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# Green behaviors towards intention to participate in river cleaning initiatives

Suhailah Shamsudin[1], A.Aldrie Amir[1], Nor Azilah Husin[2]

[1]Institute of Environment and Development (LESTARI), Universiti Kebangsaan Malaysia
[2]School of Business and Social Sciences, Albukhary International University Malaysia

Correspondence: Suhailah Shamsudin (email: elsuhailahshamsudin@gmail.com)

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## Abstract

River pollution is one of the common environmental issues. In Malaysia, the Klang River is known as one of the highest ranking rivers in the world contributing mismanaged plastic into the ocean, according to past researchers. In order to improve this situation, a non-structural approach in river conservation should be applied together with a structural approach. However, it will only be implemented successfully by the general public. This is because they play important roles in achieving river sustainability. By adopting green behaviors, the objective of this study is to predict the relationship between green self-efficacy (GSE) and green trust (GT) with the intention to participate in river cleaning initiatives. This study employs quantitative methods through a self-administered questionnaire. It involves 350 respondents from the Port Klang Area Fishermen's Association and the Selangor Recreational Boat Association (PBRS) who use the Klang River as their main route to the ocean. The respondents were randomly selected for the data collection process. The data was analyzed using SPSS to obtain preliminary data. The findings show that the reliability and validity of the instrument used is good and effective. GSE and GT have a relationship with the intention to participate in river cleaning initiatives. This study has the potential to provide information and understanding of human environmental behavior in addressing river pollution issues. Furthermore, it is anticipated that this study will serve as a crucial point of reference for scholars, authorities, and industry players in formulating holistic strategies and interventions that involve the general public to support sustainable river conservation.

**Keywords:** Green behavior, green self-efficacy, green trust, intention to participate, self-determination theory, self-perception theory, social study

## Introduction

The Klang River is the main river in the middle of Peninsular Malaysia, which flows through the capital cities in the Klang Valley (Zaki et al., 2021). The total length of the Klang River is 120km, with 11 tributaries, and it has a catchment area of approximately 1288km² (Mohamed et al., 2015; Zaki et al., 2021). The Klang Valley is the most populated area in Malaysia and is well developed with housing areas, industrial areas, commercial areas, and agricultural areas, which include land use activities such as solid waste disposal, sewage, aquaculture, animal husbandry, and more (UKM Pakarunding Sdn Bhd, 2017; Zaki et al., 2021). Moreover, data provided by Landasan Lumayan Sdn Bhd (2022) indicates that the total collection of floating debris recorded from 2016 to 2021 is approximately 77,000 metric tonnes from the Klang River. Additionally, a desktop study by The Ocean Cleanup (2020) has found that the Klang

River contributes approximately 15,000 metric tonnes per year of mismanaged plastic into the ocean. As a result, Klang River emerged as one of the highest-ranked contributors of plastic emission in the world (Meijer et al., 2021; Ritchie & Roser, 2018; van Calcar & van Emmerik, 2019). Thus, it is not surprising that the amount of floating debris is found to be extremely high and the water quality in the Klang River is notably (IGS Consultant, 2018; Landasan Lumayan Sdn Bhd, 2018).

In 2016, the Selangor State Government took action with extensive effort through the Selangor Maritime Gateway (SMG) Project to rejuvenate the Klang River (Ali, 2015). A wholly owned company of Menteri Besar Selangor Incorporated, namely Landasan Lumayan Sdn Bhd (LLSB), was mandated by the Selangor State to carry out responsibilities which include river cleaning, river rehabilitation, river development, and river connectivity of 56km of the Klang River (Menteri Besar Incorporated Selangor, 2012; Mohd Dahlan, 2020). The establishment of LLSB has brought together and further strengthened the cooperation of all government bodies, local authorities, corporations, and non-governmental bodies involved in river preservation (Ali, 2015; Jiao et al., 2022). This is supported by Husin et al. (2021), Husin et al. (2021) and Noor (2019), who emphasized that cross-sectoral collaboration is needed because strategically held cooperation involves the role of stakeholders, the public sector, and the private sector through legislation, increasing public awareness, training, and education in dealing with river pollution issues. All of these fall under non-structural measures of the river cleaning initiative.

