

EVALUATION OF QUALITY MANAGEMENT SYSTEM OF BRIDGE DEVELOPMENT PROJECT ACTORS

Novdin M Sianturi¹, Darwin Sitompul², Syahrizal³

Civil Engineering Study Program, Faculty of Engineering, Simalungun

University, Indonesia¹ University Of North Sumatra, Medan , Indonesia¹²³

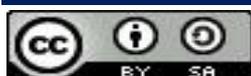
Email: snovdinm@gmail.com¹, dssitompul@yahoo.com², rizal_ar@ymail.com³

ABSTRACT

This study is the result of a rehearsal to find the factors that are the main reasons for the delay in the completion of the Sei Wampu Bridge project, Empus Village Project, Bahorok Regency and look for various alternatives to overcome them. By knowing these factors, it is hoped that the company can obtain guidelines for working on subsequent projects so that delays and quality deficiencies can be avoided. The author in this study used a qualitative approach with descriptive delivery. This study uses a descriptive type of research using qualitative methods. Descriptive research is a type of research that describes the actual situation based on data in the field. From the results of the analysis, it can be concluded that problems related to the completion of business achievements that cause not on time and quality are generally caused by 3 (three) factors, namely: the employer factor of the Bridge Construction Project Implementer, the field factor and the order variation factor.

KEYWORDS

Management Quality, Finish Project, Quality Project



This work is licensed under a Creative Commons Attribution- ShareAlike 4.0 International

INTRODUCTION

Sumatra Province has location potency enough geography strategic compared with area Other provinces in Sumatra, such as Riau and Lampung Provinces . Dear once, not yet enough developed good from object tourism nor from side utilization results earth. For support smoothness current tour the required facilities and infrastructure (Novdin M Sianturi et al., 2018) (Purba, Sianturi, Saragih, & Damanik, 2021), one of which is development bridge. The development need coordination Among Government Province with entrepreneurs as well as relevant agencies in development that (Ketaren & Sianturi, 2017). For doing development that Government Province based on instructions from The

How to cite:

Novdin M Sianturi, Darwin Sitompul, Syahrizal. (2022). Evaluation of Quality Management System of Bridge Development Project Actors. Journal of Eduvest . Vol 2(9): Page 1827-1837

E-ISSN:

2775-3727

Published by:

<https://greenpublisher.id/>

Indonesian government chooses companies decent contractor doing profession the based on criteria determined by the Directorate of Public Works of Highways in Jakarta which at the time now named Department Settlement and Regional Development, Directorate General Regional Development, Project Road Upgrades and Replacements Bridge Region I North Sumatra represented by the Replacement Section Bridge Region I North Sumatra (Kusiani et al., 2021). For expedite the implementation process profession the so required service construction. However so , since mid 1997 to end 1999 a lot occur delay implementation project in everything sector development especially in development bridge new (Lubis & Sianturi, 2012).

This company is company private whose shares part big owned family . Bridge Construction Project Executor is moving in the field of construction, agriculture, supplier, trade, common and now will focus on import-export (Damanik, Sianturi, Saragih, & Purba, n.d.)

Bridge Construction Project Executor is one of the tender winners from three package help from the OECF focused on bridge improvement in the area of North Sumatra Province. Package the is the "Bridge Replacement and Rehabilitation Project OECF Loan. IP-444 packet OP-05, Sibaganding, Etc North Sumatra," with contract number 01/KTR-A/05/02/1998, dated 28 July 1998. Supervision implementation profession assisted by Bridge Construction Project Executor as consultant package bridge Sibaganding (Debby et al., 2021), Etc as well as owner is Department Work General Republic of Indonesia, Directorate General of Highways Section of Road and Bridge Infrastructure . Execution time is 610 days and time 365 days maintenance calendar and the available funds are 1% Pure APBN and 99% OECF IP – 444 (Ketaren & Sianturi, 2017).

