LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel)	:	Water Quality Index Analysis for Water Drinking and Irrigation in the Sumowono Groundwater Basin		
Jumlah Penulis	:	4 orang (**Thomas Triadi Putranto,** Novie Susanto, Dina Rahayuning Pangestuti, Aji Bagas Putro)		
Status Pengusul	:	penulis ke-1		
Identitas Jurnal Ilmiah	:	a. Nama Jurnal	:	Jurnal Presipitasi : Media Komunikasi dan Pengembangan Teknik Lingkungan
		b. Nomor ISSN	:	P-ISSN : 1907-817X, E-ISSN : 2550-0023
		c. Vol, No., Bln Thn	:	Vol 18, No 2 (2021): July 2021
		d. Penerbit	:	Department of Environmental Engineering, Faculty of Engineering, Universitas Diponegoro
		e. DOI artikel (jika ada)	:	https://doi.org/10.14710/presipitasi.v18i2.241-253
		f. Alamat web jurnal	:	https://ejournal.undip.ac.id/index.php/presipitasi/article/view/39756
		Alamat Artikel	:	https://ejournal.undip.ac.id/index.php/presipitasi/article/view/39756/pdf
		g. Terindex	:	Sinta 2, DOAJ

Kategori Publikasi Jurnal Ilmiah (beri ✓pada kategori yang tepat) :

	Jurnal Ilmiah Internasional
√	Jurnal Ilmiah Nasional Terakreditasi
	Jurnal Ilmiah Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Reviewer		Nilai Rata-rata
	Reviewer I	Reviewer II	
a. Kelengkapan unsur isi jurnal (10%)	2,50	2,50	2,50
b. Ruang lingkup dan kedalaman pembahasan (30%)	7,00	7,00	7,00
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)	7,00	6,00	6,50
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)	7,50	7,50	7,50
Total = (100%)	**24,00**	**23,00**	**23,50**
Nilai Pengusul = (60% x 23,50) = 14,10			

Semarang,

Reviewer 2

Prof. Dr. Ir. Mohammad Bisri, MS
NIP. 19581126 198609 1 001
Unit Kerja : Teknik Pengairan FT
Universitas Brawijaya

Reviewer 1

Prof. Dr. Ir. Lily Montarcih Limantara, M.Sc.
NIP. 196209171987012001
Unit Kerja : Teknik Pengairan FT
Universitas Brawijaya

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel)	:	Water Quality Index Analysis for Water Drinking and Irrigation in the Sumowono Groundwater Basin		
Jumlah Penulis	:	4 orang (**Thomas Triadi Putranto,** Novie Susanto, Dina Rahayuning Pangestuti, Aji Bagas Putro)		
Status Pengusul	:	penulis ke-1		
Identitas Jurnal Ilmiah	:	a. Nama Jurnal	:	Jurnal Presipitasi : Media Komunikasi dan Pengembangan Teknik Lingkungan
		b. Nomor ISSN	:	P-ISSN : 1907-817X, E-ISSN : 2550-0023
		c. Vol, No., Bln Thn	:	Vol 18, No 2 (2021): July 2021
		d. Penerbit	:	Department of Environmental Engineering, Faculty of Engineering, Universitas Diponegoro
		e. DOI artikel (jika ada)	:	https://doi.org/10.14710/presipitasi.v18i2.241-253
		f. Alamat web jurnal	:	https://ejournal.undip.ac.id/index.php/presipitasi/article/view/39756
		Alamat Artikel	:	https://ejournal.undip.ac.id/index.php/presipitasi/article/view/39756/pdf
		g. Terindex	:	Sinta 2, DOAJ

Kategori Publikasi Jurnal Ilmiah (beri ✓pada kategori yang tepat)	:	☐ Jurnal Ilmiah Internasional
		☑ Jurnal Ilmiah Nasional Terakreditasi
		☐ Jurnal Ilmiah Nasional Tidak Terakreditasi

Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir Yang Diperoleh
	Internasional ☐	Nasional Terakreditasi 25	Nasional Tidak Terakreditasi ☐	
a. Kelengkapan unsur isi jurnal (10%)		2,50		2,50
b. Ruang lingkup dan kedalaman pembahasan (30%)		7,50		7,00
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)		7,50		7,00
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)		7,50		7,50
Total = (100%)		**25,00**		**24,00**
Nilai Pengusul = (60% x 24,00) = 14,40				

Catatan Penilaian artikel oleh Reviewer :

1. **Kesesuaian dan kelengkapan unsur isi jurnal:**
   Isi jurnal lengkap ditulis dalam Bahasa Inggris tersusun Title, Abstract, Introduction, Methods, Result and Discussion, Conclusion, Acknowledgement, References.
2. **Ruang lingkup dan kedalaman pembahasan:**
   Paper membahas indeks kualitas air untuk air minum dan irigasi di Cekungan Sumowono dari data kimia air melalui perhitungan rumus empiris WQI untuk air minum dan Sodium Adsoprtion Ratio (SAR) untuk kualitas air irigasi. Sampel kimia masih terbatas perlu diperbanyak.
3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:**
   Data didapat dari data lapangan yang aktual walau jumlah yang terbatas namun cukup menggambarkan kondisi kualitas air. Metodologi dengan perhitungan WQI dan SAR tepat untuk analisis kualitas air minum dan irigasi.
4. **Kelengkapan unsur dan kualitas terbitan:**
   Kelengkapan unsur jurnal lengkap dengan editor dan reviewer dari dalam dan luar UNDIP juga reviewer dari Singapura dan Jepang, terakreditasi Sinta 2, eISSN: 2550-0023.

Malang, 24 Juni 2022
Reviewer 1

Prof. Dr. Ir. Lily Montarcih Limantara, M.Sc.
NIP. 196209171987012001
Unit Kerja : Teknik Pengairan FT
Universitas Brawijaya

LEMBAR
HASIL PENILAIAN SEJAWAT SEBIDANG ATAU *PEER REVIEW*
KARYA ILMIAH : JURNAL ILMIAH

Judul Jurnal Ilmiah (Artikel)	:	Water Quality Index Analysis for Water Drinking and Irrigation in the Sumowono Groundwater Basin		
Jumlah Penulis	:	4 orang (**Thomas Triadi Putranto,** Novie Susanto, Dina Rahayuning Pangestuti, Aji Bagas Putro)		
Status Pengusul	:	penulis ke-1		
Identitas Jurnal Ilmiah	:	a. Nama Jurnal	:	Jurnal Presipitasi : Media Komunikasi dan Pengembangan Teknik Lingkungan
		b. Nomor ISSN	:	P-ISSN : 1907-817X, E-ISSN : 2550-0023
		c. Vol, No., Bln Thn	:	Vol 18, No 2 (2021): July 2021
		d. Penerbit	:	Department of Environmental Engineering, Faculty of Engineering, Universitas Diponegoro
		e. DOI artikel (jika ada)	:	https://doi.org/10.14710/presipitasi.v18i2.241-253
		f. Alamat web jurnal	:	https://ejournal.undip.ac.id/index.php/presipitasi/article/view/39756
		Alamat Artikel	:	https://ejournal.undip.ac.id/index.php/presipitasi/article/view/39756/pdf
		g. Terindex	:	Sinta 2, DOAJ

Kategori Publikasi Jurnal Ilmiah (beri ✓pada kategori yang tepat)	:	☐ Jurnal Ilmiah Internasional
		☑ Jurnal Ilmiah Nasional Terakreditasi
		☐ Jurnal Ilmiah Nasional Tidak Terakreditasi

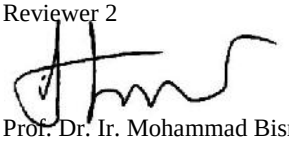
Hasil Penilaian *Peer Review* :

Komponen Yang Dinilai	Nilai Maksimal Jurnal Ilmiah			Nilai Akhir Yang Diperoleh
	Internasional ☐	Nasional Terakreditasi 25	Nasional Tidak Terakreditasi ☐	
a. Kelengkapan unsur isi jurnal (10%)		2,50		2,50
b. Ruang lingkup dan kedalaman pembahasan (30%)		7,50		7,00
c. Kecukupan dan kemutahiran data/informasi dan metodologi (30%)		7,50		6,00
d. Kelengkapan unsur dan kualitas terbitan/jurnal (30%)		7,50		7,50
Total = (100%)		**25,00**		**23,00**
Nilai Pengusul = (60% x 23,00) = 13,80				

Catatan Penilaian artikel oleh Reviewer :

1. **Kesesuaian dan kelengkapan unsur isi jurnal:**
   Isi paper lengkap ditulis dalam bahasa Inggris terdiri dari Title, Abstract, Introduction, Methods, Result and Discussion, Conclusion, Acknowledgement, References.
2. **Ruang lingkup dan kedalaman pembahasan:**
   Paper membahas analisis kualitas air untuk keperluan air minum dan irigasi di Cekungan Sumowono. Pembahasan secara spasial dari hasil analisis empiris Water Quality Index dan SAR untuk wilayah cukup luas.
3. **Kecukupan dan kemutakhiran data/informasi dan metodologi:**
   Sampel air minim untuk wilayah yang luas. Metode yang digunakan cukup tepat yakni WQI dan SAR. Dianalisis menggunakan perhitungan rumus WQI dan geospasial untuk pengambaran peta.
4. **Kelengkapan unsur dan kualitas terbitan:**
   Jurnal bagus diterbitkan oleh Departemen Teknik Lingkungan Undip dengan editor dan reviewer dari dalam dan luar UNDIP. Reviewer ada yang dari luar negeri Singapura dan Jepang. Jurnal Sinta 2 dengan similarity Index 10%, eISSN: 2550-0023.

Malang, 23 Juni 2022
Reviewer 2



Prof. Dr. Ir. Mohammad Bisri, MS
NIP. 19581126 198609 1 001
Unit Kerja : Teknik Pengairan FT
Universitas Brawijaya

SALINAN

MENTERI RISET DAN TEKNOLOGI/
KEPALA BADAN RISET DAN INOVASIA NASIONAL
REPUBLIK INDONESIA

KEPUTUSAN MENTERI RISET DAN TEKNOLOGI/
KEPALA BADAN RISET DAN INOVASI NASIONAL
REPUBLIK INDONESIA

NOMOR 200/M/KPT/2020

TENTANG
PERINGKAT AKREDITASI JURNAL ILMIAH PERIODE III
TAHUN 2020

MENTERI RISET DAN TEKNOLOGI/
KEPALA BADAN RISET DAN INOVASI NASIONAL
REPUBLIK INDONESIA,

Menimbang : a. bahwa dalam rangka pembinaan terhadap penyelenggaraan ilmu pengetahuan dan teknologi serta untuk meningkatkan relevansi, kuantitas, dan kualitas publikasi ilmiah ilmuwan Indonesia guna mendukung daya saing bangsa diperlukan peringkat akreditasi jurnal ilmiah;

c. bahwa tim Akreditasi Jurnal Ilmiah Kementerian Riset dan Teknologi/Badan Riset dan Inovasi Nasional pada tanggal 18 Desember 2020 telah menetapkan hasil akreditasi jurnal ilmiah periode III tahun 2020;

d. bahwa berdasarkan pertimbangan sebagaimana dimaksud dalam huruf a dan huruf b, perlu menetapkan Keputusan Menteri Riset dan Teknologi/Kepala Badan Riset dan Inovasi Nasional tentang Peringkat Akreditasi Jurnal Ilmiah Periode III Tahun 2020;

Mengingat …

Mengingat : 1. Undang-Undang Nomor 12 Tahun 2012 tentang Pendidikan Tinggi (Lembaran Negara Republik Indonesia Tahun 2012 Nomor 158, tambahan Lembaran Negara Republik Indonesia Nomor 5336);

2. Undang-Undang Nomor 11 Tahun 2019 Tentang Sistem Nasional Ilmu Pengetahuan dan Teknologi (Lembaran Negara Republik Indonesia Tahun 2019 Nomor 148, Tambahan Lembaran Negara Republik Indonesia Nomor 6374);

3. Peraturan Pemerintah Nomor 4 Tahun 2014 tentang Penyelenggaraan Pendidikan dan Pengelolaan Perguruan Tinggi (Lembaran Negara Republik Indonesia Tahun 2014, Nomor 16, tambahan Lembaran Negara Republik Indonesia Nomor 5500);

4. Peraturan Presiden Nomor 68 Tahun 2019 tentang Organisasi Kementerian Negara (Lembaran Negara Republik Indonesia Tahun 2019 Nomor 203);

5. Peraturan Presiden Nomor 50 Tahun 2020 tentang Kementerian Riset dan Teknologi (Lembaran Negara Republik Indonesia Tahun 2020 Nomor 89);

6. Keputusan Presiden Nomor 113/P Tahun 2019 tentang Pembentukan Kementerian Negara dan Pengangkatan Menteri Negara Kabinet Indonesia Maju Periode Tahun 2019-2024;

MEMUTUSKAN:

Menetapkan : KEPUTUSAN MENTERI RISET DAN TEKNOLOGI/KEPALA BADAN RISET DAN INOVASI NASIONAL TENTANG PERINGKAT AKREDITASI JURNAL ILMIAH PERIODE III TAHUN 2020.

