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GEOGRAPHICAL PATTERNS OF WATER RESOURCES DISTRIBUTION (ON THE EXAMPLE OF CHINA)

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The territory of China is characterized by a great variety of nature. Large plains, mountainous regions, and deserts are spread over a vast area. The climate is diverse. In contrast to Russia, latitudinal natural zoning is violated on the territory of China. A large part of the country is subject to a monsoon climate. The presence of deserts and karst areas complicates the natural features of the region in terms of the distribution of water resources. Therefore, the topic of the master's thesis from this point of view is relevant, has theoretical and practical significance, and is of interest to specialists in Belarus.

Keywords: China Water Resources; Geographical Distribution of Water Resources; South-North Water Disparity; weather conditions; socio-economic system.

ГЕОГРАФИЧЕСКИЕ ЗАКОНОМЕРНОСТИ РАСПРЕДЕЛЕНИЯ ВОДНЫХ РЕСУРСОВ (НА ПРИМЕРЕ КИТАЯ)

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Территория Китая отличается большим разнообразием природы. Равнины, горные районы и пустыни раскинулись на обширной территории. Климат разнообразен. В отличие от России, на территории Китая нарушается широтная природная зональность. Большая часть страны относится к муссонному климату. Наличие пустынь и карстовых районов региона, с точки зрения распределения водных ресурсов, является осложняющей природной особенностью. В связи с этим тема магистерской диссертации является актуальной и имеет теоретическую и практическую значимость, представляя интерес для специалистов Беларуси.

Ключевые слова: водные ресурсы Китая; географическое распределение водных ресурсов; водное неравенство погодных условий между югом и севером; социально-экономической системы.

Introduction. The distribution of water resources in China exhibits significant regional imbalances, mainly characterized by "more water in the south, less water in the north; more water in the east, less water in the west." This

and varied climate conditions. For example, the meltwater from glaciers in the Tibetan Plateau serves as an important water source for the northwest region, while the basins of major rivers such as the Yangtze and the Yellow River support the water resource needs of the eastern and central regions. Additionally, the monsoon climate significantly affects the water resource distribution in the southeastern part of China, where the summer monsoon brings abundant rainfall, providing ample water resources for the region.

However, climate change poses a potential threat to the geographical patterns of China's water resource distribution. The increase in global temperatures leads to more frequent extreme climate events, such as floods and droughts, presenting new challenges for the sustainable use and management of water resources. Particularly in the arid regions of the north and the water-scarce areas of the southwest, climate change may further exacerbate the scarcity of water resources.

This study analyzes the distribution and characteristics of water resources in different geographical regions of China, exploring how topography and climate factors shape the geographical patterns of water resources and predicting the potential changes in these patterns and their impact

Methods. Identify Data Requirements: Clarify the purpose of the research and the types of data needed (such as precipitation, river flow, temperature, etc.).

Time Range Selection: Determine the time period for data collection (such as daily, monthly, yearly) based on research objectives.

Data Sources: Identify the sources of data, which may include ground observation stations, satellite data, climate model outputs, etc.

Descriptive Statistics: Calculate basic statistical measures, such as mean, median, standard deviation, etc., to describe the fundamental characteristics of the data.

Trend Analysis: Use statistical methods (such as linear regression analysis) to analyze the trends in data over time.

Periodicity Analysis: Identify periodic patterns in the data, possibly using methods such as Fourier transform or wavelet transform.

Results. This study aims to explore the trends in water resource distribution across different regions of China and the impact of climate change on these trends. By integrating Geographic Information Systems (GIS), hydrological models, and statistical analysis methods, we have conducted a detailed analysis of water resource data and climate variables over the past ten years. Here are the main findings:

1. Trends in Water Resource Distribution. Increased North-South Disparity: Compared to thirty years ago, the amount of water resources in southern China has relatively increased, while water resources in the northern region have

continued to decrease, exacerbating the pattern of abundant water in the south and scarcity in the north.

