



UNIVERSITI PUTRA MALAYSIA

***INFLUENCE OF SOCIO-PSYCHOLOGICAL AND EXTERNAL FACTORS
ON RESIDENTS' WILLINGNESS TO PARTICIPATE IN SUSTAINABLE
SOLID WASTE HANDLING PRACTICE IN DAMMAM, SAUDI ARABIA***

OSSAMA AHMED LABIB IBRAHIM HENDAWY

FPAS 2022 8



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By

OSSAMA AHMED LABIB IBRAHIM HENDAWY

**Thesis Submitted to the School of Graduate Studies, Universiti Putra Malaysia,
in Fulfilment of the Requirements for the Degree of Doctor of Philosophy**

December 2021

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KEEP YOUR ENVIRONMENT BE SAFE

Search for a solution
to stop pollution
solutions are there
to purify the air

Plant a tree
which makes earth pollution free
for small distance use cycles
and for long journey use CNG vehicles

You can perform
some effective reform
pollution affects our health
and to cure one had to waste wealth

Pollution results in global warming
rapidly melting of glaciers is alarming
search a solution
to stop pollution!

Save nature
if you care for future
nature is like our mother
like nature there is no other

Mother Earth is so generous,
For all facilities she'll shower
nature is the strongest power don't destroy it ever
for you'll be able to replenish it never!

*Mom, Dad and my wife this is dedicated to you.
Especially kindness to my supervisors*



Abstract of thesis presented to the Senate of Universiti Putra Malaysia in fulfilment of the requirement for the degree of Doctor of Philosophy

**INFLUENCE OF SOCIO-PSYCHOLOGICAL AND EXTERNAL FACTORS
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December 2021

Chairman : Professor Latifah Abd Manaf, PhD
Faculty : Forestry and Environment

Although the main problem in Dammam city is an increasing of solid waste production without treatment except landfilling and lack of waste segregation greatly affects the residents' handling practices of solid waste due to incorrect disposing practice. This study allows the residents of Dammam are able to participate in sorting and recycling of sustainable solid waste. The objective of this study explored the possibility of Dammam residents' participation in sorting and recycling through comparing the sustainable waste handling practice from different income level groups according to family income levels, to determine the impacts of independent variables on the willingness of residents to participate in sustainable waste handling practices and examine the moderating effects of demographic factors such as gender and income level on residents' willingness to participate in sustainable handling practices in Dammam. The number of respondents was 450 from 75 different districts in Dammam City. Through objective 1 there was statistically significant difference between low and high levels household Dammam City in awareness and perceived behaviour control in willingness in waste sorting and recycling but with middle level there was only significance different in perceived behaviour control also, there was statistically significant difference between high and middle levels in government facilitators in their willingness to sort and recycle waste in Dammam City. The attitude scored highly percentage was 57.1% in waste sorting and 248 55.1% in waste recycling were in the high level of attitude towards waste recycling. The awareness scored 46.9% in sorting and 47.1 % in recycling in the high level. In perceived behaviour control scored 47.8% in sorting while it scored 49.6% in recycling were in the middle level. In market incentives scored 44.2% and social influences scored 51.1% were in the high level. Through objective 2 in attitude the correlation coefficient was strong significant 0.731 while in awareness the correlation coefficient was middle significant 0.322. The correlation coefficient in PCB was weak significant 0.25 while in market incentives and governmental facilitators, the correlation coefficients were 0.556 and 0.604 respectively and finally, The correlation in social influences the correlation coefficient was 0.344 it was middle significant. The structural equation model analysis

indicated that the model accounted for 67% of the variance in willingness to sort and recycle waste. This suggests that the model has an acceptable explanatory power. In objective 3 the moderating analysis revealed that the causal relationships between attitude willingness to sort and recycle low income $\beta = 0.3497$, $p = 0.000$ and high income $\beta = -0.1044$, $p = 0.3638$, market incentive willingness to sort and recycle low income $\beta = 0.0439$, $p = 0.0142$ and high income $\beta = 0.2583$, $p = 0.0766$, and government facilitators willingness to sort and recycle low income $\beta = 0.0451$, $p = 0.26006$ and high income $\beta = 0.4634$, $p = 0.0012$ were moderated by income level. The moderating analysis for gender revealed that the causal associations between market incentive willingness to sort and recycle male $\beta = 0.084$, $p = 0.028$ and female $\beta = 0.418$, $p = 0.129$, and social influence willingness to sort and recycle male $\beta = -0.178$, $p = 0.000$ and female $\beta = 0.708$, $p = 0.041$, were moderated by gender.