KESATU : Menetapkan Peringkat Akreditasi Jurnal Ilmiah Periode III Tahun 2020 sebagaimana tercantum dalam Lampiran yang merupakan bagian yang tidak terpisahkan dari Keputusan Menteri/Kepala Badan ini.

KEDUA ...

KEDUA : Akreditasi Jurnal Ilmiah sebagaimana dimaksud dalam Diktum KESATU berlaku selama 5 (lima) tahun mulai dari nomor dan tahun sebagaimana tercantum dalam Lampiran yang merupakan bagian yang tidak terpisahkan dari keputusan Menteri/Kepala Badan ini.

KETIGA : Setiap jurnal ilmiah wajib mencantumkan masa berlaku akreditasi di dalam laman jurnal dengan menuliskan tanggal penetapan dan tanggal akhir masa berlaku akreditasi.

KEEMPAT : Keputusan Menteri/Kepala Badan ini mulai berlaku pada tanggal ditetapkan.

Ditetapkan di Jakarta
pada tanggal 23 Desember 2020

MENTERI RISET DAN TEKNOLOGI/
KEPALA BADAN RISET DAN INOVASI NASIONAL
REPUBLIK INDONESIA,

ttd.

BAMBANG P.S. BRODJONEGORO

Salinan sesuai dengan aslinya
KEMENTERIAN RISET DAN TEKNOLOGI/
BADAN RISET DAN INOVASI NASIONAL
Sekretariat Kementerian/Sekretariat Utama
Kepala Biro Hukum dan Organisasi,

ttd.

Ardhien Nissa Widhawati Siswojo

SALINAN

LAMPIRAN
KEPUTUSAN MENTERI RISET DAN TEKNOLOGI/BADAN RISET DAN INOVASI NASIONAL REPUBLIK INDONESIA
NOMOR 200/M/KPT/2020
TENTANG
PERINGKAT AKREDITASI JURNAL ILMIAH PERIODE III TAHUN 2020

PERINGKAT AKREDITASI JURNAL ILMIAH PERIODE III TAHUN 2020

Peringkat Baru	No	Nama Jurnal	EISSN	Penerbit	Keterangan
1	1	*ASEAN Journal on Science and Technology for Development*	22249028	Universitas Gadjah Mada	Reakreditasi Tetap di Peringkat 1 mulai Volume 37 Nomor 2 Tahun 2020
	2	*Communications in Science and Technology*	25029266	Komunitas Ilmuwan dan Profesional Muslim Indonesia (KIPMI)	Reakreditasi Tetap di Peringkat 1 mulai Volume 1 Nomor 1 Tahun 2016
	3	*Economic Journal of Emerging Markets* (EJEM)	2502180X	Pusat Pengembangan Ekonomi, Fakultas Ekonomi, Universitas Islam Indonesia	Reakreditasi Naik Peringkat dari Peringkat 2 ke Peringkat 1 mulai Volume 10 Nomor 2 Tahun 2018
	4	IJOG : *Indonesian Journal on Geoscience*	23559306	Badan Geologi	Reakreditasi Tetap di Peringkat 1 mulai Volume 7 Nomor 2 Tahun 2020
	5	IJoLE: *International Journal of Language Education*	25488465	Fakultas Bahasa dan Sastra Universitas Negeri Makassar	Reakreditasi Tetap di Peringkat 1 mulai Volume 4 Nomor 1 Tahun 2020
	6	Ilmu Kelautan: *Indonesian Journal of Marine Sciences*	24067598	Departemen Ilmu Kelautan Universitas Diponegoro dan Himpunan Ahli Pengelolaan Pesisir Indonesia	Reakreditasi Tetap di Peringkat 1 mulai Volume 25 Nomor 3 Tahun 2020
	7	*Indonesian Journal of Forestry Research*	24068195	Badan Penelitian dan Pengembangan Kehutanan, Kementerian Lingkungan Hidup dan Kehutanan	Reakreditasi Tetap di Peringkat 1 mulai Volume 7 Nomor 1 Tahun 2020

Peringkat Baru	No	Nama Jurnal	EISSN	Penerbit	Keterangan
	146	Jurnal Perlindungan Tanaman Indonesia	25484788	Departemen Hama dan Penyakit Tumbuhan, Fakultas Pertanian, Universitas Gadjah Mada bekerja sama dengan Perhimpunan Entomologi Indonesia (PEI) dan Perhimpunan Fitopatologi Indonesia (PFI)	Reakreditasi Tetap di Peringkat 2 mulai Volume 24 Nomor 1 Tahun 2020
	147	Jurnal Politik	24610615	Departemen Ilmu Politik Universitas Indonesia	Akreditasi Peringkat 2 mulai Volume 5 Nomor 2 Tahun 2020
	148	Jurnal Presipitasi : Media Komunikasi dan Pengembangan Teknik Lingkungan	25500023	Departemen Teknik Lingkungan, Universitas Diponegoro	Reakreditasi Naik Peringkat dari Peringkat 3 ke Peringkat 2 mulai Volume 17 Nomor 2 Tahun 2020
	149	Jurnal Profesi Medika : Jurnal Kedokteran dan Kesehatan	26211122	Fakultas Kedokteran Universitas Pembangunan Nasional Veteran Jakarta	Reakreditasi Naik Peringkat dari Peringkat 3 ke Peringkat 2 mulai Volume 14 Nomor 1 Tahun 2020
	150	Jurnal Psikologi	23021098	Fakultas Psikologi Universitas Diponegoro	Reakreditasi Tetap di Peringkat 2 mulai Volume 19 Nomor 2 Tahun 2020
	151	Jurnal Respirasi	26218372	Universitas Airlangga	Akreditasi Peringkat 2 mulai Volume 5 Nomor 1 Tahun 2019
	152	Jurnal Respirologi Indonesia	26203162	Perhimpunan Dokter Paru Indonesia	Reakreditasi Turun Peringkat dari Peringkat 1 ke Peringkat 2 mulai Volume 40 Nomor 3 Tahun 2020
	153	Jurnal Riset Kimia	24768960	Universitas Andalas	Akreditasi Peringkat 2 mulai Volume 10 Nomor 1 Tahun 2019

154 Jurnal ...

Peringkat Baru	No	Nama Jurnal	EISSN	Penerbit	Keterangan
	57	Syaksia : Jurnal Hukum Perdata Islam	27153606	Universitas Islam Negeri Sultan Maulana Hasanuddin Banten	Akreditasi Peringkat 6 mulai Volume 15 Nomor 2 Tahun 2018

Ditetapkan di Jakarta
pada tanggal 23 Desember 2020

MENTERI RISET DAN TEKNOLOGI/
KEPALA BADAN RISET DAN INOVASI NASIONAL REPUBLIK INDONESIA,

ttd.

BAMBANG P.S. BRODJONEGORO

Salinan sesuai dengan aslinya
KEMENTERIAN RISET DAN TEKNOLOGI/
BADAN RISET DAN INOVASI NASIONAL
Sekretariat Kementerian/Sekretariat Utama
Kepala Biro Hukum dan Organisasi,

ttd.

Ardhien Nissa Widhawati Siswojo

Jurnal Presipitasi:
Media Komunikasi dan Pengembangan Teknik Lingkungan

e-ISSN: 2550-0023 p-ISSN: 1907-817X

Open Access Journal
Universitas Diponegoro

User

Username

Password

Remember me

Login

Journal Profile

(Updated 18th Jun 2022)

Number of Documents: 308

G Scholar Citation: 1204 click here (https://scholar.google.co.id/citations?hl=en&pli=1&user=sSCj99EAAAAJ)

H-Index: 17

i10-Index: 42

Impact Factor: 0.41

SINTA: Accredited 2nd Rank (https://drive.google.com/file/d/1Qhm0H3G2f usp=sharing)

Sinta Profile (https://sinta3.kemdikbud.go.id/journals/profile/2530)

Download

Article Template (https://drive.google.com/file/d/1di-C-r02LOnQ-24NzyHYRlM4tOLL2e-i/view?usp=sharing)

Reviewer Guidelines (https://drive.google.com/file/d/1N57kr9UVh WolOwyoI/view?usp=sharing)

Sinta 2 Certificate (https://drive.google.com/file/d/1UPGhAlBNT 5AI1eF/view?usp=sharing)

How to register in this journal if you are already being registered in another UNDIP journal (https://docs.google.com/document/d/1APJ6E 8iz2POzKTmOI_yqLPjSm/edit?usp=sharing&ouid=108128324972615873 15)

Notifications

- View (https://ejournal.undip.ac.id/index.php/presipitasi/notification)
- Subscribe (https://ejournal.undip.ac.id/index.php/presipitasi/notification/subscribeMailList)

Current issue: Vol 19, No 2 (2022): July 2022 (https://ejournal.undip.ac.id/index.php/presipitasi/issue/current) | Archives (https://ejournal.undip.ac.id/index.php/presipitasi/issue/archive) | Start Submission (https://ejournal.undip.ac.id/index.php/presipitasi/about/submissions)

Jurnal Presipitasi Accredited by Sinta 2 (https://ejournal.undip.ac.id/index.php/presipitasi/announcement/view/283)

Jurnal Presipitasi Indexed by DOAJ (https://ejournal.undip.ac.id/index.php/presipitasi/announcement/view/180)

Jurnal Presipitasi : Media Komunikasi dan Pengembangan Teknik Lingkungan (P-ISSN : 1907-817X (http://issn.pdii.lipi.go.id/issn.cgi?daftar&1180425884&1&&) and E-ISSN : 2550-0023 (/index.php/presipitasi/index)) is an official periodical journal published by the Department of Environmental Engineering, Faculty of Engineering, Universitas Diponegoro since 2006, jointly with FIM PII Jawa Tengah (https://www.instagram.com/fimpiijateng/) . This journal publishes both review and scientific research articles relating to the field of ***Environmental Sciences and Engineering***. This journal has been accredited by National Journal Accreditation (ARJUNA) Managed by Ministry of Research and Technology/National Research and Innovation Agency with Second Grade (SINTA 2). (https://drive.google.com/file/d/1Qhm0H3G2fT5ZwaJ2N3blp3Efz26MhDi7/view?usp=sharing) Short Abbreviation Title: *J. Presipitasi*, alternative title: *Presipitasi Journal : Communication and Development Media of Environmental Engineering.*

If you are willing to be part of us as reviewer / editor, please check this link (https://docs.google.com/forms/d/e/1FAIpQLSfVSgLWbBqMfFmspnj2R1NcmLHkD-E9tGKYj7GzkJUo_0UY9w/viewform?usp=sf_link)

Publication schedule: March, July, November | more info (/index.php/presipitasi/about/editorialPolicies#publicationFrequency)

Language: English

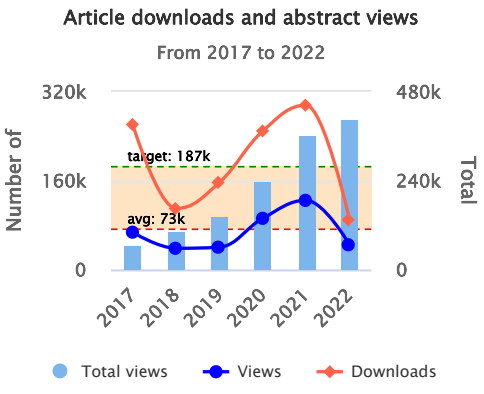
Article Processing Charges: please see this following link | more info (/index.php/presipitasi/about/editorialPolicies#custom-2)

