

## Optimization of Public Services through It-Based Drilling Well Mapping in Tasikmalaya Regency

Ade Setiadi<sup>1</sup>, Ikeu Kania<sup>2</sup>, Aceng Ulumudin<sup>3</sup>

<sup>123</sup>Universitas Garut, Indonesia

Correspondent: [24094124001@pasca.uniga.ac.id](mailto:24094124001@pasca.uniga.ac.id)<sup>1</sup>

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**ABSTRACT:** Tasikmalaya Regency faces significant obstacles in the provision of clean water, especially in areas that are prone to drought during the dry season. Although the central and provincial governments have provided assistance in the form of drilled wells, until now there is no integrated data collection system available to map the exact location of drilled wells. This research aims to create innovations in public services related to the provision of clean water by developing information technology-based drilled well mapping (Deep Well Map) so that groundwater management can be carried out more efficiently. This study applies a qualitative descriptive method with data collection techniques through direct observation, interviews with village heads in 11 villages receiving drilled well assistance, and data triangulation to ensure the accuracy of the information collected. The results of the study show that the use of information technology in drilling well mapping can produce more systematic data on the distribution of wells, technical conditions, and the level of damage that occurs. This data is then packaged in the form of a web-based digital map that can be accessed online through the blogger platform. The existence of this digital map makes it easier for local governments to maintain and repair damaged drilled wells. In addition, this mapping also contributes to more targeted policy making related to groundwater management. This innovation is expected to be a sustainable solution in meeting the needs of clean water and improving the quality of public services in Tasikmalaya Regency.

**Keywords:** Public Service Optimization, Drilled Well Mapping, Information Technology, Clean Water



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## INTRODUCTION

Clean water is a fundamental need for humans and has a very important role in various aspects of life, including the household, agriculture, and industrial sectors ([Saputro et al., 2022](#)). Along with the increasing population and the development of economic activities, the demand for clean water continues to increase ([Salman et al., 2022](#)). However, not all regions have adequate access to clean water sources, especially areas that are prone to drought. Tasikmalaya Regency is one of the regions that faces major challenges in providing clean water, especially during the dry season. Currently, the people of Tasikmalaya Regency still rely on surface water and groundwater to meet their daily needs. Between the two sources, groundwater is the main choice because it is more stable compared to surface water which is heavily affected by weather changes. However, the availability of groundwater in this area is greatly influenced by meteorological and geological factors ([Amini](#)

[et al., 2024](#)). To overcome this problem, the central and provincial governments have tried to provide assistance in the form of the construction of drilled wells to support the availability of clean water for the community. However, until now there is no integrated data collection system to accurately map the location of drilled wells. Data on the distribution of borewells, technical conditions, and the extent of damage are still limited and have not been systematically documented. As a result, the maintenance and repair of damaged drilled wells have not been carried out optimally. In addition, this limited information is also an obstacle for local governments in formulating more effective policies related to groundwater management.

Several previous studies have discussed the importance of mapping groundwater resources and the use of technology in their management ([Jumadi & Danardono, 2022](#); [Riski et al., 2023](#)). However, studies that specifically discuss the mapping of information technology-based drilled wells in Tasikmalaya Regency are still very limited. This shows that there is a research gap that needs to be overcome by developing innovations in the data collection and mapping system of drilled wells so that groundwater resource management can be carried out more effectively. Therefore, this study aims to develop innovations in public services in the clean water supply sector through the application of information technology-based drilled well mapping (Deep Well Map). With this system, it is hoped that information about the location, technical conditions, and level of damage to drilled wells can be documented more accurately and systematically. In addition, the application of information technology in this mapping is expected to help local governments make more appropriate decisions and increase the effectiveness of public services in clean water management in Tasikmalaya Regency.

In principle, clean water has a crucial role in daily life and is the main need for the community. As the population increases, the need for clean water continues to increase. This water is used mainly for various daily activities, such as drinking, cooking, and washing. Therefore, continuous efforts are needed to ensure its availability with optimal service quality ([Salman et al., 2022](#)). Currently, in the Tasikmalaya Regency area, people not only use surface water, but also use groundwater. Groundwater is water that is in the soil layer. Its availability depends on two main factors, namely meteorological factors, such as rainfall that contributes to groundwater recharge, as well as geological factors that affect its nature and storage capacity ([Amini et al., 2024](#)). So groundwater flows from areas with high potential to areas with lower potential. The flow rate is influenced by the permeability level of the aquifer media as well as the magnitude of the hydraulic gradient ([Jurnal & Geografi, 2024](#)).