Intensified Seasonal Variations: The precipitation in spring and autumn shows a downward trend, while the frequency and intensity of extreme precipitation events in summer have increased, leading to a higher risk of floods.

Impact of Climate Change.

2. Temperature Rise: The analysis shows that the average national temperature has risen by about 0.8°C over the past thirty years, especially more pronounced in the northwest and northeast regions.

Changes in Precipitation Patterns: Climate change has significantly affected the distribution of water resources through changes in precipitation patterns, particularly in the Yellow River and Yangtze River basins, where the spatial and temporal distribution of precipitation has changed.

3. Influence of Geographical Patterns. Topographical Factors: Water resources in mountainous and plateau areas are more significantly affected by rising temperatures and glacier melting, impacting water supply in downstream areas.

Changes in Land Use: Urbanization and agricultural expansion have altered land cover and land use patterns, affecting the runoff and evaporation of regional precipitation, thereby impacting the availability of water resources.

This study provides a comprehensive analysis and understanding of the complex mechanisms of geographical patterns and their influence on water resource distribution in China under the impact of climate change, offering a scientific basis for water resource management and policy formulation.

Discussion. **Reflection on the Main Findings.** Increased North-South Disparity in Water Resources. The growing disparity between the water-rich South and water-scarce North underscores the urgency in revising water management and allocation policies. This trend not only highlights regional vulnerabilities but also calls for innovative solutions to balance water distribution, such as improving the efficiency of water transfer projects like the South-North Water Transfer Project.

Intensified Seasonal Variations and Flood Risks. The observed increase in extreme precipitation events during summer months suggests a shift towards more volatile and unpredictable water resources. This necessitates enhancing flood prediction and management capabilities, as well as investing in infrastructure that can withstand extreme weather events.

Temperature Rise and Precipitation Pattern Changes. The nationwide temperature increase, especially pronounced in the northwest and northeast, indicates a clear signal of climate change. The alteration in precipitation patterns, particularly in major river basins, has significant implications for agricultural planning, water storage strategies, and overall water security.

Topographical and Land Use Influences. The distinct impact of rising temperatures and glacier melting in mountainous and plateau regions highlights the importance of protecting these critical water sources. Additionally, the effects of urbanization and agricultural expansion on water availability stress the need for sustainable land use practices that consider water conservation.

Broader Implications. The findings of this study emphasize the complexity of water resource management in the face of climate change. It is evident that both natural factors (such as geography and climate) and human activities (such as land use changes) play significant roles in shaping water resource distribution.

There is a clear need for adaptive management strategies that can respond to changing water availability and distribution patterns.

Future Research Directions. Further research is needed to refine the models used for predicting the impacts of climate change on water resources, incorporating more detailed climate scenarios and local variability.

There is also a need for longitudinal studies that can track the long-term effects of climate change mitigation and adaptation measures on water resource distribution and availability.

Conclusion. The trends observed in this study provide critical insights into the challenges posed by climate change to water resource management in China. By understanding these dynamics, policymakers, researchers, and practitioners can better prepare for the future, ensuring water security and sustainability in the face of changing climatic conditions. The discussion highlights the necessity for integrated, forward-thinking approaches that consider both the natural variability of water resources and the impacts of human activity.

Summarize. This study conducted an in-depth analysis of the changing trends of water resources distribution and the impact of climate change in different regions of China. Through the comprehensive application of geographic information systems (GIS), hydrological models and statistical analysis methods, the study revealed important changing characteristics and future potential trends of China's water resources distribution in the past decades.

Short corollary: Water resources management needs adaptive adjustments: As the impact of climate change on water resources distribution intensifies, China needs to further optimize water resources management strategies, especially in terms of improving water resource utilization efficiency and promoting rational allocation of water resources across regions.

Strengthen climate change adaptation measures: Facing the challenges brought by climate change, it is particularly important to strengthen the construction of early warning systems and response capabilities for extreme weather events, especially in terms of flood risk management and drought resistance strategies.