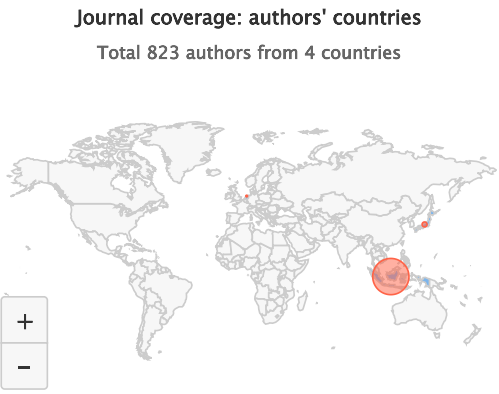
Indexing: DOAJ, SINTA, Google Scholar, etc. | more info (/index.php/presipitasi/about)

Ready for submitting a manuscript? Please follow [Author Guidelines (/index.php/presipitasi/about/submissions#onlineSubmissions)]

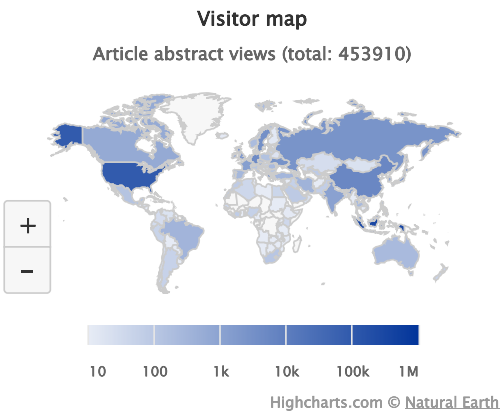
Contact: presipitasi@live.undip.ac.id

For hardcopy order: more info (https://docs.google.com/forms/d/e/1FAIpQLSdsx9Gv2m2MAUkn1lqF9m3MTkFbnyijFwe5VM4XSZ4ZLilxiQ/viewform?usp=sf_link)





(https://ejournal.undip.ac.id/index.php/presipitasi/stats) ()



(https://ejournal.undip.ac.id/index.php/presipitasi/stats)

Recent articles (#tabRecent) Most cited articles (#tabCited) Contact (#tabContact)

Vol 19, No 2 (2022): July 2022

Jurnal Presipitasi:
Media Komunikasi dan Pengembangan
Teknik Lingkungan

e-ISSN: 2550-0023 p-ISSN: 1907-817X

Open Access Journal
Universitas Diponegoro

Editorial Team

People > Editorial Team (https://ejournal.undip.ac.id/index.php/presipitasi/about/editorialTeam) Reviewer (https://ejournal.undip.ac.id/index.php/presipitasi/about/displayMembership/305/0)

Editor in Chief

Editorial Advisory Board

Associate Editors

Assistant Editor

Jurnal Presipitasi:
Media Komunikasi dan Pengembangan
Teknik Lingkungan

e-ISSN: 2550-0023 p-ISSN: 1907-817X

Open Access Journal
Universitas Diponegoro

General information (#issueInfo)

Published: 31-07-2021

Total Articles: (including Editorial) 19

Total Authors: 71

Total affiliation countries (2) (#issueCountry)

Total authors' affiliations (15) (#issueAffiliations)

Issues list

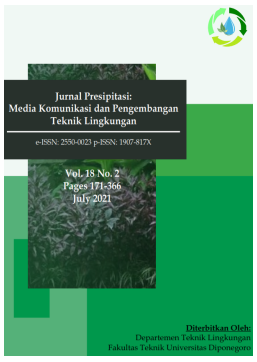
- Vol 19, No 2 (2022): July 2022
- Vol 19, No 1 (2022): March 2022
- Vol 18, No 3 (2021): November 2021
- Vol 18, No 2 (2021): July 2021
- Vol 18, No 1 (2021): March 2021
- Article in Press 2021
- Vol 17, No 3 (2020): November 2020
- Vol 17, No 2 (2020): Juli 2020
- Vol 17, No 1 (2020): Maret 2020
- Complete issues

Most cited articles

- FITOREMEDIASI PHOSPAT DENGAN PEMANFAATAN ENCENG GONDOK (EICHHORNIA CRASSIPES) (STUDI KASUS PADA LIMBAH CAIR INDUSTRI KECIL LAUNDRY)
- EVALUASI KINERJA INSTALASI PENGOLAHAN AIR MINUM (IPAM) KARANGPILANG I PDAM SURYA SEMBADA KOTA SURABAYA SECARA KUANTITATIF
- POLA PENYEBARAN LIMPASAN LOGAM LINDI TPA JATIBARANG PADA AIR SUNGAI KREO (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/10973)
- PERKEMBANGAN BIOFILM NITRIFIKASI DI FIXED BED REACTOR PADA SALINITAS TINGGI (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/4804)
- STUDI PENGARUH PENCAMPURAN SAMPAH DOMESTIK SEKAM PADI DAN

Home (https://ejournal.undip.ac.id/index.php/presipitasi/index) / Archives (https://ejournal.undip.ac.id/index.php/presipitasi/issue/archive) / Vol 18, No 2 (2021) (https://ejournal.undip.ac.id/index.php/presipitasi/issue/view/3066)

Vol 18, No 2 (2021): July 2021



July 2021 Issue

(https://ejournal.undip.ac.id/index.php/presipitasi/issue/view/3066/showToc)

Table of Contents

Review Article

Original Research Article

Re-layout of Temporary Storage Area for Toxic and Hazardous Waste using 5S (Seiri, Seiton, Seiso, Seiketsu, Sitsuke) (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/39918) (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/39

Muhammad Ilham Adelino, Meldia Fitri, Ayu Sundari

Citations 0 (https://badge.dimensions.ai/details/doi/10.14710/presipitasi.v18i2.358-366?domain=https://ejournal.undip.ac.id)

| Language: EN (#) | DOI: 10.14710/presipitasi.v18i2.358-366 (https://doi.org/10.14710/presipitasi.v18i2.358-366)

Received: 7 Jun 2021; Revised: 24 Jul 2021; Accepted: 27 Jul 2021; Available online: 31 Oct 2021; Published: 31 Jul 2021.

Regional Case Study

Community Perception and Participation of the Forestry Partnership Scheme on PT. Restorasi Ekosistem Indonesia Working Area in Jambi Province (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/39035) (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/39

Erwin Herwindo, Rosyani Rosyani, Eva Achmad

Citations 0 (https://badge.dimensions.ai/details/doi/10.14710/presipitasi.v18i2.202-211?domain=https://ejournal.undip.ac.id)

| Language: EN (#) | DOI: 10.14710/presipitasi.v18i2.202-211 (https://doi.org/10.14710/presipitasi.v18i2.202-211)

Received: 10 May 2021; Revised: 11 Jul 2021; Accepted: 12 Jul 2021; Published: 31 Jul 2021.

Implementation of Zero Etanol in the Analysis of Lambucid Tablet Sampling at PT. Kalbe Farma Tbk (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/37536) (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/37

Nisa Nurhidayanti, Deni Rusli

Citations 0 (https://badge.dimensions.ai/details/doi/10.14710/presipitasi.v18i2.212-218?domain=https://ejournal.undip.ac.id)

| Language: EN (#) | DOI: 10.14710/presipitasi.v18i2.212-218 (https://doi.org/10.14710/presipitasi.v18i2.212-218)

Received: 30 Mar 2021; Revised: 3 May 2021; Accepted: 6 May 2021; Published: 31 Jul 2021.

Water Conservation Planning at Telkom University Landmark Tower Bandung Campus (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/37012) (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/37

Bizantio Wiranta Ranadipura, Eka Wardhani

Citations 0 (https://badge.dimensions.ai/details/doi/10.14710/presipitasi.v18i2.219-230?domain=https://ejournal.undip.ac.id)

| Language: EN (#) | DOI: 10.14710/presipitasi.v18i2.219-230 (https://doi.org/10.14710/presipitasi.v18i2.219-230)

Received: 1 Mar 2021; Revised: 13 Jun 2021; Accepted: 14 Jun 2021; Published: 31 Jul 2021.

Optimization of Waste Management at the Purwosari Material Recovery Facility (MRF) Mijen District, Semarang City (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/38260) (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/38

Anik Sarminingsih, Winardi Dwi Nugraha, Alya Karmilia

Citations 0 (https://badge.dimensions.ai/details/doi/10.14710/presipitasi.v18i2.231-240?domain=https://ejournal.undip.ac.id)

| Language: EN (#) | DOI: 10.14710/presipitasi.v18i2.231-240 (https://doi.org/10.14710/presipitasi.v18i2.231-240)

Received: 5 May 2021; Revised: 28 Jul 2021; Accepted: 31 Jul 2021; Available online: 25 Aug 2021; Published: 31 Jul 2021.

Water Quality Index Analysis for Water Drinking and Irrigation in the Sumowono Groundwater Basin (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/39756) (https://ejournal.undip.ac.id/index.php/presipitasi/article/view/39

Thomas Triadi Putranto, Novie Susanto, Dina Rahayuning Pangestuti, Aji Bagas Putro

Citations 0 (https://badge.dimensions.ai/details/doi/10.14710/presipitasi.v18i2.241-253?domain=https://ejournal.undip.ac.id)

| Language: EN (#) | DOI: 10.14710/presipitasi.v18i2.241-253 (https://doi.org/10.14710/presipitasi.v18i2.241-253)

Received: 2 Jun 2021; Revised: 22 Jul 2021; Accepted: 30 Jul 2021; Available online: 25 Aug 2021; Published: 31 Jul 2021.

Jurnal Presipitasi
Media Komunikasi dan Pengembangan Teknik Lingkungan
e-ISSN: 2550-0023

Vol 18, No 2, 2021, 241-253
Article available at homepage presipitasi

Research Article

Water Quality Index Analysis for Water Drinking and Irrigation in the Sumowono Groundwater Basin

Thomas Triadi Putranto[1]*, Novie Susanto[2], Dina Rahayuning Pangestuti[3], Aji Bagas Putro[1]

[1] Geological Engineering Department, Faculty of Engineering, Universitas Diponegoro, Jl. Prof. Soedarto, SH, Kampus Undip Tembalang, Semarang, Indonesia 50275
[2] Industrial Engineering Department, Fakultas Teknik, Universitas Diponegoro, Jl. Prof. Soedarto, SH, Kampus Undip Tembalang, Semarang, Indonesia 50275
[3] Public Health Nutrition and MCH Division, Faculty of Public Health, Universitas Diponegoro, Jl. Prof. Soedarto, SH, Kampus Undip Tembalang, Semarang, Indonesia 50275

*Correspondence author, e-mail: putranto@ft.undip.ac.id

Abstract

The Sumowono Groundwater Basin is a cross-district basin located in Central Java Province, between Temanggung Regency, Kendal Regency, and Semarang Regency. The people in this area obtain fresh water from either dug wells or springs. The purpose of this research is to determine the feasibility of groundwater for drinking water and irrigation purposes. The method used was hydrogeological mapping and physical and chemical analysis of 10 groundwater samples. The samples were subjected to empirical testing of the Groundwater Quality Index to determine the feasibility of drinking water and irrigation using Sodium Adsorption Ratio (SAR) analysis and Wilcox diagram. The results showed that all samples physically have tasteless and odorous properties. For the chemical properties produced in the ten samples, the pH value ranges from about 6.85 - 7.27. The electrical conductivity is between 71.6 - 511 µS/cm. Total Dissolved Solids values are between 45.82 and 327.04 mg/L, with total hardness values ranging from 10 to 170 mg/L. From the results of the SAR analysis, it is found that the groundwater classes were included in S1C1 and S1C2, so that groundwater has low alkaline in both sodium and salinity, respectively. Thus, groundwater is considered suitable for consumption and irrigation purposes,

Keywords: groundwater; sodium adsorption; Sumowono; water quality index; Wilcox diagram

1. Introduction

A groundwater basin is defined as an area bounded by hydrogeological boundaries. All hydrogeological events such as filling, draining, and releasing groundwater occur, referring to the Regulation of the Minister of Energy and Mineral Resources No. 2 of 2017 concerning groundwater basin. Each groundwater basin has its hydrogeological characteristics, which can hydraulically relate to other groundwater basins or not at all (UU No. 17/2019). One of the basins in Central Java is the Sumowono Groundwater Basin. Groundwater produced and contained in the earth is based on several processes, including deposition due to atmospheric salt, interactions between groundwater and rocks, and

Jurnal Presipitasi
Media Komunikasi dan Pengembangan Teknik Lingkungan
e-ISSN : 2550-0023

Vol 18, No 2, 2021, 171-180
Article available at homepage presipitasi

Research Article

A Brief of Water and Soil Pollution Management (Recent Trend and Economic Perspective)

Muhammad Safri[1*], Nurhayani[1], Desy Rosarina[2]

[1]Development Economics Program, Faculty of Economics, Universitas Jambi, Jambi, Indonesia
[2]Industrial Engineering, Universitas Muhammadiyah Tangerang, Tangerang, Indonesia
* Correspondence author, e-mail: m_syafri@unja.ac.id

Abstract

Soil and water pollution are the most crucial issues in the world. Various reports have informed that pollution has had long-term adverse effects on environmental sustainability and human health. Several methods have been reported to be effective in reducing pollutant parameters in water and soil. The methods often used in water and soil remediation are bioremediation (land-vetting, bio-cell. Bio cell, Phytoremediation, Land venting, Composite, Bio venting, Bio slurry), Adsorption, Pretreatment (Ultrasonic), Microwave, Electrokinetic disintegration, High-Pressure Homogenization/HPH, Thermal Hydrolysis, Acid hydrolysis (HCl, H_2SO_4, H_3PO_4, and HNO_3), Ozonation, Fenton Oxidation, Fe (II) - activated persulfate, Protease, amylase, lipase. This paper will explain water and soil pollution and the methods used to overcome them. Information collection is carried out using secondary data; internationally reputable journals and accredited national journals are used to obtain information about the effectiveness and costs incurred. This paper will provide a holistic comparison of prices, effectiveness, and information on various remediating water and soil pollution methods around the world. Based on the NPV and IRR analysis, the water treatment method using the adsorption method is an economically feasible method with an IRR value of 51%.

