Universe Scientific Publishing
ORIGINAL ARTICLE

Survey of Urban Geographical Environment Research Based on Urban Planning and Land-use

Yuanyuan Kong*, Gang Xu, Juan Yang, Cheng Liu and Zhongling Cheng
School of Geographical Science, Southwest University, Chongqing 400715, China

ABSTRACT Every city was constructed on a region with special geomorphology. The construction and development of the city was based on it. The relationship between urban geographical environment and urban planning was intimate. This paper gave a brief introduction of the history and development of the urban geological research, urban geographical research, urban geomorphic disasters research and urban geographical environmental quality comprehensive assessment research based on the condition of urban planning and land-use. At last, the problem and the trend of urban geographical environment research were discussed.

KEYWORDS
Urban geographical environment
Urban planning
Land-use
Geomorphic disasters

1. Introduction

Urbanization is an inevitable trend of development of human society, is a manifestation of national modernization, but with the progress, urbanization of the industrial process, resulting in a series of urban physiognomy environmental issues, and has attracted great attention around the world. Expanding urban construction, the city has continuously transformed the landscape structure. Human activities have become modern urban physiognomy most important shapers [1]. Human-made activities and urban natural landscape appearance together in the process of urban physiognomy environment, breaking the original balance of urban physiognomy environmental impact on the urban environment and landform pressure increasingly obvious deterioration of the urban environment and urban physiognomy disasters become more prominent. It has seriously hampered the development of the city and transformation. Depth study of urban physiognomy environment and to guide urban planning and construction, to promote sustainable urban development is of great practical significance.

doi: 10.18686/utc.v1i1.2
Received: February 12, 2014; Accepted: April 23, 2014; Published online: June 28, 2014

*Corresponding author: School of Geographical Science, Southwest University, Chongqing 400715, China. E-mail: yuanyuan_kk33@163.com

2. Urban geology

Urban planning work has always attached importance to investigate and collect urban engineering geological environment and urban planning and construction of urban infrastructure geological data is a multi-factor, multi-level complex process. Early 20th century, the Royal Society of Canada has published about geological understanding of the meaning and importance of urban centers papers. The late 1920s, Germany took the lead Department published a special soil maps for urban planning, to support urban planning. After World War II, Germany, Czech Republic, Slovakia and the Netherlands and other countries carried out geological mapping system to guide urban planning and construction. 20th Century 60–70 years, urban geological work to expand water and soil pollution survey content evaluation, investigation and assessment of municipal waste hazards, the geological resources potential and exploitation of exploration and evaluation. Applied Geochemistry solve the problem of waste pollution has become a trend, the German first draw the soil potential and limitations described in "geological potential map" for city planners reference. In 1970s, many cities in Spain to carry out 1:2.5 square geotechnical mapping work for urban planning. In the 1980s the typical characteristics of foreign cities geological work is driven by a new electronic automation theme mapping work. The early 1990s, the British Geological Survey initiated the "London Underground and surface computerization project (LOCUS)", the goal of the project is for the production of land-use planning, civil construction and solve various geological and environmental problems theme member, using the GIS and modeling techniques have powerful. 1993 Geo-

logical Survey of Canada has adopted a variety of GIS systems to complete digital map for urban planning services [2]. With the rapid development of modern science and technology, space technology, remote sensing technology, GPS technology, computer science and other technology can also be applied to a comprehensive geological study to the city. To tie in with the overall urban planning, the late 1980s, the city of Haikou project conducted a comprehensive evaluation of the geological environment, prepared the "Haikou geological environment quality and land engineering capacity assessment" to the city as the center of the ring hydraulic comprehensive survey studies in full swing, it has completed more than 80 serious shortage of water resources prediction city centralized water supply sources of groundwater assessment and 75 major cities of Beijing, Tianjin, Shanghai and other. In 1990 the former Ministry of Geology and Mineral Resources Division of Environmental editor of the "major coastal urban water resources and geological environmental assessment" report on water resources and geological environment 21 cities evaluated. This is a more comprehensive argumentation China's first urban geological environment and geological resources and environment carried out, the city is also a systems engineering geological work [3].

