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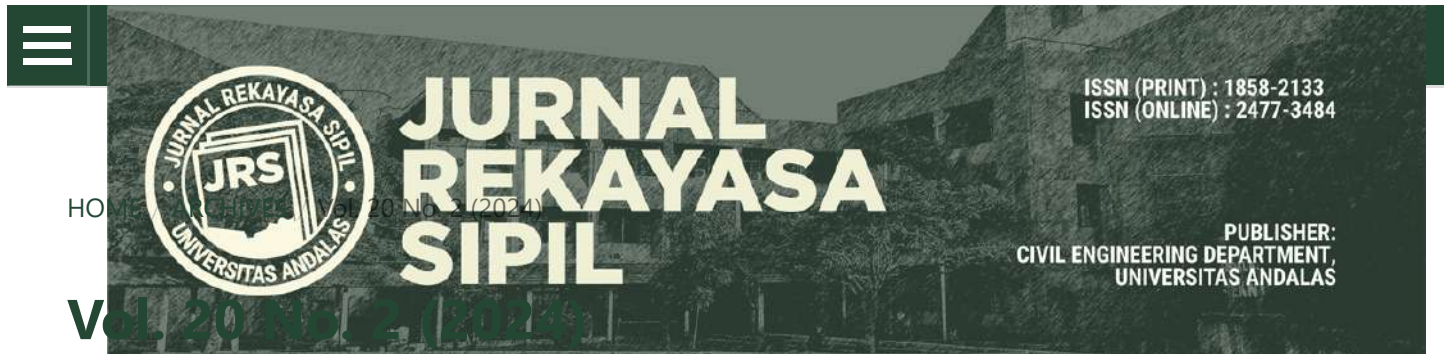
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JRS-Unand number 2 Vol.20, published July 2024.

This issue of the journal contains six papers discussing construction disputes, transportation, disaster management, and flood control. The first study identifies construction dispute mitigation based on a literature review from 2013 to 2023. The evaluation of the performance of the Trans Jateng Bus and identification of the risk of road construction delays are the next focuses. In addition, the study examines the preparedness of UII students for earthquakes, the analysis of the Benanain River discharge during Tropical Cyclone Seroja, and the effectiveness of retention ponds for flood control in Sukamanah, Tasikmalaya City.

PUBLISHED: 30-07-2024

ARTICLES

Identifikasi Mitigasi Sengketa Konstruksi: Systematic Literature Review Periode 2013-2023

DOI: <https://doi.org/10.25077/jrs.20.2.60-74.2024>

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IDENTIFIKASI MITIGASI SENGKETA KONSTRUKSI: SYSTEMATIC LITERATURE REVIEW PERIODE 2013-2023

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ABSTRAK

Sengketa konstruksi merupakan kasus terbanyak yang masuk ke ranah arbitrase atau pengadilan. Banyak penelitian yang mengungkapkan langkah mitigasi yang dapat diambil untuk mengurangi potensi terjadinya perselisihan namun masih dibatasi dengan lingkup penelitian yang berfokus pada satu aspek saja. Studi ini bertujuan untuk melakukan review literatur secara mendalam untuk mendapatkan langkah-langkah mitigasi sengketa konstruksi yang komprehensif. Metode yang digunakan adalah systematic literature review pada jurnal terindeks Scopus dengan tingkat kuartil 1 dan 2 dalam rentang 2013 sampai dengan 2023 serta dilanjutkan dengan analisis secara visual menggunakan program VOSviewer untuk mendapatkan mitigasi sengketa yang paling banyak direkomendasikan. Mitigasi sengketa konstruksi yang dihasilkan dapat dikelompokkan berdasarkan kategori sengketa yang terdiri dari "administrasi kontrak", "desain", "dokumen kontrak", "eksternal", "kompetensi", "kontraktor", "pemilik proyek", "perilaku", "perubahan pekerjaan", "tender", dan "proyek". Mitigasi sengketa yang paling banyak direkomendasikan adalah kategori dokumen kontrak yang meliputi penggunaan standar dokumen kontrak, dokumen kontrak yang lengkap serta dokumen kontrak yang jelas. Penelitian ini dapat menjadi acuan referensi ilmu pengetahuan bagi akademisi maupun pelaku konstruksi terkait faktor-faktor penyebab sengketa konstruksi serta langkah-langkah mitigasi yang dapat diterapkan.