In implementation project the owner did regulation to ensure project the permanent walk although in state crisis monetary, including contractor's All Risk insurance, guarantees Implementation and Guarantee of Advances that make party company deliver all dividend company as guarantee for doing Bridge Sibaganding Etc, and make company lack of capital in doing the profession although already handed over 13.5% down payment given the owner, however that all no could complete project caused liberation of the affected area development bridge new (Purba et al., 2021). Project the is one unity from Bridge Sibaganding which consists of from a number of bridge (Kusiani et al., 2021)..

Bridge construction it is very necessary when this , remember old bridge already aged more from 40 years and already no worthy again for traversed by heavy vehicles. For that required planning making bridge new in anticipate spike usage quite a bridge high (Purba et al., 2021), because existence object Bukit Lawang tourism and increasing level of life population local consequence tourism that (Ketaren & Sianturi, 2017).

Construction of the Sei Wampu . Bridge need correct coordination in take all risky action tall where party Bridge Construction Project Executor management (contractor) in implementation experience very complicated problem, ok from state natural surrounding as well as outside from circumstances in the project that are not support in speed up profession bridge that . In reality the expected target company in complete sixth bridge for 420 days calendar no walk with good (N M Sianturi, Kamarudin, Wahab, & Saudi, 2019). Lateness the caused by need frame that doesn't in accordance Among Request from Department Settlement and Regional Development (Novdin M Sianturi, 2014), Directorate General Regional Development , Project Road Upgrades and Replacements North Sumatra Region I Bridge with production factory skeleton steel bridge from Australia, which effect side from lateness production skeleton as well as delivery skeleton bridge the make all profession constrained until more than 6 months (Novdin M. Sianturi, Nofirman, Yulianti, Fatmawati, & Hendriarto, 2022) . Consequence Thing the company experience loss as well as addition time sufficient execution long so that cost implementation Becomes more big (Novdin M Sianturi, 2015). Implementation sixth

bridge the should eat time 610 days calendar in agreement contract between owner and contractor . In reality until month March year 2000 implementation process profession the has eat time 590 days kelandar, project Bridge Sibaganding and Lau Tembo condition 98% complete worked on, Sei Wampu and Sei Batang bridges Attack condition 82% complete done as well as Sei Glare Bridge and Aek Calm condition only 75% finished worked on (Purba & Sianturi, 2013). Field inspection of the Sei Wampu (Purba & Sianturi, 2013). Bridge experience various obstacles, including rain which, in continuous flood continuously result in abutment role of bridge along scaffold skeleton bridge damaged carried by the incoming flood waters from upstream river (Novdin M Sianturi et al., 2018). Incoming frame to field no in accordance with time delivery ordered by the company result in profession no done appropriate time (Wahyuni, Lathifa, & Susilo, 2019). Beside that , the most important problem experienced by the company is skeleton bridge no have suitable weight with the expected so that bridge experience damage and make the implementation process Becomes add 1 month until bridge could returned like beginning with helped scaffolding on the 10th , 11th and 12th segments (1 segment = 5 meters where long 60 meters bridge and required 12 segments / joints) (Novdin M Sianturi, Saragih, Purba, & Damanik, 2021). Consequence incident the party company experience loss from side time and cost repair component bridge broken frame (Novdin M Sianturi & Saragih, 2020).

From the description above seen that implementation Sei Wampu Bridge Bridge the no appropriate time and quality no in accordance with what you want owner's side . See Thing the writer To do evaluation back management system quality related Department Settlement and Regional Development projects with third standard including standard poured product in drawings and specifications, work process standards as outlined in the method work as well as standard poured system in system quality (Novdin Manoktong Sianturi, 2022).

