

SUCCESSFUL IMPLEMENTATION OF
EROSION AND SEDIMENTATION CONTROL
PLAN FOR REDUCING ENVIRONMENTAL
IMPACT IN THE CONSTRUCTION INDUSTRY

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MASTER OF SCIENCE

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ABSTRAK

Hakisan dan pemendapan buatan manusia boleh menjejaskan persekitaran. Pelan perlindungan alam sekitar, termasuk rancangan kawalan hakisan dan pemendapan (ESCP), dapat mengurangkan kesan persekitaran tapak pembinaan. Walau bagaimanapun, banyak cabaran yang menjadi penghalang kepada pelaksanaan ESCP. Kajian ini menunjukkan sokongan terhadap Matlamat Pembangunan Lestari Pertubuhan Bangsa-Bangsa Bersatu. Kajian ini dilakukan ke arah matlamat ke-11.C, bandar dan komuniti lestari. Misi rasmi SDG 11 adalah untuk "Menjadikan bandar inklusif, selamat, berdaya tahan dan mampan" Memahami punca yang menjadi penghalang kepada pelaksanaan ESCP dapat mengatasi masalah itu, tetapi informasi tersebut masih tidak mencukupi. Kajian ini bertujuan untuk mengkaji faktor-faktor untuk melaksanakan ESCP dengan berjaya di negara-negara membangun seperti Malaysia dengan mengetahui cabaran utama dalam pelaksanaan ESCP, mengenal pasti faktor kritikal yang dapat melaksanakan ESCP dengan berjaya, dan mengklasifikasikan hubungan antara faktor kritikal yang dikenal pasti. Populasi sasaran untuk kajian ini ialah profesional individu yang terlibat dalam pelaksanaan ESCP, termasuk pegawai dari Jabatan Alam Sekitar, Jabatan Pengairan dan Saliran, dan Jabatan Infrastruktur Dewan Bandaraya, Majlis Bandaraya, Majlis Perbandaran, dan Majlis Daerah, jurutera dan pegawai persekitaran dari kontraktor dan firma perunding. Penyelidikan ini menggunakan tinjauan soal selidik sebagai metodologi untuk menjawab objektif kajian ini. Oleh itu, kajian ini mengenal pasti cabaran utama dalam melaksanakan ESCP di tapak pembinaan. Objektif tersebut dapat dicapai dengan menganalisa data dari 102 peserta dalam cabaran utama dalam tinjauan ESCP dengan melakukan analisis deskriptif untuk mencari min dan sisihan piawai sebelum nilai normalisasi dikira. Nilai normalisasi menunjukkan faktor kejayaan adalah kritikal, dan faktor kejayaan penting apabila nilai normalisasi melebihi 0.50. Semua nilai normalisasi di bawah 0.50 dikeluarkan dari data untuk mengelakkan kekeliruan dalam proses analisis faktor. Kemudian, dari nilai inormalisasi, keseluruhan data disenaraikan analisis faktor dibuat. Analisis faktor ini meminimumkan bilangan pemboleh ubah bagi setiap faktor yang mempunyai beban besar dan menyatukannya ke dalam beberapa kumpulan komponen. Akhirnya, senarai komponen untuk kedua-dua objektif penyelidikan disenaraikan. Seterusnya, perbincangan tertumpu pada component yang mempunyai nilai normalisasi keseluruhan lebih dari 0.60 kerana nilai tersebut terletak pada skala kritikal. Cabaran yang dihadapi oleh dalam industri pembinaan mengakibatkan pelaksanaan ESCP pada tahap yang rendah. Cabaran dalam melaksanakan ESCP dapat dikategorikan kepada tiga komponen, Pengetahuan, Sikap dan Kesedaran, Masalah Teknikal, dan Kos. Menyelesaikan cabaran ini dapat meningkatkan pelaksanaan ESCP. Oleh itu, ia akan menyelamatkan persekitaran sambil membangunkan negara. Pada masa yang sama, faktor kejayaan dalam melaksanakan ESCP dapat dikategorikan kepada empat komponen, Penguatkuasaan, Pengetahuan, Sikap dan Kesedaran, Pengurusan, dan Perancangan. Faktor-faktor ini mampu meningkatkan pelaksanaan ESCP dalam industri pembinaan. Oleh itu, kita dapat membangunkan negara sambil mengekalkan alam semula jadi untuk generasi masa hadapan. Akhir sekali, kajian ini membantu memberi kesedaran, pengetahuan, dan kepentingan ESCP dalam membantu kontraktor dan perunding menguruskan peruntukan sumber mereka dengan betul, membantu pengamal industri untuk mengembangkan strategi yang efisien dan dapat menghapuskan kaedah yang kurang berkesan yang digunakan untuk meningkatkan kadar kejayaan pelaksanaan ESCP, menambahkan kajian baru dalam kajian terkini, dan membantu pihak berkuasa dalam pembuatan polisi dalam menangani masalah yang berkaitan dengan pelaksanaan ESCP. Penemuan utama merangkumi cabaran utama untuk melaksanakan ESCP adalah: 'Implimentasi ESCP dan kerja pembinaan tidak selari,' 'kurangnya publisiti mengenai ESCP,' 'kegagalan untuk menyelenggara fasiliti ESCP secara berkala,' 'kekurangan kos peruntukan untuk pelaksanaan ESCP, " kontraktor merasakan pelaksanaan ESCP dikenakan bayaran yang berlebihan, " dan 'menyelesaikan ESCP hanya untuk laporan.' Penemuan ini menyumbang pengetahuan yang lebih baik dalam mengembangkan strategi untuk pelaksanaan ESCP yang berkesan untuk melindungi alam sekitar.