Abstrak tesis yang dikemukakan kepada Senat Universiti Putra Malaysia sebagai memenuhi keperluan untuk ijazah Doktor Falsafah

PENGARUH SOSIO-PSIKOLOGI DAN FAKTOR LUARAN TERHADAP KESEDIAAN PENDUDUK UNTUK TERLIBAT DALAM KELESTARIAN AMALAN PENGENDALIAN SISA PEPEJAL DI DAMMAM, ARAB SAUDI

Oleh

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Walaupun masalah utama di bandar Dammam ialah peningkatan pengeluaran sisa pepejal tanpa rawatan kecuali pelupusan sampah dan kekurangan pengasingan sisa sangat menjejaskan amalan pengendalian sisa pepejal penduduk kerana amalan pelupusan yang salah. Kajian ini membolehkan penduduk Dammam dapat mengambil bahagian dalam pengasingan dan kitar semula sisa pepejal lestari. Objektif kajian ini meneroka kemungkinan penyertaan penduduk Dammam dalam pengasingan dan kitar semula melalui membandingkan amalan pengendalian sisa lestari daripada kumpulan tahap pendapatan yang berbeza mengikut tahap pendapatan keluarga, untuk menentukan kesan pembolehubah tidak bersandar ke atas kesediaan penduduk untuk mengambil bahagian dalam amalan pengendalian sisa mampan dan mengkaji kesan penyederhanaan faktor demografi seperti jantina dan tahap pendapatan terhadap kesediaan penduduk untuk mengambil bahagian dalam amalan pengendalian mampan di Dammam. Bilangan responden adalah 450 dari 75 daerah berbeza di Bandar Dammam. Melalui objektif 1 terdapat perbezaan yang signifikan secara statistik antara isi rumah Dammam City tahap rendah dan tinggi dalam kesedaran dan kawalan tingkah laku yang dilihat dalam kesanggupan dalam pengasingan dan kitar semula sisa tetapi dengan tahap pertengahan hanya terdapat perbezaan yang signifikan dalam kawalan tingkah laku yang dirasakan juga, terdapat perbezaan yang signifikan secara statistik antara peringkat tinggi dan pertengahan dalam kerajaan fasilitator dalam kesediaan mereka untuk mengisih dan mengitar semula bahan buangan di Bandar Dammam. Sikap mendapat peratusan yang tinggi ialah 57.1% dalam pengasingan sisa dan 248 55.1% dalam kitar semula sisa berada dalam tahap sikap yang tinggi terhadap kitar semula sisa. Kesedaran mendapat markah 46.9% dalam pengisihan dan 47.1% dalam kitar semula pada tahap tinggi. Dalam kawalan tingkah laku yang dirasakan mendapat markah 47.8% dalam pengisihan manakala skor 49.6% dalam kitar semula berada pada tahap pertengahan. Insentif pasaran mendapat 44.2% dan pengaruh sosial mendapat 51.1% berada pada tahap tinggi. Melalui objektif 2 dalam sikap pekali korelasi adalah signifikan signifikan 0.731 manakala dalam kesedaran pekali korelasi adalah signifikan sederhana 0.322. Pekali

korelasi dalam PCB adalah bererti lemah 0.25 manakala dalam insentif pasaran dan fasilitator kerajaan, pekali korelasi masing-masing adalah 0.556 dan 0.604 dan akhirnya, Korelasi dalam pengaruh sosial pekali korelasi ialah 0.344 adalah signifikan sederhana. Analisis model persamaan struktur menunjukkan bahawa model itu menyumbang 67% daripada varians dalam kesediaan untuk mengisih dan mengitar semula sisa. Ini menunjukkan bahawa model itu mempunyai kuasa penjelasan yang boleh diterima. Dalam objektif 3 analisis penyederhanaan mendedahkan bahawa hubungan sebab akibat antara sikap kesediaan untuk mengisih dan mengitar semula pendapatan rendah $\beta = 0.3497$, $p = 0.000$ dan pendapatan tinggi $\beta = -0.1044$, $p = 0.3638$, kesanggupan insentif pasaran untuk mengisih dan mengitar semula pendapatan rendah $\beta = 0.0439$, $p = 0.0142$ dan pendapatan tinggi $\beta = 0.2583$, $p = 0.0766$, dan kesediaan fasilitator kerajaan untuk mengisih dan mengitar semula pendapatan rendah $\beta = 0.0451$, $p = 0.26006$ dan pendapatan tinggi $\beta = 0.4634$, $p = 0$. Analisis penyederhanaan untuk jantina mendedahkan bahawa perkaitan sebab akibat antara kesanggupan insentif pasaran untuk mengisih dan mengitar semula lelaki $\beta = 0.084$, $p = 0.028$ dan perempuan $\beta = 0.418$, $p = 0.129$, dan kesan sosial kesanggupan untuk mengisih dan mengitar semula lelaki $\beta = -0.178$, $p = 0.000$ dan β perempuan = 0.708, $p = 0.041$, disederhanakan mengikut jantina.

