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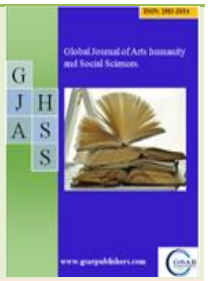

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SOURCES WRITTEN ON ENVIRONMENTAL GEOMORPHOLOGY BETWEEN 2000-2023: ARTICLES AND BOOKS

BY

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Abstract

Within the scope of the science of environmental geomorphology, which is defined as the primary use of geomorphology in solving the problems arising from human use of the earth and was first used as a term by Coates (1971); Geomorphological processes, human land, and water ecosystems, analysis of appearances, use of geomorphological products and how geomorphology can be used for environmental planning and management functions are examined within this concept. A systematic evaluation of studies on environmental interaction, whether positive or negative, constitutes the most important goal of modern studies. This study aimed to scan and evaluate foreign sources written on environmental geomorphology between 2000 and 2023 in order to determine the perspective on the natural environment, morphological units, landscape, changes, and developed methods. The material and data sources of the study consist of foreign studies (articles, books) conducted as subject-field studies. The information obtained through literature review was compiled and examined in the conclusion section.

Key Words: Environment, Geomorphology, Natural Environment, Morphological Unit, Landscape.

1. Introduction

Within the scope of environmental geomorphology, which is defined as the primary use of geomorphology in solving problems that arise from human use of the earth and was first used as a term by Coates (1971); geomorphological processes, human land and water ecosystems, analysis of appearances, use of products of geomorphological origin and how geomorphology can be used for environmental planning and management functions are examined within this concept. A systematic evaluation of studies on positive or negative environmental interactions is the most important goal of modern studies.

2. Purpose

This study aims to scan and evaluate foreign sources written on environmental geomorphology between 2000-2019 in order to determine the perspective on the natural environment, morphological units, landscape, changes, and developed methods.

3. Method and Technique

The material and data sources of the study consist of foreign studies (articles, books) conducted as subject-field studies. The information obtained through the literature review is compiled and examined in the conclusion section.

4. Study Examples and Evaluations

Jones et al. (2000) in the article titled “Effects of Roads on Hydrology, Geomorphology, Irregularity and Disturbance Patches in Flow Networks”; Based on the example they made on Andrews Forest in Oregon (USA), they presented a perspective on how road networks interact with flow networks in landscape networks. They showed how these interactions can affect ecological/biological processes in stream-riverside systems. At the landscape scale, they emphasize that certain identifiable geometric peak flows (floods) and interactions including debris flows (rapid movements of soil and sediments) are affected by the arrangement of the road network along steep flow channels downstream. Although the flow network is created by the interference patches peak-flow and debris-flow

irregularities, the starting and ending situations of the roads can change the landscape distributions without mountain landscapes. They based their observations on a series of studies in Andrews Experimental Forest, Oregon (USA) that the density of debris flow points and flood crests can change the balance between the stream network. They stated that these dynamic changes can occur in stream and riparian networks in mountain landscapes, where road networks affect floods and debris flows and thus change the degradation patch. They measured ecological/biological variables of low-impact stream segments based on the number of upstream road crossings by establishing an area sampling scheme to determine the magnitude of various road impacts on streams and riparian zones. They concluded that peak flows and debris flows, other hydrological and geomorphic products, are affected by road flow interactions, debris flow processes are modified by roads, and thus roads built on valley floors can facilitate these slope flows.

Marchetti (2002) in his article titled "Environmental Changes in the Central Po Plain (Northern Italy) Due to Fluvial Modifications and Anthropogenic Activities." It is argued that land grants for war veterans between the 1st and 3rd centuries AD caused deforestation, soil erosion, and degradation of the Po Delta River, and that land abandonment and reforestation in the highlands are now causing erosion. Artificial channel control and channel gravel extraction in the mountain sector of the basins have caused erosion along the rivers and along large parts of the Adriatic coast. In their article "Environmental Change in River Channels: A Neglected Element; Towards Geomorphological Typologies, Standards and Monitoring", Sararmış-Newson (2003) propose a geomorphological procedural basis for channel typologies that can structure the sampling frame in terms of environmental geomorphology and rationalize the variables to be monitored. They argue that the winter floods in England and Wales provide an excellent opportunity for such monitoring. Rivers integrate the effects of change in atmospheric and terrestrial systems, which they then deliver to the coast. They comment that geomorphological processes along the pathway create dynamic and diverse habitats in both instream and riparian/floodplain ecotones. The dynamics of channel change are at odds with human resource development, with the result that many rivers and riparian environments have been significantly altered, making interpretation of change difficult. They argue that the collection of geomorphological data on both form and process is overwhelmingly an academic pursuit. They discuss the method and technique of using a unique repeat channel survey and long-term bedload sediment data to provide guidance on both definitions of change and variables and research techniques that could form the basis of improved national-scale monitoring in the future.