Besides cross-sectoral collaboration, a public outreach program is also a non-structural measure. A public outreach program involves efforts to educate the public on the importance of clean rivers and to shift mindsets and behaviors towards responsible waste management for a more sustainable society (Chan et al., 2020; Husin et al., 2021; Husin et al., 2021). However, the effectiveness of these efforts requires general public involvement, including the local community living along the river. Past research has shown that general public play a crucial role in the preservation and conservation of the environment, particularly in relation to the sustainability of rivers (Ahmed et al., 2020; Chan et al., 2020; Hui Lai et al., 2017; Husin et al., 2021; Husin et al., 2021; Leng et al., 2020; Mustakim et al., 2019; Nardini & Conte, 2021; Noor, 2019; Shi et al., 2022; Weng, 2005). However, community involvement in river cleaning activities remains low and tepid (Ghani, 2021).This is supported by feedback from the Global Environment Center (2022) which stated that the frequency of activities up to 2021 for both civilian volunteers and target groups is still insufficient, despite the recorded number of active and inactive members which stands at 18,056 (public volunteers) and 44,605 (target groups). This data only represents activities carried out under the GEC network, which is located upstream of the Klang River. On the other hand, the data obtained from Landasan Lumayan Sdn Bhd (2022) pertains to the environmental awareness programs implemented by LLSB from 2016 to 2020, which are located downstream of the Klang River, as shown in Table 1.

**Table 1.** Environmental awareness programs by Landasan Lumayan Sdn Bhd

| Year | Environmental awareness programs |
|---|---|
| **2016** | Volunteering of river patrol unit (supervising river trail). |
| **2017** | Volunteering of river patrol unit (supervising river trail). |
| **2018** | • Volunteering of river patrol unit (supervising river trail).<br>• Townhall. |
| **2019** | • River tributary cleaning activities.<br>• Beautification of fishermen jetties. |

| | |
|---|---|
| **2020** | • Community engagement to increase public awareness of proper plastic bottle disposal.<br>• Media interview series with BFM, Malay Mail, Astro Awani, RTM, The Star & Malaysian Insight.<br>• Competition of 'SMG Water Doing? Show Us Your Art'.<br>• Flag relay and plogging in conjunction with Malaysia's 63rd National Day at Interceptor™ as depart location.<br>• River Tour with Freda Liu (influencer) for media social coverage in conjunction with the World River Day on 27th Sept 2020.<br>• Documentary shooting of Selangor Maritime Gateway Project broadcasting by FINAS at RTM.<br>• Selangor World River Day 2020 – gotong royong activities. |

Source: Landasan Lumayan Sdn Bhd, 2022

Through the evaluation of the data obtained, it is clear that non-structural measures of the river cleaning initiative still require greater improvement and involvement. The sustainability of the Klang River demands intensified public education and participation in river care and responsible waste management to transform mindsets and curtail rampant river pollution. It is highlighted through news reports of indiscriminate waste dumping, which underscores the urgent need to raise public awareness about preserving our (Malaysian Plastics Manufacturers Association & Malaysian Plastics Recyclers Association, 2019; Muhammad Saufi et al., 2021; Nunis, 2020; Pfordten, 2021). Therefore, the above fact suggests that there is a research gap regarding the importance of the general public roles in addressing the issue of river pollution.

This study aims to predict the relationship of green self-efficacy (GSE) and green trust (GT) on the intention to participate in river cleaning initiatives located at the downstream of Klang River. This study enhances our understanding of reducing river pollution by evaluating and improving existing theories. By examining the factors that influence people's intention to participate in river cleaning initiatives, it reveals how individuals perceive themselves and their actions. The inclusion of green self-efficacy and green trust as predictors helps design effective interventions and enriches the academic literature on environmental behavior.

## Literature review

### *Intention to participate in river cleaning initiatives*

The term "participation" is often used in the academic literature on environmental sustainability when referring to the involvement of local communities in achieving conservation goals. However, Jia et al. (2022) argue that a desire to participate must first exist within the community to drive engagement in such initiatives. In other words, the feeling of wanting to take part is a prerequisite for establishing an effective participation mechanism. "Community participation" or "public participation" refers to the involvement of various stakeholders at the local level (Ahmed et al., 2020). Initiatives that engage communities in caring for the environment are called community-based conservation. According to Forgie et al. (2019) community-based conservation consists of grassroots activities that lead individuals and organizations to cooperate towards targeted environmental objectives. The concept helps decentralize natural resource management powers to the local level (Zanetell & Knuth, 2004). Thus, it encompasses diverse efforts, from river cleanups to water quality monitoring, that can achieve cleaner rivers more effectively than solely relying on expensive machinery.

