



COMMUNITY CONCERNS OF RIVER POLLUTION IN TERENGGANU, MALAYSIA

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Abstract

Purpose of the study: This study aims to identify the determinants of the behavior of people living in polluted rivers in Terengganu.

Methodology: This study was conducted in a quantitative approach using a survey method for data collection. A total of 373 respondents were selected by cluster sampling. The study site was held at ten rivers that were considered polluted in Terengganu. Instruments used to collect the data were questionnaire form and analyzed with software, namely IBM Statistical Package for Social Science (SPSS) and Analysis of Moment Structure (AMOS).

Main Findings: The findings show that knowledge and exposure to environmental messages through the media is a dominant factor influencing respondents' behavior on river conservation.

Applications of this study: The study is expected to raise awareness and change people's behavior in addressing issues of environmental degradation, especially for sustainable, healthy rivers, and better quality of life. This is because the river is clean, healthy, and of good quality to ensure the well-being of the community.

Novelty/Originality of this study: Studies on factors that determine environmental behavior by researchers have often focused on studies of personal variables (e.g., knowledge, attitudes, values, beliefs) and thus ignore the direct role of situational variables as they are emphasized. Therefore, a comprehensive study should be conducted to build or change human behavior towards the environment.

Keywords: *Environmental Concern, Knowledge, Media Exposure, Environmental Behavior, River Pollution.*

INTRODUCTION

The country is now encountering multiple environmental issues that are getting more challenging. Various environmental issues that are being addressed and planned in the process of preserving nature. Global Issues in the 21st century globally focus on things that are threatening the harmony, beauty, and the well-being of human life. Air quality in the cities, river water quality, destruction of forests, household wastes, and hazardous wastes are the few examples of environmental issues encountered by our country (Chin, Preto, Thuppil, & Ashfold, 2019; Deletic & Wang, 2019; Thatcher & Yeow, 2016). The stated issues involve major aspects that are directly related to the behavior and the lifestyle of people who only care about economic and material development regardless of the importance of environmental protection for future generations. Although not all pollutions are caused by human actions, they consciously or unconsciously have done much damage to the earth (Bouman, Steg, & Kiers, 2018; Zhao, Zhou, & Han, 2018; Ningrum & Herdiansyah, 2018). The negative impacts of environmental destruction are on the people and consequently contribute to the worsening quality of the life of humans and other creatures on this earth.

Of late, environmental pollution has been a major concern for our country, especially with the worsening of river quality. The observation made by JAS shows that the quality of river water in the country has deteriorated badly (Wan Nor Azilawanie Tun Ismail & Aziz Amin, 2020b). Malaysia's environmental quality report clearly shows a large number of rivers are still classified as polluted and moderately polluted in Malaysia. In 2017, out of 477 supervised rivers, 219 (46%) were classified as clean, 207 (43%) moderately polluted, and 51 (11%) polluted. The quality of river water in terms of the Water Quality Index (IKA) showed a decrease in 2017. The percentage of rivers categorized as clean decreased to 46% in 2017 compared to 58% in 2015. Whereas the rate of rivers classified as polluted has increased from 7% in 2015 to 11% in 2017 (Department of Environment, 2017). This depicts that the quality of river water in Malaysia is at risk of pollution, which harms the sustainability of the country's water resources.

The community's concern to keep the river and the surrounding area clean is still low. They have no awareness of the importance of the river to human life. They are also less aware of the adverse effects of river pollution. The pollution of the river by irresponsible parties is only viewed with one eye by the surrounding community. Various policies and awareness campaigns are implemented by the government, private and non-governmental organizations to cultivate this awareness. However, it does not seem to bring the expected results. The very same situation is also proven from previous studies which shows that various water pollution cases have occurred lately (Hua, 2019; Tuan Fauzan Tuan Omar, Ahmad Zaharin Aris,