Based on the description that has been stated above, it looks that since project done from beginning month August 1998 implementation often no in accordance with schedule (time schedule) that has been set earlier (Sipayung, Sianturi, Arta, Rohayati, & Indah, 2021). This thing means that Bridge Construction Project Executor does not could do project Sei Wampu Bridge Bridge with appropriate time and with appropriate quality with desire owner project (owner) (Sipayung et al., 2021). because that , feel need for find factors reason main lateness as well as mismatch quality that, then look for alternative solution to overcome it so that in the future come delays and nonconformities quality the no repeated again (Purba et al., 2021). In other words, the problem main will discussed in rehearsal this is look for factors reason main too late solution project as well as not accordingly quality with desire owner project , then look for alternative the solution (Novdin M Sianturi et al., 2021).

rehearsal this aim for look for the factors that become reason main late settlement process project Sei Wampu Bridge and looking for various alternatives to overcome it . With know factors the expected company could get guidelines for doing projects next until delay and lack of custom quality could be avoided.

RESEARCH METHOD

The author in this study used a qualitative approach with descriptive delivery. This study uses a descriptive type of research using qualitative methods. Descriptive research is a type of research that describes the actual conditions based on data in the field. Meanwhile, according to Moleong that qualitative research is rooted in a natural background as divinity, and on humans as research tools, utilizes qualitative methods of inductive data analysis, directs research objectives in an effort to find theories more concerned with processes than results. Choosing a set of criteria to write down the validity of the data, the research design is tentative, the research results are agreed upon by the research subjects .

RESULTS AND DISCUSSION

Internal and External Analysis

Reviewed from nature , then necessary elements get attention are you serious could grouped between internal and external . The internal elements that are weakness are :

- Structure Organization found in Management
- Coaching found in Management
- Rewards and Punishments are in Management
- Knowledge practical found in HR
- The number of personnel is in HR
- Inaccuracies information found in Change Construction
- Leadership weak individual .

Temporary according to external elements which is threat are :

- Claim is in the element Executor Project .
- Land claims are found in elements Social / environmental .
- Community demands exist is in the social / environmental element.
- Disturbance Security is also in the elements social / environmental .
- Worker +/- is in formal change .

Elements that have relative mean value high that is internal and can so that can be categorized as Strengths are :

- Retrieval decision / policy is in management.
- Coordination in management.
- Description of the tasks contained in the structure organization .
- Delegation authority vested in management .
- Work with the team that is an element of culture.

As for what is categorized as opportunities (opportunities) between other :

- Availability institution education managerial such as the Research in the Master of Management Program in the Field of Technology in Bridge Construction Projects.
- Emergence energies expert field civil from circle College tall
- Available management system ISO 9000 quality for contractor
- Existence projects completed bridge done previously
- Availability Quality education and training .

By complete the elements that are Strengths , Weaknesses , Opportunities as well as threat could be seen in table 1.

Table 1 Strengths , Weaknesses , Opportunities and Threats

Strength (S)	Weakness (W)	Opportunity (O)	Threat (T)
Description Task	Leadership Individual still weak coaching Not enough	Availability of institutions managerial education like Research Institute for Master Program in Technology Management in	There is a claim from implementing party field There is a claim land ownership There is a claim Public

		Bridge Construction Projects Project relatively done	
Delegator authority Taking policy	decision/ Rewards and punishments are not enough	The emergence of energy civil expert college circles Tall. There is a system ISO quality management 9000 for contractors Availability of materials in the field The emergence of education and training training quality	Disturbance security
Coordinati	Knowledge Practical not enough		There is a job add/subtract
Teamwork	Inaccuracy Information tall		
	Inaccuracy Information tall		
	Organizational Structure		

SWOT/ TOWS . Matrix

After fourth components (strengths , weaknesses , opportunities and threats) can be known , next with use SWOT matrix is worked on to get alternative strategy based on logic maximizing the same strengths and opportunities with that must be able to minimize weaknesses and overcoming threats . By complete SWOT/TOWS matrix is shown in table 2

