

INTERACTIONS BETWEEN GROUNDWATER AND SURFACE WATER IN THE HAILIUTU RIVER BASIN, ERDOS PLATEAU, CHINA: A QUANTITATIVE ANALYSIS

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ABSTRACT

The intention of this research was to look at how surface water and groundwater interact in the Hailiutu River Basin, which lies on the Erdos Plateau in China. A quantitative analytical procedure was used during the whole inquiry. It was thought that the properties of the aquifer had a big impact on how the basin worked, even though the basin's dynamics were intended to be the dependent variable. Because groundwater was meant to be the independent variable, the aquifer's qualities were thought to be very important. The researcher used a quantitative method to analyse hydrological data. This helped the researcher reduce the chance of bias and make sure that the data collected was a good representation of the complete population. A basic random sampling approach was also employed to make sure that the sample was a good representative of the complete group. The researcher looked at the aquifer's permeability, storage coefficients, and recharge potential to see how well the mechanisms that move water between groundwater and surface surfaces are being managed. The major purpose of the research was to figure out how much these factors affect the result. Ultimately, the objective of the investigation was to ascertain the extent to which these characteristics influence the current circumstances. The researcher looked at how the flow patterns of surface water and the levels of groundwater changed over time and in various places. The main goal of this study was to find out how closely related the two systems are. Consequently, the intensity of the correlation between the two systems was evaluated. Using statistical analysis and modelling, it was possible to figure out how much groundwater changed the river's base flow.

Keywords: Groundwater, Recharge Potential, Storage Coefficients, Permeability, River's Base flow.

1. INTRODUCTION

Some people think that the Hailiutu River Basin, which lies on the Erdos Plateau in China, is a place where the interaction between groundwater and surface water is very important for maintaining the balance of hydrology and ecology. But a lot of people have grasped this. There may be underground groundwater systems in dry and semi-arid areas, like the Erdos Plateau, that are below the surface. These systems are often deeply linked to how surface water conditions change and how much of it is available. Because groundwater systems are located below the surface, this is what has happened. Because of this, it is very important to look at the links between these two forms of water to make sure that the ecosystem stays healthy throughout time and that water resources are managed wisely. Some studies concentrated exclusively on the Hailiutu River Basin; however, prior research in arid regions analogous to the Hailiutu River Basin indicated that the aquifer's characteristics—specifically its permeability, water retention capacity, and recharge rate—substantially influenced the volume and timing of groundwater inflow into the river. This was also true for the Hailiutu River Basin and other areas that were similar to it. Conversely, only a limited number of research initiatives focused mostly on the Hailiutu River Basin. To address the highlighted gap, a quantitative study of the interactions between groundwater and surface water in the basin was conducted. This research was conducted to address the current knowledge deficiency about the given issue area. (Gao et al., 2021) contended that the characteristics of the aquifer substantially impacted the hydrological processes being examined. So, they decide to make groundwater the independent variable in their study. The researcher used quantitative approaches to collect and examine data on how water moves across the environment. This helped us achieve the study objectives. People utilised this logbook to keep track of a lot of crucial information, such the levels of groundwater, the movement of aquifers, and other things. A basic random sample procedure was employed to make sure that the data gathered was accurate and covered the whole basin. This step needs to be done first to make sure that the data that was obtained was not biased in any manner. The goal was to find out more about these tendencies. This was done to look for trends. The researcher used statistical analysis and computer modelling to find out how the aquifer's qualities impact the river's flow. The goal was to find out more about how they are linked. With these methods, it was feasible to locate sites where groundwater had a large impact on how rivers flowed. In other circumstances, the groundwater was removed because it wasn't permeable enough or because it couldn't flow into the river (Feng et al., 2025).