***Keywords**:* economic analysis; soil; water; wastewater; wastewater treatment

1. Introduction

Environmental pollution has been reported in various countries around the world (Landrigan and Fuller, 2015). The decline in water and soil quality is a crucial issue and is the most widely discussed in various scientific articles. World Water Congress reports that water pollution has occurred in various cities worldwide, including Aqaba, Bangkok, Beijing, Chennai, Durban, Kampala, Lima, and Manila. This international congress reports that the decrease in water quantity and quality is caused by human activities, including agriculture, mining, industrial manufacturing, infrastructure development, and other human activities (International Water Association, 2018). Other studies have also reported that a decrease in water quality has occurred in Southeast Asian countries such as Indonesia, Thailand, Malaysia, Myanmar, Cambodia, Vietnam, Philippines (Anh et al., 2007; Ferrer et al., 2012; Watanabe et al., 2016). The decline in water quality in various countries includes a decrease or increase in pH so that water is acidic or alkaline, high metal ion content, high BOD, COD and TSS concentrations, and dye content and other parameters. Apart from water, the soil has also been reported as a part of the environment that has experienced a decline in quality. Soil pollution also occurs due to human activities; a recent study reports that China's agricultural activities have caused soil contamination. This

Jurnal Presipitasi
Media Komunikasi dan Pengembangan Teknik Lingkungan
e-ISSN : 2550-0023

Vol 18, No 2, 2021, 192-201
Article available at homepage presipitasi

Research article

The Effectiveness of Reducing Ammonia Content Using Phytoremediation Methods in Domestic Waste of Pelita Bangsa University

Nisa Nurhidayanti[1*], Nadya Ulfani Sara[1]

[1]Environmental Engineering Program, Faculty of Engineering, Universitas Pelita Bangsa, Jalan lnspeksi KaIimaIang TegaI Danas Arah DeIta Mas, Kecamatan Cikarang Pusat, Kabupaten Bekasi, Jawa Barat lndonesia 17530
*Corresponding author, email: nisa.kimia@pelitabangsa.ac.id

Abstract

Pelita Bangsa University is a private university with an increasing number of students every academic year. The increase in the number of students causes an increase in the amount of domestic waste generated. This study aims to determine the effectiveness of reducing Ammonia content in Pelita Bangsa University Domestic Waste by phytoremediation method using Apu Wood (Pistia stratiotes L.) and Kana Flower (Canna Indica) as well as the use of coffee grounds as activated carbon. The first step in this research is the manufacture of activated carbon from coffee grounds. The next step is to take samples of the Pelita Bangsa University domestic waste test. The test samples were brought to the laboratory, and the Ammonia parameter was tested to determine the initial concentration of the waste. Then the next step is the acclimatization process of plants and then continued with the Range Finding Test process. After that, the waste treatment process is carried out with a phytoreactor. Furthermore, the waste from the phytoreactor processing is taken to the laboratory for testing the ammonia parameters. The last step is to analyze the test results data. Based on the results of laboratory tests, the ammonia content after the phytoremediation process with and without a filter is <0.1 mg/L with the effectiveness of reducing the ammonia concentration by 97.10% with the addition of coffee grounds activated carbon filter and 96.7% for the use of the phytoremediation method without filters.

Keywords: ammonia, phytoremediation, domestic waste

1. Introduction

The number of cases of environmental pollution, especially water pollution in developing countries such as Indonesia, has resulted in various severe symptoms and must be dealt with immediately. The cause of pollution does not only come from industrial waste. However, it can also come from the results of domestic activity waste originating from households, trade, schools, offices, and similar facilities and disposing of the domestic wastewater without prior treatment into the environment. Then, on the other hand, as the population increases and the development of an area can cause an increase in the amount of domestic waste produced. Higher education is an educational institution that carries out the tri dharma, namely education and teaching, research, and community service. In carrying out the tri dharma, all activities carried out by the academic community can produce domestic waste. Domestic waste generated comes from soapy water and fecal water. One of the growing universities is the private university of Pelita Bangsa University, located in the Bekasi Regency. Pelita

Water Quality Index Analysis for Water Drinking and Irrigation in the Sumowono Groundwater Basin

by Thomas Triadi Putranto

Submission date: 21-Jun-2022 10:55AM (UTC+0700)
Submission ID: 1860543628
File name: 39756-126152-1-PB.pdf (1.67M)
Word count: 5521
Character count: 28719

Jurnal Presipitasi
Media Komunikasi dan Pengembangan Teknik Lingkungan
e-ISSN: 2550-0023

Vol 18, No 2, 2021, 241-253
Article available at homepage presipitasi

Research Article

Water Quality Index Analysis for Water Drinking and Irrigation in the Sumowono Groundwater Basin

Thomas Triadi Putranto[1]*, Novie Susanto[2], Dina Rahayuning Pangestuti[3], Aji Bagas Putro[1]

[1] Geological Engineering Department, Faculty of Engineering, Universitas Diponegoro, Jl. Prof. Soedarto, SH, Kampus Undip Tembalang, Semarang, Indonesia 50275
[2] Industrial Engineering Department, Fakultas Teknik, Universitas Diponegoro, Jl. Prof. Soedarto, SH, Kampus Undip Tembalang, Semarang, Indonesia 50275
[3] Public Health Nutrition and MCH Division, Faculty of Public Health, Universitas Diponegoro, Jl. Prof. Soedarto, SH, Kampus Undip Tembalang, Semarang, Indonesia 50275

*Correspondence author, e-mail: putranto@ft.undip.ac.id

Abstract

The Sumowono Groundwater Basin is a cross-district basin located in Central Java Province, between Temanggung Regency, Kendal Regency, and Semarang Regency. The people in this area obtain fresh water from either dug wells or springs. The purpose of this research is to determine the feasibility of groundwater for drinking water and irrigation purposes. The method used was hydrogeological mapping and physical and chemical analysis of 10 groundwater samples. The samples were subjected to empirical testing of the Groundwater Quality Index to determine the feasibility of drinking water and irrigation using Sodium Adsorption Ratio (SAR) analysis and Wilcox diagram. The results showed that all samples physically have tasteless and odorous properties. For the chemical properties produced in the ten samples, the pH value ranges from about 6.85 - 7.27. The electrical conductivity is between 71.6 - 511 µS/cm. Total Dissolved Solids values are between 45.82 and 327.04 mg/L, with total hardness values ranging from 10 to 170 mg/L. From the results of the SAR analysis, it is found that the groundwater classes were included in S1C1 and S1C2, so that groundwater has low alkaline in both sodium and salinity, respectively. Thus, groundwater is considered suitable for consumption and irrigation purposes,

Keywords: groundwater; sodium adsorption; Sumowono; water quality index; Wilcox diagram

1. Introduction

A groundwater basin is defined as an area bounded by hydrogeological boundaries. All hydrogeological events such as filling, draining, and releasing groundwater occur, referring to the Regulation of the Minister of Energy and Mineral Resources No. 2 of 2017 concerning groundwater basin. Each groundwater basin has its hydrogeological characteristics, which can hydraulically relate to other groundwater basins or not at all (UU No. 17/2019). One of the basins in Central Java is the Sumowono Groundwater Basin. Groundwater produced and contained in the earth is based on several processes, including deposition due to atmospheric salt, interactions between groundwater and rocks, and

evapotranspiration (Putranto et al., 2018). Analysis of groundwater quality is a critical activity to determine the composition of groundwater that can be used to support the health of human life.

The groundwater quality assessment in this study was based on the Indonesian Minister of Health (Permenkes, 2010). According to Al-hadithi (2012), determining the quality of groundwater suitable for consumption requires an analysis of the Water Quality Index (WQI) by calculating some of the chemical content in groundwater using a weighting approach. This weighting assessment is based on several chemical parameters or the presence of ion content possessed by the entire groundwater sample and its effect on human health (Taloor et al., 2020). WQI analysis is used to classify groundwater resources for various purposes such as agriculture, drinking water, and many other activities (Udeshani et al., 2020). Proper sustainable groundwater management can support future development and ensure water supply availability that occurs in several climates. That effort may provide a sense of security related to food security and energy development. The stability of the availability of drinking water that is beneficial for industrialization development and sustainable urban development can also be provided (Bappenas, 2019).

The Sumowono groundwater basin is a cross-district basin located in Central Java Province, between Temanggung Regency, Kendal Regency, and Semarang Regency. Communities in this area get clean water from using groundwater, either using dug wells or springs. Agriculture, plantations, and settlements dominate land use in this area. Research related to natural resources, especially groundwater, is rarely carried out in this area. Therefore, along with regional developments in the Sumowono area, conducting studies related to groundwater quality is necessary.

The purpose of this study was to determine the groundwater quality index (WQI) in the Sumowono Groundwater Basin for drinking water and irrigation. Some researchers widely use WQI as an elective tool to assess the state of ecosystems, and this method is based on a group of physicochemical and biological characteristics of water samples (Namibia 2007; Simoes et al., 2008; Alobaidy et al., 2010; Kumar et al., 2013). It also assesses the feasibility level for irrigation using Sodium Adsorption Ratio (SAR) analysis and the Wilcox diagram (Wilcox, 1959). SAR is a measurement to express the ratio of Sodium (Na^+) ions to $Ca^{(2+)}$ and $Mg^{(2+)}$ in meq/L (Kumar et al., 2013). The SAR value will indicate the level of irrigation water undergoing cation exchange in the soil (Salifu et al., 2017). Meanwhile, the Wilcox diagram is used to represent the danger of sodium alkalinity in irrigation water quality based on the comparison of the percentage value of sodium (Na^+) and the electrical conductivity/EC in µS/cm. Groundwater for irrigation with a SAR value of less than 10 meq/L is classified as an excellent/low hazard with a EC value <250 µS/cm. Meanwhile, a SAR value between 10 and 18 meq/L is called "Good/medium hazard" with a EC250-750 µS/cm value and "Doubtful/high hazard" if the SAR value is between 18 and 26 meq/L with a EC750 value. -2.250 µS/cm. SAR values greater than 26 meq/L and EC values > 2,250 µS/cm are considered unsuitable for agriculture (Salifu et al. 2017).

The research location is located in the Sumowono Groundwater Basin, between Temanggung Regency, Kendal Regency, and Semarang Regency (Figure 1) with an area of 207 km^2. Sumowono groundwater basin has a topographical height of 206–1,010 meters above sea level (masl). The land use of the Sumowono groundwater basin area is dominated by land use in the form of plantations covering an area of 69.4 km^2, bushes 45.2 km^2, dry fields covering an area of 35.4 km^2, and residential areas 11.2 km^2 (DESDM, 2016). Thus, the need for raw water sources for agricultural and drinking water is significant for evaluation related to the Groundwater Quality Index/WQI.