Table 2 SWOT/TOWS Matrix cases Project Sei Wampu Bridge Bridge

	Strength (S)	Weakness (W)
Internal factors	1. Standard job description 2. Experience on bridge/road projects 3. Have a good name 4. Making the right decision/policy. 5. 5. Certain work culture	1. Leadership is still low. 2. Less coaching. 3. Less Reward & Punishment 4. Inaccuracy 5. High Information
External Factors		
External Factors Opportunity (O)	Strategy - SO	Strategy – WO
1. The existence of the MM-USU Managerial educational institution 2. There are completed projects High 3. The emergence of bid experts. College Civil Investigation 4. The existence of an ISO 9000 Quality standard management system for contractors 5. Availability of materials in the field 6. The emergence of training/training 7. good quality	N1 : Reviewing the working method of implementing in the field to be more effective in accordance with national and international standards (S1,O4) N2 : Make a policy to prioritize the use of local materials if it is in accordance with existing standards (S3,O5)	N3 : Involving experts from universities in civil society in accordance with (W7, O3) N4 : Conduct comparative studies to similar projects that are relatively successful (W2, W4, O2) N5 : Involve employees who have the potential to participate in S1 and MM programs (W1,W3,O1) N6 : Improving the skills of workers through the education and training program (W5,O6)
Threat (T)	Strategy - ST	Strategy - WT
1. There is a claim from the executor in the field 2. There is a land ownership claim 3. Community demands 4. Security Disruption 5. 5. There is additional/less work	N7 : Appeal to field implementers to use the appropriate local manpower as much as possible. (S2,T3) N8 : Forming a special team consisting of people from various fields to handle field problems that arise. (S4,S5,T1,T5)	N9 : Collaborating with local youth organizations in maintaining environmental security. (W6,T4) N10 : Cooperate with the local government and local Tripika elements to provide counseling and approach to the community. (W3,T2)

Solving Solution Selection Problem

Retrieval process decision for set alternative to be priority use Analytical Hierarchy Process (AHP) method or what is known taking multi-criteria decision . From solution solving problem , can be conducted with method view / make an outline of what happened, where will appear evaluation convenience implementation, cost implementation and expectations result . Of the three elements the will appear SWOT matrix , from the SWOT matrix so we will see ten alternative solving related problems with convenience implementation , cost implementation .