Despite the differences in how it is defined, the common thread across various definitions of the desire to participate seems to concern environmental conservation and preservation, which motivates involvement in related activities. In other words, individuals generally wish to participate in environmental protection efforts when they feel intrinsically driven to engage in such initiatives. As Chen & Gao (2021) stated, an individual's intention is the cause of a behavior. Forming implementation intentions strengthens the mental association between a situation and the intended action (Zhang et al., 2021). For this study, the intention to participate in the river cleaning initiative is defined as when an individual feels motivated or compelled from within to participate in activities related to the river cleaning effort. The intention itself, stemming from pro-environmental attitudes, encourages participation rather than any external incentive. The literature suggests that harnessing intrinsic motivation and local knowledge within a community is key to sustaining conservation outcomes. Focusing on fostering this intrinsic motivation may be lead to encouraging engagement in conservation initiatives.

In the context of river conservation, the participation of communities living near the river is critical, as Leng et al. (2020) stated that local communities can detect sources of pollution faster than people living farther away. For example, Mumbi and Watanabe (2021) selected upstream, downstream, and industrial communities along a river as their sample for investigating the willingness to participate in conservation volunteer programs. Community-based conservation encompasses practices that directly or indirectly lead to preservation (Leng et al., 2020). Thus, to foster an intention to participate in river cleaning initiatives, engaging communities proximate to the resource is vital.

Residents of areas bordering the Klang River represent a key stakeholder group whose involvement is crucial for implementing effective and sustainable conservation efforts. However, the intention to participate in river cleaning initiatives remains limited presently due to minimal awareness of the importance of caring for the river. Therefore, the focus of this study on Klang River adjacent communities is essential for understanding and cultivating local participation in the cleanup initiative. Tapping into the intimate knowledge and vested interests of riverside residents could be a key factor in ensuring the sustainability of conservation outcomes along the Klang River.

*Green Self-efficacy (GSE)*

The term "Green Self-efficacy" originates from the term self-efficacy, which means an individual's belief in their ability to organize and carry out a course of action (Bandura, 1997). According to Sellers et al., (2013), self-efficacy explains the extent to which an individual believes they are capable of engaging effectively in an activity. The concept of self-efficacy, an individual's belief in their ability to organize and execute actions, has been adapted to the environmental realm through the term "Green Self-efficacy." This powerfully captures one's conviction that they possess the capability and decide to take the necessary measures to attain environmental objectives (Chen et al., 2015; Sh. Ahmad et al., 2022; Tashiro, 2022; Yusliza et al., 2021) This definition finds resounding agreement among Chen (2016), Huang (2016), Tabernero and Hernández (2011) and Yusliza et al. (2020), who emphatically stated that individuals with high green self-efficacy can channel their unwavering focus into combating environmental degradation. Emboldened by their self-belief, they possess the profound ability to influence their own mindset, surmounting any obstacles that may arise in pursuing their ecological objectives. Their commitment is unshakable, providing the necessary drive to realize their environmental goals. Moreover, these eco-champions can adeptly strategize more productive avenues by optimizing available resources and charting an efficient course toward their targeted sustainability benchmarks. In this study's context, GSE encapsulates an

individual's confidence in their capability to undertake river cleaning activities with unparalleled effectiveness. As astutely noted by Guo et al. (2019) pro-environmental conduct emanates from within when one's green self-efficacy soars to remarkable levels. This deep-rooted belief ignites the passion to safeguard nature's delicate balance.