[Fatimah Md. Yusoff, & Shuhaimi Mustafa, 2019](#) and [Kozaki et al., 2019](#)). Among the most discussed cases is the Kim Kim River in Johor which had affected the health of more than 2000 civilians and resulted in 111 schools being closed following the dumping of chemicals into the river by irresponsible parties ([Yap, Peng, & Leow, 2019](#); [Berita Harian, 2019](#)) and the Selangor River case which was contaminated by diesel oil and as a result 1133 areas were affected with water disruption following the incident ([Berita Harian, 2019](#)). This water crisis has given us the awareness that the seriousness of water pollution in our country is a no laughing matter. It also teaches us about the importance of conserving and preserving water sources, especially rivers. Therefore, we should not take it lightly, and all the parties involved should take serious and effective measures to make sure the same incident will not be repeated.

It should be noted the increase in the awareness of the environment and behavior adopted is one of the key elements in building the nation's capacity towards sustainable development. Raising your awareness can also create a caring and responsible society for the environment. Therefore, increasing public awareness to build a shared responsibility for the environment should be emphasized towards a more comprehensive and coordinated effort to achieve a better quality of life ([Wan Nor Azilawanie Tun Ismail & Aziz Amin, 2020a](#)). This action is embodied in the Eleventh Malaysia Plan, which emphasizes that green growth will be the driving force for Malaysia to achieve sustainable socio-economic development to ensure the harmony between the improvement of the quality of life and the sustainability of natural resources and the environment ([Economic Planning Unit, 2017](#)). Also, continuous efforts must be made to educate and raise awareness for the entire community to appreciate eco-friendly practices in all aspects of life. Laws and scientific methods alone will not be enough to foster a sustainable mindset among the community. Having exposure related to the environment should be extended to the community, not only to increase the knowledge and awareness of the phenomenon and the law of nature but also to highlight the package of life, which includes the development of attitude, way of thinking, identity and culture. It is only then will the public understand the importance of protecting and conserving each component of the environment.

LITERATURE REVIEW

According to [Liu & Mu \(2016\)](#); [Binder & Blankenberg \(2016\)](#); [Hamidi Ismail, Abd. Rahim Md. Nor, & Tuan Pah Rokiah Syed Hussain \(2013\)](#) and [San & Norzaini Azman \(2011\)](#), individual concern on environmental conservation is a significant step in preserving nature. Various actions and approaches are taken by multiple parties in preserving and conserving the environment to create a caring and responsible community. Concerns in this study include knowledge, values, attitudes, perceived behavioral control, self-efficacy, subjective norms, exposure to environmental messages through the media, recycling facilities, intention, and community behavior in addressing river pollution issues.

1. Environmental knowledge

Environmental knowledge can be defined as general knowledge of facts, concepts, and relations related to nature and its key ecosystems ([Aprile & Fiorillo, 2017](#) and [Fryxell & Lo, 2003](#)). According to [Onder & Kocaeren \(2015\)](#) and [Mohammad Affendy Omaridin & Nazirah Zainul Abidin \(2014\)](#), knowledge regarding the environment is a lifelong learning process. It aims to generate awareness to all levels of age in the community about the environment, having the knowledge, skills, and commitment to make decisions that directly or indirectly impact the quality of the environment. Environmental education is crucial in the community because it is the key to sustainability ([Tucker & Izadpanahi, 2017](#) and [Noor Azizah Samsudin & Zanaton H. Iksan, 2015](#)). In short, environmental knowledge involves what people know about the environment. This important connection leads to aspects or effects of the environment and the collective responsibility required for sustainable development.

2. Environmental values

Environmental value is interpreted as a system that supports any action that leads to the well-being of the environment ([Kaida & Kaida, 2016](#) and [Saripah Abdul Latif et al., 2012](#)). Defining different environmental values will lead to varying interpretations of behavior between one and the other. It contains elements of consciousness and feelings that are often shown in the individual's attitudes and actions ([Katz-Gerro, Greenspan, Handy, & Lee, 2017](#) and [Fryxell & Lo, 2003](#)). Environmental values are highly subjective and may be evaluated based on their function and their economic importance, or they may be found on the given satisfaction and happiness or might be evaluated based on the well-being and stability provided for human survival ([Lincoln & Ardoin, 2016](#) and [Dietz, Fitzgerald, & Shwom, 2005](#)).