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This thesis was submitted to the Senate of the Universiti Putra Malaysia and has been accepted as fulfilment of the requirement for the degree of Doctor of Philosophy. The members of the Supervisory Committee were as follows:

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TABLE OF CONTENTS

	Page
ABSTRACT	i
ABSTRAK	iii
ACKNOWLEDGEMENTS	v
APPROVAL	vi
DECLARATION	viii
LIST OF TABLES	xv
LIST OF FIGURES	xvii
LIST OF APPENDICES	xix
LIST OF ABBREVIATIONS	xx
CHAPTER	
1 INTRODUCTION	1
1.1 Background of the study	1
1.2 Problem Statement	2
1.3 Research Objectives	4
1.4 Research Questions	4
1.5 Scope of the study	5
1.6 Significance of the study	7
1.7 Thesis Organization	8
2 LITERATURE REVIEW	9
2.1 Introduction	9
2.2 Theoretical Background of the Study	9
2.2.1 Theory of Planned Behaviour	11
2.2.2 Norm Activation Model	12
2.2.3 Social Marketing Theory	14
2.2.4 Participation Theory	15
2.3 Conceptual Framework	16
2.4 Policy and Legislations of Solid Waste Handling in Saudi Arabia (Cabinet Resolution No. 308/4135/1437).	18
2.5 Overview of Sustainable Solid Waste Management in Dammam, Saudi Arabia	20
2.5.1 Solid Waste Generation and Composition in Dammam, Saudi Arabia	22
2.5.2 Solid Waste Collection and Disposal in Dammam, Saudi Arabia	23
2.5.3 Solid Waste Treatment in Dammam, Saudi Arabia	24
2.6 Residents' Sustainable Solid Waste Handling Practice (Sorting and Recycling)	27
2.6.1 Residents Willingness and Behaviours	31
2.6.2 Factors Influencing Residents' Sustainable Waste Handling Practice in Sorting and Recycling	32
2.6.2.1 Independent Variables	33

	2.6.2.2	Dependent Variable	42
2.7		Determinants of Residents 'sustainable waste handling practice framework	43
2.8		Summary	44
3		RESEARCH METHODOLOGY	45
3.1		Introduction	45
3.2		Description of Study Area	48
3.3		Population and Household areas in Dammam	50
3.4		Sample Size	52
3.5		Research Instrumentation	56
	3.5.1	Questionnaire Development	57
	3.5.2	Sections of the Questionnaire	59
	3.5.2.1	Section 1 the demographic questions	59
	3.5.2.2	Section 2 Attitudes, Awareness, Perceived Behavioural Control, and Willingness/Intention in solid waste sorting and recycling	59
	3.5.2.3	Social Influence, Market Incentives, and Government Facilitators	61
3.6		Validation of the Instrument	62
3.7		Pilot Study	66
3.8		Reliability	68
3.9		Statistical Data Analysis	69
	3.9.1	Descriptive Statistics	69
	3.9.2	ANOVA Analysis	69
	3.9.3	Structural Equation Modelling	70
	3.9.4	Preliminary Data Analysis	71
	3.9.4.1	Data Preparation	71
	3.9.4.2	Data Cleaning	71
	3.9.4.3	Data Screening	71
	3.9.5	Statistical Techniques to Compare Groups	72
	3.9.5.1	Statistical Techniques to Explore Relationships	72
	3.9.5.2	Pearson Product-moment Correlation	72
	3.9.5.3	Multiple regression	72
	3.9.5.4	Moderating Analysis	73
3.10		Summary	74
4		RESULTS AND DISCUSSION	75
4.1		Introduction	75
4.2		Socio Demographic Background of the Household Respondents toward Engaging in Sustainable Waste Handling Practices	75
	4.2.1	Gender of Respondents	77
	4.2.2	Age Group of Respondents	77
	4.2.3	Marital Status of Respondents	78
	4.2.4	Educational Level of Respondents	79
	4.2.5	Employment of Respondents	79
	4.2.6	Household Size	80

4.2.7	Household Monthly Income	81
4.3	Comparing the sustainable waste handling practices from different income level groups (High, Middle and Low) in Dammam City	82
4.3.1	Evaluation the different levels of residents concernig sustainable waste handling practices in Dammam City	82
4.3.1.1	Attitudes towards Waste Sorting and Recycling	82
4.3.1.2	Awareness towards Waste Sorting and Recycling	83
4.3.1.3	Perceived Behavioural Control towards Waste Sorting and Recycling	83
4.3.1.4	Willingness towards Sort and Recycle Waste	84
4.3.1.5	Market Incentives towards Waste Sorting and Recycling	84
4.3.1.6	Social Influence on Waste Sorting and Recycling	85
4.3.1.7	Government Facilitators towards Waste Sorting and Recycling	85
4.3.2	Comparing the sustainable waste handling practices from different income level groups (High, Middle and Low) in Dammam City	89
4.3.2.1	Attitude in waste sorting and recycling	89
4.3.2.2	Awareness in waste sorting and recycling	89
4.3.2.3	Perceived Behaviour Control (PBC) in waste sorting and recycling	90
4.3.2.4	Social Influences in waste sorting and recycling	90
4.3.2.5	Market Incentive in waste sorting and recycling	90
4.3.2.6	Government Facilitators in waste sorting and recycling	91
4.4	Determination the effect of independent variables on residents' willingness to participate in sustainable waste handling in Dammam City by using Structural Equation Model Analysis (SEM)	97
4.4.1	Determination the relationships of all predictor variables and the outcome variable (willingness) to sort and recycle waste handling in Dammam	98
4.4.1.1	Attitude and Willingness in sorting and recycling of Waste Handling	98
4.4.1.2	Awareness and Willingness in sorting and recycling of Waste Handling	98
4.4.1.3	Perceived Behavioural Control and Willingness in sorting and recycling of Waste Handling	98