According to Sellers et al. (2013) self-efficacy can be understood through the lens of Self-Determination Theory (SDT) and its subsidiary Cognitive Evaluation Theory. These theoretical frameworks reveal that individuals are motivated to pursue and achieve goals when their fundamental needs for competence, autonomy, and social connectedness are met. Bandura (1994) the founder of self-efficacy theory, identifies three essential pillars: First, individuals must thoroughly understand the task and execute it effectively. Second, they must have the freedom to take appropriate actions. Third, strong social bonds must reinforce their belief in their own ability to behave effectively. This interplay shows that when individuals have sufficient knowledge and insight, they develop a strong confidence in their ability to take action. As they receive positive feedback on their actions, their effective behaviors are reinforced and intensified (Sellers et al., 2013).This positive cycle unleashes the full potential of human agency, propelling individuals toward their goals with unwavering self-assurance. Individuals are empowered to combat environmental degradation with a strong sense of GSE. This inner drive strengthens their commitment and reduces perceived obstacles in achieving ecological goals. It enables them to strategize effectively and optimize limited resources to meet sustainability targets. GSE fuels an unstoppable determination to restore nature's delicate balance, fostering a harmonious relationship between humanity and the nurturing planet. Those who embody this belief become environmental guardians, taking resolute actions that pave the way for a sustainable ecological renaissance. In their capable hands, the fate of the natural world finds its most dedicated protectors (Chen et al., 2015; Yusliza et al., 2020). Guo et al. (2019) further emphasize that GSE is a fundamental form of self-awareness that shapes an individual's perception of their ability to drive environmental change. This self-awareness guides actions and strengthens determination, empowering people to overcome limitations and work towards sustainability. GSE is a powerful force for self-actualization, igniting the passion to preserve nature's delicate balance.

Moreover, the literature reveals that GSE is often utilized as a moderating and mediating variable (Guo et al., 2019; Sh. Ahmad et al., 2022; Tashiro, 2022), while recent studies position it as an independent variable (Yusliza et al., 2020, 2021). This study employs GSE as an independent variable to understand how it drives participation in river cleaning initiatives. Huang (2016), Pradhan et al. (2020) and Yusliza et al. (2021) assert that individuals with high GSE possess confidence in their ability to control motivations, behaviors, and social environments. Consequently, those with elevated GSE are more likely to strive towards cleaner rivers by engaging in cleaning initiatives, transcending prior conditions. Thus, it is possible to hypothesize that:

*H1. GSE has a positive relationship with the intention to participate in the river cleaning initiative*

*Green Trust (GT)*

The term ‘Green Trust’ originates from the word ‘trust’, which conveys the belief that a party can be relied upon and depended on because they do not manipulate and firmly uphold their promises (Chen et al., 2015). Chen (2010) defined trust as one's willingness to accept vulnerability based on positive behavioral expectations towards another party and their intentions. Trust exists based on three factors: ability, integrity, and benevolence (Chen, 2010; Chen et al., 2015; Chen & Chang, 2012, 2013). Wasaya et al. (2021) stated that trust is

grounded in three critical elements with similar terms: credibility, validity, and benevolence. Thus, trust in a party arises from the willingness to be vulnerable due to their integrity, benevolence, and capability to undertake actions (Chen, 2010; Chen & Chang, 2013; Lal et al., 2017). As for Green Trust, Chen (2010) defines it as the willingness to depend on a product or service based on the belief or expectation that it possesses credibility, benevolence, and capability in delivering environmental performance impact. In this study's context, when an individual has high confidence in a service or initiative's ability to reduce environmental pollution, particularly river pollution, that person will develop trust to continue engaging with that initiative. GT represents a profound belief that the endeavor will uphold its promise of environmental stewardship, fostering an unwavering commitment to contribute towards a cleaner, more sustainable world.

According to Sh. Ahmad et al. (2022), trust is a determinant of commitment to a relationship. This is because trust is an influential driver for individuals to engage with green movements. Previous studies indicate that GT positively correlates with and influences one's desire and behavior to participate in green initiatives, such as purchasing green products, exhibiting pro-environmental conduct, and selecting services that reduce environmental impact (Chen et al., 2015; Chen et al., 2015; Chen & Chang, 2012, 2013; Guerreiro & Pacheco, 2021). Through GT, individuals are more inclined to sustain their confidence and belief in the green movement they undertake for an extended period, deriving greater satisfaction from their choice (Chen & Chang, 2012, 2013; Guerreiro & Pacheco, 2021). According to Chen, Lin, et al. (2015), trust exists based on dependence and a sense of goodwill. Dependence refers to the level of confidence in someone's words and behaviors. Goodwill pertains to mutually beneficial goals and welfare. They assert that trust helps reduce an individual's vulnerability and apprehensions. However, trust must be cultivated through information and knowledge about the offered product or service (Lal et al., 2017). GT can be nurtured within individuals when they obtain sufficient information about the intended green initiative. Knowledge about the objectives, application, and benefits indirectly provides them with understanding. Consequently, this fosters trust within them to commit to the green movement they wish to participate in. GT represents an unshakable belief that the endeavor aligns with their values and will deliver on its environmental promises.

