

Simulation of landslide risk in javanroud basin using AHP method considering geomorphic properties

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Extended abstract

1- Introduction

Whenever slop is exposed to unsteadiness, landslide occurrence is unavoidable on the surface according to the heavy rain, under layers of the slop and fault movement.

The slops of Javanroud Basin are one of the slops in folded Zagros, which are exposed to landslide. Recording 31 landslides on the surface of this small area confirms this issue. The aim of this research is recognition of this unsteadiness according to the strength and weakness based on AHP model.

2- Methodology

The method applied in this research is analytic hierarchy process (AHP). The base of this model is comparing variables by pair wise by Matrix relationship. In this way, pair wise of the effective variables on the landslide were considered and based on relative weights the output was extent.

The process of the research has been done by GIS. The outcome of this research has been presented the zoning map of landslide severity in the four classes including very high, high, average and low. The applied data and maps included; geology map 1/100000, topography map 1/50000, Dem, satellite picture A.T.M (2002) and GIS software.

3- Discussion

The natural feature of the environment such as the weak materials of the earth, the half-wet cold climate, the wide spread of the running waters, the low hill earth with thick over weathered layers, accompanying with human interference through flattening of the slop and road building in such foothills are the ground work of many and repeated occurrence of the land sliding in the basin of Javanroud.

4- Conclusion

The result showed that about half of the area in Javanroud basin (about 58%) was classifying very high and high risk to land slide, and 36% is under the danger of medium occurrence of landslide which involve the width of Shili and Marn

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layers, Goorpi and Radiolarit formation, seem natural. Based on these finding only in 5.5% of Javanrood area the possibility of the occurrence of landslide is weak.

Key words: Javanrood, AHP method, Landslide, analytical hierarchy process.

References

- Abramson, Lee. W; Thomas, S. Lee; Sunil Shirma; Glen, M. Boyee (1995); Slope stability and stabilization methods.
- Ahmadi, Hassan; Esmaili Abazar; Feizina, Sadat; Shariat jafary, mohsen; (2003); The zoning of the danger of mass movement using two methods of multi variable regression (MR) & analytic hierarchy process (AHP) case study (Garmichai basin); Iran natural resource magazine (No 56 Pp 336-393).
- Ahmadi, Hassan; Mohamadkhani, Shirin; Feizina, Sadat; Ghodosi, Jamal; (2005); Modeling of regional danger of mass movement using quality features and analytic hierarchy process (AHP) case study Taleghan basin; Iran natural resource magazine (No 58 Pp 3-14).
- Ahmadi, Hassan; Talebi Esfandrani, Ali; (2001); The study of the effective factors in creating mass movement the case study in Ardal region, Chaharmahal Bakhtiari province, Iran natural resource magazine (No 54 Pp 323-329).
- Amini, Abbas; (2006); Zoning model of the landsliding danger in Javanrood basin, M.A Thesis, Kermanshah, Razi University.
- Anbalagan, R. (1992); Landslide hazard development and zonation mapping mountainous terrain. Engineering geology. 32. pp.267-277.
- Asgharpour, M.G; (2004); multi criterion decisions Tehran, Tehran university publication.
- Atkin, B. C; Johnson, J. A (1988); the earth, problems and perspectives, USA, Blackwell scientific publications, pp147-161.
- Bai, Naser; (2007); Study and zoning of mass movement emphasizing land sliding and case study, Madarso river basin, M.A Thesis Tabriz, Tabriz university.
- Cook. R.u; Dorkamp.J.c; (1998); translated by shahpoor Godarzinejad, Geomorphology and environment management, Tehran; Samt publication; Pp 201-210.
- Dai, F.D; C.F.Lee (2002); Landslide characteristics and slope instability modeling using GIS. Lantau island. Hong Kong. Geomorphology. 42. Pp213-228.
- Esmaili uri Abazar; (2002); the zoning of the danger of mass movement in Gramichai basin, (M.A thesis) Tehran natural resource colloque, Tehran university.
- Ghodosi pour, H; (2005); Analytic hierarchy process; Tehran, Amir Kabir Technical University (Tehran poli tecnic).
- Hashmi, Tabatabaai; (2007); zoning of danger of land sliding in parts of Ardabil province, the magazine of the latest finding of building and housing Pp21-25.
- Jabari, Iraj; (2005); the analysis of the limitation of zoning of sensitive regions to mass movement, Geography and development, No 6 Pp 71-92.
- Mahdipoor, Fatemeh; Mesgari, Mohamad saedi; (2004); A pattern for the location based on based on multi variable decision making methods in GIS.
- Mohamadi, Farajollah; (2003); Dianamic Geomorphology; Tehran, payamnoor publication; Pp 43-47.

- Parhizcar, Akbar; Ghafari Gilandeh, Ali; (2006); Geography information site and multi criterion Analysis, Tehran, Samt publication.
- Prakash, T. N (2003); Land suitability analysis for agricultural crops: A fuzzy multi criteria decision making approach, M.S. Theses international institute for geo-information science and earth observation enschede, the netherlands.
- Saaty, T. L (1980); the analytic hierarchy process, New York, McGraw-Hill.
- Shadfar, Mohammad; Yamani, Mojtaba; Ghodsi, Jamal; Ghayomian, Jafar; (2007); zoning of the danger of land sliding using analytic hierarchy process (chalkeood basin, Tonekabon); research and development in natural resources, No 75 Pp 118-126.
- Shariat Jafari, Mohsen; Ghayomian, Jafar; (2008); The evaluation of the usefulness of the pair variable the ecstastic analysis model in zoning of land sliding danger, scientist magazine of Tehran university No 34 Pp 137-143.
- Shirani, Korosh; Jafar, Ghayomian; Mokhtari, Ahmad; (2007); The analysis and evaluation of ecstastic methods of pair and multi variables in zoning of the danger of land sliding in Marbar river basin, water and basin magazine, soil and basin keeping college Pp 36-48.
- Tarbock, Edward; Jeish Lotkin, Friedrich; (1989); Trajomeh Rasool Okhravi; Geology basis, Tehran, Madresh publication.
- Ven Westen, C. J; R. Soeters (1998); Geographic information system in slope instability zonation. ITC. Netherlands.

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