4.4.1.4	Market incentives and Willingness in sorting and recycling of Waste Handling	98
4.4.1.5	Social Influence and Willingness in sorting and recycling of Waste Handling	99
4.4.1.6	Government Facilitators and Willingness in sorting and recycling of Waste Handling	99
4.4.2	Determination the effect of independent variables on residents' willingness to participate in sustainable waste handling in Dammam City by using Structural Equation Model Analysis (SEM)	100
4.4.2.1	The Effect of Independent Variables on Households' Willingness to Sort and Recycle	101
4.5	Examination of the moderating effect of demographic factors such as gender and income levels on residents' willingness to participate in sustainable handling practice Dammam City	106
4.5.1	Moderating Effect of Income levels on relationship between attitude and willingness to sort and recycle waste	110
4.5.2	Moderating Effect of Income levels on relationship between awareness and willingness to sort and recycle waste	110
4.5.3	Moderating Effect of Income levels on relationship between perceived behavioural control and willingness to sort and recycle waste	111
4.5.4	Moderating Effect of Income levels on relationship between market incentives and willingness to sort and recycle waste	111
4.5.5	Moderating Effect of Income levels on relationship between social influence and willingness to sort and recycle waste	111
4.5.6	Moderating Effect of Income levels on relationship between government facilitators and willingness to sort and recycle waste	111
4.5.7	Moderating Effect of gender on relationship between attitude and willingness to sort and recycle waste	111
4.5.8	Moderating Effect of gender on relationship between awareness and willingness to sort and recycle waste	112
4.5.9	Moderating Effect of gender on relationship between perceived behavioural control and willingness to sort and recycle waste	112

4.5.10	Moderating Effect of gender on relationship between market incentive and willingness to sort and recycle waste	112
4.5.11	Moderating Effect of gender on relationship between social influence and willingness to sort and recycle waste	112
4.5.12	Moderating Effect of gender on relationship between government facilitators and willingness to sort and recycle waste	112
5	SUMMARY, CONCLUSIONS AND RECOMMENDATIONS FOR FUTURE RESEARCH	117
5.1	Introduction	117
5.2	Summary of the Overall Research	117
5.3	Conclusions	118
5.4	Policy Implications	120
5.5	Limitation of the Study	121
5.6	Recommendations for Future Studies	122
	REFERENCES	125
	APPENDICES	144
	BIODATA OF STUDENT	174
	LIST OF PUBLICATIONS	177

LIST OF TABLES

Table	Page	
2.1	Amount of Solid Waste Generation in Saudi Arabia	22
2.2	Main Environmental Impacts of MSW landfill in Dammam City	24
2.3	Waste Generation Rate Analysis in Eastern Area, Saudi Arabia	30
2.4	Influencing factors which affecting on Residents' Sustainable Waste Handling Practice (Sorting and Recycling)	32
3.1	Distribution of Different Socio-economic Income Levels in Dammam City	50
3.2	Sample Size Determination for Different Statistical Analysis, Cohen	53
3.3	Income levels of population/ region in Dammam City	56
3.4	The definition and formula of I-CVI, S-CVI/Ave and S-CVI/UA	64
3.5	Information about Experts in Sustainable Waste Management	65
3.6	Construct Content Validity Index (CVI) for the Five Experts	65
3.7	Rule of Thumb for Categorising Cronbach's alpha	68
3.8	Summary of reliability tests for the Instrument of the Study	68
3.9	Data Analysis for the Questionnaire	69
4.1	Socio-Economic Profile of the Respondents (n=450)	76
4.2	Summary of the Participants' Levels for the Variables of the Study	87
4.3	Independent Sample ANOVA-Test among low, middle and high-Income Households	91
4.4	Anova-Test Analysis to compare among different income levels (high, middle and low) Households in different variables of the study in the table the significant result $p < 0.05$ means is significant	94
4.5	Descriptive of Results for Differences in Willingness to Sort and Recycle among Different Income Groups	95
4.6	A NOVA of results for Differences in Willingness to Sort and Recycle among Different Income Groups	95

4.7	The Bonferroni and Scheffe Post Hoc Multiple Comparisons Test Showing Pairs of Means that are Significantly Different from Each Other	96
4.8	Correlation Matrix of the Independent Variables and the Dependent Variable	97
4.9	Unstandardized and Standardized Regression Weights in the Hypothesized Path Model	102
4.10	Results of Moderation Test of Income Level on the Relationship between Predictors and Willingness to Sort and Recycle	109
.11	Results of Moderation Test of Gender on the Relationship between Predictors and Willingness to Sort and Recycle	110
4.12	The Outcomes of the Hypotheses Testing	114