3. Attitude

Attitude is abstract and it reflects the individual's character, personality, and the individual himself ([Bamberg & Rees, 2015](#) and [Vasile, 2011](#)). With attitude, personality can be formed. Attitude is shaped by experience and is greatly influenced by one's behavior ([Turkyilmaz, Uslu, & Durmus, 2015](#) and [Schultz, 2002](#)). Individual attitudes play an important role in balancing nature. Optimistic individuals will instil the right mindset for the environment in their daily lives ([Paco & Lavrador, 2017](#) and [Vasile, 2011](#)).

4. Perceived behavioral control

The perceived behavioral control is the degree to which a person has control over a given behavior and how he or she can act ([Wang et al., 2019](#) and [Botetzagias, Dima, & Malesios, 2015](#)). The degree of control and ability of the individual is based on the resources and opportunities that exist from within or outside the person ([Ajzen, 2012](#)). If a person has high confidence in his or her ability to execute the behavior, then his or her intention to carry out the behavior is stronger. Whereas, control of the perception of low-level behavior should be less motivated to engage in the action ([Prapavessis, Gaston, & Dejesus, 2015](#) and [Ajzen, 2002](#)).

5. Self-efficacy

Self-efficacy is associated with positive behaviors and attitudes of an individual ([Huang, 2015](#)). Self-efficacy can be clarified as a person's assessment of himself or how he views himself in positive or negative ways ([Bandura, 1991](#) and [Bandura & Adams, 1977](#)). An individual's self-efficacy can produce effective environmental behaviors. A study conducted by [Onder & Kocaeren \(2015\)](#) and [Ojedokun & Balogun \(2010\)](#) shows that self-efficacy has a significant connection with environmental behavior. An individual must be confident and have high self-efficacy for each behavior to be more effective in addressing environmental issues such as recycling by [Zhang et al. \(2016\)](#) and using reusable shopping bags ([Kim, Kim, Han, & Holland, 2016](#)). It can also affect the effort people put into their behavior ([Bandura & Adams, 1977](#)).

6. Subjective norm

Subjective norms involve behaviors expected by society and motivation to engage themselves in those behaviors mentioned. Subjective norms refer to human perceptions of other people who are significant to them and consider whether they are behaving in that expected way ([Wang et al., 2019](#); [Ajzen, 1991](#) and [Ajzen & Madden, 1986](#)). It is about human actions based on the perception of what others think they should do. The construction of social factors that are defined as subjective norms in the theory of planned behavior is the social pressure or other individual's perception or the society in influencing someone to execute an action ([Zhang, Geng, & Sun, 2017](#) and [Liao et al., 2016](#)). These social influences can come from interpersonal influences such as husband or wife, children, or friends. If the social expectations encourage the individual to execute such behavior, then the person is more likely to perform it ([Leeuw et al., 2015](#) and [Soyez, 2012](#)).

7. Exposure to environmental messages through the media

The role of the mass media in publishing documentaries and publishing reading material by environmental issues is essential for the public to get information on accurate and up-to-date environmental issues ([Srivastava, Nakazawa, & Chen, 2016](#) and [San & Norzaini Azman, 2011](#)). Also, the shows and programs that inculcate the public's attitude towards maintaining public hygiene that is repeatedly published in the media can emphasize the importance of maintaining cleanliness and health in the community. Indirectly, it will affect people's knowledge and awareness of it to determine their behavior patterns in the environment ([Hong, Kim, & Xiong, 2019](#) and [Lee, 2011](#)). Besides, the use of precise and natural language and having simple graphics through advertisements in electronic medias such as television, radio, and print media like newspapers, magazines, and posters can help raise public awareness of the environment ([Jiménez-Castillo & Ortega-Egea, 2015](#) and [Mustafa Ozden, 2008](#)). Community participation can also have a profound effect on the effectiveness of the campaign. For instance, community involvement in recycling programs will not only address environmental issues but also create a thriving attitude among the community ([Miliute-Plepiene, Hage, Plepys, & Reipas, 2016](#)).