Past studies have frequently utilized GT in researching green marketing strategies (Chen, 2010; Chen et al., 2015; Chuah et al., 2020; Sh. Ahmad et al., 2022; Wasaya et al., 2021). The focus lies on promoting and marketing an organization's or company's products, services, and brands, with studies aiming to increase consumer demand for green offerings. Additionally, GT is often employed as a moderator and mediator (Chen, 2010; Chuah et al., 2020) to investigate changes in buyer’s behavior or purchase intentions. Few researchers have used GT as a predictor of consumer demand (Sh. Ahmad et al., 2022; Wasaya et al., 2021). Hence, this study utilizes GT as a predictor or independent variable in a different context, namely individual behavior to participate in river cleaning initiatives. Sh. Ahmad et al. (2022) found that GT drives one's desire to join green movement activities. In this study's context, when individuals have high confidence in a service's ability to reduce environmental pollution, particularly river pollution, they will continue engaging with that initiative. Those with elevated GT possess a keen desire to participate in river cleanups, believing such initiatives will enhance river cleanliness and mitigate pollution. Therefore, it is possible to hypothesize that:

*H2. GT has a positive relationship with the intention to participate in the river cleaning initiative*

*Fundamental theories*

This study employs two theories to explain the relationships between predictors and the dependent variable. Self-determination Theory (SDT) is employed to elucidate the link between green self-efficacy (GSE) and the intention to participate in river cleaning initiatives. Additionally, Self-perception Theory (SPT) also adopted to understand the connection between green trust (GT) and the same dependent variable.

Diverging from the well-trodden theoretical paths of Guo et al. (2019), Okumah et al. (2020), Paswan et al. (2017), Yusliza et al. (2020, 2021), this study unleashes the underutilized potential of SDT to illuminate the nexus between GSE and the intention to participate in river cleaning initiatives. While SDT has been less applied in environmental contexts (Darner, 2007, 2009, 2014; Yusliza et al., 2020), its focus on intrinsic motivation and psychological needs offers a fresh lens through which to view the drivers of pro-environmental engagement. By embracing this seldom-explored theoretical paradigm, this research endeavors to unearth novel insights into the psychological forces that catalyze ecological preservation efforts.

The self-determination theory (SDT) posits that individuals are intrinsically motivated to engage in activities when they experience a sense of autonomy, competence, and relatedness (Darner, 2014; Deci & Ryan, 1985). In the context of this study, SDT is pertinent because it suggests that individuals may voluntarily participate in river cleaning initiatives, driven by an inherent love for the environment and a desire to act without external monitoring (Darner, 2014; Ryan & Deci, 2002). Furthermore, SDT highlights the positive impact on pro-environmental behavior, as individuals derive satisfaction from such actions and experience guilt when they fail to engage (Darner, 2007; Deci & Ryan, 2008). For those with GSE, SDT fosters an intrinsic awareness of their ability to complete environmental tasks based on their own competencies when participating in river cleanup initiatives (Darner, 2009; Quach et al., 2020).

Next is the Self-perception Theory (SPT), introduced by Daryl Bem in 1972, to explain the relationship between GT and the intention to participate in river cleaning initiatives. The theory posits that individuals draw inferences about their attitudes and beliefs based on observing their past behaviors (Arbuthnot et al., 1976; Lacasse, 2015). According to this perspective, one's prior experiences shape attitudes (Lacasse, 2015). SPT has been widely applied in consumer behavior research, particularly in the context of green product selection and perceptions (Cornelissen et al., 2008; Kamalanon et al., 2022), as well as in influencing attitudes toward environmental issues (Arbuthnot et al., 1976; Lacasse, 2015; Xiong et al., 2022). In this study, SPT suggests that individuals with GT will form positive attitudes towards participating in river cleaning initiatives based on their past engagement in such activities (Arbuthnot et al., 1976; Cornelissen et al., 2008), believing that these efforts contribute to reducing pollution and improving river cleanliness. Notably, this study departs from previous research by employing GT within the context of human behavior in river cleaning initiatives, supported by the self-perception theoretical framework.