LIST OF FIGURES

Figure		Page
2.1	Components of Theory of Planned Behaviour (TPB)	12
2.2	Schwartz's Norm Activation Model	14
2.3	Conceptual framework of the study	17
2.4	Variation of Solid Waste Generation in Saudi Arabia	23
2.5	Distribution of Landfill sites in Saudi Arabia according to suitability	25
2.6	Landfilling municipal solid wastes in Abqaiq	26
2.7	Rehabilitation of the landfill in Dammam	27
2.8	Segregation and Recycling similar bins for Solid Waste Collection in Dammam	28
2.9	Participation in Sustainable Waste Recycling	29
2.10	Solid Waste Management Program	30
3.1	Research methodology framework for the data collection of different income levels of Dammam City	47
3.2	Distribution of the main and different cities in Saudi Arabia including Dammam City	48
3.3	GIS Map of Dammam districts by neighbourhoods.	51
3.4	GIS Map of Distribution of income levels by neighbourhoods in the districts	52
3.5	Raosoft sample size calculation	54
3.6	The measurements of Theory of Planned Behaviour	58
3.7	Independent moderators (moderating effect)	73
4.1	Percentages of respondents based on gender in Dammam City (n=450)	77
4.2	Percentages of Respondents based on Age Group in Dammam City (n=450)	78

4.3	Percentages of respondents based on marital status in Dammam City (n=450)	78
4.4	Percentages of respondents based on educational level (n=450)	79
4.5	Percentages of respondents based on employment in Dammam City (n=450)	80
4.6	Percentages of respondents based on household size (n=450)	80
4.7	Percentages of respondents based on monthly household income (n=450)	81
4.8	Percentages of Respondents for the three income levels based on household sorting and recycling (n=450)	88
4.9	The output of the Integrated Model, showing its predictive power	101

LIST OF APPENDICES

Appendix		Page
1	Research Questionnaire	144
2	Income Levels in Neighbourhoods Districts in Dammam City	162
3	Population by Age Groups, Nationality (Saudi/Non-Saudi), and sex in Eastern Region Area	163
4	Population by Gender, Government and Nationality (Saudi/ Non-Saudi)	164
5	Labor Market 2018 Fourth Quarter	165
6	Labour Markt 2018 Fourth Quarter	166
7	Labour Market 2018 Fourth Quarter	167
8	Methods of Municipal Solid Waste Handling in Dammam through Eastern Province Municipality	168

LIST OF ABBREVIATIONS

MSW	Municipal Solid Waste
SWM	Sustainable Waste Management
GHGE	Green House Gas Emission
TPB	Theory of Planned Behavior
NAM	Norm Activation Model
TRA	Theory of Reasoned Action
PBC	Perceived Behavioral Control
SMT	Social Marketing Theory
SMC	Social Marketing Concept
PEB	Pro-environmental Behavior
CVI	Construct Validity Index
PCA	Principle of Component Analysis
SEM	Structure Equation Modeling
AVE	Average Variance Extract
CR	Construct Reliability
AGFI	Adjusted Goodness fit index
GFI	GFI Goodness fit index
NFI	Bentler-Bonett normed fit index
IFI	Bollen's Incremental fit index
TLI	Tucker-Lewis index
CFI	Chi square Comparative fit Index
RMSEA	Root Mean Square Error of Approximation
EAA	Exploratory Data Analysis

CHAPTER 1

INTRODUCTION

1.1 Background of the study

The accelerated and continuous growth in the urban population has caused a dramatic boost in municipal solid waste (MSW) generation, leading to severe socio-economic and environmental impacts. The improper handling and disposal of waste is a growing concern as the amount of waste generation increases worldwide (Al-Khatib & Arafat, 2010). About 1.5–1.8 billion metric tons of Municipal Solid Waste (MSW) are produced yearly in the world, and the amount is forecast to approach approximately 27 billion tons by 2050 (UNEP, 2010). This generation of municipal solid waste will continue to cause serious environmental, health, and socioeconomic impacts, as a huge amount of land is used for waste disposal and storage, which consequently leads to air, soil, and underground water pollution (Wang 2019, Khalil 2019). The major contributing factors to the high increase in waste generation include rapid urbanisation, industrialisation, a change in consumption pattern and lifestyle, as well as the introduction of hazardous waste that is harmful to the public and environment (Khalil 2019)

Unfortunately, more than half of the solid waste generated is disposed of through unsafe and uncontrolled landfilling (Chalming & Gaillochot, 2009). The major contributing factors to the high increase in waste generation include rapid urbanization, industrialization (Malik et al., 2015), change in consumption patterns and lifestyles, as well as the hazardous waste is considered as a harmful to the public and environment (Chung & Lo, 2008; Batool & Ch, 2009; Al-Khatib& Arafat, 2010). The primary methods used for MSW disposal in The Kingdom of Saudi Arabia are landfilling and combustion, with small percentage of MSW being converted to compost. However, such waste disposal practices are not sustainable as they pose severe dangers to the environment and public health, which results in high rates of morbidity and mortality (Chen & Tung, 2010; UNEP, 2010; Opoyemi, 2012). Improper MSW disposal without proper treatment also causes surface and ground waters pollution (Al-Sabahiet et al., 2009).