8. Recycling facilities

One of the most effective steps that can be taken to address waste disposal issues is through recycling activities ([Basri, Zawawi, Zain, Mohamad, & Kasa, 2016](#)). Having an effective recycling program is important. It does not only have the potential to minimize solid waste dumped at the landfill but can also reduce pollution, especially water pollution ([Botetzagias et al., 2015](#) and [Lange, Bruckner, Kroger, Beller, & Eggert, 2014](#)). The accessibility of recycling facilities is a key factor when discussing the factors that influence recycling practices. Facilities mentioned referring to the existing facilities for recycling ([Zhang et al., 2016](#) and [Mtutu & Thondhlana, 2016](#)). For example, the provided recycling bins, the proximity of these facilities from home, the convenience of sightings the facilities, the management of the bins, and so on. The lack of effective facilities not only limits the likelihood of recycling but also lowers expectations about how their recycling activities can be reached ([Lange et al., 2014](#) and [Knussen, Yule, MacKenzie, & Wells, 2004](#)).

9. Intention

The intention variable is defined as the motivation, or the desire and willingness of the person to engage in the behavior ([Ajzen, 2012](#) and [Ajzen, 1991](#)). According to the Theory of Planned Behavior, intention is a crucial component in the implementation of a behavior ([Wang et al., 2019](#); [Greaves et al., 2013](#) and [Ajzen, 1991](#)). The higher a person's desire to execute an action, the more likely it is for a person to act ([Pan, Chou, Morrison, Huang, & Lin, 2018](#)).

10. Behavior

Behavior is defined as any action that a person commits to benefit or contribute to the well-being of others ([Morren & Grinstein, 2016](#); [Afsar, Badir, & Kiani, 2016](#); [Whitley, Takahashi, Zwickle, Besley, & Lertpratchya, 2016](#)). [Laurens \(2012\)](#) argues that people's behavior towards the environment must have something to do with what they feel and think about the environment as well as pro-environmental actions. [Laily Hj. Paim et al. \(2013\)](#) point out that to shape behavior effectively, it is important first to identify the specific behavior that you want to change. This makes it more convenient and efficient to do and, at the same time, makes it easier to monitor the success of this change program. These identified behaviors need to be continuously focused on so that they become a habit rather than an instruction. This is since habits can be formed through repetition and strengthening techniques.

METHODOLOGY

The research design used in this study was quantitative research using the survey method. Data collection was carried out at ten areas at the rivers, which were categorized as contaminated in the state of Terengganu. The polluted rivers were identified based on the Malaysian Environmental Quality Report in 2016 on the status of river water quality monitored by the Department of Environment. Thus, the selected areas are the Kampung Laut (Ibai River), Kampung Penarik (Chalok River), Nyior Village (Paka River), Gong Balai Village (Merchang River), Setia Jaya (Merang River), Gong Nangka Village (Marang River), Pekan Sari Tembila (Keluang River), Tengah Village (Kertih River), Padang Kubu Village (Ransan River) and Yak Yah Village (Sungai Bungkus). A total of 373 respondents were selected by cluster sampling. The data were collected using a questionnaire form and analyzed descriptively and inferences with IBM Statistical Package for Social Science (SPSS) and Analysis of Moment Structure (AMOS) software. The questionnaire for this study was divided into 11 sections, namely, part A (knowledge), part B (values), part C (attitude), part D (perceived behavioral control), part E (self-efficacy), part F (subjective norm), part G (exposure to environmental messages through the media), part H (recycling facilities), part I (intention), part J (behavior) and part K (respondents' background). A summary of the study instrument is shown in Table 1.