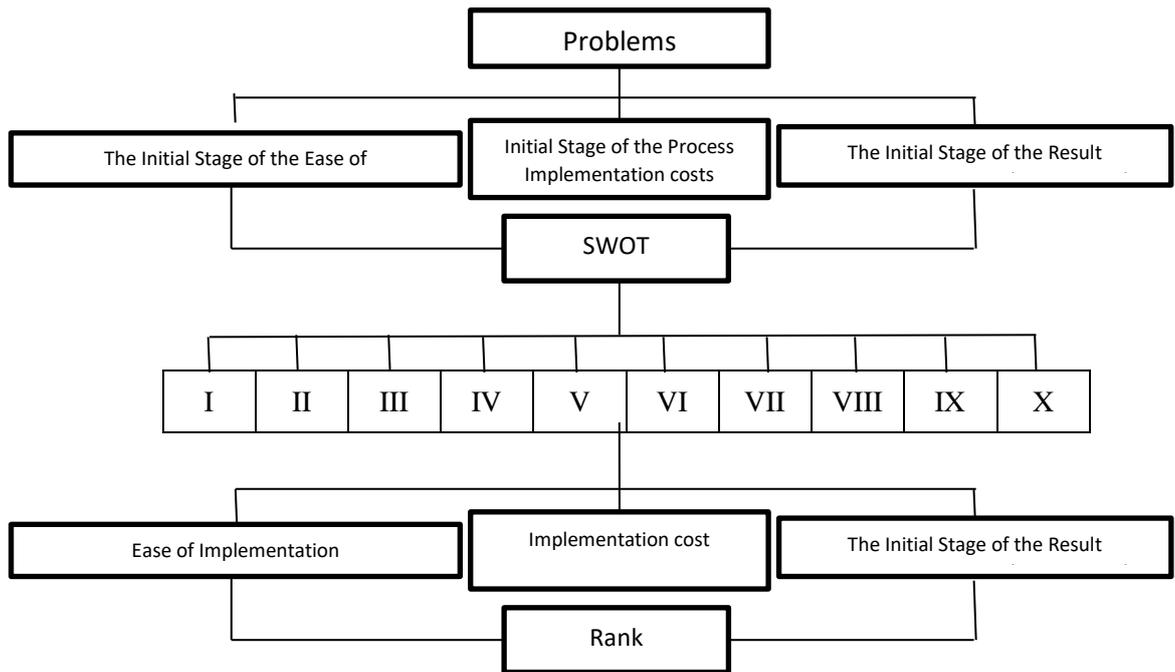


Figure 1 The Process of Finding Ranking Alternative Solutions for Solutions Problem.

The criteria used in choose alternative are ; NK1 = Convenience implementation
NK2 = Cost implementation
NK3 = Expectations results

Next conducted weighting criteria and followed with evaluation to alternative based on criteria as already _ set above _ through how to brainstorm with using the form in the attachment . After that conducted calculation with use matrix comparison pair and normalization , continued with consistent test for knowing what is the consistency ratio (CR), where if CR 0.10 then matrix comparison could be accepted (answer) consistent). Calculation more could see appendix B. _

As for the results calculation in weighting criteria could be seen in table 3.

Table 3 Weighting Results Criteria

Criteria	Weight
NK1 : Convenience implementation	0.25965
NK2 : Cost □	0.41749
NK3 : Expectations results	0.32286

Then results evaluation to alternative solution solving problem based on the criteria above shown in tables 4,.5 and.6.

Table Assessment Results To Alternative Problem Solutions based on Criteria
Convenience Execution (NK1)

Alternative Solution Troubleshooting	Score
Alternative Solution Solution Problem I	0.0988
Alternative Solution Solution Problem II	0.0749
Alternative Solution Solution Problem III	0.1024
Alternative Solution Solution Problem IV	0.1048
Alternative Solution Solution Problem V	0.1041
Alternative Solution Solution Problem VI	0.1019
Alternative Solution Solution Problem VII	0.1037
Alternative Solution Solution Problem VIII	0.0979
Alternative Solution Solution Problem IX	0.1081
Alternative Solution Solution Problem X	0.1036

Table 5 Assessment Results To Alternative Problem Solutions based on Criteria
Cost Implementation (NK2)

Alternative Solution Troubleshooting	Score
Alternative Solution Solution Problem I	0.1091
Alternative Solution Solution Problem II	0.0740
Alternative Solution Solution Problem III	0.1009
Alternative Solution Solution Problem IV	0.1035
Alternative Solution Solution Problem V	0.1009
Alternative Solution Solution Problem VI	0.1012
Alternative Solution Solution Problem VII	0.1005
Alternative Solution Solution Problem VIII	0.0993
Alternative Solution Solution Problem IX	0.1078
Alternative Solution Solution Problem X	0.1029

Table 6 Assessment Results To Alternative Problem Solutions based on Criteria Expected Results (NK3)

Alternative Solution Troubleshooting _	Score
Alternative Solution Solution Problem I	0.1083
Alternative Solution Solution Problem II	0.0724
Alternative Solution Solution Problem III	0.1003
Alternative Solution Solution Problem IV	0.1039
Alternative Solution Solution Problem V	0.1024
Alternative Solution Solution Problem VI	0.1013
Alternative Solution Solution Problem VII	0.1032
Alternative Solution Solution Problem VIII	0.1017
Alternative Solution Solution Problem IX	0.1081
Alternative Solution Solution Problem X	0.0983

After conducted weighting criteria and values for every alternative solution problem based on each known criteria, then the next step is calculate the Average Value (NR) for every alternative solution solving problem with use formula :

$$NT \bar{i} = \sum_{j=1}^N A_{ij} - W_j \quad \text{where } W_j = \text{Weight for } j \text{ criteria}$$