2. BACKGROUND OF THE STUDY

The Erdos Plateau, where the Hailiutu River Basin is located, was the focus of the study that was done in China's dry and semi-arid regions. This option was made because people were becoming more worried about the area's water shortage and the status of the ecology. Even though it has been known for a long time that groundwater and surface water interact with each other as part of hydrological cycles, there is still a lot of research that needs to be done to figure out how these interactions work in certain parts of northern China. People have known about these relationships for a long time, yet the fact that this is the case has not changed. During dry seasons when there wasn't much rain, surface flows in the Hailiutu Basin typically relied on groundwater. This was especially true when it was dry. This was particularly true when it was dry and windy outside. This insight was very useful and important during the drought seasons. Because of this, the aquifer's features had a big impact on how much water was accessible across the entire basin. The aquifer was important, which is why this happened. Previous studies have shown that the permeability of aquifers, their recharge capacity, and their storage capacity are essential factors in establishing the balance between groundwater outflow and surface water maintenance. This was consistent with the results of the previous investigation. However, the quantitative assessments conducted in this location did not provide a substantial

quantity upon completion. Because ecosystems, farming, and the people who live there all rely on a steady supply of water, it is even more important to understand how these different parts are connected (Thomas et al., 2024). The Erdos Plateau's economy was growing quickly, and more people were living there, which led to more groundwater exploitation. This changed the normal hydrological processes that were happening and put river systems' ability to bounce back at risk. This happened because all of these things happened at the same time. This occurred due to the substantial growth of the economy in the Erdos Plateau. In the framework of this study, groundwater functioned as the independent variable, aquifer features acted as the influencing factor, and the Hailiutu River Basin represented the dependent variable. The objective of this research was to examine how subsurface properties affected the relationship between groundwater and surface water. This was done to find out how closely surface water and groundwater are linked (Wang et al., 2023).

3. PURPOSE OF THE STUDY

This research aims to ascertain the degree to which the characteristics of the aquifer influence the hydrological dynamics of the Hailiutu River Basin, situated on the Erdos Plateau in China. The researcher conducted this experiment to determine the degree to which the aquifer's qualities affected the issue at hand. The goal of the data gathering for the research was to look into how the aquifer's qualities affect the basin's hydrological dynamics. This study aimed to examine how aquifer characteristics—specifically permeability, storage capacity, and recharge potential—affect groundwater discharge into rivers and the overall stability of water resources within the basin. The main goal of the research was to find out how much the factors indicated above affected the quantity of groundwater that flowed into the rivers. The primary objective of the performed investigation was to determine the volume of groundwater contained within the aquifers. The researchers were particularly interested in how the qualities that were just spoken about affected the quantity of groundwater that flowed into rivers after they were shown. The Hailiutu River Basin functioned as the dependent variable throughout the whole of the conducted investigation. The features of the aquifer served as the dependent variable in this study, whereas groundwater functioned as the independent variable. In this study, the groundwater was the independent variable that was employed. In this semi-arid setting, the project aimed to gather a significant volume of data to provide an extensive understanding of the variables influencing water availability.

4. LITERATURE REVIEW

Research on groundwater-surface water interactions has shown that the interaction between these two systems is very important for keeping river base flows, controlling water quality, and keeping ecological stability in both humid and dry areas at the same time. Numerous studies have shown that this premise is true. At the start of the research, a lot of attention was paid to the hydrological connection that was made by the aquifer's features. According to the researchers who did the study, permeability, transmissivity, and recharge potential were the most important elements that determined how much groundwater flowed into rivers. The researchers that did the study came to this result. Research was undertaken in dry and semi-arid regions, revealing that groundwater often sustains surface water flows during drier periods. This led to the conclusion that groundwater is to blame for this. This helped groundwater become an important buffer against the consequences of climate change, which was a big step forward. Many studies have been done to learn more about how river basins in China, such as the Yellow River and the Tarim River, work. The objective of this study was to get a more profound comprehension of the system's functionality. The researchers discovered that the natural balance of these river basins had been disturbed, and the patterns of streamflow in these basins had changed because so much groundwater had been pumped out. Because of the adjustments that had been made, it was clear that this was the case. The research performed on