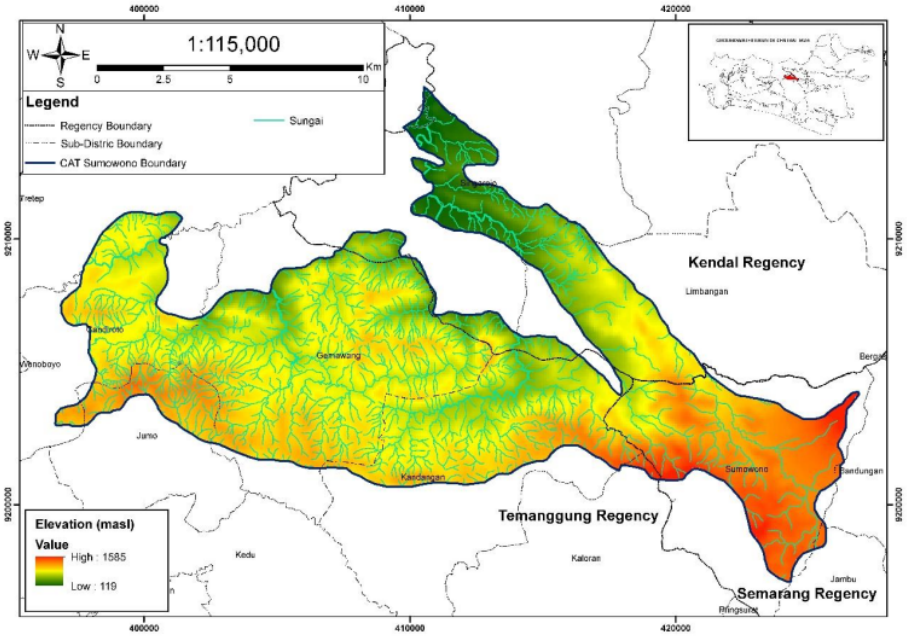


Figure 1. Sumowono groundwater basin location and its elevation

2. Methods

The methodology used in this study is an inventory of points of interest obtained from the results of hydrogeological mapping in the field. From the mapping activity, as many as 115 points of interest are obtained. To obtain the pH value and the value of Electrical Conductivity/ EC) in the field using WtW pH 3210 and Cond 3310 tools. From the entire hydrogeological mapping point (Figure 4), 10 samples of groundwater were selected based on variations in geological conditions (Figure 4). Figure 2) and land use, so that 9 samples from shallow wells and 1 spring water sample were obtained for detailed groundwater quality testing. Further testing of water samples to determine the chemical composition in each sample is carried out in the Envilab laboratory. The chemical data tested were total dissolved solids (TDS), SO_4^{2-}, Cl^-, NO_3^-, and hardness/Total Hardness as in Varol (2020); Munagala et al. (2020); Acharya et al. (2018); Suvarna et al. (2020). The chemical parameter values obtained were used to calculate the WQI value. Horton first introduced this WQI method (1965) and Brown et al. (1970). Furthermore, this application has been developed by many other researchers as one of the considerations for groundwater management for drinking water (Debels et al., 2005; Saeedi et al., 2009; Tsegaye et al., 2006, HortonKannel et al., 2007; Sener et al., 2007). al., 2017; Aguilar et al., 2019). The higher the influence in groundwater, the greater the weight it has. The Sumowono groundwater basin area predominantly consists of agricultural areas with natural and chemical fertilization, so the presence of nitrate (NO_3^-) concentrations is assumed to have a substantial impact. On the other hand, total hardness has an insignificant impact so that it is given the slightest weight.

The standard of drinking water quality in the Republic of Indonesia is based on the Regulation of the Minister of Health (Permenkes) No. 492/2010. It is necessary to calculate the Water Quality Index analysis by calculating the weighting of the chemical parameters of the groundwater, as shown in Table 1 above, to determine whether or not drinking water can be consumed. The results of this weighting consider the effect on human health. The determination and weighting will be relative because the content of each analyzed water will produce different hydrochemical concentrations. The WQI analysis

uses the regulations from the Government of Indonesia issued by the Minister of Health in 2010. The Wi value is obtained by dividing the weight of each parameter by the number of muscles (Equation 1), then calculating the qi value, which is obtained from comparing the parameter value (Ci) with the standard value. Equivalent (Si) is then multiplied by 100 (Equation 2). In addition, they are adding the values of Wi and qi to perform the Sub Index (SI) value of each parameter, as shown in Equation 3. After all SI values are obtained, the WQI value can be obtained from the total sum of all SI values of each parameter. (Equation 4). The results of these values will later be included in the WQI classification using the Permenkes No. standard. 492/2010, so that the quality of groundwater for drinking water will be known.

Table 1. Chemical parameter for determining the WQI

Parameter	Permenkes (2010)	Weight (w_i)	Wi
pH	6.5-8.5	4	0.18
TDS (mg/L)	500	4	0.18
SO_4^{2-} (mg/L)	250	4	0.18
Cl^- (mg/L)	250	3	0.14
NO_3^- (mg/L)	50	5	0.23
Total Hardness (mg/L)	500	2	0.09
Total		22	1.00

The Wilcox diagram (Wilcox, 1955) is used to determine water quality for irrigation purposes. The results of this Wilcox diagram will get the suitability of water for irrigation purposes with the Sodium Hazard condition of the SAR with the EC value contained. If the EC value and sodium value condition are high, then the water is not suitable for irrigation (Brindha and Elango, 2011).

$$Wi = \frac{wt}{\sum_{i=1}^{n} wi} \quad \text{..... (1)}$$

$$qi = \frac{Ci}{Si} \times 100 \quad \text{..... (2)}$$

$$SI = Wi \times qi \quad \text{..... (3)}$$

$$WQI = \sum SI \quad \text{..... (4)}$$

The method of determining the Wilcox diagram uses the percentage of sodium hazard from the value of Sodium Absorption Ratio/SAR (Ricards, 1954) with the value of EC. Calculation of the concentration of each chemical parameter for SAR analysis is presented in meq/L. The EC value obtained can be related to the TDS. The higher the salinity value contained in the water, the higher the number of ions or minerals dissolved in the water. This high ion content indicates that the dissolved salt content is high. If a water source has high salt content, this is physically harmful to plant growth. This condition can occur due to toxins formed due to osmosis at the absorption of water in the soil (Todd, 1980). The magnitude of the SAR value (Richards, 1954) is calculated from equation 5 below:

$$SAR = Na^{(+)}/(\sqrt{(Ca^{2+} + Mg^{2+}/2)} \quad \text{.....(5)}$$

3. Result and Discussion

3.1 Geological Condition

The lithology that dominates the Sumowono groundwater basin is volcanic rock. If sorted from old to young formation according to the Geological Map Sheet, Magelang-Semarang (Thaden et al., 1996) (Figure 2) consists of andesite intrusion (Tma) and basalt intrusion (Tmb). The Kerek Formation (Tmk) consists of alternating claystone, marl, tuff sandstone, conglomerate, sandstone, volcanic breccia, and limestone. Above the Kerek Formation, the Penyetan Formation (QTp) comprises tuffaceous sandstone, volcanic breccia, tuff, claystone, and lava flows that dominate the Sumowono groundwater basin area. Then, the Kaligetas Formation (Qpkg) with volcanic breccia lithology, tuff, lava flows, tuffaceous sandstone, and claystone. Above it are rocks of Mount Kemalon and Mount Sangku (Qks) in the form of

plagioclase sortie, solid to smooth hollow lava. Jembangan volcanic rock (Qj) in the form of lava flows. Gajahmungkur Volcanic Rock (Qhg) is composed of andesite lava flows. Sindoro Volcanic Rock (Qsu) consists of andesite augite olivine lava. Cleft Volcanic Rock (Qls) is composed of hyperstein augite lava. Alluvium (Qa) deposits are composed of gravel, gravel, sand, and silt.

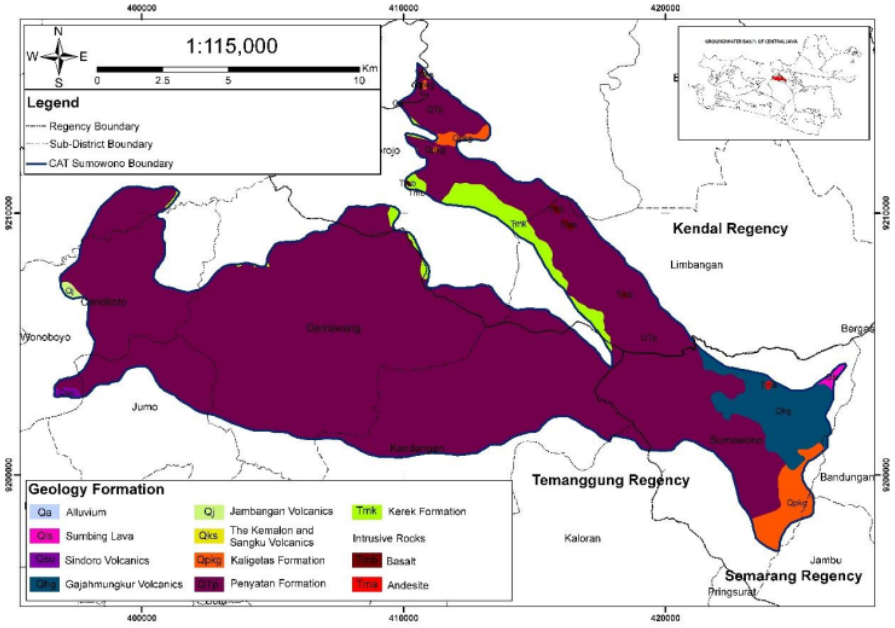


Figure 2. Regional geological map of Sumowono groundwater basin (Thanden, et al., 1996).

3.2 Hidrogeological Condition

Based on the Regional Hydrogeological Map, the Sumowo CAT consists of the Pekalongan Sheet (Effendi et al., 1985) and the Semarang Sheet (Said and Sukrisno, 1988). Sumowono groundwater basin consists of 2 types of groundwater and aquifer productivity, namely aquifers with flow through fissures, fractures, and channels (aquifers with moderate to high productivity), and aquifers or nests with low productivity and rare groundwater, which is composed of two parts, namely aquifers with low productivity. Small local productivity means and areas of groundwater are scarce (Figure 3). Existing aquifers are free aquifers

From the results of the hydrogeological mapping, 46 dug wells and 69 springs were found (Figure 4). The groundwater availability is mainly located in the Penyetan Formation, which has a lithology dominated by tuff sandstones and volcanic breccias. Based on regional hydrogeological maps, the aquifer system develops through fissures, fractures, and channels. Aquifers have moderate to high productivity levels. Most of it is used for domestic household needs, irrigation, and fisheries. The direction of groundwater flow is from the south and southeast to the north of the study area. For the characteristics of this free aquifer, it follows a topographical pattern. Namely, the elevation is in the south and valleys or hillsides in the north as described by Fetter (2001) and Barkah et al. (2015).