A_{ij} = Value for alternative 1 based on j

Then conducted sorting priority and set start from alternative solution solving problems that have an Average Score (NR) and an assignment order priority could be seen in table 6.7 with method shorten sentence alternative solution solving problems like the following ASPM this :

Table 7 Calculation Results of Total Value (NR) and Determination Order Priority

Alternative	Score Based On Criteria			Score Average2 (Nr)	Priority
	NK1	NK2	NK3		
ASPM 1	0.0988	0.1091	0.1083	0.1054	I
ASPM 2	0.0749	0.0740	0.0724	0.0738	X
ASPM 3	0.1024	0.1009	0.1003	0.1012	IX
ASPM 4	0.1048	0.1035	0.1024	0.1036	IV
ASPM 5	0.1041	0.1009	0.1013	0.1020	VI
ASPM 6	0.1019	0.1012	0.1032	0.1021	V
ASPM 7	0.1037	0.1005	0.1017	0.1019	VII
ASPM 8	0.0979	0.0993	0.1081	0.1017	VIII
ASPM 9	0.1081	0.1078	0.0983	0.1047	II
ASPM 10	0.1036	0.1029	0.1056	0.1040	III
WEIGHT	0.2597	0.4175	0.3229		

CONCLUSION

From result analysis obtained conclusion that related problems _ with effort achievement solution that causes no appropriate time and quality in general caused by 3 (three) factors , namely : employer factor (Bridge Construction Project Executor), factor field and variation order factors . Then after To do analysis quantitative to elements reason from third the above factors , then next with usage SWOT matrix and Analytical Hierarchy Process obtained 10 (ten) alternatives strategic

1. Method review work executor field for more effective with national standard .
2. Shaping team specially made up of people from various fields to handle problems or obstacles that arise in the field .
3. Working same with party related for stage counseling know approach to Public like local government local .
4. Raising work together with local youth organization in guard security environment .
5. Make policy for more prioritize use of local raw materials when Fullfill standard job mix.
6. urge to executor field for as far as possible possible use energy work local when Fulfill criteria work .
7. Engaging power expert from circle College in _ investigation geology in see location development project .
8. Increase Skills watchman through the training program or training .
9. Follow potential workers / employees _ for follow in education Diploma, Bachelor and MM programs.
10. To do comparative study to similar projects _ where relatively successful .

REFERENCES

- Damanik, Dermina Roni Santika, Sianturi, Novdin Manoktong, Saragih, Deardo Samuel, & Purba, Virgo Erlando. (n.d.). Analisis Penurunan dan Lendutan Sistem Pondasi Tiang Sebagai Perkuatan pada Tanah Gambut. *TEKNIK*, 42(1), 273–281.
- Debby, Farida, Umi, Nongkeng, Hasan, Ybnu, Muhammad, Al Amin, La Ode Abdul Salam, Manoktong, Sianturi Novdin, & Yusriadi, Yusriadi. (2021). The role of work environment and leadership on employee performance through employee work discipline. *Proceedings of the International Conference on Industrial Engineering and Operations Management*, 3734–3740.
- Ketaren, Kataresada, & Sianturi, Novdin M. (2017). Decision Making Modelling with Logistic Regression Approach. *International Journal of Applied Engineering Research*, 12(19), 9067–9073.
- Kusiani, Eni, Ansar, Syahrudin, Bakri, Muh, Syukrano, Muhammad, Yusriadi, Yusriadi, & Manoktong, Sianturi Novdin. (2021). Increasing the professionalism of military teachers with training and experience through competence. *Proceedings of the International Conference on Industrial Engineering and Operations Management*, 3298–3304.
- Lubis, Muhammad Efrizal, & Sianturi, Novdin M. (2012). Penetapan Model