Table 1: Summary of instrument

Part	Variables	Source	No. Item
1A	Knowledge	(Xiao & Hong, 2010; Naimah Salleh et al., 2009 and DeChano, 2006)	9
B	Values	(Sony & Ferguson, 2017)	10
C	Attitude	(Dlacic & Kadic-Maglajlic, 2015)	6
D	Perceived behavioral control	(Swaim et al., 2016 and Macovei, 2015)	6
E	Self-efficacy	(Homburg & Stolberg, 2006)	9
F	Subjective norm	(Swaim et al., 2016 and Knussen et al., 2004)	8
G	Exposure to environmental messages through the media	(Yatish Joshi Zillur Rahman, 2016)	6
H	Recycling facilities	(Mtutu & Thondhlana, 2016 and Knussen et al., 2004)	6
I	Intention	(Swaim et al., 2016 and Lee, 2011)	8
J	Behavior	(Xiao & Hong, 2010)	10
K	Respondents' background		6
Total Item			84

Results

Demographic profiles

Table 2 shows the distribution of respondents' profiles by a detailed category. The total number of respondents for this study was 373 residents living within 500 meters of 10 rivers, which were categorized as contaminated in the state of Terengganu. The respondents in this study were those aged 16 years and above. Based on the respondents, the findings found that the majority of respondents with 25.7% (96) percent were at the age of 30 to 39 years old. Next, the results showed that the majority of respondents with 55.5% (207) percent were female. The majority of respondents were married couples with a percentage of 64.6%, which equals to 241 respondents. The findings also showed the majority of the respondents are educated up to the upper secondary level, with 48.0% (179). In terms of employment, the majority of 24.9% (93) respondents were housewives. Finally, 56.3% (210) of the respondents had a household income below RM1500.

Table 2: Socio-demographic Profile of Respondents (n=373)

Socio-demographic factor		Frequency (n)	%
Age	16 to 19	43	11.5
	20 to 29	93	24.9
	30 to 39	96	25.7
	40 to 49	78	20.9
	50 to 59	45	12.1
	≥ 60	18	4.8
Sex	Male	166	44.5
	Female	207	55.5
Marital Status	Married	241	64.6
	Divorced	10	2.7
	Widowed	13	3.5
	Unmarried	109	29.2
Educational level	No formal education	3	0.8
	Primary school (UPSR)	24	6.4
	Lower Malaysian certificates (SRP/PMR/)	71	19.0
	Malaysian Certificate of Education (SPM/SPVM/MCE)	179	48.0
	Higher School Certificate (STPM/HSC)	25	6.7
	Diploma	43	11.5
	Degree	24	6.4
	Master/ PhD	4	1.1
Job categories	Government sector	33	8.8
	Private sector	79	21.2
	Self-employed	82	22.0
	Housewife	93	24.9
	Student	36	9.7
	Retiree	7	1.9
	Unemployed	43	11.5
Household Income	≤ RM1500	210	56.3
	RM1501 to RM3000	110	29.5
	RM3001 to RM4500	25	6.7
	≥RM4501	28	7.5

Determinants of respondents' behavior

Based on Figure 1, the Structural Equation Model (SEM) shows the overall indicators of good fit ($\chi^2 = 1419.792$, $\chi^2 / DF = 2.290$, $p = .000$, $GFI = .830$, $CFI = .903$, $IFI = .904$, $TLI = .890$, $RMSEA = .059$). Knowledge, values, attitudes, perceived behavioral control, self-efficacy, subjective norms, exposure to environmental messages through the media, and recycling facilities are predictors, namely, exogenous (independent) constructs and behaviors are endogenous (dependent) constructs. Indicators for the construct of knowledge represented (A1, A2, A3), values (C5, C6, C7), attitude (Ee1, Ee2, Ee3), perceived behavioral control (F2, F3, F4, F5), self-efficacy (G3, G4, G5, G8), subjective norm (H2, H4, H5, H8), exposure to environmental messages through the media (I2, I3, I4, I5, I6) and recycling facilities (J1, J3, J4). Indicators L2, L5, L6, and L7 and L8 are an indicator of the construct of behavior.