A strong commitment and unflinching public support by the government is necessary to achieve the successful implementation of a sustainable waste management strategy in Saudi Arabia. This can be achieved by ensuring strong legislation, creating awareness, providing financial support, introducing modern technologies and encouraging residents' participation in waste sorting and recycling, which will significantly help transform Saudi Arabia into a “green” country (Zafar 2020). Solid waste management primarily aims to eliminate or minimize the negative impacts of waste materials on human health and the environment to encourage economic development and create a better quality of life (Memon 2010).

In Dammam, sustainable waste is collected from individual or community bins and disposed of in landfills or dumpsites; it is characterized by lack of both waste disposal facilities and tipping fees. Energy recovery, recycling, reuse, and solid waste sorting remain in their infancy, though they are receiving more attention. Waste sorting and recycling are driven by an active informal sector. Recycling rate ranges from 10-15%, mainly due to the presence of the informal sector which extracts paper, metals and plastics from municipal waste (Valkenburg et., 2008).

Currently, the rate of recycling rate in ranges from 10.5% to 15.5%, which an informal sector that extracts metals, paper, and plastics from municipal waste mainly influences (Zafar, 2015). Sustainability of waste handling practices, including waste sorting and recycling among residents of Dammam city also, it can be predicted by using the socio-psychological and external variables to understand their solid waste management behaviour (Karim Ghani et al., 2013; Zhang & Wen, 2014; Zhang et al., 2015; Xu et al., 2017).

The generation of solid waste in Dammam is 1,093000 tons per year. In MSW, plastic is the second most abundant waste produced in Dammam City. Only 15–20% of all produced plastic waste is recycled by sorting method and the main problem of this processing is that the accumulation of solid wastes without any treatment unless through informal sectors whereas the disposal of plastics wastes to landfill without safety precaution and of course the results in the environmental and operational overburden to the landfill due to slow degradation process. The pyrolysis process can be used for treating plastic wastes material with generation of energy in the form of fuel oil and valuable products like char coal (Abdul-Aziz, H2007; Sharma B.K, 2014).

The type of municipal solid waste (MSW) is associated with the community and source and, therefore, varies significantly from city to city. Typically, the major fraction of sustainable waste is consisting of 40% food waste and 50.6% prominent waste (Abdul Aziz et al., 2007). (Abdul Aziz et al., 2007). Food waste contains rice (38.7%), meat (25%), bakery products (18.7%), and fats (13%) as major fraction (Adhikari et al., 2008). Plastic is the second largest stream found in the MSW which is about 5-17%. However, some other components are also found in waste stream, which include textile (6.4%), glass (4.6%) and minerals (8.1%) (Khan and Kaneesamkandi 2013).

1.2 Problem Statement

Over the past few decades the management of solid waste has become a critical issue facing countries worldwide (Chen, et al., 2010; Zhang and Wen, 2014), particularly developing countries (Wang and Wang, 2013) such as Saudi Arabia, that faces challenges regarding the management of solid waste (Zafar, 2015). This problem is alarming; especially in cities such as Dammam landfilling is the major way of solid waste management.

Saudi Arabia has been facing rapid population growth, urbanization and industrialization, which lead to high generation of solid waste (Al Nizam, 2015a). The country's population increases averagely at 3.4% over the last four decades and more than 75% of the population live in urban areas, which bring about the need for the authorities to initiate measures to improve waste source separation and recycling among residents in the country. This situation has resulted in the increased problem of huge amount of uncontrolled generation of solid waste (Ouda et al., 2013, Zafar, 2015).

The major method used for waste disposal in the cities of Saudi Arabia is mainly landfilling and combustion, with little amount of waste being converted for compost. However, the dominant practices for waste disposal are not sustainable as they pose serious impacts to the environment and public health. The improper waste disposal without proper treatment causes dangers such as pollution of ground and surface waters (Al-Sabahi et al., 2009). Additionally, these improper waste handling practices are responsible for second highest share of Green House Effect emissions (CO₂, CH₄, N₂O) aside fossil fuels (Rahman and Khondaker, 2012). It was forecasted that, most of the dumping sites in the country may likely reach their capacities in coming few years (Ouda et al., 2013). This indicates the need to change from the current waste management practices to sustainable waste management practice such as waste separation and recycling approaches (Zafar 2020).

Some reports suggest that the rate of recycling in Dammam ranges from 10% to 15%. However, the degree or level of residents' waste sorting and recycling practices have not been investigated in Dammam city to understand their MSW management behaviour as the baseline to support recovery activities (KarimGhani et al., 2013) also, the lack of guidelines and regulations of waste sorting greatly affects the residents' handling practices of solid waste as they incorrectly dispose of it (Anjum 2016, Naguyen 2015).