Pettsa et al (2005) in their article titled "Dams and Geomorphology: Progress in Research and Future Directions" have studied the areas for dam construction, assessment of their impacts, planning operations and proactive geomorphology assessment applications, and sustainability of river ecosystems. Rivers change the flow and sediment transfer, which drives the changes in channel form along the lower flow regulated by dams. The article reviews the process-form relationships in terms of environmental geomorphology under three effective themes by establishing a conceptual framework, extending monitoring data, and remote sensing technology. The themes in this channel change are channel dynamics, role of riverside vegetation, and ecological factor. They have explained the negativities on downstream flow, reciprocal artificial flow regimes, sediments, flood capacity, channel migration, diversion, and river usage range by placing dams at the center of human progress in terms of water resources regulation and their negative effects on historical and degradation. Geomorphological processes below dams; They evaluated the dam ecology policy under the headings of flows (sediment transport), channel change below the dam (channel degradation, channel increase, role of vegetation). They included the dam ecology policy for deltas, coastal erosion, floodplain, flood impact, and channel dynamics.

Marston (2008) in his article "Land, Life and Environmental Change in Mountains" examines three specific views offered by geographers to increase understanding of human impacts on the stability of mountain landscapes, using examples from the Himalayan Range in Pakistan, the Nanga Parbat massif in the Garhwal Himalaya in Northwest India and the Manaslu-Ganesh Himalaya in Central Nepal. He argues that one of the greatest challenges facing mountain researchers is to separate human-induced environmental change. To increase understanding, he suggests an explanation of the disconnect between physical landscape changes in mountains and mountain science, using political creation-resource management theory, quantitative-native, postpositivist theory, and related fieldwork methods. He predicts that the harsh physical processes in mountainous regions and the rapid deterioration of ecosystems due to climate change make mountain dwellers vulnerable to natural hazards. He identifies a method for studying mountains through geospatial analysis, measuring and mapping biophysical processes, and applying social theory to large parts of mountains. The 2002 International Year of Mountains awareness, built on the values and slogan of the mountain region, is evaluated as a result.

Csiki-Rhoads (2010) states in their article titled "Hydraulic and Geomorphological Effects of River Dams" that field studies on channel morphology and sedimentology of the upper and lower reaches of river dams are few and limited in geography. Current studies emphasize that the long-term response of rivers to the presence of river dams is variable in terms of both upstream sediment storage and downstream channel erosion. Future research should focus on the integration of process-based field studies, numerical modeling, and experimental studies to determine how the geomorphological response of rivers to riverside dams varies with geographic context and the effects of these dams on flow structure, channel erosion, deposition patterns, and sediment transport.

Church (2013) in his article titled "Refocusing Geomorphology: Fieldwork in Four Actions" emphasized that the analysis of landscape formation processes changed with the introduction of transportation and remote sensing tools and methods with the

emergence of modernity after the mid-20th century. He emphasized that in order to be able to trace the evolution of areas and objects from the beginning to the present, an evaluation should be made on four movements and that these are the beginning, 19th century, refocusing, and the developments in the second half of the 20th century and that a historical development record should be kept. He emphasized that geomorphological assessment should be made with these four movements in environmental studies and evaluated the Vesuvius lava character and landscape appearance sampling. He also explained the development of a quantitative perspective on measuring landscape morphometry to understand river networks and the focus on the monitoring and evaluation of geomorphological processes of local areas and the use of remote sensing data in a specific and narrow-focused way, as well as the association of geomorphologically interesting events (flow, sediment, and transportation).