3. Urban geomorphology

3.1. Urban geomorphology and its effects on the city's urban planning and construction

Every city has a unique landscape environment, every city has a unique landscape environment, and geomorphology geomorphic conditions provided environmental research, environmental assessment and other important basic information for urban planning and environmental studies for the construction of the landscape. Overseas in the 1950s, in particular the impact of the 1960s research on urban landscapes focused on the study of urban land and water ecosystems certain aspects, and began to notice the process of human activity on the landscape hydrological processes such as construction activities impact of river sediments, due to excessive extraction of groundwater leads to ground subsidence problems affecting the landslide on urban development and the like. Leicester held in Bucharest in 1967 International Conference on geography, first proposed urban topography problems. First held in 1974, the annual meeting of the Geological Society of America symposium urban physiognomy, 1976 published the proceedings of this symposium; 20th century 70-80 years on urban landscape research papers and reports are also emerging, Detwyler and Marcus editor of "Urbanization and Environment"; Coates editor of the three-volume set of "Environmental geomorphology and landscape protection", where the second episode of "Urban geomorphology"; the former Soviet scholar Keluo Ji Ust compiled the "Cities and terrain" "Leveson's' geological and urban environment"; Cooke et al, "Urban geomorphology in arid zones"; Douglas of "urban environment ", etc. have been published [4].

Domestic cities geomorphological research started late, by the mid-1980s was formally raised this issue. In December 1987, held in Guangzhou, China Geographical Society Conference on Geomorphology and Quaternary, Professor Ding Xizhi submitted to the Assembly "On Urban geomorphology" papers, Southwest Normal University exchange "physiognomy Translations urban environment (in the General Assembly The first episode) "; in September 1988, hosted by the Southwest Normal University, Department of Geography, held in Chongqing "Beibei" urban physiognomy Seminar; May 1990, hosted by the Chengdu Institute of Mountain Disaster and Environment, Chinese Academy of Sciences, in Chengdu He held a "National Urban geomorphology Symposium"; in October 1992, "China Urban geomorphology study" was published. With the in-depth study of urban topography, geomorphology city to city landforms application development. Ding Xizhi and other aspects of the city through the distribution pattern of China and geomorphic relationships and the distribution of Chinese cities and other parts of the landscape are analyzed landforms Chinese urban construction [5]; geomorphology disaster Liu Shuzhen from the city location, the scale of development and human-induced three discusses aspects of urban construction in mountainous landscape environment [6]; DIAO Cheng-tai of Chongqing City as the research object, discusses the urban environment and landform urban expansion relations [7]; Lu Tao, and in Fuling City, for example, from the ground terms of slope, the ground level and composition of the material broken analyzes the Fuling city geomorphological features and human-made appearance battalion force from the impact point of view classified discusses the influence of low mountain valley topography of the city's urban transport [8].

3.2. Influence of urban geomorphology on urban development

The formation of the city's development is closely related to the environment and landform. Geomorphic environment provides for urban development and infrastructure underlying surface, while the city's geographical structure, morphology, landscape, function and other aspects have a profound impact [9]. Former urban development, urban planning major work is needed to understand the nature and distribution of natural resources and disasters, determine the location and extent of natural resources and disasters. Through field surveys, land and material resources geomorphological mapping, identification and evaluation of urban development needs, limit the adverse impact of urban development on the environment of urban topography, geomorphology to predict the potential impact of the environment on urban development, evaluation of geomorphic hazards disasters on urban development. Af-

ter the period of urban development and urbanization, planners and managers to understand the impact on the natural environment and urban development of the city's impact on the environment, focusing on environmental conditions of urban development. This period can be studied by geomorphological mapping and geomorphological processes signs classification, and to predict environmental change through time or space analogy. With the rapid development of urban construction, the impact of urban physiognomy in urban development has gradually deepened. British scholar Douglas in "urban environment" a book that questions the suitability of the terrain of the city, within the city some locations for suitability issues specific buildings and urban development on soil and terrain stability of the problem, is the city The main problem geomorphology studies. Qing Ming Zhong Kunming geomorphological conditions on urban development were studied, analyzed the impact of natural landforms on urban development and zoning discusses the geomorphology and urban development suitability; rice paper treasure studied Yinchuan City geomorphology Influence of urban settlements and urban development, urban topography is considered an important factor affecting the development direction of the city, urban planning, urban construction, urban settlements, security, public health, environment and urban style and so on.