the Erdos Plateau indicates that aquifers are under escalating stress due to water shortages and the perpetually expanding need for agricultural irrigation. This was shown to be true since there is less water available. This knowledge, which was previously unknown, was found as a consequence of the voyage. The stress caused the quantity of water that flowed into river systems to go down, and it also caused the amount of groundwater to go down. International studies have also been very helpful because they have shown that quantitative methods like hydrological modelling, isotopic tracing, and statistical analysis have been used a lot to look at groundwater–surface water exchanges and to capture both spatial and temporal variability. These methods have been used to look at how groundwater and surface water interact with one other. These methods have been used to figure out how groundwater and surface water move between each other. Even still, the localised, basin-specific study that looked at aquifer characteristics as factors that helped understand these relationships still had a big gap in its coverage. This was the case despite the fact that the investigation was performed in a basin-specific way (Dai et al., 2021). Even though basic frameworks for integrated water resource management have been developed, there haven't been many research that focus on the Hailiutu River Basin. Even though the Hailiutu River Basin is very important for the environment and the economy on the Erdos Plateau, this is what has happened. The understanding of how the variability of the aquifer effects base flow contributions and seasonal river dynamics in the region was constrained due to the lack of targeted study that were completed in the area. This was the case as few research were undertaken in the area. The study also stressed the need of doing a thorough quantitative analysis and using a systematic sampling procedure to make sure that the depiction of hydrological processes is correct. Consequently, the present study used quantitative methods and random sampling to examine the interactions between groundwater and surface water in the Hailiutu River Basin. This exercise was important to find out how big these interactions were. This study used previously collected data while concurrently addressing existing knowledge deficiencies. This information was used to reach the results of this study. The research contributed to the enhancement of sustainable water management practices in river basins experiencing semi-arid conditions. This was achieved by enhancing the understanding of the relationship between groundwater and surface water. Putting the inquiry in the context of existing theories and facts made it feasible to do this project effectively (Allafta & Opp, 2022).

5. RESEARCH QUESTION

What role did aquifer characteristics play on Hailiutu River Basin, Erdos Plateau, China?

6. RESEARCH METHODOLOGY

6.1 Research Design

The SPSS version 25 was used for the quantitative data analysis. A 95% confidence interval and odds ratio were used by the researchers to assess the direction and strength of the statistical association. A statistically significant criteria was established by the researchers at $p < 0.05$. The data's basic features were revealed via a thorough investigation. Data examined using computer tools for statistical assessment and data gathered via surveys, questionnaires, and other methods are often subject to quantitative techniques of evaluation.

6.2 Sampling

Participants were requested to complete questionnaires to participate to the research. Researchers distributed 800 questionnaires after identifying a research population of 670 individuals utilising the Rao-soft method. Following the collection of 768 replies, the researchers eliminated 68 due to incompleteness, yielding a final sample size of 700.

6.3 Data and Measurement

The study mostly utilised data acquired from a questionnaire survey. The participant's essential demographic information was requested first. Participants were subsequently given a 5-point Likert scale to evaluate the online and offline channels. The researchers rigorously analysed several resources, especially internet databases, for this secondary data acquisition.