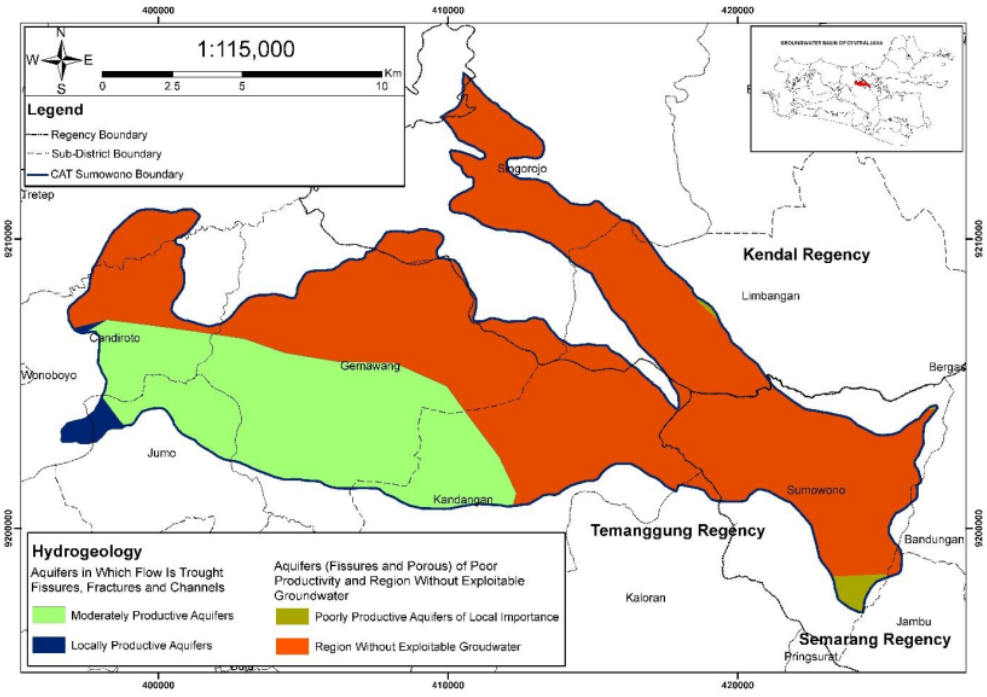


Figure 3. Regional hydrogeological map of Sumowono groundwater basin (Effendi, 1985; Said and Sukrisno, 1988)

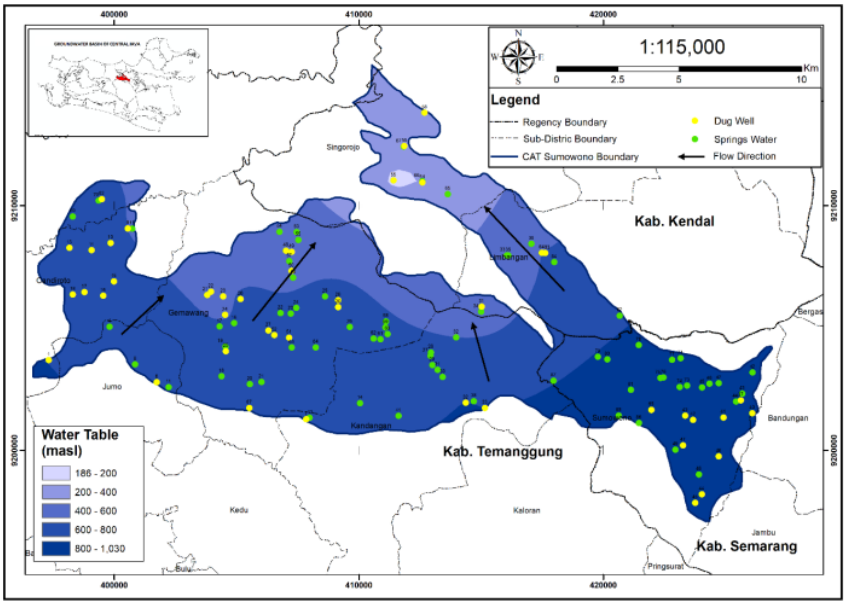


Figure 4. Water table map and its direction of Sumowono groundwater basin

3.3 Groundwater Geochemical Properties

The results of the analysis of the geochemical parameters of the groundwater studied are presented in total (Table 2). The values of pH, EC, TDS, total hardness in $CaCO_3$, Mg, Ca, Na, Cl, NO_3-N, and SO_4 were analyzed for chemical concentrations for WQI and SAR calculations.

The degree of acidity (pH) value ranged from 6.85 to 7.27 (Figure 5). These results indicate that the degree of acidity contained in the groundwater tends to be neutral. From these results, according to Permenkes No. 492/2010 is suitable for drinking water standards. The lowest pH value was found in SG 10 (6.85), while the highest was in SG-9 (7.27) located in Limbangan District, Kendal Regency (Table 1).

Table 2. Geochemical analysis of groundwater samples in Sumowono groundwater basin

No.	Coordinate		Sample	EC	pH	TDS	Mg^{2+}	Ca^{2+}	Na^{+}	Cl^{-}	$CaCO_3^{-}$	NO_3-N	SO_4^{2-}
	X	Y	Code	µS/cm		mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L	mg/L
Maximum allowed (492/MENKES/PER/IV/2010)					6.5-8.5	500			200	250	500	50	250
1	398993	9208185	SG-01	111	7.22	71.04	21.6	36.6	6.83	16	14	1.15	11
2	398929	9206408	SG-02	158	7.25	101.12	21.6	61.6	8.64	22	41	4.62	12
3	407292	9201919	SG-03	256	7	163.84	16.6	59.3	9.21	24	72	1.91	27
4	406543	9204732	SG-04	123	7.1	78.72	10.9	63.9	7.01	16	35	1.20	7.3
5	407018	9208160	SG-05	377	6.97	241.28	30.9	82.9	9.89	27	85	1.83	63
6	411626	9201402	MA-06	71.6	6.4	45,824	9.55	35.9	6.82	3	10	1.40	22
7	423854	9198023	SG-07	271	7.04	173.44	17.6	51.5	14.1	9	49	1.58	34
8	424901	9201236	SG-08	340	7.16	217.6	29.7	85.6	10.8	13	103	1.27	22
9	417533	9208116	SG-09	171	7.27	109.44	12.7	53.9	8.24	4	66	0.671	13
10	411339	9210931	SG-010	511	6.85	327.04	18.3	94.5	12.3	8	170	0.595	72

Chemical parameters widely found in drinking water are Calcium (Ca^{2+}) and Magnesium($^{2+}$). Calcium and magnesium in drinking water have many beneficial effects on human health. However, at very high concentrations, they can also have some adverse effects. Calcium, for example, can block the absorption of heavy metals in the body and is thought to cause an increase in bone mass and prevent certain types of cancer (Jaworek, 2014). On the other hand, very high concentrations can affect the absorption of other essential minerals in the body. Magnesium is an essential element in the functioning of the heart and blood vessels. However, high drinking water levels may have a laxative effect, especially in the case of water with a high concentration of magnesium sulfate. The concentration of Mg2+ in Sumowono groundwater basin ranged from 9.6-30.9 mg/L while Ca2+ was 35.9-94.5 mg/L. Based on Jaworek (2014), calcium levels in mineral water in Europe range from 47-222 mg/L, while Mg^{2+} is lower between 9-70 mg/L. From the results of the chemical analysis of groundwater samples, the concentrations of Ca^{2+} and Mg^{2+} are included in the range of chemical concentrations of mineral water.

Meanwhile, Sodium (Na^{+}) content in groundwater in Wonosobo groundwater basin is 6.8-14.1 mg/L. The value of Na+ concentration is still allowed as drinking water-based on Permenkes No. 492/2010. In addition, the value of hardness (Total Hardness/$CaCO_3$) in Sumowono groundwater basin ranges from 10-170 mg/L. This value is still below the limit according to Permenkes No. 492/2010. Based on the classification of hardness values (Sen, 2015), the Sumowono groundwater basin area is composed of low-high hardness. Judging from the spatial map in Figure 8, the higher the hardness value towards the north, composed of volcanic rocks rich in Ca2+ minerals (Thanden et al., 1996).

The concentration of Cl^{-} values in groundwater samples at Sumowono groundwater basin ranged from 3-27 mg/L. This value is still below the limit for drinking water based on Permenkes No. 492/2010. Groundwater in Sumowono groundwater basin is natural groundwater that comes from rainwater. Some groundwater samples have a chloride concentration of less than 10 mg/L. By leaching chlorides from chemical fertilizers in agricultural soils or wastewater discharged to the soil surface, chloride concentrations in groundwater can increase to 20 or 30 mg/L or more (Environmental Southland, 2020).

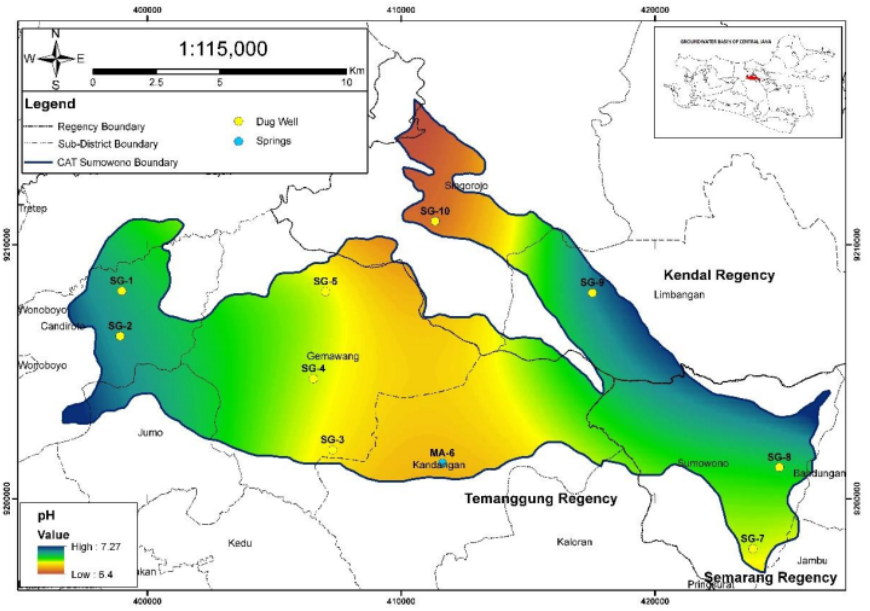


Figure 5. pH map of groundwater samples in Sumowono groundwater basin.

The EC value in the study area has a value ranging from 71.6 – 511 µS/cm. From the EC value obtained, it can be said that the research area has good-very good groundwater quality (Sen, 2015). Based on the EC map shown in Figure 6, it can be seen that the dominant high EC number (above 500 µS/cm) is located on the north side of the study area, SG 10, with claystone lithology in the Kerek Formation (Thanden et al., 1996).

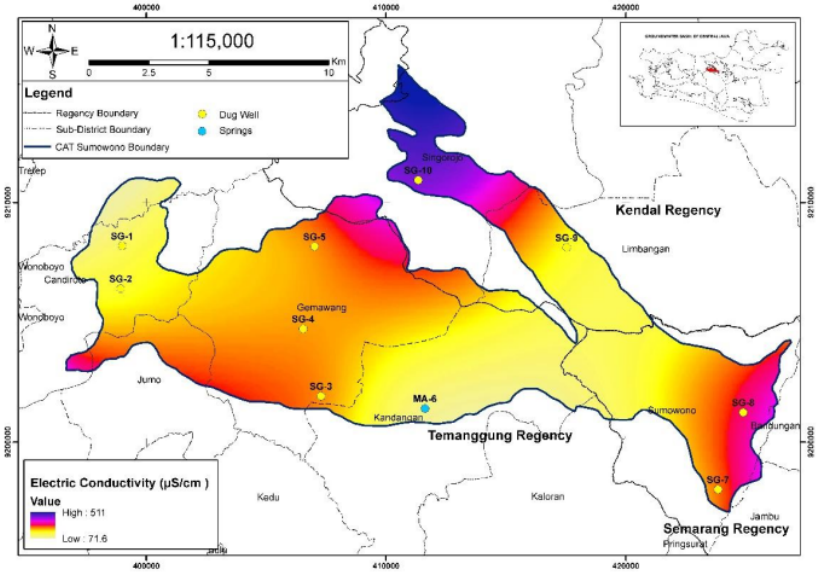


Figure 6. Electrical conductivity map of groundwater samples in Sumowono groundwater basin.

The value of dissolved solids (TDS) in the study area ranged from 45.82 – 327.04 mg/L. Based on the results of the TDS value, the Sumowono groundwater basin area does not exceed the allowable limit (<500 mg/L) for drinking water (Permenkes No. 492/2010). Judging from the TDS contour map (Figure 7), the TDS contour looks more prominent towards the north of the study area. The contact between rocks and groundwater influences the magnitude of the TDS value in groundwater. The rocks in the northern part are sedimentary rocks that are readily soluble in water (Sen, 2015; Appelo and Postma, 2005).