Moreover, it is unclear if residents' sustainable waste handling practice (sorting and recycling) between different income levels which can be predicted by socio-psychological and external variables, as they have been found to have predicted waste management behavior in various countries (Zhang, and Wen 2014; Zhang, et al., 2015; Xu et al., 2017). For the purpose of this study the following variables will be focused; attitude, awareness, perceived behavioral control, willingness (internal /psychological factors), social influence, market incentives and government facilitators (external factors), income level and gender [demographic (moderating) variables].

The waste management system in Dammam is characterized by lack of waste disposal facilities and absence of tipping fees. Solid waste sorting, recycling, reuse and energy recovery is still at an early stage, although they are getting increased attention. Currently, informal sector is the major driven force to waste sorting and recycling. It was reported that the rate recycling in Saudi ranges from 10-15%, which is mainly influenced by the presence of the informal sector which extracts paper, metals and plastics from municipal waste (Zafar, 2015). However, there is low participation of residents in the formal waste separation and recycling.

There is a lack of study that investigated the determinants of residents' sustainable waste handling practice in Saudi Arabia, particularly in Dammam city using combine effects of external and internal factors. The present study tends to fill this gap. In this study emphasis will be placed very much on the 'individual factor'. That is to say, the essential unit for this research is household through two aspects, the first is raising awareness among the residents through study the impact of psychological and external factors on Dammam`s residents. The second is to work on solving the problem from its foundation, which is stimulating with improving of sustainable waste handling by sorting and recycling in Dammam city (Zhang 2015, Xu 2017).

This study proposed examine the moderating factors which affecting on willingness of sorting and recycling to improve waste handling practices such as gender and income levels because Saudi Arabia community has tended to the participation of women in all political life and without ignoring as they are a partner in the community and have an effective role in community participation activities more than last previous periods.

1.3 Research Objectives

In general, this study evaluated influence of socio-psychological and external factors on residents` willingness to participate in sustainable waste handling practices in Dammam City, Saudi Arabia.

The specific objectives of this study were as follows:

- 1- To compare the sustainable waste handling practice from different income level groups in Dammam City;
- 2- To determine the impact of the independent variables on the willingness of residents to participate in sustainability of waste handling in Dammam City; and
- 3- To examine the moderating effect of demographic factors such as gender and income level on residents' willingness to participate in sustainable handling practices Dammam City.

1.4 Research Questions

These research questions are important to appear what is the problem according there is not good management program to deal with sustainable solid waste handling and to increase the behaviour awareness with residents in Dammam City. Concerning the specific objectives, With respect to the first objective, this study investigated the following question:

- i. What are the different levels of attitude, awareness, perceived behavioural control, social influences, and the willingness/intention among households in different source of sustainable waste sorting and recycling?
- ii. What is the relationship between psychological and external factors regarding sustainable waste handling in Dammam City?

With respect to the second objective, this study focused on the following questions:

- i. What are the relationships between attitude, awareness, perceived behavioural control, social influences, market incentives, governmental facilitators, and willingness among households in Dammam City?
- ii. Are there any significant differences in attitude, awareness, and perceived behavioural control, social influences market incentives, governmental facilitators, and willingness/intention in source segregation of sustainable waste for recycling practice of households in Dammam City based on gender and income levels?

With respect to the third objective, this study focused on the following questions:

- i. What is the effect of these independent variables on residents' willingness to allow the participation of sustainability of waste handling in Dammam City?
- ii. What are the moderating effects of gender and income level on willingness residents in participating in sustainability of handling practices in Dammam City?

1.5 Scope of the Study

This study scoped on exploring the level of residents' waste sorting and recycling practices because it has not been investigated or understood in Dammam city; additionally, the socio-psychological and external factors regarding waste sorting of the residents of Dammam city are unclear. One can predict residents' sustainable waste handling practices, such as sorting and recycling, by considering existing studies which predict waste management behavior in other countries (Karim Ghandi 2013, Zhang 2014). and recycling as well as helping to enhance the understanding of the socio-psychological and external predictors of residents' willingness to participate in waste sorting and recycling.

Concerning different influences of psychological and external factors on the willingness of residents to participate in sustainable waste handling practice, especially in sorting and recycling handling practice in different income level districts in Dammam City, this study covered all the different income level districts in Dammam City, which contains 75 districts (22 high-income level, 31 middle-income level, and 22 low-income levels).

This study examined various respondents' perspectives on sorting and recycling sustainable waste handling of waste generation.

Dammam City was selected to represent municipal solid waste handling practices among the different cities in Saudi Arabia. It is considered a good city for this study because it is the capital of the Eastern Province and the sixth-most populous in Saudi Arabia. Also, it is the 4th largest metropolitan area both in area and population in the Gulf Cooperation Council. In Dammam City, 31% of residents are in the high-income category, 42% are in the middle-level category, and 27% are in the low level (Zafar, 2020).