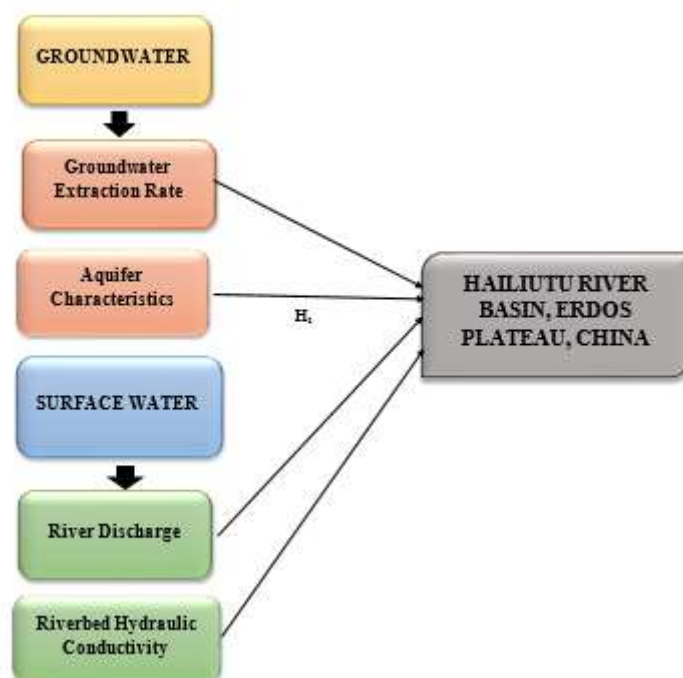
6.4 Statistical Software

Statistical analysis was conducted using MS-Excel and SPSS 25.

6.5 Statistical Tools

The primary characteristics of the data were understood via the use of descriptive analysis. Using ANOVA, the researcher must examine the data.

7. CONCEPTUAL FRAMEWORK



8. RESULT

• Factor Analysis

Factor Analysis (FA) is often used to find hidden variables in observable data. Regression coefficients are often used to provide evaluations in the absence of discernible visual or diagnostic indicators. Success in financial analysis is significantly reliant on models. The goals of modelling are to identify errors, intrusions, and apparent linkages. The Kaiser-Meyer-Olkin (KMO) Test is one tool for evaluating datasets that have been generated by numerous regression analyses. The representativeness of the model and the variables in the sample are checked by them. There seems to be data duplication based on the numbers. Data is more easily comprehensible when proportions are smaller. The output of KMO is an integer from 0 to 1. A sufficient sample size is defined as a KMO value between 0.8 and 1. According to Kaiser, these are the acceptable limits: According to Kaiser, the following are the requirements for admission:

The usual range is 0.60 to 0.69, however this range is much lower at 0.050 to 0.059.

A range of 0.70 to 0.79 is considered average for middle grades.

Ranging from an 80 to an 89 on the quality point scale.

They discover awe between 0.90 and 1.00.

Testing for Bartlett's Sampling Adequacy and KMO (Table1) The Kaiser-Meyer-Olkin .943 scale

The findings of Bartlett's sphericity test are as follows: Chi-square, significance = .000, about 190 degrees of freedom this substantiates the legitimacy of the assertions made on sampling. The researchers used Bartlett's Test of Sphericity to ascertain the relevance of the correlation matrices. A Kaiser-Meyer-Olkin value of 0.943 indicates that the sample is deemed adequate. Bartlett's sphericity test yields a p-value of 0.00. A researcher may ascertain that the correlation matrix is not an identity matrix if Bartlett's sphericity test yields a significant result.

Table 1: KMO and Bartlett's Test

KMO and Bartlett's Test		
Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.943
Bartlett's Test of Sphericity	Approx. Chi-Square	4550.968
	df	190
	Sig.	.000

Moreover, the Bartlett Test of Sphericity confirmed the broad applicability of correlation matrices. The Kaiser-Meyer-Olkin metric of sample adequacy is 0.943. The researchers obtained a p-value of 0.00 via Bartlett's sphericity test. The correlation matrix did not pass Bartlett's sphericity test, indicating a significant outcome.

➤ **VARIABLES:**

❖ **DEPENDENT VARIABLE**

- **Hailiutu River Basin, Erdos Plateau, China:**

The Hailiutu River Basin, which lies in the western part of the Erdos Plateau in Inner Mongolia, China, used to be an important semi-arid watershed. The researcher could find this basin when the researcher visit Inner Mongolia. Interactions between groundwater and surface water kept biological and hydrological processes working in this region. These relationships were very important for keeping these systems running. The basin's ecosystem isn't particularly robust since it doesn't get much rain, a lot of water evaporates, and it depends a lot on groundwater to keep rivers flowing during dry times. The basin's vulnerability was what made this ecology special. This was particularly important to think about when the weather was dry. It was made up of a network of tributaries and aquifers that worked together to help with farming, taking care of animals, and the people who lived there. This area is known for having water shortages. (Mengmeng et al., 2022) found that it had a lot of water for where it was located. The geological structure of the basin, which included aquifers that were both porous and let water flow through them, showed that these aquifers were involved in the process of groundwater recharge and release. Because of this, it is an important case study for learning how