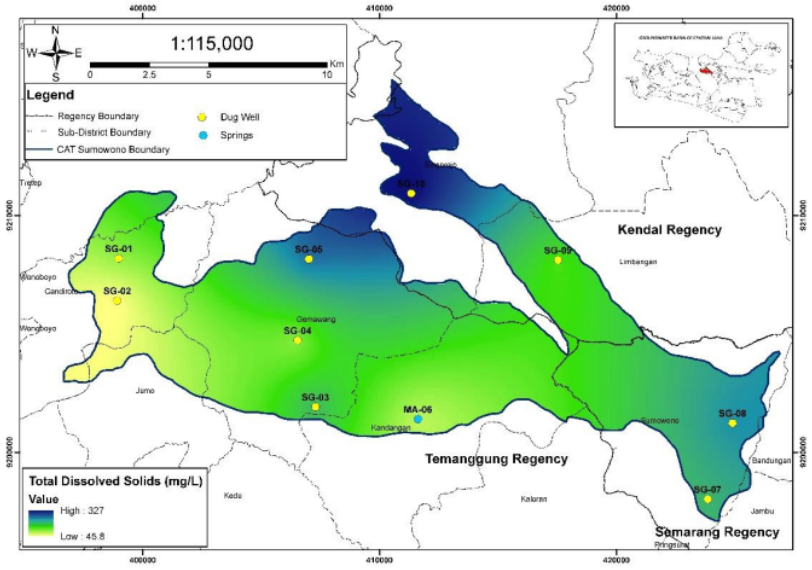


Figure 7. TDS map of groundwater samples in Sumowono groundwater basin.

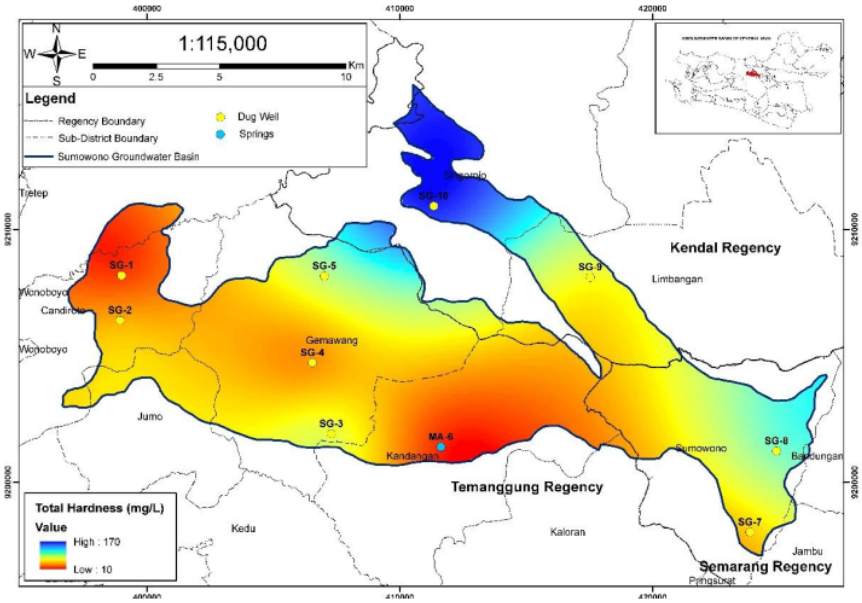


Figure 8. Total hardness map of groundwater samples in Sumowono groundwater basin.

3.4 Groundwater Quality Analysis for Drinking Water Using the WQI Method

WQI is defined as an assessment technique that provides the combined effect of individual water quality parameters on the overall quality of water for human consumption (Mitra, 1998). For this purpose, six water quality parameters have been selected (Table 1). Parameter considerations for developing a WQI depend on the intended use of the water. The parameters are selected according to the availability of data. They are relatively crucial in determining the quality of water for human consumption. The standards set for this purpose are by Permenkes No. 492/2010. The empirical formula for calculating WQI is presented in equations 1-4. From the results of the calculation of WQI according to the classification of the Minister of Health No. 492/2010 groundwater in Sumowono groundwater basin has potable and excellent conditions with values between 22.88-48.14 (Table 3). The spatial map of the WQI analysis is presented in Figure 9.

Table 3. WQI analysis based on Permenkes No. 492/2010

WQI scale	Level	Distribution (%)	Sample no.
< 50	Excellent	100	SG 01, 02, 03, 04, 05, 07, 08, 09, 10, and MA 06
50-100	Good	-	
100-200	Moderate	-	
200-300	Low	-	

3.5 Groundwater Quality Analysis for Irrigation Water Based on SAR Value

Sodium adsorption ratio (SAR) is a measurement of the ratio of Sodium (Na^+) ions to Calcium (Ca^{2+}) and Magnesium (Mg^{2+}) ions, expressed in meq/L, according to equation 5. Irrigation water containing large amounts of Sodium is of particular concern because of the effect on the soil and poses a Sodium hazard. The continuous use of water with a high SAR value causes damage to the soil's physical structure. Sodium is absorbed and becomes bound to soil particles. The soil then becomes hard and dry compact, and increasingly resistant to water penetration. Fine-textured soils, especially those with high clay content, are most subject to this action. Certain amendments may be required to keep soils below a high SAR (Salifu et al., 2017). If present in large enough quantities in the soil, Calcium and Magnesium will counter the effects of Sodium and help maintain good soil properties (Fipps 2003).

A SAR value of more than 9 indicates moderate or high sodium or low calcium plus magnesium content in groundwater. Suppose this type of water is used in irrigation. In that case, it can cause dispersion of soil colloids, impairing soil texture and permeability. This result is in conditions similar to drought (Younger and Casey 2003). In the study area, the calculation of the SAR value using equation 5 obtained a value of 0.21-0.43. The Wilcox diagram (1955) as shown in Figure 10 shows that the sodium alkali hazard of groundwater samples shows a low level. Meanwhile, the EC value ranges from 71.6-511 µS/cm, with a low to medium level of salt/salinity (low to medium). The Wilcox diagram shows 5 samples (50%) in the C1S1 category (SG-01, SG-02, SG-04, MA-06, SG-10) in the west and south and one in the north, which is very good for irrigation. The other 50% of samples in the middle to the east are included in the S1C2 category, suitable for irrigation. Thus, based on SAR analysis and Wilcox diagram, groundwater samples in Sumowono groundwater basin are suitable for use as a source of irrigation water.

4. Conclusion

It was found that 10 samples tested on Sumowono groundwater basin according to the Minister of Health's (2010) standard were classified as drinking water and the quality was excellent. For irrigation purposes, based on SAR analysis and Wilcox diagrams, 5 samples (SG-1, SG-02, MA-6, SG-03, and SG-10) showed that the 5 samples were perfect for irrigation purposes. The other 5 samples, namely numbers SG-04, SG-05, SG-07, SG-08, and SG-09 were included in the excellent category for irrigation purposes. The

study of monitoring well networks related to groundwater vulnerability due to pollution can be an effort in managing and monitoring groundwater in Sumowono groundwater basin in future research.

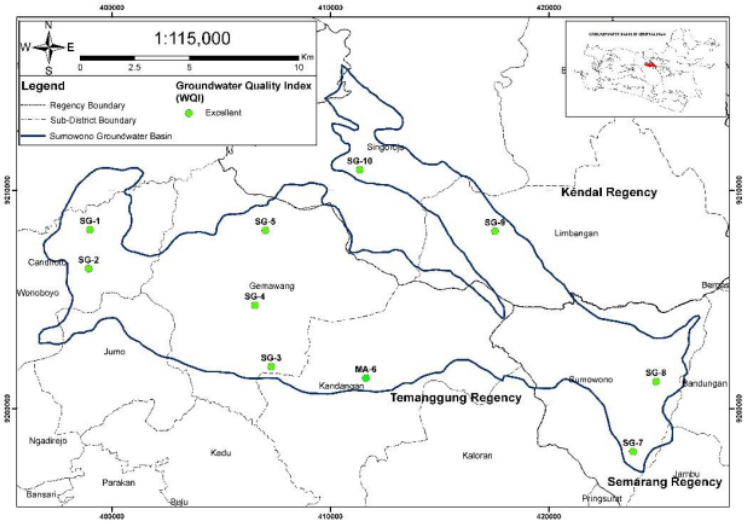


Figure 9. WQI analysis map based on Permenkes No. 492/2010 shows excellent quality.

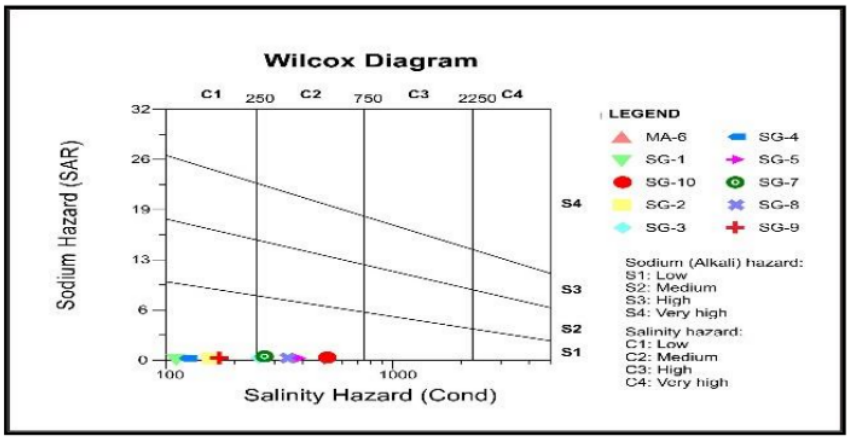


Figure 10. Wilcox diagram of Sumowono groundwater basin showing a group of SAR and Conductivity.

5. Acknowledgment

The author would like to thank the Institute for Research and Community Service (LPPM) Diponegoro University through research funding under the Research Development and Application (RPP) scheme with Research Assignment Letter No. 329-69/UN7.6.1/PP/2020 and the Department of Energy and Mineral Resources of Central Java Province for cooperation in the use of data.

6. References

Acharya, S., Sharma, S.K., Khandegar, V. 2018. Assessment of groundwater quality by water quality indices for irrigation and drinking in South West Delhi India, Data in Brief, 18, 2019-2028.

Aguilar, J.A.P., Campo, J., Meneu, A.N., Garcia, E.G., Andreu, V. 2019. Analysis of Existing Water Information for the Applicability of Water Quality Indices in the Fluvial-Littoral Area of Turia and Jucar Rivers, Valencia, Spain. Journal of Applied Geography, 111, 102062.

Al-hadithi, M. 2012. Application of Water Quality Index to Assess Suitability of Groundwater Quality for Drinking Purposes in Ratmao-Pathri Rao Watershed, Haridwar District, India. American Journal of Scientific and Industrial Research, 10, 5251.

Alobaidy, A.H.M.J., Abid, H.S., Maulood B.K. 2010. Application of Water Quality Index for assessment of Dokan Lake ecosystem, Kurdistan Region, Iraq. Journal of Water Resource and Protection 2:792–798.

Appelo, C.A.J. and Postma. 2005. Geochemistry and groundwater pollution 2nd Ed, A.A. Balkema Publishers, Leiden, The Netherlands.

Bappenas. 2019. Rencana pembangungan jangka menengah nasional 2020-2024. Kementerian Perencanaan Pembangunan Nasional/Bappenas.

Barkah, M.N., Djajang Jedi Setiadi D.J., Hadian, M.S.D. 2015. Perhitungan potensi airtanah di kawasan kampus unpad jatinangor dengan metode numerik, Bulletin of Scientific Contribution, Vol. 13, No. 3, 250-258.

Brindha, K. and Elango, L. 2011. Hydrochemical characteristics of groundwater for domestic and irrigation purposes in Madhuranthakam, Tamil Nadu, India. Earth Sciences Research Journal, Earth Sci. Res. SJ. 15 (2) 101-108: Colombia.

Brown, R.M., McClelland, N.I. Deininger, R.A., Tozer, R.G. 1970. A water quality index- do we dare?. Water Sew. Work 117, 339-343.

Debels, P., Figueroa, R., Urrutia, R., Barra, R., Niell, X. 2005. Evaluation of water quality in the Chilla'n river (Central Chile) using physicochemical parameters and a modified water quality index. Environmental Monitoring & Assessment 110, 301–322.

Dinas Energi dan Sumber Daya Mineral/DESDM. 2016. Penyusunan zona pemanfaatan dan konservasi airtanah pada CAT Sumowono. Semarang.

Efendi, A.T. 1985. Peta hidrogeologi Indonesia Lembar Pekalongan. Direktorat Geologi Tata Lingkungan, Bandung.

Environmental Southland. 2020. Chloride in groundwater. https://www.es.govt.nz/environment/water/groundwater/chloride-in-groundwater [Online akses 15 Januari 2021.]

Fetter, C. W., 2001, Applied Hydrogeology 4th ed., United States: Prentice-Hall.

Fipps, G. 2003. Standards and salinity management and salinity management water analysis. Texas A&M System

Horton, R.K. 1965. An index number system for rating water quality. Journal of the Water Pollution Control Federation, 37 (3), 300–306.