Clean water can be obtained from a variety of sources, but not all of it can be used to meet needs. This is due to pollution caused by natural factors and human activities ([Riski et al., 2023](#)). In 2015, the United Nations designed a strategy to realize sustainable development in the concept of Sustainable Development Goals (SDGs). This commitment emphasizes the various challenges faced by the world community, such as poverty, inequality, climate change, environmental degradation, welfare, peace, and justice ([FITRI et al., 2022](#)). Basically, water is one of the basic needs for human needs that is very basic and irreplaceable. In Tasikmalaya Regency, especially in areas that are prone to clean water in the dry season, it is a problem that still needs to be addressed. Nowadays, as development increases in various sectors Of course, it will also be followed by an increase in the use of groundwater. Currently, there has been assistance for drilled wells from the Central (Geological Agency) and the Province (West Java Provincial Energy and Mineral

Resources Office) spread across the Tasikmalaya Regency area. The physical condition of the drilled well is still used by the community to meet the needs of clean water, but some of it is no longer used due to the possibility of damage to the physical well.

The current condition in the Tasikmalaya Regency area is the existence of assistance drilled wells from the Central and Provincial Provinces that are scattered and used by the community. The distribution of the drilled wells has not been mapped through the Drilled Well Map (*Deep Well Map*) so that the distribution has not been seen in the Tasikmalaya Regency area. In order to maximize the provision of physical data on drilled wells, it is necessary to prepare a map of drilled wells so that the distribution of the drilled wells can be clearly seen. Also in order to maximize the utilization of the drilled well that has been damaged, it is necessary to repair (Maintenance) the physical borewell. One of the things needed to support these activities is the need for data on damage to drilled wells spread across the Tasikmalaya Regency area so that public services, namely clean water services by the government, can be maximally implemented. IT-based drilled well mapping is an innovation in public services. Public organizations prioritize the provision of quality and high-standard services. In the context of services, information transparency contributes to increasing public understanding of their rights and obligations ([Hidayat, 2017](#)). In principle, public management is the process of managing and regulating public resources and providing services to meet the needs of the community efficiently. This activity includes planning, organizing, implementing, and evaluating public policies, including the management of budgets and other resources, with the aim of improving the welfare and quality of services for the community ([Pelayanan Publik pada Mal Pelayanan Publik Kabupaten Jember Syifaul Jannah & Khotimah, 2024](#)). Policy is a set of principles and concepts that are used as a reference and basis for decision-making. Along with the rapid development of the times and the increasing use of information technology, technology should be able to be a solution to overcome various obstacles in public services (Nasikhah, 2019). So service arises from the ability and creativity in its development to realize common goals. Even though the government faces various obstacles in providing maximum services, the public still expects quality public services ([Hagie, Nadiyah, 2020](#)).

Now is the modern era that requires technology-based innovation. The continuous advancement of information and communication technology encourages various activities to continue to adapt and innovate. In the face of these changes, the government has adopted e-Government as a strategy to improve the quality of public services for the community ([Tasyah et al., 2021](#)). In principle, the development of information and communication technology has a significant impact on the social and political structure in Indonesia, and contributes to shaping and influencing communication systems in urban and rural environments ([Wirany et al., 2022](#)). In the era of globalization, technological advances occur rapidly, especially in information systems. Every company, organization, school, and government agency utilizes information technology to improve security and manage data efficiently ([Ria & Budiman, 2021](#)). The application of innovation in the product distribution process by utilizing information technology (IT) is very necessary so that production results can be spread more widely and run efficiently ([Fitrah et al., 2021](#)). Technology and information are closely interconnected, where information technology covers various aspects related to its use as a tool, manipulation, and data management. The two form an inseparable unit ([Zahwa & Syafi'i, 2022](#)). The government and the community must look for innovations so that the availability of clean water can be fulfilled in daily life ([Ariyanti & Lutfi, 2023](#)).

In addition, to overcome water limitations due to the increasing need for clean water, village communities have taken the initiative to create innovations by building facilities that can overcome the problem of limited water resources. With this innovation, residents can use water more freely in their homes ([Ariyanti & Lutfi, 2023](#)).