development affects water resources. This is because the basin sits on the Erdos Plateau. The Hailiutu River Basin was also a great example of a semi-arid hydrological system in northern China. At that time, this basin was in Tibet. This basin was located in the eastern part of the country. The aquifers in these systems were the most crucial thing to think about when figuring out how strong the rivers and wetlands were. In the Erdos Plateau environment, the basin not only helped save human lives, but it also helped save animals and maintain the region's natural balance. It was important to study the connection between groundwater and surface water since they have effects on both the environment and society (Brännlund, 2024).

❖ INDEPENDENT VARIABLE

• Groundwater:

Groundwater is water that is found under the Earth's surface, in the soil's pores, cracks, and aquifers, which are geological structures that let water flow through them. Another name for groundwater is subterranean water. In the business, this kind of water is called "groundwater." On the other hand, groundwater was slowly built up by rain, snowfall, and drainage from the surface. This is different from surface water, which was made up of rivers, lakes, and reservoirs. Groundwater, on the other hand, only formed after these three processes happened. It gradually descended lower till it hit the ground after being put in underground reservoirs. This went on until it was ultimately thrown away. There wasn't a single one of these parts in the water on the surface. It is said to be one of the most important parts of the hydrological cycle that happens all across the world since it acted as a buffer when there wasn't much rain or there was a drought. Besides being a source of replenishment for surface water bodies, it also acted as a buffer during these periods. In general, there were two main zones of groundwater: the unsaturated zone, where air and water were present in the soil's pores, and the saturated zone, where all available spaces were filled with water. Water molecules made it easy to tell these two zones apart. In each of these areas, the presence of water was employed to describe the area. The top barrier in the saturated zone was called the water table, which was also the name for the place where the water table was. Some of the geological factors that affected the flow and availability of groundwater were porosity, permeability, and the characteristics of the aquifer. These traits made it easier or harder to move and store water, depending on the situation. These parts are in charge of managing the flow of groundwater (Vukušić, 2022). In dry and semi-arid locations, groundwater was necessary for drinking water, farming, and industry since surface water was either not enough or only available at certain times of the year. For all of these things to happen, groundwater was very important. One thing that set these regions apart was that there was no surface water. This was especially true in places that were likely to become dehydrated and in situations that were only partly dry. Because to its existence, many ecosystems were able to maintain base flows in rivers and wetlands, which helped preserve biodiversity and ecological stability. This was done by keeping base flows stable in a lot of different places. On the other side, too much extraction, pollution, and changes in land use were threats to its natural balance. This led to the loss of ecosystems that depended on water tables and the fall of those tables. This happened because the natural equilibrium was upset, which caused this consequence. As a result, groundwater was not only a resource that was hidden from view, but it was also an important resource that needed to be managed well to ensure long-term water security and support sustainable development. This was the case because groundwater was a resource that was hidden from view (ZHIHUA et al., 2024).