Table 3 shows regression coefficient values to see the influence of independent variables namely knowledge, values, attitudes, perceived behavioral control, self-efficacy, subjective norms, exposure to environmental messages through the media and recycling facilities on dependent variables, which are behaviors. The results of the SEM analysis show that the regression model proposed by the researcher has found knowledge variable ($\beta = -.224$, $CR = -2.590$, $p < .05$) and exposure to environmental messages through the media variable ($\beta = .575$, $CR = 7.900$, $p < .05$) is a significant predictor variable for behavioral variables. Whereas, for the values variable ($\beta = .116$, $p = .076$), attitude ($\beta = .074$, $p = .507$), behavioral

perception control ($\beta = .046, p = .709$), self-efficacy ($\beta = .066, p = .454$), subjective norms ($\beta = .060, p = .471$) and recycling facilities ($\beta = .012, p = .827$) do not indicate significant predictor variable for behavioral variables on river conservation when the p-value exceeds the alpha value ($p > .05$).

Table 3: Regression Weights

Path		Unstd. Reg. Weights Estimate	S.E.	Std. Reg. Weights β	C.R.	p	Result
Knowledge	→ Behavior	-.235	.091	-.224	-2.590	.010	Significant
Value	→ Behavior	.081	.046	.116	1.775	.076	Not Significant
Attitude	→ Behavior	.083	.125	.074	.664	.507	Not Significant
Behavioral perception control	→ Behavior	.048	.128	.046	.374	.709	Not Significant
Self-efficacy	→ Behavior	.062	.082	.066	.749	.454	Not Significant
Subjective norm	→ Behavior	.058	.081	.060	.721	.471	Not Significant
Media exposure	→ Behavior	.572	.072	.575	7.900	***	Significant
Recycling facilities	→ Behavior	.008	.038	.012	.219	.827	Not Significant