Kata kunci : konstruksi, mitigasi, sengketa, *systematic literature review*, VOSviewer

1. PENDAHULUAN

Kasus sengketa konstruksi merupakan kasus terbanyak dalam rentang tahun 2014 sampai dengan 2018 yang dalam laporan Badan Arbitrase Nasional Indonesia (BANI) tahun 2019 mencapai 26,6% dari total kasus yang diputuskan. Nilai ini sangat tinggi dikarenakan lebih dari seperempat kasus sengketa di Indonesia merupakan sengketa konstruksi. Berdasarkan (Arcadis, 2022), penyebab terjadinya sengketa paling sering diakibatkan oleh penyusunan klaim yang buruk dan tidak berdasar, kesalahan dalam dokumen kontrak, kegagalan dalam memenuhi dokumen kontrak serta perubahan dari pihak pemilik proyek. Sementara itu, teknik untuk menghindari klaim yang efektif adalah review dokumen kontrak dan spesifikasi, manajemen risiko dan meninjau kemampuan kontraktor untuk membangun.

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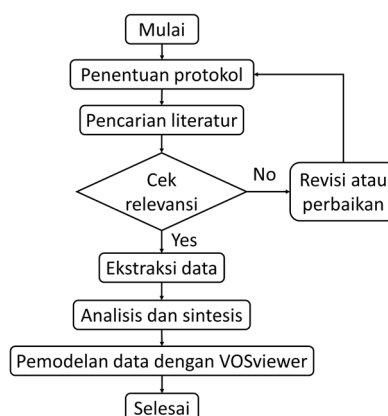
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Perancangan kondisi kontrak yang buruk dapat berujung pada litigasi (Jagannathan & Delhi, 2020). Dalam penulisan dokumen kontrak sangat dipengaruhi oleh risiko (Gad et al., 2011) serta perlu adanya negosiasi prakontrak dalam menyepakati aturan dalam mengukur dan menilai dampak penundaan proyek untuk mengurangi intensitas konflik (Aibinu, 2009). Potensi terjadinya sengketa juga dapat dihindari dengan pelaksanaan pekerjaan yang sesuai dengan dokumen kontrak (J. Lee & Ham, 2021). Beberapa alat bantu pun dapat digunakan dalam mengurangi sengketa, antara lain checklist administrasi kontrak (Sexton et al., 2020), checklist dokumen kontrak (Abotaleb et al., 2019), manajemen konflik (C. Lee et al., 2017) dan (Maiti & Choi, 2018), hingga penggunaan Building Information Modelling (BIM) (Shin et al., 2022).

Banyak peneliti yang membahas mitigasi sengketa konstruksi namun penelitiannya masih bersifat khusus atau fokus pada satu aspek yang ditinjau. Oleh karena itu, diperlukan studi yang mendalam untuk mendapatkan mitigasi yang mencakup setiap faktor penyebab yang berpotensi menyebabkan sengketa. Salah satu penelitian yang menelaah literatur secara rinci yaitu penelitian (Cakmak & Cakmak, 2013) yang membagi sengketa menjadi 7 kategori yaitu “pemilik proyek”, “kontraktor”, “desain”, “kontrak”, “perlaku”, “proyek” dan “faktor eksternal”. Namun penelitian (Cakmak & Cakmak, 2013) ini perlu dilakukan pembaharuan dikarenakan cakupan studi yang sudah cukup lama yaitu rentang tahun 1985 sampai dengan 2012. Studi ini bertujuan untuk mendapatkan langkah-langkah mitigasi yang komprehensif untuk seluruh faktor penyebab sengketa dengan menggunakan dan mengembangkan kerangka yang diuraikan dalam penelitian (Cakmak & Cakmak, 2013) serta mencari langkah mitigasi yang paling banyak direkomendasikan.

2. METODA PENELITIAN

Mitigasi sengketa konstruksi yang komprehensif didapat melalui *review* studi literatur dan pemodelan data menggunakan program VOSviewer untuk mendapatkan mitigasi yang paling banyak direkomendasikan. Tahapan studi dijabarkan pada **Gambar 1** yang diawali dengan penentuan protokol dalam melakukan *review* literatur yang terdiri dari strategi pencarian yang dijelaskan pada **Tabel 1** dan pencarian menggunakan kriteria inklusi dan eksklusi yang dijelaskan pada **Tabel 2**. Protokol merupakan ketentuan yang ditetapkan sebelum melakukan *review* agar terhindar dari bias dan pemahaman yang bersifat subyektif dari peneliti.



Gambar 1. Tahapan Penelitian

Proses pencarian dan pemeriksaan relevansi dengan rinci digambarkan dalam PRISMA diagram yang terdiri dari tahap *identification* (pemilahan artikel menggunakan protokol), *screening* (pemilahan dengan membaca *abstract* dari artikel), *eligibility* (pemilahan dengan

mebaca keseluruhan artikel), dan *included* (artikel yang diikutsertakan pada tahap ekstraksi data) (Jesson et al., 2011). Hasil pencarian yang sudah sesuai dengan protokol dilanjutkan dengan ekstraksi data yang relevan dengan tujuan studi serta dilakukan analisis dan sintesis. Tahap terakhir yaitu pemodelan data yang telah diekstrak menggunakan program VOSviewer (van Eck & Waltman, 2023).