## Study method

According to Shukla (2020) sampling is the process of selecting several elements from the population to form a conclusion about that population. The method of determining the sample size is based on the statistical formula recommended by Krejcie & Morgan, (1970) as follows:

$$n = \frac{x^2 NP(1-P)}{d^2(N-1) + x^2 P(1-P)}$$

Note: n = required sample size; $x^2$ = chi-square for specified confidence level at 1 degree of freedom (1.96 for 95% of confidence level); N = population size; P = population portion (assumed to be 0.5 since this would provide the maximum sample size); $d^2$ = desired margin of error (0.05)

Based on the above formula, the sample size required for this study is 293. This sample number represents the study population of 1,220 small boat operators in the Klang and Port Klang districts. However, the sample taken is above the estimated minimum value. A self-administered questionnaire was used to conduct a survey. A sample of 350 respondents from the Port Klang Area Fishermen's Association community, namely Pengkalan Nelayan Kampung Sg. Sireh residing downstream of the Klang River (refer to Figure 1) and Selangor Recreational Boat Association (PBRS) members who use the Klang River as their main route to the ocean were randomly selected.

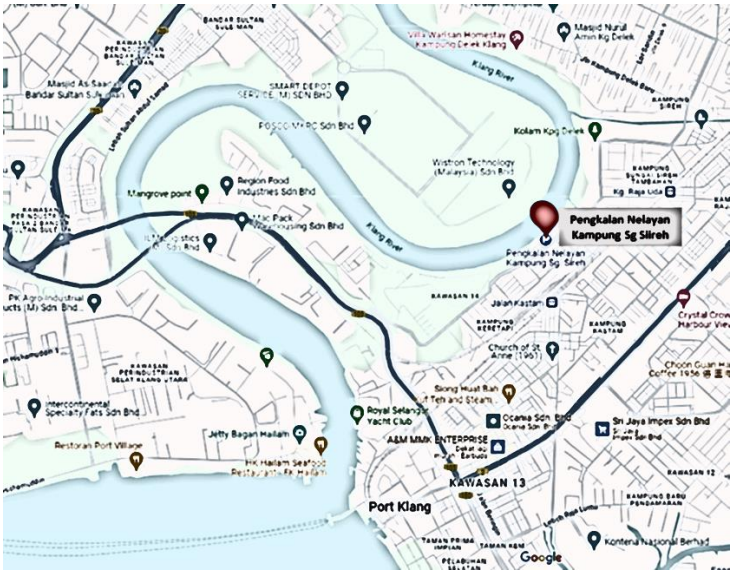


**Figure 1.** Downstream of Klang River (google.com/maps)

The questionnaire was divided into four sections: demographics, self-efficacy assessment in addressing river pollution issues, measurement of individual trust levels towards river cleaning initiatives, and measurement of availability, ability, and time allocation for participating in river cleaning initiatives. The questionnaire employed a Likert scale with response options ranging from “1 - Strongly Disagree” to “5 - Strongly Agree”.

The findings of the study were analyzed using SPSS version 21.0. It revealed that respondents had difficulties understanding the questionnaire's requirements despite clear instructions. Some respondents required assistance due to low literacy levels, necessitating the questionnaire to be read aloud and their responses recorded. Several items from the GSE and Intention to participate in river cleaning initiatives constructs were excluded due to semantic redundancy. The measurements of the constructs are described in Table 2.