ABSTRACT

Human-made erosion and sedimentation can severely affect the environment. Environmental protection plans, including the erosion and sedimentation control plan (ESCP), can reduce construction sites' environmental impacts. However, numerous challenges are hindering successful ESCP implementation. This study shows support for the United Nations Sustainable Development Goals. This study is done towards the 11th goal, 11.C, sustainable cities and communities. SDG 11's official mission is to "Make cities inclusive, safe, resilient and sustainable" (Assembly, U. G., 2017). While understanding the underlying challenges in ESCP implementation can address that problem, that information is lacking. This study investigates the factors for implementing ESCP successfully in developing countries such as Malaysia by determining the key challenges for implementing ESCP, identifying the critical success factors for implementing ESCP, and classifying the relationship between the identified critical factors. The target population for the interviews is individual professionals that are involved in ESCP implementation, including officers from the Department of Environment, the Department of Irrigation and Drainage, and Infrastructure Department of City Halls, City Councils, Municipal Councils, and District Councils, Engineers and Environmental officers of contractors and consultant firms. This research uses a questionnaire survey as the methodology to answer the research objective. Therefore, this study identifies the key challenges in implementing ESCP at construction sites. To achieve that objective, data from the 102 participants in the key challenges in implementing ESCP surveys undergo the descriptive analysis to find the mean and standard deviation before the normalized value is calculated. The normalized value indicates the success factor is critical, and the success factor is important when normalized is above 0.50. Then, from the normalized value, the overall data is listed. Factor analysis minimizes the number of variables at each factor with large loads and groups them into several groups of a component. Finally, the list of components for both research objectives is listed. Key challenges in implementing ESCP can be categorized into three components: knowledge, attitude and awareness, technical issue, and cost. Solving these challenges may increase the implementation of ESCP. Thus, it will save our environment while building our nation. At the same time, critical success factors in implementing ESCP can be categorized into four components: Enforcement, Knowledge, Attitude and Awareness, Management, and Planning. Implementing these factors may result in an increase in the implementation of ESCP in our construction industry. Thus, Malaysia can develop while maintaining its natural treasures for our future generations. Last but not least, this paper helps create awareness, knowledge, and importance of ESCP helps to manage their resource allocation properly, assisting industry practitioners to develop strategies that target to eliminate the less effective method that is currently used to improve the success rate of implementing ESCP, adding new literature in current literature, and support government authorities in policymaking to decide between tackling problems related to the implementing of ESCP. The major findings include the key challenges for implementing ESCP are: 'progress between ESCP and construction works is not parallel,' 'lack of publicity on ESCP,' 'failure to maintain ESCP facilities periodically,' 'cost-reduction process in ESCP implementation,' 'contractors perceived that ESCP is overcharged,' and 'completed the ESCP just for the report.' Also, the fragmentation between project stakeholders in the construction industry results in other key challenges that partially affect some project members. These findings contribute a better knowledge in developing strategies for effective ESCP implementation to protect the environment.

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LIST OF ABBREVIATIONS

ESCP	Erosion and Sediment Control Plan
WEQ	Equation of Wind Erosion
USLE	Equation of Universal Soil Loss
RUSLE	Revised Universal Soil Loss Equation
BMP	Best Management Practice
DID	Department of Irrigation and Drainage
DOE	Department of Environment
EIA	Environment Impact Assessment
LD-P2M2	Land-Disturbing Pollution Prevention and Mitigation Measures
ANOVA	Analysis of variance
CPESC	Certified Professional in Erosion and Sediment Control
BCI	Building Material Cost Index
CIDB	Construction Industry Development Board
AHP	Analytical Hierarchy Proses
SDG	The Sustainable Development Goals
UN-GA	The United Nation General Assembly

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