Tabel 1. Strategi Pencarian

No.	Komponen	Details
1	<i>Keyword</i>	<i>Mitigation</i>
2	<i>Platform</i>	<i>Scopus</i> terindeks kuartil 1 dan 2
3	<i>Domains</i>	<i>Civil, engineering, construction, arbitration, litigation</i>
4	<i>Boolean operators</i>	“AND” digunakan untuk menggabungkan istilah utama dan “OR” untuk memasukkan sinonim

Tabel 2. Kriteria Inklusi dan Eksklusi

Kriteria Inklusi	Kriteria Eksklusi
1. Diterbitkan di jurnal yang terindeks <i>Scopus</i> dengan tingkat kuartil 1 dan 2	1. Tidak relevan dengan bidang penelitian
2. Bahasa Inggris	2. Bukan berupa Jurnal (tutorial, paparan, editorial, poster, <i>keynotes blog</i> and buku).
3. Artikel dapat diakses secara digital.	
4. Publikasi pada tahun 2013 sampai dengan 2023.	

Dalam studi ini menggunakan acuan kerangka kategori sengketa dari penelitian (Cakmak & Cakmak, 2013) seperti terlihat pada **Tabel 3** yang dalam analisisnya dikembangkan sesuai dengan hasil data yang didapatkan. Variabel pada Tabel 3 merupakan rangkuman yang dilakukan oleh (Cakmak & Cakmak, 2013) berdasarkan penelitian-penelitian eksisting terkait penyebab sengketa konstruksi.

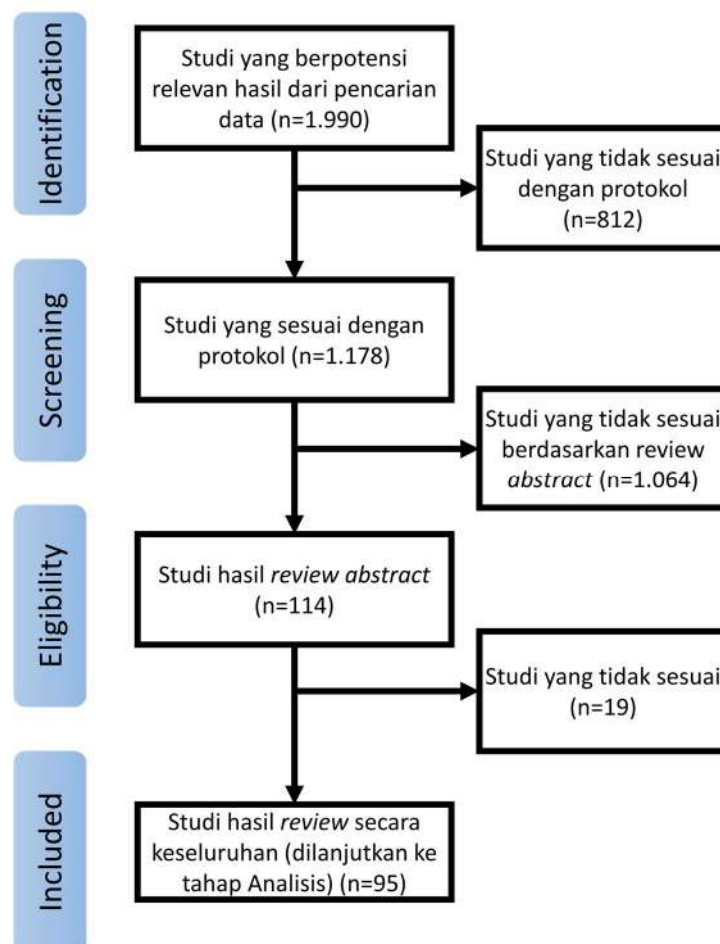
Tabel 3. Kategori Sengketa (Cakmak & Cakmak, 2013)

<i>Category of Disputes</i>	<i>Cause of Disputes</i>
<i>Owner related (A)</i>	<i>variations initiated by the owner (A1)</i> <i>change of scope (A2)</i> <i>late giving of possession (A3)</i> <i>acceleration (A4)</i> <i>unrealistic expectations (A5)</i> <i>payment delays (A6)</i>
<i>Contractor related (B)</i>	<i>delays in work progress (B1)</i> <i>time extensions (B2)</i> <i>financial failure of the contractor (B3)</i> <i>technical inadequacy of the contractor (B4)</i> <i>tendering (B5)</i> <i>quality of works (B6)</i>
<i>Design related (C)</i>	<i>design errors (C1)</i> <i>inadequate / incomplete specifications (C2)</i> <i>quality of design (C3)</i> <i>availability of information (C4)</i>
<i>Contract related (D)</i>	<i>ambiguities in contract documents (D1)</i> <i>different interpretations of the contract provisions (D2)</i> <i>risk allocation (D3)</i> <i>other contractual problems (D4)</i>
<i>Human behavior related (E)</i>	<i>adversarial / controversial culture (E1)</i> <i>lack of communication (E2)</i>