According to the Asian Development Bank, innovation is something new, implementable, and beneficial. Innovation is not just an event or activity, but includes concepts, processes, applications, and abilities that play a role in determining the success of an organization. In the public sector, innovation plays a role in creating value for society ([Dan & Di, n.d.](#)). Public service can be interpreted as an effort to provide services to individuals or the community who have an interest in an organization, in accordance with the rules and procedures that have been set. Basically, the government plays the role of a servant of the community, not for its own interests, but to meet the needs of the community and create an environment that supports the development of the abilities and creativity of each individual to achieve common goals ([Kurniawan, 2017](#)). Information Technology plays a crucial role in improving operational efficiency, driving innovation in product development, revolutionizing business models, improving customer experience, and ensuring operational security and sustainability ([Arsana et al., 2021](#)). The rapid development of modern society, along with the demand for change in the system of government, gave birth to a new concept in the governance management paradigm called Good Governance ([Dan & Di, n.d.](#)). In principle, the benefits of this activity are to find out the distribution of drilled wells in the Tasikmalaya Regency Area, prepare materials for repair activities (maintance) of drilled wells that have been damaged, provide information about drilled well data poured through the Drilled Well Map (*Deep Well Map*) IT-based. So this activity is a policy material for the Regional Government in carrying out the utilization and management of groundwater.

## **METHOD**

This study applies a qualitative descriptive method with the aim of obtaining a deeper understanding of the phenomenon studied through data analysis from various sources. This approach was chosen because it provides flexibility in exploring the implementation of information technology-based drilled well mapping as a form of innovation in improving the effectiveness of public services in Tasikmalaya Regency.

### **Data Collection**

Data collection in this study was carried out through three main techniques:

#### **1. Direct Observation**

Observation was carried out to obtain a factual picture of the condition of drilled wells spread across 11 villages receiving assistance. These observations include the location of the well, technical conditions, as well as possible damage found in the field.

#### **2. Interview with Key Informant** Interviews were conducted with village heads from each village receiving drilled well assistance. The criteria for selecting an informant include:

- a. The village head is responsible for the management of drilled wells in his area.

- b. Have an understanding of the obstacles and needs of the community in the use of drilled wells.
  - c. It can provide insight into the role of local governments in the provision and maintenance of drilled wells.
3. Data Triangulation To ensure the accuracy and validity of information, this study applies the source triangulation technique, namely by comparing data from observations, interviews, and supporting documents, such as government reports and technical data on drilled wells from related agencies.

## **Data Analysis**

The data obtained was analyzed using a thematic analysis approach, which included the following stages:

1. Data Reduction
  - a. Selecting and simplifying data relevant to the research objectives.
  - b. Categorize data into key themes, such as borewell conditions, maintenance challenges, and the impact of technology applications on public services.
2. Data Presentation
  - a. The classified data is presented in the form of narrative descriptions and tables to facilitate comparisons between villages.
  - b. Data visualizations, such as web-based digital maps, are used to provide a clearer picture of the distribution of borewells and the extent of their damage.
3. Drawing conclusions
  - a. Analyze the findings to understand the impact of the application of information technology in drilling well mapping.
  - b. Identify patterns and trends that can be the basis for the preparation of policy recommendations for local governments.

Through this approach, the research not only documents the condition of drilled wells, but also evaluates the effectiveness of digital mapping innovations in supporting more strategic decision-making in the public service sector.

## **RESULT AND DISCUSSION**

This research resulted in a mapping of drilled wells based on information technology (Deep Well Map), which serves to provide data on the location, technical condition, and level of damage to drilled wells. This mapping was implemented in 11 villages receiving borewell assistance in



Tasikmalaya Regency and packaged in the form of a web-based digital map that can be accessed online through a blogger platform.

One of the main advantages of this system is its ability to manage data in a more structured manner, making it easier to identify the distribution of drilled wells and their technical conditions. Prior to the implementation of this system, information related to drilled wells was still scattered in various documents without clear integration, making it difficult to maintain and repair efforts optimally. With this digital mapping, local governments can more easily access and update drilled well data, which ultimately increases efficiency in groundwater resource management.

The application of information technology in the mapping of drilled wells has a considerable impact on public policy in the management of clean water resources. Better data integration allows local governments to:

1. Developing data-driven policies, namely more accurate information, supports more effective long-term planning in the maintenance of borewells and the provision of new clean water infrastructure.
2. Accelerating the response to borewell damage, namely with a digital system, the process of identifying and repairing damaged borewells can be carried out more quickly and efficiently.
3. Increasing transparency and accountability, namely online access to drilled well data, provides opportunities for the community and other stakeholders to participate in the supervision and management of groundwater resources.

Although this system provides various benefits, there are several challenges in its implementation, such as the limitations of digital infrastructure in some regions and the need to increase the capacity of human resources in managing and optimizing this system in a sustainable manner.