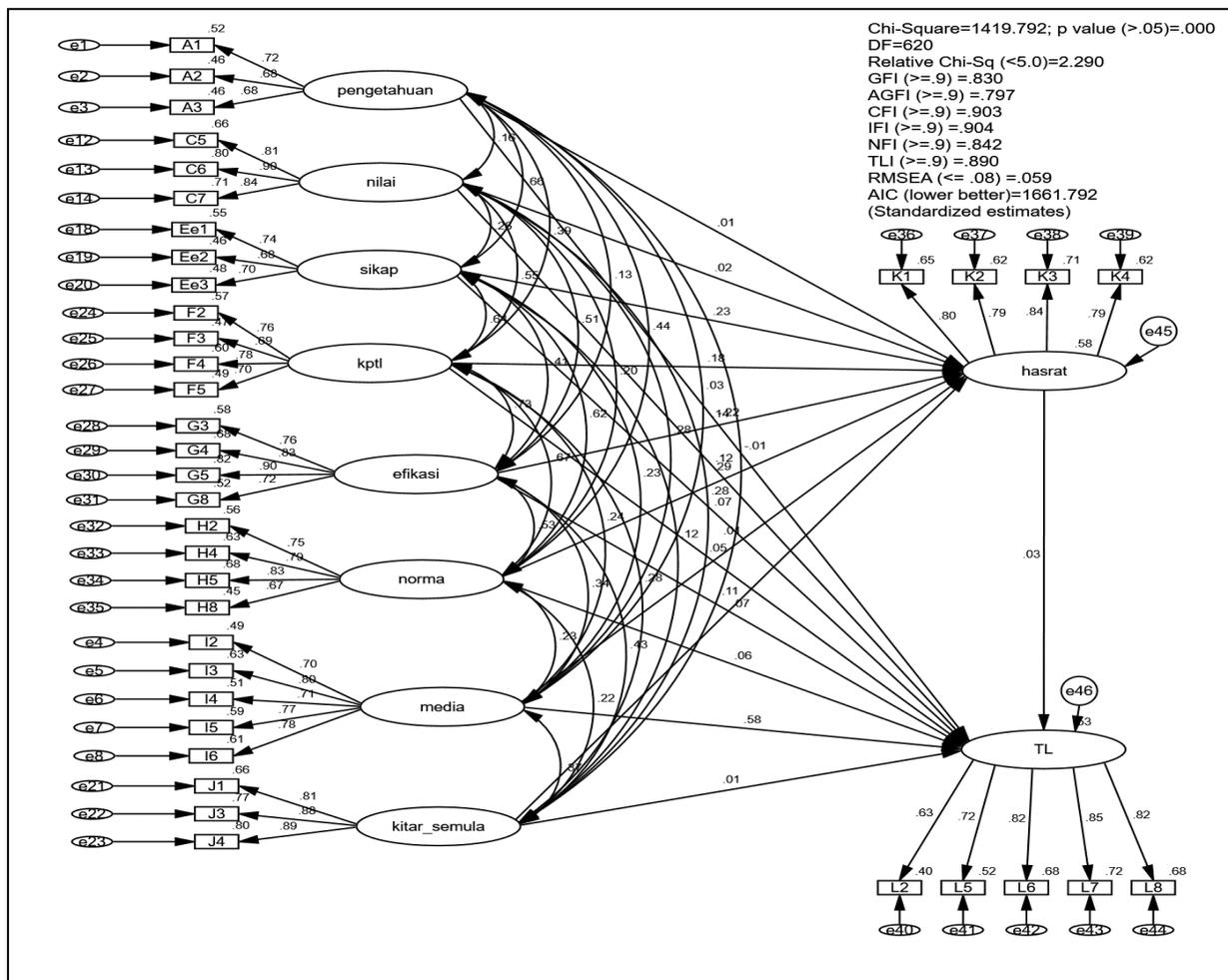


Figure 1: The Structural Equation Model (SEM)

Thus, the findings indicate that factors of knowledge and media exposure can influence respondents' behavior towards river conservation. However, from both of the predictors, exposure to environmental messages through the media has a greater impact ($\beta = .575$) than knowledge ($\beta = -.224$). This indicates that the factor of exposure to the media is more prominent than the knowledge factor. The result of the SEM analysis indicates that the variance value in the endogenous behavioral variables predicted by the eight variables is .530. This implies that 53 percent of the variance in behavior is predicted by both the exogenous variables of knowledge and the exposure to environmental messages through the media. This denotes that there is a .470 or 47 percent variance in the behavioral variables that cannot be predicted by this regression model. This variant might be due to unknown external factors throughout the study.

DISCUSSION

The novelty of this research is to explore the factors that determine the environmental behavior of the community living in polluted rivers in Terengganu. The results of this study found that knowledge and exposure to environmental messages through the media are the determinants of river conservation behavior among the respondents living near the polluted rivers. This shows that having great knowledge and high exposure through media can further enhance people's behavior towards river conservation. On the other hand, having low knowledge and low exposure through the media can cause residents to fail to behave well in maintaining river conservation. This finding is consistent with the study [Otto & Pensini, \(2017\)](#); [Nor'Aini Yusof, Suraiyati Rahman, & Iranmanesh \(2015\)](#), and [Onder & Kocaeren \(2015\)](#). This suggests that the discussion of [Ajzen's \(1991\)](#) Planned Behavior Theory and early models of environmental pro-behavior as well as environmental responsibility behavior models on the relevance of knowledge to proven behavior are still relevant in empirical studies in the community scenario for today's river conservation. Knowledge is essential for life, and education is a process to improve one's behavior or morals for the better. Knowledge is essential in educating and creating a society that loves cleanliness and perfection in the management system associated with garbage. This element should be owned by the community to streamline the management machinery. In fact, not only for solid waste management, other programs and activities will also be disrupted if public knowledge is low or poor. According to [Paco & Lavrador, \(2017\)](#); [Zareie & Navimipour, \(2016\)](#), and [Zsoka, Szerenyi, Szechy, & Kocsis, \(2013\)](#), a high level of knowledge will encourage respondents to behave well. Respondent's awareness of the issue related to river pollution is a very important matter, and the enhancement of respondents' knowledge of river conservation will be able to produce a caring and environmentally responsible community. Knowledge of river conservation is important to the pursuit of the well-being of life. Knowledge of river conservation can be gained through formal or informal education. An effective way to foster this awareness is to provide education, awareness, and understanding of environmental well-being ([Wan Nor Azilawanie Tun Ismail & Aziz Amin, 2020b](#)).