<i>Category of Disputes</i>	<i>Cause of Disputes</i>
	<i>lack of team spirit (E3)</i>
<i>Project related (F)</i>	<i>site conditions (F1)</i>
	<i>unforeseen changes (F2)</i>
<i>External factors (G)</i>	<i>weather (G1)</i>
	<i>legal and economic factors (G2)</i>
	<i>fragmented structure of the sector (G3)</i>

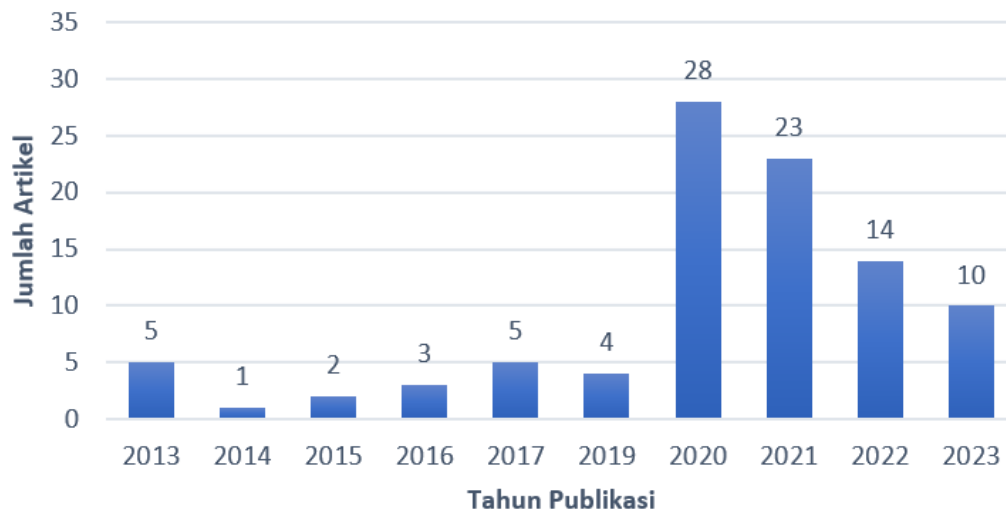
3. HASIL DAN PEMBAHASAN

Hasil pencarian literatur menggunakan strategi pencarian pada **Tabel 1** menghasilkan 1.990 artikel. Setelah dilakukan pemeriksaan relevansi dengan kriteria pada **Tabel 2**, artikel yang sesuai dengan protokol sebanyak 1.178 artikel. Pemeriksaan dilanjutkan dengan *review abstract* dengan artikel yang sesuai sebanyak 114 artikel. Pemeriksaan terakhir dengan melakukan *review* secara keseluruhan artikel dengan hasil 95 artikel yang relevan dan dilanjutkan pada proses ekstraksi data. Rincian proses pemeriksaan diperlihatkan pada **Gambar 2**

