Koshabar basin of Resvanshahr and on this basis is divided into five parts . Recently, attention has been paid to the prevention, reduction and mitigation of natural disasters by creating a Scientific and Technical Committee of the International Decade for Natural Disaster Reduction (IDNDR). Efforts within this international framework have been taken worldwide; however, since natural disasters continue to devastate developing countries (e.g. Hurricane Mitch in Central America), a major emphasis on prevention should be addressed [or undertaken] by institutions at all levels, namely international, national, regional, local, etc. Strategies for prevention of natural disasters are universal, yet, their applicability needs to take into account the particular characteristics of the threatened entity, in such a way that a better understanding of the vulnerability of a specified social entity (natural human) could lead to the development of adequate disaster prevention strategies. Understanding and reducing vulnerability is undoubtedly the task of multi-disciplinary teams. Amongst geoscientists, geomorphologists with a geography background might be best equipped to undertake research related to the prevention of natural disasters given the understanding not only of the natural processes, but also of their interactions with the human system. In this sense, geomorphology has contributed enormously to the understanding and assessment of different natural hazards (such as flooding, landslides, volcanic activity and seismicity), and to a lesser extent, geomorphologists have started moving into the natural disaster field.

MATERIALS AND METHODS

The geographical coordinates of the Khoshabar basin in Guilan Province are located at 48 51 11 to 49 01 52 degrees east longitude and 37 25 14

circumference is 39.15 km . The map 3.1 show the position of the basin in Rezvanshahr township.

Figure1: pallidus in the loss of land and destroyed

Figure2: gully erosion, vandalism, land

Figure3: The change in land use and erosion Earth

Figure4: Creating a landslide destroyed the

Figure5: The flood destroyed the original

Figure6: Surface Erosion in Pasture

Figure 7: The destruction of the bridge due to flooding

METHODS

It is a area of a region where the runoff resulted from the perspirations on it all naturally is directed to a point called the centralization point and if the centralization point is in the basin , that is the basin forms a completely closed area it is named closed basin and if the centralization point is at the end of the basin so that the runoff can exit from the basin , it is called open basin (Alizade ,1990). For studying this basin the 1:5oooot topography maps of Resvan shahr, Asalem , Masal and Tarom have been used. The map 3.6 shows the Khoshabar basin. For study and research is the need for basic statistics maps altitude of 1900 m from the sea level . The area of this basin is 62.5 km2 and the length of its main channel to the mouth is 18.45 km and its . The topographic maps at scale 1/50000 geological maps of land use operation was , Geomorphologic studies have provided important parameters to analyze statistical tests were done to identify sensitive areas . Then, using the composition of the morphological classification of risk zones was identified. Using GIS software, maps and studies that were interpreted. Initially it is necessary to introduce the technique and naming geomorphologic facies and facies defined expression has been detected. Special case of a single thing we facies of deposits and rugged topography and climate and vegetation that makes conscious. After determining facies and geomorphic mapping by

combining maps of slope, aspect, elevation and geomorphologic maps of the unit of work that will be called homogeneous. Nomenclature of Units for each type and Abbreviations specially selected. These symptoms include a set of criteria is used to name the different parts. These symptoms include a set of criteria is used to name the different parts. To introduce the mountain means of enjoying the mountains of Mark M, To determine the type of geomorphologic taken based on the layout of the letters I and R means regular and irregular means was used. In order to determine the geomorphologic Mark O means rocky outcrops (out crop) and C as separate domains covered by sediments and soils have been used. The average percentage for each of these two types of exposure to the letter m (M small) will illustrate, To determine the morphological characteristics of each facies of the letters used in such a way that the left-to-right order of the letters of credits. Type, facies and outcrop and its percentage in the target zone show.