❖ FACTOR

• Aquifer Characteristics:

Aquifers have both physical and hydrological qualities when it comes to subterranean geological formations. These traits or features influence how well the underlying geological

formations can store, move, and release groundwater. It is important to remember that these traits might alter based on the kind of geological framework that is there. To describe the properties of an aquifer, a number of them were found. These traits, together with their flow and link to surface water systems, had a big effect on how well they controlled the availability of groundwater, which was one of the most essential things they did. This was one of the most essential things they did. The aquifer's porosity, permeability, transmissivity, stativity, and recharge potential were the most important things to look at when figuring out how important it was. People thought that all of these traits were highly significant. Porosity was the proportion of empty spaces in rock or sediment that could hold water. Permeability was how easily water could flow through connected pore holes or cracks. Porosity was a way to tell how much water a substance could store. Porosity and permeability were two different conceptions. Permeability and porosity are two different ideas, and the researcher can't use them interchangeably. Transmissivity measured how well an aquifer could move water horizontally across its saturated thickness, while stativity measured how much water an aquifer could hold or let go of when pressure changed. The aquifer's ability to carry water was used to test both of these things. The examination was conducted on both of these attributes. When the researcher speak about an aquifer's recharge potential, the researcher mean how well it can replace itself by infiltration from rain or surface water. This is what the researcher mean when the researcher say "recharge potential." Geological factors such the kind of rock, the makeup of the sediment, and the structural features affected these traits. This made the aquifer behave quite differently in different areas. The aquifer acted differently in various places, which created this change (Firozjaei et al., 2021).

- **Relationship Between Aquifer Characteristics and Hailutu River Basin, Erdos Plateau, China**

There was a strong relationship between the qualities of aquifers and the Hailutu River Basin, which lies on the Erdos Plateau in China. This basin is in the nation of China. This happened because the physical and hydraulic features of the aquifers had a direct effect on the basin's long-term survival and hydrological balance. The Hailutu River was in a semi-arid area, thus it needed groundwater discharge to maintain its baseflow steady during dry seasons, which were times when there wasn't much rain. This happened because the river was in a semi-arid area. During the times of year when it didn't rain, it was very important to remember this. The researcher looked at a number of aquifer parameters, such as porosity, permeability, transmissivity, storage capacity, and recharge potential, to figure out how much groundwater was sent to the river system and in what order it was sent. This allowed water to flow efficiently, which made sure that groundwater was discharged into the river at a steady rate. This was achievable because there are aquifers that are quite porous. Because of this, surface fluxes didn't become unstable, which helped to establish ecological resilience. On the other hand, aquifers that don't let water through easily or don't have enough storage space make it hard for groundwater and surface water to mix. This is due to the fact that these aquifers can only hold so much water (Huang et al., 2021). As a result, baseflow goes down, and the area becomes more vulnerable to seasonal droughts and individuals being involved in exploitative activities. It was also the recharge capacity, which was controlled by how much rainwater could get into the earth and the kind of rock it was made of that was very important in deciding how quickly aquifers could replenish and keep groundwater supplies going. This was a very important thing to think about when figuring out how fast groundwater supplies stay steady. Because of this, some places were better than others at keeping surface water flows stable. The goal was to help the farming and business sectors. Because of this, the natural contributions to the Hailutu River went down, which affected the river's ability to make water in a way that was right for a long time. It is vital to remember that the aquifer's attributes were not only passive geological

features; they also actively controlled the flow of water in the basin. This has happened because of the aquifer's properties. These traits had a direct effect on the quantity of water that was accessible, the area's ecological stability, and the region's economic viability (Kamara et al., 2020).

On the basis of the above discussion, the researcher formulated the following hypothesis, which was analyse the relationship between Aquifer Characteristics and Hailiutu River Basin, Erdos Plateau, China.

“H₀₁: There is no significant relationship between Aquifer Characteristics and Hailiutu River Basin, Erdos Plateau, China.”

“H₁: There is a significant relationship between Aquifer Characteristics and Hailiutu River Basin, Erdos Plateau, China.”

Table 2: H₁ ANOVA Test

ANOVA					
Sum					
	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	39588.620	197	5295.599	1215.702	.000
Within Groups	492.770	502	4.356		
Total	40081.390	699			

The outcome is substantial in this research. Statistical significance is achieved with a p-value of .000 (below the .05 alpha level), and the F value is 1215.702. This suggests that researchers might support the alternative view, ***“H₁: There is a significant relationship between Aquifer Characteristics and Hailiutu River Basin, Erdos Plateau, China”*** is accepted and the null hypothesis is rejected.