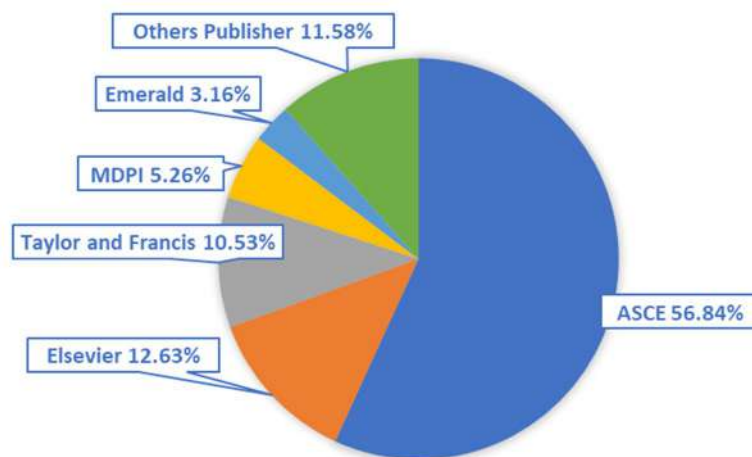


Gambar 2. PRISMA Diagram

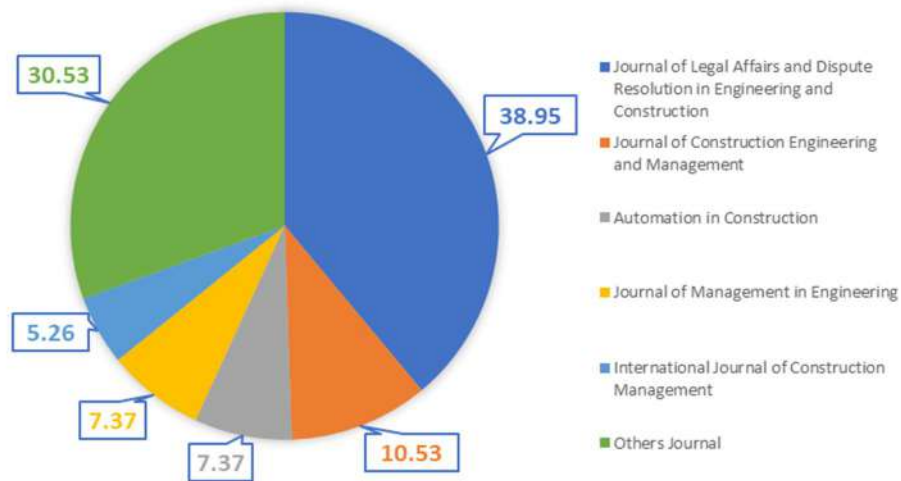
Berdasarkan 95 artikel terpilih, artikel paling banyak adalah pada tahun 2020 yaitu sebanyak 28 artikel (**Gambar 3**). *Publisher* yang paling banyak menerbitkan artikel terkait adalah *American Society of Civil Engineers* (ASCE) sebesar 56,84% (**Gambar 4**) sedangkan untuk jurnal adalah *Journal of Legal Affairs and Dispute Resolution in Engineering and Construction* sebesar 38,95% (**Gambar 5**). Lokasi penelitian paling banyak berasal dari Amerika Serikat sebesar 23,16% (**Tabel 4**).



Gambar 3. Artikel Terpilih Berdasarkan Tahun Publikasi



Gambar 4. Artikel Terpilih Berdasarkan *Publisher*



Gambar 5. Artikel Terpilih Berdasarkan Jurnal

Tabel 4. Artikel Terpilih Berdasarkan Lokasi Penelitian

No.	Lokasi Penelitian	Bobot (%)	No.	Lokasi Penelitian	Bobot (%)
1	Amerika Serikat	23,16%	17	Nepal	2,11%
2	Tidak disebutkan	10,53%	18	Mesir	2,11%
3	India	7,37%	19	Ceko	1,05%
4	Malaysia	6,32%	20	Yunani	1,05%
5	New Zealand	5,26%	21	Nigeria	1,05%
6	China	4,21%	22	Asia dan Timur Tengah	1,05%
7	Saudi Arabia	3,16%	23	Inggris	1,05%
8	Korea	3,16%	24	Qatar	1,05%
9	Turki	3,16%	25	United Arab Emirates, Australia, Brazil, Malaysia, Saudi Arabia dan Inggris	1,05%
10	United Arab Emirates	3,16%	26	Amerika Serikat, Kanada, China, dan Peru	1,05%
11	Australia	3,16%	27	Yordania	1,05%
12	Timur tengah	2,11%	28	Sri Langka	1,05%
13	United Kingdom	2,11%	29	Norwegia	1,05%
14	Afrika Selatan	2,11%	30	Indonesia	1,05%
15	Pakistan	2,11%			
16	Kanada	2,11%			
Total					100,00%

Selain 7 kategori dari (Cakmak & Cakmak, 2013), penelitian ini menghasilkan 11 kategori sengketa konstruksi dengan 4 usulan kategori baru, yaitu administrasi kontrak, kompetensi, perubahan pekerjaan dan tender seperti pada Tabel 5. Administrasi kontrak dan kompetensi diusulkan menjadi sub-kategori tersendiri dikarenakan banyak penelitian yang mengungkapkannya sebagai salah satu penyebab sengketa konstruksi namun belum terdapat dalam penelitian (Cakmak & Cakmak, 2013). Perubahan pekerjaan yang dibahas dalam penelitian (Cakmak & Cakmak, 2013) adalah perubahan lingkup pekerjaan yang termasuk dalam kategori pemilik proyek diusulkan menjadi kategori baru karena perubahan pekerjaan yang ditemukan adalah berkaitan dengan ketidaksepakatan atas perubahan pekerjaan atau ketidaksepakatan atas dampak dari perubahan pekerjaan yang tidak hanya ada pada salah satu pihak melainkan terkait dengan seluruh pihak yang terlibat. Hal yang sama dengan kategori

tender yang dalam penelitian (Cakmak & Cakmak, 2013) termasuk dalam kategori kontraktor diusulkan menjadi kategori tersendiri karena faktor ini tidak hanya terkait dengan kontraktor.