4. Urban disaster research and mitigation geomorphology

City geomorphic disasters including floods, landslides, avalanches, landslides, ground subsidence and collapse, etc., which endanger the safety of the city, the impact of urban construction and economic development. Before the 1960s, disaster research mainly limited to foreign cities and prediction mechanism, focusing on investigation and analysis of disaster formation conditions and active process. Early 1970s, Hewitt put forward "one to multi-hazard" research ideas. Hewitt and other research-based ideas, Puget Sound researchers in this area for disasters as floods, earthquakes, storms, fires, volcanic activity, etc., each hazard mapping, respectively, to generate total potential loss diagram. With the dramatic increase in disaster losses, prompting human disaster reduction work referred to an unprecedented degree. Japan, Britain and some other countries have carried out hazard assessment earthquakes, floods, tsunamis, mudslides, landslides, and emphasized the disaster investigation in the relevant mitigation regulations (such as "Disaster Relief Act of Japan", "Earthquake Insurance Law"), the statistical, evaluation and mitigation and relief measures accordingly determine responsibility [10]. US First California earthquakes, landslides and other 10 kinds of natural disasters risk assessment. Through this research, come 1970–2000 California lost 10 kinds of natural disasters may cause $ 55 billion, if effective prevention methods, life casualties can be reduced by 90%, the economic losses can be significantly reduced. 1970–1976, a multi-disciplinary team of experts to carry out the US natural disaster risk assessment and mitigation policy research, which aims to improve the level of understanding for natural disasters, to explore the effectiveness of various mitigation policies, policy analysis and mitigation system various constraints, which made a series of recommendations or feasible measures to federal, state and local governments. In order to promote international cooperation, the United Nations passed a resolution in 1987, determined to carry out "10 years of the International Natural Disaster Reduction" campaign in the 20th century, the last 10 years. With the maturity and development of GIS technology in recent years of GIS analysis, GIS and decision support systems integration and virtual reality technology, GIS has gradually developed and applied to the study of urban disasters and mitigation.

Before the 1970s, disaster research mainly confined to distribution of disaster, the formation mechanism analysis, trend forecasting and other aspects; 70 years later, began to break through the traditional research model; Since the 1980s, national support, authorities have conducted a survey of more than 100 specialized evaluation collapse (unstable rock), landslides, mudslides and other major geological disasters. 1990 compilation of 1:1000 million Chinese earthquake disaster losses over the next 50 years forecast map. With the regional economic construction, especially the needs of urban development, and have launched a series of regional geological disaster research work, compilation published "The geological hazard types 1:500 million Chinese map", "1:600 million Chinese landslide disaster map", l:600 million Chinese mudslides distribution and hazard zoning map "maps". Since the 1990s, China has successively launched a regional evaluation of the risk of geological disasters, geological disasters and the establishment of the risk assessment model. With the dramatic increase in the development and geomorphology disaster losses economy, people are starting to focus on disaster mitigation and economic research. Yu Guangyuan in 1987 nationwide seminar disaster economics, economic theory of natural disasters are described proposed disaster economics belong entrepreneurial economics, economic performance and reduction of the effect of "negative to positive" economic benefits; Ma Zongjin presented with the "plague of" natural disaster damage loss represents the views of the scale in 1988; DIAO Cheng-tai think the city is a potential hazard geomorphological environment of [11]. 1998, the state promulgated the "China Disaster Planning" attaches great importance to fully demonstrate significant mitigation projects and GIS, GPS and other high-tech applications in the mitigation of, and strengthen the Chinese science and technology capacities for disaster reduction, began construction of China Security and Disaster Science and Technology and engineering disciplines.

5. Comprehensive evaluation of urban environmental quality geomorphology

With the gradual deepening of urban physiognomy of environmental studies, urban topography environmental work has shifted comprehensive study of urban social and economic sustainable development seriously. Indonesia in the early 1980s, urban land use or spatial planning in the geological environment quality were taken into account, a comprehensive study of the environmental conditions, environmental geological information region, especially under potential groundwater recharge area, collapse, liquefaction and ground Shen, sewage treatment suitably, Soft and other information. Early 1990s, Cendrero put forward based on the quality of the natural environment unit hierarchy of evaluation of new ideas. The method of the human environment as a natural unit consists of a number of different environmental factors constitute, each unit has a relative homogeneity, character advanced unit with integrated indicators to characterize the lower unit. Evaluation factors and overall environmental quality of the environment when, according to the nature of the problem, select evaluation factors, and translate them into comparable indicators, and then weighted according to the relative importance of a comprehensive evaluation, with a comprehensive index of environmental factors to measure the overall quality of the environment quality [12]. Mu Guichun in the landscape of the mountainous city to explore the idea of a comprehensive evaluation of urban environmental quality of the landscape and regional evaluation [13]. Huang Jianjun et al [14] to determine the level of each index analysis and expert judgment by the method of combining weights, press kilometer network will Baoji City is divided into 180 units, calculate the comprehensive quality of geological environment in the regions. Gu peak days, the use of GIS technology to build a Xianyang City geological environment information database, the geological environment in Xianyang City a comprehensive evaluation and economic evaluation, based on the evaluation results to determine the Xianyang City urban land use and land development sequences recommendations, and the development of the Urban Geological Environment Information System.