Brierley and Li (2013) in their article titled "Geomorphology and Environmental Management of the Yellow River Source Region" have studied the geological, climatic, and anthropogenic factors that shape the ecosystem and unique landscapes of the Yellow River Source Region, and especially the fact that the area has been exposed to environmental changes in the Quaternary. They have reached conclusions that in recent years, land has been degraded by desertification in pastures and wetlands, water resources have decreased, and biodiversity is under threat. They have developed cost calculations, environmental approach, landscape platform creation, and suggestions regarding biodiversity within the concept of sustainability of degradation. In their studies, they have presented a general overview of environmental problems related to landscape. They have explained the effect of tectonic factors on geomorphological variability of river systems, the effect of instability on slopes on vegetation variability, and made potential efficiency assessments, and created reorganization programs. In their studies, they have interpreted the effect of shallow landslide activity, soil protection, and soil erosion in the Loess hills, and the effect of the boom created by tourism infrastructure developments on the rate of change on the landscape and ecosystem by presenting a pasture management plan.

Clarke et al. (2016) tried to give direction to the basic principles in environmental geomorphology studies in their article titled "Communicating with Geomorphology: An Empirical Assessment of the Discipline, Impact and Visibility" by saying that we can make sense of the contribution of geomorphology to society and the environment by explaining the studies through proactive discussion and analysis to learn what they want us to do in geomorphology and how well we can do it. For this purpose, they made a survey-based assessment in their study.

Meadows (2016) in his study titled "Anthropocene Geomorphology: Perspectives on the Past, Signals for the Future?"; The term Anthropocene, the drivers of change and the time-graded human impacts demand, and the path to clarify the options that will enable us to respond to global environmental changes are determined. The term Anthropocene was introduced in the study to emphasize the human reality. Because the world system is being transformed by humans, directly or indirectly - accidentally or intentionally. Humans are changing almost all environments of the world, therefore, these changes need to be followed before the progressive effects of time. A series of instructive case studies on how the increasing harmful effects of increasing human numbers using advanced technology affect geomorphology, the evolving footprint of humanity in the world systems, the role of geomorphology in understanding the nature and extent of accelerated soil erosion problems, the impact of large dams and artificial ground, and the application of the method to understand the fundamental conditions of the world system processes, the different effects of quaternary and future climate change. By examining the concept of drivers in geomorphological change processes by Slaymaker and his colleagues, he explains geomorphological processes as dynamic drivers and focuses on human activity as cumulative drivers. He analyzed human impacts on geomorphology by examining accelerated soil erosion with examples from the USA and Cape Town, geomorphological effects of dams with examples from Southeast Asian dams and delta development, and excavation and creation of artificial grounds with examples from the Irwell River (England). He emphasizes the need to increase the popularity of the International Geological Sciences Anthropocene Working Group (IUGS) studies as an active role in the media, to increase grants on the effects of human-induced problems on landscapes to ensure a sustainable future, to make human-landscape systems a high priority research initiative, and to ensure social, behavioral and economic participation in high collaboration between geosciences, biosciences, and engineering fields.

Zinck (2016) has examined the correlation between applied geopedology and geomorphology in his book titled "Relationships Between Geomorphology and Pedology: A Brief Overview". In his study; he emphasized that the main goal of his study was to initiate soil inventory programs in hundreds of developing countries and many tropical countries to support the increase in agricultural production required by rapid population growth and that these programs were mostly carried out by public institutions and partly by consultancies. He explained the integrated approach based on the applied geopedological soil paradigm with the example of Venezuela. He emphasized the need to emphasize the integration between geomorphology-pedology and the environment by defining, sampling, classifying, and mapping soils. He examined the contribution of soil surveys to geomorphology in terms of determining how they lead to geomorphic and soil erosion preparation and emphasized two types of studies. These are; Geomorphogenic processes and paleogeographic studies, Investigating the nature of the processes at work. He emphasized that phic studies are an indicator of paleogeomorphology. According to him; landscape stability phase, inference factors and conditions probability, and interpretation of paleo soils prevailing in the same period reveal the evolution and configuration of the landscape in terms of environmental geomorphology. He stated that there is not enough doctoral study on this subject, there are very few references in international journals, and there is very little information on how to make integrated pedo geomorphic maps.

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