Tabel 5. Rangkuman Referensi Mitigasi Sengketa Berdasarkan Kategori Sengketa

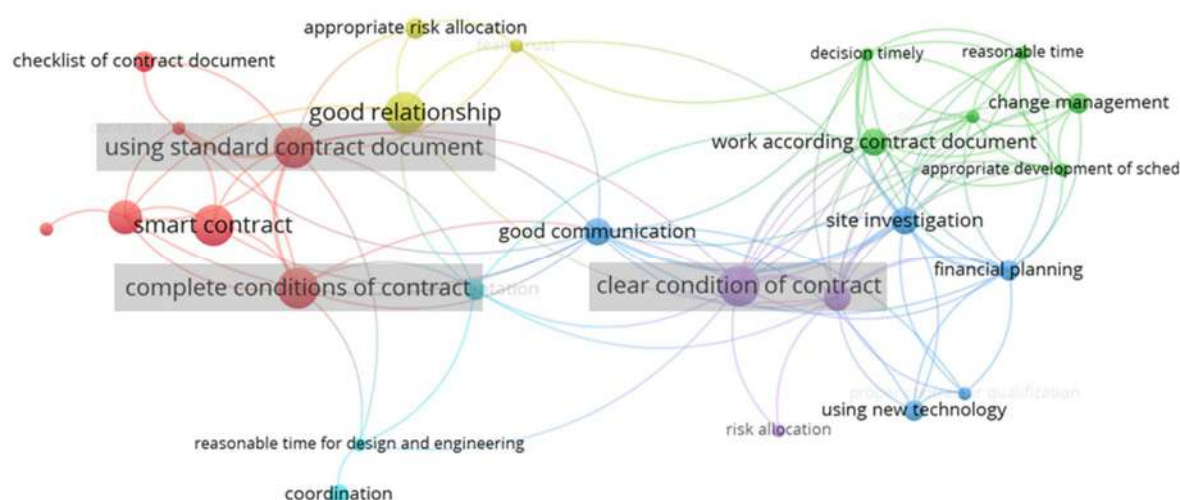
Kategori Sengketa/ Sub-kategori Sengketa	Referensi
Administrasi kontrak (A)	
Pelaksanaan administrasi kontrak tidak sesuai dokumen kontrak (A1)	(Abotaleb et al., 2019), (Arifin, 2022), (H. Chong & Phuah, 2013), (H. Y. Chong et al., 2013), (Jelodar et al., 2021), (Khahro et al., 2023), (C. Lee et al., 2017), (J. Lee & Ham, 2021), (Maiti & Choi, 2018), (Maqsoom et al., 2020), (Marzouk & El-rasas, 2014), (Senaratne & Farhan, 2023), (Sexton et al., 2020), (Shin et al., 2022), (Zafar et al., 2023)
Kontrak (B)	
Alokasi Risiko (B1)	(Agrawal et al., 2021), (Alsharef et al., 2021), (Amoah & Nkosazana, 2023), (Awwad et al., 2016), (Elhag et al., 2020), (Hanna et al., 2023), (Hiyassat et al., 2020), (Ramanathan & Rathinakumar, 2017), (Seneviratne & Michael, 2018), (Shabana et al., 2023), (Zhu et al., 2020)
Ambigu (B2)	(Chan et al., 2021), (Koc & Gurgun, 2021)
Ketidaktjelasan (B3)	(Nabi et al., 2020), (Koc & Gurgun, 2021), (J. Lee & Ham, 2021), (Marzouk & El-rasas, 2014), (B. A. K. S. Perera et al., 2019), (Shabana et al., 2023), (Shen et al., 2017)
Ketidaktlengkapan (B4)	(Abdel-hamid & Mostafa, 2023), (Abotaleb et al., 2019), (Asadi et al., 2022), (Assaad et al., 2021), (Assaad, Asce, Elsayegh, et al., 2020), (Assaad, Asce, Elsayegh, et al., 2020), (Guerra et al., 2020), (J. Lee, Ph, et al., 2020), (Nabi et al., 2021), (B. A. K. S. Perera et al., 2019), (Saseendran et al., 2020), (Senaratne & Farhan, 2023), (Sinha et al., 2020)
Perbedaan Interpretasi (B5)	(Awwad et al., 2016), (Senaratne & Farhan, 2023)
Masalah terkait dokumen kontrak lainnya (B6)	(Assaad, Asce, Ph, et al., 2020), (Elkhayat & Marzouk, 2022), (Kisi et al., 2020), (Maqsoom et al., 2020), (Senaratne & Farhan, 2023)
Desain (C)	
Kesalahan/ketidaktlengkapan/kualitas/tidak adanya informasi/keterlambatan (C1)	(Charehzehi et al., 2017), (Nabi et al., 2022), (B. A. K. S. Perera et al., 2019), (Zafar et al., 2023)
Eksternal (D)	
Keadaan kahar (D1)	(Aladağ et al., 2021), (Alsharef et al., 2021), (Hennings et al., 2022), (Olanrewaju et al., 2023), (A et al., 2021)
Kondisi ekonomi (D2)	(Senaratne & Farhan, 2023)
Peraturan/Regulasi (D3)	(J. Lee & Ham, 2021)
Pihak ketiga/Politik/Sosial/Budaya (D4)	(Zafar et al., 2023)
Kompetensi (E)	
Kompetensi yang buruk (E1)	(Ahmed et al., 2021), (Awwad et al., 2016), (Ayhan et al., 2021), (Francis et al., 2022), (Hanák & Vítková, 2022), (Jelodar et al., 2021), (Khahro et al., 2023), (Senaratne & Farhan, 2023), (Vandemark et al., 2021), (J. Wang et al., 2023)(C. Wang et al., 2019)
Kontraktor (F)	
Keterlambatan penyelesaian pekerjaan (F1)	(Asim et al., 2017), (Bektas et al., 2021), (Hansen et al., 2023), (Jelodar et al., 2021), (Marzouk & El-rasas, 2014), (Munvar et al., 2020), (N. A. Perera et al., 2016)
Klaim (F2)	(Asce & Mehdi, 2020), (Asce et al., 2020), (Ali et al., 2020), (Eladaway et al., 2020), (Guévremont et al., 2020), (Khahro et al.,