Furthermore, the exposure of information through the media is seen to influence one's thinking and actions. This result is consistent with the study of [Hynes & Wilson \(2016\)](#) and [Hong et al. \(2019\)](#). The media is important in educating and providing complete information to society. Inaccurate information leads to misunderstandings, inaccessible information, skeptical society, and so on that involve elements of disbelief. Therefore, the media is very important in influencing the background of study respondents or society in general. According to a study conducted by [Huang \(2015\)](#), people rely on media such as television, newspapers, and the internet for information or information on environmental issues. [Liao et al. \(2016\)](#) and [Ors \(2012\)](#) state that the media is an effective way to bring attention to environmental issues and to make the public aware of the problems caused by pollution. Thus, it can play an important role in building public pressure to do something through their involvement in pro-environmental behavior. The media is also seen as the middleman between the public, the government, and the private sector in the dissemination of information. The media is also seen as a platform to channel knowledge and provide information that can educate the public to act decisively to ensure the river is protected. Besides, the government and organizations can use media as a promotional tool to encourage environmental action by individuals. The results of the study conducted by [Huang \(2015\)](#) dan [Ors \(2012\)](#) reveal the important function of media use in people's behavior. Information from the media can be a powerful force as society relies on media-related environmental messages that may influence their environmental actions.

CONCLUSION

The issue of the decline of river water quality is one of the dilemmas of environmental change that is closely linked to daily activities and health quality. To create a peaceful river environment, it depends on the knowledge, attitudes, involvement, and understanding of society on the adverse effects of an individual's actions. The well-being of a river can only be attained if everyone plays their part in their responsibility. The findings show that the determinants of knowledge and the disclosure of information through the media have a direct link in contributing to the behavior of river conservation among respondents. Knowledge of river conservation is essential to the pursuit of well-being. Knowledge of river conservation can be achieved through formal or informal education. An effective way to foster awareness is to provide education, awareness, and understanding of the well-being of the environment. The education-related to environmental issues is a tool for gain knowledge and awareness of environmental problems, which is the basis for responsible actions and behaviors for the environment. Furthermore, mass media plays such an important role in today's life that everyone can't isolate themselves



from its influence, be it through print or electronic media. Therefore, it can be seen that developments and information through the media have positive implications for the behavior of river conservation among respondents. The media also contributes to today's educational development.

LIMITATIONS AND STUDY FORWARD

This study focuses on the determinants of river conservation behavior. Although there are several sources of river pollution such as industrial activity, land development, or land work, this study will focus on activities only in terms of behavior. The study area is focused only on polluted rivers in the state of Terengganu. The other factors or impacts can be explored in future studies in terms of affecting the social dimensions such as quality of life, security, social capital, mental health, and protection (Aziz Amin, Zainul Zolkifeli, & Mohd Syaiful Nizam Abu Hassan, 2019; Zainul Zolkifeli & Aziz Amin, 2018 and Zainul Zolkifeli & Aziz Amin, 2019).

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AUTHOR CONTRIBUTION

The first author's contribution was to draught the text, collect the data, construct the tables, evaluate the data, and interpret the findings. The second author was involved in preparing and supervising the work, processing the work, assisting with manuscript drafting, correcting, and revising the manuscript to improve manuscript quality.

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