- Bangkitan Pergerakan Untuk Beberapa tipe Perumahan di Kota Pematangsiantar. *Media Teknik Sipil*, 10(1).
- Purba, Virgo Erlando, & Sianturi, Novdin M. (2013). Kajian Pemilihan Pondasi Sumuran sebagai Alternatif Perancangan Pondasi. *Jurnal Rancang Sipil*, 2(1).
- Purba, Virgo Erlando, Sianturi, Novdin Manoktong, Saragih, Deardo Samuel, & Damanik, Dermina Roni Santika. (2021). Kombinasi Abu Dasar Batu Bara dan Abu Vulkanik sebagai Material Beton. *Jurnal Permukiman*, 16(1), 10. <https://doi.org/10.31815/jp.2021.16.10-20>
- Sianturi, N M, Kamarudin, M. K. A., Wahab, N. A., & Saudi, A. S. Mohd. (2019). The Hydraulic Modelling on Sediments Ponds in Binanga Aron River, North Sumatera Indonesia. *International Journal of Recent Technology and Engineering (IJRTE)*, ISSN, 2277–3878.
- Sianturi, Novdin M., Nofirman, Nofirman, Yulianti, Eka Budi, Fatmawati, Endang, & Hendriarto, Prasetyono. (2022). Relevancy technological innovation and community economic development in Indonesia. *Linguistics and Culture Review*, 6, 117–130. <https://doi.org/10.21744/lingcure.v6ns3.2091>
- Sianturi, Novdin M. (2014). Performance of Clean Water Reservoir in Pematangsiantar, Indonesia, Affected by Earthquake. *Journal of Civil Engineering Research*, 4, 2163–2340.
- Sianturi, Novdin M. (2015). Evaluasi Terhadap Pengelolaan Sampah Dalam Meningkatkan Pelayanan Aset Di Kota Pematangsiantar. *Jurnal Teknik Sipil*, 13(3), 240–254.
- Sianturi, Novdin M, Kamarudin, Mohd Khairul Amri, Toriman, Mohd Ekhwan, Wahab, N. A., Hakpam, Surachate, Lertbunchardwong, Kanittha, Potikengrith, Tepvisit, Islam, Mir Sujaul, & Harith, Hazamri. (2018). Assessment of environmental management in Lake Toba, Samosir Regency, North Sumatera Province, Indonesia. *Int. J. Eng. Technol*, 7(3.14).
- Sianturi, Novdin M, Saragih, Deardo S., Purba, Virgo E., & Damanik, Dermina R. S. (2021). Bahaya Longsor dan Pencegahan Di Kelurahan Sukadame Kecamatan Siantar Utara Kota Pematangsiantar. *Pubarama: Jurnal Publikasi Pengabdian Kepada Masyarakat*, 1(2).
- Sianturi, Novdin M, & Saragih, Deardo Samuel. (2020). EVALUASI PEMBANGUNAN DRAINASE RINGROAD PANGURURAN–TOMOK STA 32+ 000 SAMPAI DENGAN STA 38+ 000 DI KABUPATEN SAMOSIR. *Jurnal Santeksipil*, 1(1).
- Sianturi, Novdin Manoktong. (2022). Evaluation of Multi-Function Drainage Channels For Running Water Fish Culture For The Benefit of The Community In Pangururan District. *International Journal of Engineering, Science and Information Technology*, 2(2), 118–128.
- Sipayung, Kammer Tuahman, Sianturi, Novdin Manoktong, Arta, I. Made Dwipa, Rohayati, Yeti, & Indah, Diani. (2021). Comparison of Translation Techniques by Google Translate and U-Dictionary: How Differently Does Both Machine Translation Tools Perform in Translating? *Elsya: Journal of English Language Studies*, 3(3), 236–245.
- Wahyuni, Dwi, Lathifa, Rifqi Fuadatul, & Susilo, Vendi Eko. (2019). *Safety of Bioinsecticide Ekstract Sugar Apple Seed's Granule (Annona squamosa L.) on Histology of White Rat (Rattus norvegicus B.)*.