Kategori Sengketa/ Sub-kategori Sengketa	Referensi
	2023), (Kisi et al., 2020), (Lo & Å, 2013), (Mustaffa et al., 2023), (B. A. K. S. Perera et al., 2019), (Rai, 2020), (Kisi et al., 2021), (Subedi, Asce, Pradhananga, & Asce, 2021), (Subedi, Asce, Pradhananga, Asce, et al., 2021)
Manajemen konstruksi (F3)	(Marzouk & El-rasas, 2014), (Khahro et al., 2023), (Amoah & Nkosazana, 2023), (Charehzehi et al., 2017), (Sai et al., 2021), (Naji et al., 2022), (Sheng et al., 2020), (Zafar et al., 2023), (Vandemark et al., 2020a)
Pekerjaan ulang (F4)	(Jelodar et al., 2021), (Safapour et al., 2019)
Penghentian pekerjaan sementara dan pemutusan kontrak (F5)	(J. Lee & Ham, 2021)
Permasalahan keuangan (F6)	(Jelodar et al., 2021), (Marzouk & El-rasas, 2014), (Charehzehi et al., 2017), (Paraskevopoulou & Benardos, 2013)
Permasalahan kualitas (F7)	(Vandemark et al., 2020b), (J. Lee, Ahn, et al., 2020)
Sub-kontraktor/Supplier (F8)	(Marzouk & El-rasas, 2014), (Nabi et al., 2022)
Sumber daya (F9)	(Jelodar et al., 2021), (Zafar et al., 2023), (Seneviratne & Michael, 2018)
Pemilik Proyek (G)	
Jadwal pekerjaan (G1)	(Khahro et al., 2023), (Marzouk & El-rasas, 2014)
Lahan (G2)	(Shabana et al., 2023), (Sinha et al., 2020), (Zafar et al., 2023), (Vandemark et al., 2020a)
Pembayaran (G3)	(Marzouk & El-rasas, 2014), (Ahmadisheykhsarmast & Sonmez, 2020), (Badi et al., 2020), (Hamledari et al., 2021), (Nanayakkara et al., 2021), (Saygili, 2022), (Senaratne & Farhan, 2023)
Penghentian pekerjaan sementara dan pemutusan kontrak (G4)	(J. Lee & Ham, 2021)
Perencanaan (G5)	(Marzouk & El-rasas, 2014)
Perizinan (G6)	(Marzouk & El-rasas, 2014), (Shabana et al., 2023)
Permasalahan keuangan (G7)	(Ramachandra & Bamidelerotimi, 2015)
Sumber daya (G8)	(Shabana et al., 2023)
Perilaku (H)	
Itikad tidak baik (H1)	(Maqsoom et al., 2020), (A et al., 2021), (Zhu et al., 2020)
Komunikasi (H2)	(Elhag et al., 2020), (Jelodar et al., 2021), (Sabri & Torp, 2022), (Senaratne & Farhan, 2023), (Zafar et al., 2023)
Masalah terkait perilaku lainnya (H3)	(Zhu et al., 2020), (Elhag et al., 2020), (Sabri & Torp, 2022), (Zafar et al., 2023), (Jelodar et al., 2015), (Ling et al., 2013), (Nabi et al., 2022), (Nanayakkara et al., 2021), (Vandemark et al., 2021)
Perubahan pekerjaan (I)	
Ketidaksepakatan perubahan pekerjaan/ketidaksepakatan dampak perubahan pekerjaan (I1)	(Alhyari & Hyari, 2022), (Du et al., 2016), (Khalafallah et al., 2019), (Ur et al., 2021), (Marzouk & El-rasas, 2014), (Naji et al., 2022), (Nanayakkara et al., 2021), (Shabana et al., 2023)
Proyek (J)	
Kondisi lapangan (J1)	(Jelodar et al., 2021)
Unforeseen condition (J2)	(Amoah & Nkosazana, 2023)
Tender (K)	

Kategori Sengketa/ Sub-kategori Sengketa	Referensi
Ketidaklengkapan atau ketidakpahaman dokumen tender/ Penawaran harga terendah(K1)	(Alshamrani et al., 2022), (Elhag et al., 2020), (Jelodar et al., 2021), (Marzouk & El-rasas, 2014), (Nabi et al., 2022), (Sabri & Torp, 2022), (Zafar et al., 2023)

Catatan: Detail mitigasi terlihat pada pemodelan VOSviewer.