9. DISCUSSION

The findings of this research indicated that the characteristics of the aquifer significantly influenced the interactions between groundwater and surface water in the Hailiutu River Basin, situated on the Erdos Plateau in China. This basin was where the study took place. The study was conducted in China. The quantitative analysis showed that aquifer features like permeability, transmissivity, storage capacity, and recharge potential had a big effect on how much groundwater flowed into surface flows during the dry seasons, when there was the least amount of rain. Even in the lightest rainstorms, this was still true. Even when the rain stopped, everything remained the same. This was something that had to be remembered, particularly during the dry seasons. The results demonstrate that the river's baseflow contributions were not only steadier but also higher than they would have been without aquifers that let water flow through them easily. This preserved the river's water source and made it more able to bounce back from changes in its surroundings. In certain places, the relationship between groundwater and surface water was weaker when the groundwater wasn't particularly permeable and the storage capacity wasn't very great. Both of these things made the association weaker. But it's vital to remember that these places didn't have as much space to store things. As a result, the flow sustainability went down and the sensitivity to groundwater extraction pressures went up. The data also showed that the different types of aquifers were responsible for the varying hydrological responses that happened in different parts of the basin. The conclusion reached was that management concepts could not be applied universally; instead, they must be tailored

to the unique requirements of each individual context. The conclusion that was reached was as indicated above. The findings from seasonal studies indicated that groundwater functioned as a buffer during periods of low precipitation in semi-arid climatic conditions. This makes it evident that groundwater is very important for keeping rivers flowing steadily. The analysis found that the significant groundwater abstraction needed by the agricultural and industrial sectors had upset the system's natural equilibrium.

10. CONCLUSION

The study's results lead the researchers to believe that the aquifer's characteristics were a big part of how the Hailiutu River Basin's hydrological balance and overall sustainability were determined. The basin sits on the Erdos Plateau in China. The investigation's results resulted in this conclusion, which the researchers reached. Both quantitative methods and random simple sampling have been used to illustrate that the interactions between groundwater and surface water are heterogeneous. Both of these approaches have demonstrated this to be true. On the other hand, the aquifer's many distinct features, such as how permeable it is, how much water it can hold, and how well it can recharge, had a big effect on them. This was shown via the employment of several ways. The findings revealed that aquifers with enhanced permeability and storage capacity significantly augmented the base flow supplied to the river. Analysts came to these conclusions. So, there was a more steady supply of surface water, especially during dry seasons when it didn't rain much. This was particularly true in the dry seasons. This insight was particularly pertinent during the arid seasons. Aquifers with poor permeability and limited capacity to recharge, on the other hand, prevented groundwater from migrating into river systems. This was the case because of how these two things worked together. Because of this situation, it was more likely that the basin will have ecological stress and water shortages. The inquiry's findings also showed that the problems had become substantially worse since groundwater was still being utilised for farming and industry. The fact that the difficulties had become worse showed that this was true. Because of this, the basin's capacity to cope with the effects of climate change over time was put in danger, and the natural buffering role that aquifers usually have was weakened. The study findings provided compelling evidence that the management of water resources in semi-arid regions cannot rely just on surface water monitoring; it requires a comprehensive understanding of the subsurface dynamics. The study gave us this knowledge. This success was made possible by using a method that blended the characteristics of aquifers with the effects of hydrological processes. The findings provide more evidence that groundwater and surface water should be managed as an integrated system. When figuring out how to acquire water in a way that is good for the environment, the most important thing to think about is the aquifer's characteristics. The study results suggest that aquifer-specific strategies must be integrated into water management plans that are both successful and cohesive in the Erdos Plateau. The researcher may do this by employing a mix of these methods. To make sure that the Hailiutu River Basin stays stable throughout time, it is very important to find a balance between the drinking water needs of the people and the need to protect the natural environment.

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