

UNIVERSITI TEKNOLOGI MARA

TECHNICAL REPORT

**WASTE COOKING OIL (WCO) COLLECTION CENTER
LOCATION IN SEREMBAN 3 BY USING AHP
(P29S22)**

**AMIRAH RUSDAH BINTI ZULKIFLI (2021132249)
NURFARHANA BINTI AB WAHID (2021100625)
SALWA NUR AIN BINTI SUHAILI (2021196345)**

**Supervisors:
Dr Zati Aqmar Binti Zaharudin
Puan Syadatul Syaeda Binti Mat Saleh**

**Report submitted in partial fulfillment of the requirement
for the degree of
Bachelor of Science (Hons.) (Mathematics Management)
College of Computing, Informatics and Media**

FEBRUARY 2023

ACKNOWLEDGEMENTS

IN THE NAME OF ALLAH, THE MOST GRACIOUS, THE MOST MERCIFUL

First of all, we are grateful to Allah S.W.T for giving us the strength as a group to complete this final year project successfully in a given time. Alhamdulillah, we were able to overcome the distance learning mode, rescheduled classes, and other issues brought on by the COVID-19 epidemic thanks to Allah's blessings.

We would like to express our special gratitude to our project supervisors, Dr Zati Aqmar Binti Zaharudin and Puan Syadatul Syaeda Binti Mat Saleh, for giving us the golden opportunity to do this study and providing us with invaluable feedbacks and guidance. This project has taught us so much new knowledge, especially regarding household attitudes and practices towards WCO recycling by conducting online surveys. In addition, to establish the preferred WCO collection center for householders in Seremban 3, Negeri Sembilan using the AHP method. The challenge of finishing this project required much planning and research on new topics, and we admitted that we would have been lost without Dr. Zati Aqmar and Puan Syadatul Syaeda guidance. Thus, our supervisors's kindness, compassion, and support will never be forgotten, and we are very thankful to have them as our supervisors.

Finally, as our project reached its various stages of completion, we were grateful to our parents and other family members for their love and prayers that helped us get through the entire study. We would also like to express our gratitude to our friends for their encouragement and useful suggestions to complete this project.

TABLE OF CONTENT

ACKNOWLEDGEMENTS	I
LIST OF TABLES	IV
LIST OF FIGURES	IV
ABSTRACT	VI
CHAPTER 1 INTRODUCTION	1
1.1 Motivation.....	1
1.2 Problem Statement	3
1.3 Objectives.....	4
1.4 Significant and Benefit of the Study	4
1.5 Scope and Limitations of Study	5
1.6 Definition of Terms and Abbreviations	6
CHAPTER 2 BACKGROUND THEORY AND LITERATURE REVIEW	8
2.1 Introduction	8
2.2 Background Theory.....	8
2.3 Literature Review	9
2.3.1 Previous Study on Household Attitudes and Practices towards WCO.....	9
2.3.2 Analytical Hierarchy Process (AHP).....	13
2.3.3 Past Attributes.....	16
2.4 Summary	17
CHAPTER 3 METHODOLOGY AND IMPLEMENTATION	19
3.1 Introduction	19
3.2 Research Framework.....	19
3.2.1 Data Collection	20
3.2.2 Determine the problems.....	20
3.2.3 Develop a hierarchy framework for analysis.....	20
3.2.4 Construct pairwise comparison matrix (criteria)	23
3.2.5 Determine the weightage of criteria	25
3.2.6 Check Consistency	25
3.2.7 Develop all priority ranking	27
3.3 Implementation for the Criteria for respondent 1 (Criteria).....	27
3.3.1 Construct the Pairwise Comparison Matrix.....	27

3.3.2 Normalized Matrix	28
3.3.3 The Weightage of the Criteria	29
3.3.4 Consistency Matrix.....	30
3.4 Calculation for the Criteria for respondent 1 (Alternatives)	32
3.4.1 Calculation for the Alternative Based on Criteria 1 for respondent 1	32
3.4.2 Calculation for the Alternative Based on Criteria 2 for respondent 1	37
3.4.3 Calculation for the Alternative Based on Criteria 3 for respondent 1	42
3.4.4 Calculation for the Alternative Based on Criteria 4 for respondent 1	46
3.4.5 The weightage of Alternatives.....	51
CHAPTER 4 RESULTS AND DISCUSSION.....	52
4.1 Result and Discussion	52
4.1.1 Develop Hierarchical Framework	52
4.1.2 Data Analysis.....	53
4.2 Result and Analysis.....	53
4.2.1 Part A: Overview of Household’s Attitudes towards WCO Management.....	54
4.2.2 Part B: AHP Results	59
CHAPTER 5 CONCLUSIONS AND RECOMMENDATIONS	66
5.0 Overview	66
5.1 Conclusion.....	66
5.2 Recommendations	67
REFERENCES.....	68
Appendix.....	72

ABSTRACT

The current rise in population density, the consumption of oil in food preparation, resulted in a massive volume of waste cooking oil (WCO) production worldwide either from household or commercial activities. Low of awareness in disposing of WCO may contribute to water and soil contamination, disrupt aquatic life, cause sewer system blockages and overflows, raise water treatment and waste management costs, and have unfavorable consequences for the entire environmental system. The aims of this study are to identify household attitudes and practices towards WCO recycling by conducting online surveys and establish the preferred WCO collection center for householders in Seremban 3, Negeri Sembilan using the Analytic Hierarchy Process (AHP) method. The AHP is a one of the multi-criteria decision-making tools, that is a math and psychology-based system for organizing and evaluating complicated choices. For this study, four (4) Criteria's were considered in choosing the preferable WCO collection center location such as transportation cost, distance , facilities and responses. Regarding that Criteria's, five (5) alternatives were identified which are Shell (A1), Family Store (A2), PETRONAS (A3), UiTM Seremban 3 (A4) and UniCITY Square (A5). By ranking the WCO Collection Center based on the criteria, the preferred locations among the alternatives can be achieved. As a result, household will be able to improve their decision-making skills and select the best place of choosing WCO collection center location.