6. Discussion

In summary, urban planning and land use for the center of the city geomorphological environmental research has been made many important achievements, but in the process of urbanization continues to accelerate, increasing urban environmental issues in the new situation, urban environmental research is facing new challenges and opportunities: (1) Environmental geological survey the city is an important prerequisite for urban planning and construction. According to the data indicate that the urban environment geological survey work and urban planning, construction and management of a certain degree of disconnection, which would seriously hamper the sustainable development of urbanization and city. In the mountainous city, geomorphology environment on urban construction and development more restrictive, such as the current construction of the Three Gorges Reservoir immigrant's Metro, expansion and construction of new development zones in other cities there are such problems. (2) Human-made effects affect the appearance of urban landscape gradually deepening human ability to transform the urban landscape is also growing, irrational human-made hazards appearance activity is also growing. The human ability to shape the landscape is obvious, how to regulate the appearance of human-made activities to reduce the incidence of geomorphic hazards, how to evaluate the impact of human activities create the appearance to be further studied. (3) Landforms disaster many cities, the annual losses due to disasters caused huge city. Experts and scholars on the distribution of disaster, formation mechanism, trend forecasting and other aspects of the system study, however, the lack of in-depth study of the impact of urban physiognomy disasters on urban economy. With economic development, the economic disaster of urban physiognomy will accomplish much. It is only through the landscape of urban disaster risk evaluation, forecasting losses due to urban physiognomy disasters, in order to formulate reasonable measures to effectively prevent geomorphology disasters, reduce disaster losses. (4) With the acceleration of urban modernization and promoting the development of urbanization, urban topography deteriorating environmental quality, on urban environmental quality of the landscape began to pay attention to it, there are already some studies and papers published, but the landscape of urban environmental quality Comprehensive Evaluation of small, underutilized closely linked with urban planning, cannot form a system of guidance on urban planning, urban land use and urban layout. For the systematic study of urban physiognomy environment, a holistic view of the problem of urban physiognomy work will continue to deepen. That is a whole city geomorphology study issues quantitative system with appropriate indicators to characterize the environmental quality of urban topography, geomorphology of urban environmental quality comprehensive evaluation, thereby establishing and perfecting the appropriate monitoring system and integrated into the overall urban environmental management track, urban planning and construction, to achieve sustainable development of cities. This will be the focus and the need to break the local urban geomorphological research.

References

1. Diao, C. T., Huang, X., & Li, M. (2000). On the human-made appearance battalion force. *Southwest China Normal University (Natural Science), 25*(4), 462–466.
2. Yuan, L. S. (2004). Urban environmental geology progress at home and abroad. *Chinese Journal of Geological Hazard and Control, 15*(4), 96–100.

3. Fang, H. (2001). Chinese urban environmental geology thoughts review and future work. *Volcanic Geology and Mineral Resources, 22*(2), 84–86.
4. Guang, P. (2004). Urban geomorphology study. *Normal University (Natural Science), 25*(3), 80–84.
5. Ding, X. Z., & Liu, S. Z. (1990). Landforms Chinese urban distribution and construction influence. *Southwest China Normal University (Natural Science), 15*(4), 453–461.
6. Liu, S. Z. (1990). Mountain town landscape issues. *Southwest China Normal University (Natural Science),15*(4), 478–483.
7. Diao, C. T. (1990). Chongqing landforms environment and urban expansion. *Southwest China Normal University (Natural Science), 15*(4), 484–489.
8. Lu, T., & Diao, C. T., & Yue, Z. Z. (2003). On the urban physiognomy and its impact on urban transport. *Southwest China Normal University (Natural Science), 28*(4), 308–312.
9. Diao, C. T. (1994). *City geomorphology.* Chongqing: Southwest China Normal University Press, 14–15.
10. Zhang, L., Zhang, C., & Luo, Y. H. (1998). Geological disaster assessment theory and practice. *Beijing: Geological Publishing House*, 3–4.
11. Diao, C. T. (1992). Environmental hazards of urban geomorphology study. *Chinese Science Bulletin, 37*(18), 1688–1690.
12. Zhang, L. J., Gu, Y. M., & Liu, M. H. (1999). Main trend overseas geological research and working environment. *Hydrogeology and Engineering Geology, 26*(6), 1–5.
13. Chun, M. G. (1990). Mountain city of Chongqing geomorphology idea. *Southwest China Normal University (Natural Science), 15*(4), 462–469.
14. Li, X. M., & Huang, J. J. (2000). Baoji City geological environment quality evaluation. *XI'AN Engineering University, 23*(l), 50–53.