Data hasil ekstraksi dari artikel terpilih dibuat pemodelan menggunakan program VOSviewer dengan cara memasukkan kata kunci dari setiap langkah mitigasi yang ditemukan. Langkah mitigasi terbesar adalah pada kategori dokumen kontrak yaitu penggunaan standar dokumen kontrak, dokumen kontrak yang lengkap dan dokumen kontrak yang jelas sebagaimana terlihat pada **Gambar 6**.



Gambar 6. Hasil Pemodelan dengan Program VOSviewer

Dokumen kontrak yang ditulis dengan buruk dan pelaksanaan administrasi kontrak yang buruk merupakan sumber sengketa dalam proyek konstruksi yang menurut (Abdel-hamid & Mostafa, 2023) dapat dimitigasi dengan penggunaan standar dokumen kontrak. Penggunaan standar dokumen kontrak tetap harus disesuaikan dengan kebutuhan proyek atau dengan kata lain dapat dilakukan modifikasi ketentuan kontrak mengikuti kondisi dari proyek (Saseendran et al., 2020). Hal yang sama diungkapkan oleh (Senaratne & Farhan, 2023). Dalam penyusunan konsep dokumen kontrak terkait tanggung jawab pemilik proyek juga dapat merujuk pada standar dokumen kontrak (Abotaleb et al., 2019) begitu juga untuk mekanisme pembayaran yang akan digunakan (Elhag et al., 2020).

Kelengkapan dokumen kontrak juga merupakan mitigasi untuk mengurangi potensi terjadinya sengketa. Dokumen kontrak harus mengatur secara rinci setiap hal yang berkaitan dengan pekerjaan (Sinha et al., 2020). Pada penelitian (B. A. K. S. Perera et al., 2019) menggaris bawahi bahwa dokumen kontrak harus mengatur khusus mengenai perubahan pekerjaan terkait perselisihan, inspeksi, persetujuan, pembayaran dan penundaan serta khususnya mengenai mekanisme yang tepat untuk memproses dan mengevaluasi perubahan pekerjaan tersebut. Hal-hal lain juga yang perlu dipastikan kelengkapannya adalah terkait ketentuan penggunaan *Building Information Modelling* (BIM) (Assaad et al., 2021), standar penyampaian 3D model dalam dokumen kontrak (Guerra et al., 2020), ketentuan pekerjaan ulang berdasarkan faktor penyebabnya (Asadi et al., 2022), serta ketentuan bukti pembayaran dan jaminan pembayaran (Senaratne & Farhan, 2023). Selain kelengkapan dokumen kontrak, kejelasan dari dokumen kontrak juga menjadi mitigasi sengketa konstruksi terbanyak. Beberapa aspek yang harus

dijabarkan secara jelas adalah ruang lingkup pekerjaan (B. A. K. S. Perera et al., 2019), spesifikasi teknis (Shen et al., 2017), hubungan formal, peran dan tanggung jawab para pihak (Marzouk & El-rasas, 2014), ketentuan perubahan pekerjaan (B. A. K. S. Perera et al., 2019), tanggung jawab keselamatan (Nabi et al., 2020), ruang lingkup operasi konstruksi (J. Lee & Ham, 2021), serta ketentuan kontrak atas perbedaan kondisi lapangan dan/atau peristiwa keadaan kahar (Shabana et al., 2023).

Penelitian ini mencakup kategori sengketa baru sebagai acuan referensi ilmu pengetahuan bagi akademisi maupun pelaku konstruksi terkait faktor-faktor penyebab sengketa konstruksi serta langkah-langkah mitigasi yang dapat diterapkan pada pelaksanaan proyek konstruksi baik di Indonesia maupun di tingkat internasional.

4. KESIMPULAN

Penelitian ini memuat kategori sengketa baru yang merupakan hasil pengembangan dari penelitian (Cakmak & Cakmak, 2013) yang berupa 11 kategori sengketa dilengkapi dengan langkah mitigasi yang dapat diterapkan untuk mengurangi potensi terjadinya sengketa pada proyek konstruksi. Aspek terbesar yang perlu diperhatikan adalah terkait dokumen kontrak yang sedapat mungkin merujuk pada standar dokumen kontrak yang telah ada. Kelengkapan dan kejelasan dari dokumen kontrak juga menjadi aspek penting sebelum melaksanakan pekerjaan.

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