The TPB hypothesises that have determinant of behaviour is the individual's willingness to perform or not to perform that behaviour. Willingness are influenced by three factors: the first one is attitude the individual's favourable or unfavourable evaluation of performing the behaviour. The second one subjective norm, the individual's perception of social pressure to perform or not to perform the behaviour. The final one the Perceived control, the individual's perception of their ability to perform the behaviour. Factors external to the model, for example personality, past experience and demographic characteristics may also influence behaviour, but it is argued that this influence is indirect, mediated through the components of the model

This study used the Theory of Planned Behaviour (TPB), which is a conceptual framework that examines the factors influencing someone's behaviour towards a particular issue. The TPB has been extensively applied in understanding waste sorting and recycling behaviour (Kelly et al., 2006; Shaw, 2008; Begum et al., 2009; Sidique et al., 2010; Ramayah et al., 2012). However, the majority of these studies were conducted in developed countries and especially in the United States, the United Kingdom., and some high economy Asian countries. Thus, ascertaining the theory's validity in other economic and cultural settings (Lee & Green, 1991), such as Saudi Arabia, is essential. Thus, the application of TPB in Saudi Arabia concerning the influences of psychological factors on waste sorting and recycling in different income levels will fill a knowledge gap.

This research attempts to construct a theoretical research model by adding market incentive, government facilitators and awareness into the popular Theory of Planned Behavior (TPB) to explain resident's waste sorting intention and also, it is effective for understanding households' waste sorting intention. Nevertheless, it is undeniable that there are several limitations in this research. Firstly, the data is only collected in Dammam city. Though Dammam city is one of the major cities and shares some common characteristics with other cities, the economic development level, resident's environmental awareness and waste sorting level may be different from other cities. Thus, it should be cautioned to generalize the current research results to other research context. In the following research, the survey data should be collected from more cities. Secondly, the respondents of this research are urban residents. To enrich the research results and further improve the generalizability of results, respondents from rural areas should also be included. Finally, limited variables have been added into TPB model to

explore resident's waste sorting intention. Other variables such as emotion, motivation and perceived value are not considered

1.6 Significance of the study

The results of this research are apt to improve the understanding of the psychological and external predictors of residents' willingness to participate in waste sorting and recycling. They also can help the authorities to develop policies to support promoting waste sorting and recycling and helping in good management of a suitable waste handling through significantly methods to facilitate waste handling with economically safe. Theoretically, this study will provide information about the population's sustainable practices in waste treatment in residential areas of Dammam City and highlight the nature of the relationships between psychological and external factors around sustainable waste treatment practices among the residents of Dammam City. Also, this study will be a source of information and awareness that households, communities, municipal authorities, the national waste management authorities, and other waste management stakeholders in Saudi Arabia need.

This study will fill research gaps related to sustainable household waste treatment practices in other cities in the Kingdom of Saudi Arabia and provide necessary information for those cities not only but also, it will provide practical information for authorities to properly plan waste sorting and recycling in Dammam City. It is also likely to help reduce the environmental problems that poor waste handling causes among Dammam City households. Policymakers can use this study's results in implementing sustainable waste sorting and recycling program to ensure the participation of a maximum number of residents in Dammam City.

We have highlight in this study case of Dammam residents by evaluating the psychological and external factors such as attitude, awareness, perceived behaviour control, market incentives, government not only but also, gender and income levels which divided into income groups in Dammam, where the desire of Dammam residents to participate varies from one income to another.

In addition, it was necessary to study the influencing psychological factors and the extent of Dammam residents' willingness to participate in sustainable waste treatment practices in Dammam such as the examination of the moderating influence of demographic factors such as gender and income level on the desire of the population In participating in sustainable handling practices in Dammam. (Echevarría 2017, Chen 2010).

1.7 Thesis Organization

Overall, this thesis comprises five chapters, which are organized as follows:

Chapter 2 presents a critical and comprehensive review of various literatures regarding the influences of psychological and external factors on the willingness of residents to participate in sustainable waste handling and related policy and plan strategies in Dammam City. The primary focus of this research is the participation of respondents in the sorting and recycling of sustainable waste handling practices in Dammam.

Chapter 3 provides descriptions and justifications of the overall study framework and research design applied in this study. Besides a description of selected study areas, sample size, instrumentation, data collection, sampling strategies, and qualitative and quantitative data analysis are described in detail.

Chapter 4 presents a complete account of questionnaire survey results and interpretations about the objectives and research questions. This entails a descriptive analysis of the respondents' socio-economic profile and their levels of attitude, awareness, perceived behavioural control, social influence, market incentives, and government facilitators and willingness sorting and recycling. The results provide insights into the differences in the mean score of the variables among the high, middle, and low-income households. The second part of the chapter contains inferential statistics, which provides the result of the correlation analysis among the variables of the study. The SEM analysis and Multi-Group Moderation Analysis are presented in the third part of the chapter. Finally, the chapter presents a discussion of all the results found in this study and a summary of the findings.

Chapter 5 concludes the main findings and significance of this study and then drawing conclusions concerning each objective and research questions. The limitations of this study and relevant recommendations for future research are also discussed.

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