RESULTS AND DISCUSSION

Natural hazards and geomorphology the term natural hazard implies the occurrence of a natural condition or phenomenon, which threatens or acts hazardously in a defined pace and time. Hungr, Fell, Couture, Eberhardt (2005) Different conceptualizations of natural hazards have not only evolved in time, they also reflect the approach of the different disciplines involved in their study. In this sense, a natural hazard has been expressed as the elements in the physical environment harmful to man an interaction of people and Nature the probability of occurrence of a potentially damaging phenomenon **.**From among the various natural factors which can cause an environment to be unstable, the geological , climatic , topography , geomorphology and vegetation factors and can be pointed out and kind of living and construction activities are among human factors . Although the time factor is crucial , and many factors may change and transform over time , over time , many factors (litho logic ,topographic conditions)may remain relatively stable and other factors , especially human factors may change and transform generally (the tectonic movements like earthquake and construction activities and social and economic changes and so on) Wright, Rathje (2003). Therefore Crosta. and Frattini, (2000), by examining the above mentioned factors and the number of instability occurrence and basis for their spreading over time , their occurrence in the future can be predicted . The Khoshabar basin of Rezvanshahr township is one of the minor branches of the large Shafaroud in the western Guilan . It originates from Amirkooh heights in the west , from Khalestan mountain in the north west and from Sekoohsar in the South and it with many branches after crossing over various places such as Dashtmian , Chozovil , Khalgovan , Shirvankhan baba and so on connects to the large Shafarood River in the Sarak region. Politically , this basin is in Rezvanshahr township and its direction is from the south to the north eastern and at last connects to Caspian Sea after running in a long course . The lowest part of the basin is near the Sarak village with 140 m from the sea level and its high part is located in an altitude of 1900 m from the sea level . The area of this basin is 62.5 km2 and the length of its main channel to the mouth is 18.45 km and its circumstance is 39. 15 km .This basin concerning topography is divided two parts : foothill and mountainous . The mountainous part itself is divided into two parts of low and high . the most area of the basin is in the high lands and topographically , this basin is a mountainous basin . Concerning the soil ,in the basin is divided into the two following units : the low forest mountains where have half deep to deep monotone acid soils with heavy texture , this unit of soil is in small area of the north eastern of the Khoshabr basin ; and the high forest mountains with an altitude of 300 to 2500m from the sea level where have monotone shallow to half deep soil with heavy texture .The geomorphologic factors have role in the natural hazards of the Khoshabr basin.Considering the present findings in the fourth part of the thesis , the existence of rocky and river cliffs and various kinds of erosions in the basin and also sliding , falling , crawling and flooding and geomorphologic forms along with other natural and human factors , the geomorphologic factors have role in the natural hazards of the Khoshabar basin and the answer of the above mentioned hypothesis is positive .It seems that the slope and height factors have the main role in the natural hazards of the basin .Topography of the basin shows that the above basin is mountainous and steep .Considering destruction of vegetation and changing land use in the basin by residents around the main river and various forms of erosion , the role of topography and slope is completely effective and the risk of flooding and other hazards in this basin have relationship with slope and topography . Therefore , slope and height factors have the main role in the natural hazards of the Khoshabar basin and the answer of the above hypothesis is positive .Facies MIO: Domain irregular outcrop and rocky outcrops cover

about 10 to 20 percent attrition in the rocky outcrops of the mountain. It faces a total of 19.6% of the catchment area covers. Facies MIOm: irregular slopes covered with erosion and deposition of detached rocky outcrop about 50 to 70 percent, and about 50 to 30 percent of the mountain unit. This facies makes up about 11 percent of the surface area of the Khoshabar basin. Facies MIC: irregular slopes covered with erosion and deposition of detached in some places rocky outcrop about 10 to 20 percent of this rocks are discussed on a small area of about 5 acres to be seen. Facies MOm: Regular the erosion and deposition of detached rocky outcrop about 50 to 70 percent, about 50 to 30 percent (geological strata with steep topography is too steep), the scope of its area is about 65 hectares and, MRC: The corrosive cover regular and sometimes discontinuous deposits of approximately 10 to 20 percent exposed and rocky outcrops. This is the highest level in the basin, and about 62 percent of the area it serves. QA: terraced alluvial deposits of the rivers and mountains that had been on the land for gardening and agriculture, with the main river bed sediments, the sediments are usually situated at the periphery of the parties. QS: falling rocks and debris caused by the phenomenon of physical weathering at the base of the slopes, rocky slopes, sometimes regular, sometimes irregular, LS: landslide and mass movement of land due to water over the area can be seen. Classification of risk events in the region can be obtained by morphology Studies: 20 tons per acre of soil erosion. The scope of the loss and slip. Mud flows during high water flooding in the basin. Gap Road landslide risk. The reduction of groundwater, Vulnerable area during dry water year. In the area of economic and social decline and chocolate. Filling water estuaries and reducing problems of water management for agriculture. Recommendations for the area: Construction of artificial forests were an important factor in the operation of drainage and flood control is. Suitable land for the construction of planted forests consist mainly of valleys, mountains and hill areas are, Determine ways to attract people's participation in protection of water catchment. Change abatement of the basin. Prevent the entry of a female animal pasture and early exit. Promote the cultivation of forage plants and supply basic inputs. Stability of slopes to prevent erosion using mechanical instrument the biomechanical. Prevent indiscriminate felling of trees in steep areas. River engineering River dredging to prevent bank erosion.

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