This information technology-based drilled well mapping model has great potential to be applied in other regions, especially in areas that face similar problems in the supply of clean water. Some steps that can be taken to implement this model in other areas include:

1. Conducting initial data collection on existing drilled wells is to collect technical information about the location, capacity, and condition of the drilled well to ensure complete and accurate data.
2. Developing a GIS-based system is utilizing more advanced mapping technology to improve accuracy and provide more interactive features.
3. Increasing stakeholder involvement is building cooperation with local governments, communities, and research institutions to ensure sustainability and optimal use of this mapping system.

The study conducted a mapping of borewells in 11 villages and found that most of the wells suffered damage of varying severity. The observation results showed that 7 out of 11 drilled wells experienced high sedimentation, which led to a decrease in water discharge. Interviews with village heads revealed that the main factors that cause this problem are the lack of periodic maintenance and limited budget for the maintenance of drilled wells.

Maps of drilled wells, photos of drilled wells and technical data of drilled wells spread across 11 villages / sub-districts of Tasikmalaya Regency which can be accessed through bloggers: <https://petasumurborkabtasik.blogspot.com/>

## CONCLUSION

This research highlights the importance of information technology-based drilling well mapping as an innovation in improving the quality of public services, especially in the provision of clean water in Tasikmalaya Regency. Groundwater has a very crucial role for the community, especially in areas that are prone to drought during the dry season. Although the central and provincial governments have provided assistance in the form of drilling wells, data on their distribution are still not systematically documented in an integrated mapping system. In this study, a qualitative descriptive method was used by collecting data from various sources, such as direct observation and interviews with village heads in 11 villages receiving drilled well assistance. The results of the study show that the use of information technology in mapping drilled wells through Deep Well Map is able to provide more accurate information related to the location of the well, technical conditions, and the level of damage that occurred. This innovation not only facilitates the process of maintaining and repairing damaged drilled wells, but also supports local governments in formulating more optimal and sustainable groundwater management policies. The implementation of this technology-based system is expected to be a long-term solution in increasing access to clean water and improving the quality of public services in Tasikmalaya Regency. Although this research has succeeded in developing an information technology-based drilled well mapping system, there are several limitations that need to be considered.

First, the scope of the study is still limited to the 11 villages that receive drilled well assistance, so it does not reflect the overall condition of drilled wells in Tasikmalaya Regency. Second, this study still relies on a qualitative approach with a descriptive method, so it does not include a more in-depth quantitative analysis of the social and economic impacts of the implementation of this mapping system. Third, the mapping system developed is still based on the blogger platform, which has limitations in interactive features and does not support real-time data updates. Based on the limitations that have been identified, there are several recommendations that can be considered in future research. First, the scope of the research should be expanded to all areas of Tasikmalaya Regency so that the mapping of drilled wells becomes more comprehensive and representative. Second, the mapping system needs to be further developed by adopting GIS (Geographic Information System) technology, which has more interactive features and supports real-time data updates. Third, the next research can combine quantitative methods to analyze the impact of the implementation of drilled well mapping on community welfare and the effectiveness of clean water management policies. Fourth, closer collaboration is needed between local governments, research institutions, and other stakeholders to support the implementation and sustainability of this mapping system in clean water management policies in Tasikmalaya Regency.