Jaworek, L.R. (ed). 2014. Calcium and magnesium in groundwater: occurrence and significance for human health, Taylor & Francis Group, London, UK

Kannel, P.R., Lee, S., Lee, Y.S., Kanel, S.R., Khan, S.P. 2007. Application of water quality indices and dissolved oxygen as indicators for river water classification and urban impact assessment. Environmental Monitoring & Assessment, 132, 93–110.

Kumar, P.J.S., Elango, L & E. J. James, E.J. 2013. Assessment of hydrochemistry and groundwater quality in the coastal area of South Chennai, India. Arabian Journal of Geosciences, vol. 7: 2641–2653.

Mitra, B.K. 1998. Spatial and temporal variation of ground water quality in sand dune area of Aomori prefecture in Japan. Paper number 062023, 2006 ASAE annual meeting.

Munagala, S, Jagarapu, D.C.K., Ratnamla, R.B.S.S. 2020. Determination of water quality Index for ground waterer municipal dumpsite in Guntur. Materials Today: Proceedings: Elsevier

Namibian, M. 2007. A new Water Quality Index for environmental contamination contributed by mineral processing: a case study of Amang (tin tailing) processing activity. J Appl Sci 7:2977– 2987

Permenkes. 2010. Peraturan Menteri Kesehatan No. 492 / MENKES / PER / IV / 2010 Tentang Persyaratan Kualitas Air Minum. Indonesia: Jakarta.

Putranto, T.T., Qadarisman, A.H., Santi, and Najib. 2018. Groundwater quality analysis in Nusakambangan GroundwaterBasin/Indonesia. E3S Web of Conferences 73, 04024.

Ricards, L.A. 1954. Diagnosis and improvement of saline and alkaline soils, U.S Department of Agriculture Hand Book, 60.

Saeedi, M., Abessi, O., Sharifi, F., Maraji, H. 2009. Development of groundwater quality index. Environ. Monit. Assess. 163 (1–4), 327–335.

Said, H.D dan Sutrisno. 1988. Peta hidrogeologi Indonesia Lembar Semarang. Direktorat Geologi Tata Lingkungan, Bandung.

Salifu, M., Aidoo, F., Hayford, M.S., Adomako, D., Asare, E. 2017. Evaluating the suitability of groundwater for irrigational purposes in some selected districts of the Upper West region of Ghana, Applied Water Science volume 7: 53–662

Sen, Z. 2015. Practical and applied hydrogeology, ITU Hydraulics Lab. Maslak, Istanbul, Turkey.

Sener, S., Erhan Sener, E., Davraz A. 2017. Evaluation of water quality using water quality index (WQI) method and GIS in Aksu River (SW-Turkey). Science of the Total Environment, Vol. 584–585, p. 131–144.

Simoes, F.S., Moreira, A.B., Bisinoti, M.C., Gimenez, S.M.N., Yabe, M.J.S. 2008. Water Quality Index as a simple indicator of aquaculture.effects on aquatic bodies. Ecological Indicator 8:476–484

Suvarna, B, Reddy, S.Y., Sunitha, V, Reddy, B.M., Prasad, M., Reddy, R.M., 2020. Data on Application of Water Quality Index Method for Appraisal of Water Quality in Around Cement Industrial Corridor, Yerraguntal Mandal, Y.S.R District, A.P South India, Data in Brief: Elsevier

Taloor, A.K, Rayees A.P, Narsimha, A, Ali, S, Manhas, D.S., Roy, S, Singh, A.K. 2020. Springwater quality and discharge assessment in the Basantar watershed of Jammu Himalaya using geographic information system (GIS) and water quality (WQI). Groundwater for Sustainable Development: Elsevier.

Thanden, R.E., Sumadirdja, H., Richards, P.W., Sutisna, K dan Amin, T.C. 1996. Peta geologi lembar Magelang Semarang, Jawa. Pusat Penelitian dan Pengembangan Geologi, Bandung.

Todd, DK. 1980. Groundwater Hydrology. New York. Amerika Serikat: Wiley

Tsegaye, T., Sheppard, D., Islam, K.R., Johnson, A., Tadesse,W., Atalay, A., Marzen, L. 2006. Development of chemical index as a measure of in stream water quality in response to land use and land cover changes. Water Air Soil Pollution, 174, 161–179.

Udeshani, W.A.C., Dissanayake, H.M.K.P., Gunatilake, S.K., Chandrajith, R. 2020. Assessment of Groundwater Quality Using Water Quality Index (WQI): A Case Study of Hard Rock Terrain in Sri Langka. Groundwater for Sustainable Development 11(2020) 100421.

Undang-Undang No. 17 Tahun 2019 tentang Sumber Daya Air. Jakarta.

Varol, M. 2020. Use of Water quality index and multivariate statistical methods for the evaluation of water quality of a stream affected by multiple stressors: A case study. Environmental Pollution, 266 (3) 115417

Wilcox, L.V. 1955. Classification and use of irrigation waters, US Department of Agriculture, Circ. 969, Washington DC, USA.

Younger P. and Casey, V. 2003 A simple method for determining the suitability of brackish groundwaters for irrigation. Waterlines 22:11–13.

Water Quality Index Analysis for Water Drinking and Irrigation in the Sumowono Groundwater Basin

ORIGINALITY REPORT

10%	5%	7%	2%
SIMILARITY INDEX	INTERNET SOURCES	PUBLICATIONS	STUDENT PAPERS

PRIMARY SOURCES

1	Abdul Hameed M. Jawad Alobaidy, Haider S. Abid, Bahram K. Maulood. "Application of Water Quality Index for Assessment of Dokan Lake Ecosystem, Kurdistan Region, Iraq", Journal of Water Resource and Protection, 2010 Publication	<1%
2	Submitted to GGS IP University Delhi Student Paper	<1%
3	Submitted to University of Glasgow Student Paper	<1%
4	www.rrcap.ait.ac.th Internet Source	<1%
5	S. Ponsadailakshmi, S. Ganapathy Sankari, S. Mythili Prasanna, G. Madhurambal. "Evaluation of water quality suitability for drinking using drinking water quality index in Nagapattinam district, Tamil Nadu in Southern India", Groundwater for Sustainable Development, 2018	<1%

	Publication	
6	Submitted to Wageningen University Student Paper	<1 %
7	www.ijstr.org Internet Source	<1 %
8	Garuda.Kemdikbud.Go.Id Internet Source	<1 %
9	Zhongpei Liu, Dongqing Zhang, Jianhua Ping, Yuping Han, Qingfeng Cai. "Applicability evaluation of groundwater in the People's Victory Canal Irrigation Area, China", DESALINATION AND WATER TREATMENT, 2019 Publication	<1 %
10	www.irjmets.com Internet Source	<1 %
11	jfas.info Internet Source	<1 %
12	Ajay Kumar Taloor, Lalit Mohan Joshi, Bahadur Singh Kotlia, Akhtar Alam et al. "Tectonic imprints of landscape evolution in the Bhilangana and Mandakini basin, Garhwal Himalaya, India: A geospatial approach", Quaternary International, 2020 Publication	<1 %

13	Poonam Tirkey, Tanushree Bhattacharya, Sukalyan Chakraborty, Suman Baraik. "Assessment of groundwater quality and associated health risks: A case study of Ranchi city, Jharkhand, India", Groundwater for Sustainable Development, 2017 Publication	<1 %
14	Slamet Budiyanto, Anies, Hartuti Purnaweni, Henna Rya Sunoko. "Environmental Analysis of The Impacts of Batik Waste Water Polution on The Quality of Dug Well Water in The Batik Industrial Center of Jenggot Pekalongan City", E3S Web of Conferences, 2018 Publication	<1 %
15	moam.info Internet Source	<1 %
16	www.rroij.com Internet Source	<1 %
17	Abhay Kumar Singh, G. C. Mondal, T. B. Singh, S. Singh, B. K. Tewary, A. Sinha. "Hydrogeochemical processes and quality assessment of groundwater in Dumka and Jamtara districts, Jharkhand, India", Environmental Earth Sciences, 2012 Publication	<1 %
18	La Baco Sudia, Lies Indriyani, Lukman Yunus, Baso Mursidi, Asramid Yasin, Albasri,	<1 %

	Muhammad Nurdin. "Water Quality in Thirty Freshwater Springs and Twenty Four Brackish Springs in the Karst Area to Realize Sustainable Water Resources Management", Sustainability, 2021 Publication	
19	Manasree Sarkar, Subodh Chandra Pal, Abu Reza Md. Towfiqul Islam. "Groundwater quality assessment for safe drinking water and irrigation purposes in Malda district, Eastern India", Environmental Earth Sciences, 2022 Publication	<1 %
20	Michalos, . "Care in Community", Encyclopedia of Quality of Life and Well-Being Research, 2014. Publication	<1 %
21	etd.adm.unipi.it Internet Source	<1 %
22	hess.copernicus.org Internet Source	<1 %
23	journal.unnes.ac.id Internet Source	<1 %
24	www.scihub.org Internet Source	<1 %
25	"Spatial Distribution of Water Quality Parameters with using Gis", International	<1 %

Journal of Innovative Technology and Exploring Engineering, 2019
Publication

---

26 Anueva Acharya, Motee Lal Sharma, Kiran Bishwakarma, Pragati Dahal et al. "Chemical Characteristics of the Karmanasha River Water and Its Appropriateness for Irrigational Usage", Journal of Nepal Chemical Society, 2020 <1%
Publication

---

27 G Yuliyanto, M I Nurwidyanto. "Integrated survey to identify potential groundwater aquifers in Jabungan Semarang using geoelectric and microtremor methods", Journal of Physics: Conference Series, 2021 <1%
Publication

---

28 Maurice Monjerezi, Cosmo Ngongondo. "Quality of Groundwater Resources in Chikhwawa, Lower Shire Valley, Malawi", Water Quality, Exposure and Health, 2012 <1%
Publication

---

29 Miaojun Wei, Jianhua Wu, Wenqu Li, Qixiao Zhang, Fengmei Su, Yuanhang Wang. "Groundwater Geochemistry and its Impacts on Groundwater Arsenic Enrichment, Variation, and Health Risks in Yongning County, Yinchuan Plain of Northwest China", Exposure and Health, 2021 <1%
Publication

30	Nandian Mareta, Rachmat Fajar Lubis, Boy Yoseph CSS Syah Alam, Mohammad Sapari Dwi Hadian. "HYDROGEOLOGICAL IDENTIFICATION OF THE WELARAN WATERSHED KARANGSAMBUNG BASED ON DESCRIPTIVE-QUALITATIVE METHOD", RISET Geologi dan Pertambangan, 2021 Publication	<1 %
31	Pradeep Kumar Naik. "Hydrogeochemistry of the Koyna River basin, India", Environmental Earth Sciences, 12/2009 Publication	<1 %
32	S. Krishna Kumar, N. Chandrasekar, P. Seralathan, Prince S. Godson, N. S Magesh. "Hydrogeochemical study of shallow carbonate aquifers, Rameswaram Island, India", Environmental Monitoring and Assessment, 2011 Publication	<1 %
33	iosrjournals.org Internet Source	<1 %
34	orbit.dtu.dk Internet Source	<1 %
35	www.omicsonline.org Internet Source	<1 %
36	www.yogivemanauniversity.ac.in Internet Source	<1 %

37	Al-Omran, Abdulrasoul, Fahad Al-Barakah, Abdullah Altuquq, Anwar Aly, and Mahmoud Nadeem. "Drinking water quality assessment and water quality index of Riyadh, Saudi Arabia", Water Quality Research Journal of Canada, 2015. Publication	<1%
38	Anusha Nadella, Dhrubajyoti Sen. "Application of wastewater quality index (WWQI) as an evaluation tool: a case of stormwater flow channel (SWF) of Kolkata, India", Environmental Monitoring and Assessment, 2022 Publication	<1%

Exclude quotes	Off	Exclude matches	Off
Exclude bibliography	On		

Water Quality Index Analysis for Water Drinking and Irrigation in the Sumowono Groundwater Basin

GRADEMARK REPORT

FINAL GRADE

/0

GENERAL COMMENTS

Instructor

PAGE 1

PAGE 2

PAGE 3

PAGE 4

PAGE 5

PAGE 6

PAGE 7

PAGE 8

PAGE 9

PAGE 10

PAGE 11

PAGE 12

PAGE 13