## REFERENCE

- Amini, R. T., Siswoyo, H., & Hendrawan, A. P. (2024). Pemetaan Kerentanan Air Tanah terhadap Pencemaran Berdasarkan Metode DRASTIC di Kecamatan Mojoagung Kabupaten Jombang. *Journal of Sustainable Civil Engineering (JOSCE)*, 6(01), 12–21. <https://doi.org/10.47080/josce.v6i01.3052>
- Ariyanti, R., & Lutfi, M. (2023). Pengembangan Bangunan Infrastruktur Air Bersih Desa Cinangka Kecamatan Ciampea Kabupaten Bogor. *SINKRON: Jurnal Pengabdian Masyarakat UIKA Jaya*, 1(1), 18. <https://doi.org/10.32832/jpmuj.v1i1.1670>
- Arsana, I. N. A., Wulandari, D. A. P., Pratistha, I., Waas, D. V., & Meinarni, N. P. S. (2021). Pelatihan Dasar Komputer Dan Teknologi Informasi Bagi Perangkat Desa Kukuh. *Jurnal Widya Laksmi: Jurnal Pengabdian Kepada Masyarakat*, 1(1), 20–25. <https://doi.org/10.59458/jwl.v1i1.11>
- Dan, K., & Di, I. (n.d.). *Inovasi Pelayanan Publik Berbasis E-Government : Studi Kasus Aplikasi Ogan Lopian Dinas*. 3(1), 66–77.
- Fitrah, N., Mustanir, A., Akbari, M. S., Ramdana, R., Jisam, J., Nisa, N. A., Qalbi, N., Febriani, A. F., Irmawati, I., Resky S., Muh. A., & Ilham, I. (2021). Pemberdayaan Masyarakat Melalui Pemetaan Swadaya Dengan Pemanfaatan Teknologi Informasi Dalam Tata Kelola Potensi Desa. *SELAPARANG Jurnal Pengabdian Masyarakat Berkemajuan*, 5(1), 337. <https://doi.org/10.31764/jpmb.v5i1.6208>
- FITRI, A., Pratiwi, D., Dewantoro, F., & Lestari, F. (2022). Pemanenan Air Hujan Sebagai Alternatif Penyediaan Air Bersih Di Desa Banjarsari, Kabupaten Tanggamus. *Journal of Social Sciences and Technology for Community Service (JSSTCS)*, 3(1), 55. <https://doi.org/10.33365/jsstcs.v3i1.1799>
- Haqie, Nadiah, A. (2020). INOVASI PELAYANAN PUBLIK SUROBOYO BIS DI KOTA SURABAYA Zulfa Auliana Haqie. *Inovasi Pelayanan Publik*, 5, 23–30.
- Hidayat, W. (2017). *Tangerang Live Di Kota*. 48–57.
- Jurnal, G., & Geografi, P. (2024). Pemetaan Sebaran Air Tanah Wilayah Kota Piru Kabupaten Seram Bagian Barat. 3(1), 20–28. <https://doi.org/10.30598/geoforumvol3iss1pp55-66>
- Kurniawan, R. C. (2017). Inovasi Kualitas Pelayanan Publik Pemerintah Daerah. *FLAT JUSTISIA: Jurnal Ilmu Hukum*, 10(3), 569–586. <https://doi.org/10.25041/fiatjustisia.v10no3.794>
- Nasikhah, M. A. (2019). Inovasi Pelayanan Transportasi Publik Berbasis Teknologi Informasi. *Jurnal Inovasi Ilmu Sosial Dan Politik*, 1(1), 26. <https://doi.org/10.33474/jisop.v1i1.2670>
- Pelayanan Publik pada Mal Pelayanan Publik Kabupaten Jember Syifaul Jannah, I., & Khotimah, K. (2024). *the Creative Commons Attribution-Share.Alike 4.0 International License Article info Abstrak*. 1, 43–52.
- Ria, M. D., & Budiman, A. (2021). Perancangan Sistem Informasi Tata Kelola Teknologi Informasi Perpustakaan. *Jurnal Informatika Dan Rekayasa Perangkat Lunak (JATIKA)*, 2(1), 122–133.



- Riski, A., Purnaini, R., & Kadaria, U. (2023). Teknologi Tepat Guna Pengolahan Air Sungai Menjadi Air Bersih. *Jurnal Teknologi Lingkungan Laban Basah*, 11(2), 442. <https://doi.org/10.26418/jtlb.v11i2.65742>
- Salman, A. B., Jamaluddin, A., Bakti, A., & Rama. (2022). Pengaruh Distribusi Air Bersih Terhadap Kepuasan Pelanggan di Perusahaan Umum Daerah (Perumda) Air Minum Tirta Danau Tempe Kabupaten Wajo. *PRECISE: Journal of Economic*, 1(2), 32–51.
- Tasyah, A., Lestari, P. A., Syofira, A., Rahmayani, C. A., Cahyani, R. D., & Tresiana, N. (2021). Inovasi Pelayanan Publik Berbasis Digital (E-Government) di Era Pandemi Covid-19. *Jurnal Ilmu Administrasi: Media Pengembangan Ilmu Dan Praktek Administrasi*, 18(2), 212–224. <https://doi.org/10.31113/jia.v18i2.808>
- Wirany, D., Natasha, S., & Kurniawan, R. (2022). Perkembangan Teknologi Informasi dan Komunikasi terhadap Perubahan Sistem Komunikasi Indonesia. *Jurnal Nomosleca*, 8(2), 242–252. <https://doi.org/10.26905/nomosleca.v8i2.8821>
- Zahwa, F. A., & Syafi'i, I. (2022). Pemilihan Pengembangan Media Pembelajaran Berbasis Teknologi Informasi. *Equilibrium: Jurnal Penelitian Pendidikan Dan Ekonomi*, 19(01), 61–78. <https://doi.org/10.25134/equi.v19i01.3963>