**Table 2.** Measurements constructs of the variables

| Variable | Description | Item |
|---|---|---|
| **GSE** (Chen et al. 2015) | To measure the level of self-efficacy in dealing with the problem of river pollution. | a. I am efficient in carrying out the task of river preservation effectively.<br>b. I am able to perform the task of river preservation effectively.<br>c. I am able to find a creative |

| | | |
|---|---|---|
| | | solution to deal with the problem of river pollution. |
| **GT** (Chen, 2010) | Measurement of an individual's level of trust in river cleaning initiatives. | a. I feel that this river cleaning initiative is generally reliable.<br>b. Generally, I feel that this river cleaning initiative is credible because the performance of the river cleanliness is getting better.<br>c. I feel that this river cleaning initiative is generally trustworthy.<br>d. The aim of this river cleaning initiative meets my expectations.<br>e. The river cleaning initiative implemented shows a high commitment in achieving its sustainability. |
| **Intention to Participate** (Kroneman et al., 2018) | To measure the availability, ability, and time that an individual can allocate to involve himself in river cleaning initiatives. | a. I would like to give my opinion as an improvement to the river cleaning initiative.<br>b. I have enough experience to participate in this river cleaning initiative.<br>c. I am willing to spend time to participate in this river cleaning initiative. |

## Results and Discussion

*Respondent demography profile*

From 350 questionnaires distributed, only 300 were returned. This is because some of the respondents were unavailable and outside of the area during the data collection implementation. However, the response rate of 85.7% (n = 300) that has been returned is acceptable for this study as it is equivalent to Alias & Amin, (2019) study which has 373 respondents. In addition, the response rate of this study is also better compared to the 68.33% (n = 120) response rate by Husin et al., (2021) and has a larger number of respondents than Husin et al., (2021) with only 82 respondents. These three previous studies have the same research context as this study, which is the sustainability of river conservation. Table 3 shows the profile of the respondents for this study. The table shows that all respondents were male (100%). The majority of respondents were in the age category of 41 – 50 years and above (43.7%), had a school-level education (79.7%), were self-employed (48%), earned a monthly income of RM3,000 and below (58.7%), and resided in the Port Klang area (51.7%).

**Table 3.** Respondent demography profile

| Category | Number of respondent (n) | Percentage (%) |
|---|---|---|
| Gender | | |
| • Male | 300 | 100 |
| • Female | 0 | 0 |
| Age | | |
| • 18 – 30 | 48 | 16 |
| • 31 – 40 | 75 | 25 |

| | | |
|---|---|---|
| • 41 – 50 | 131 | 43.7 |
| • 51 years and above | 146 | 15.3 |
| Education level | | |
| • None | 18 | 6 |
| • School | 239 | 79.7 |
| • *Mean missing value* | 1 | 0.3 |
| • College/ Institute | 36 | 12 |
| • University | 6 | 2 |
| Employment | | |
| • Not working | 11 | 3.7 |
| • Pensioner | 69 | 23 |
| • Self-employed | 144 | 48 |
| • NGO | 6 | 2 |
| • Private company | 68 | 22.7 |
| • Government servant | 2 | 0.7 |
| Income | | |
| • RM3,000 below | 176 | 58.7 |
| • Mean missing value | 1 | 0.3 |
| • RM3,100 – RM5,000 | 100 | 33.3 |
| • RM5,100 – RM10,000 | 22 | 7.3 |
| • Mean missing value | 1 | 0.3 |
| Residence | | |
| • Klang | 144 | 48 |
| • Shah Alam | 0 | 0 |
| • Subang Jaya | 0 | 0 |
| • Petaling Jaya | 1 | 0.3 |
| • Lain-lain: Pelabuhan Klang | 155 | 51.7 |

*Reliability and validity analysis*

The Cronbach's Alpha value is used to assess the reliability and validity of each construct in the questionnaire. According to Asbulah et al. (2018), a Cronbach's Alpha value of 0.9 – 1.0 is considered very good and effective with a high level of consistency, while a score of 0.7 – 0.8 is considered good and acceptable, and a score of 0.6 – 0.7 is considered acceptable. Table 4 shows the Cronbach's Alpha scores for each construct, and it was found that GT variable construct obtained a very good and effective score with a high level of consistency. Meanwhile, for the variable constructs GSE and Intention to participate in river cleaning initiatives, the scores shown were good and acceptable.

**Table 4.** Reliability and validity results

| Variables | Cronbach Alpha (α) |
|---|---|
| **GSE – 3/5 item** (Chen et al. 2015) | .861 |
| **GT – 5 item** (Chen, 2010) | .919 |
| **Intention to Participate – 3/5 item** (Kroneman et al., 2018) | .765 |

*Pearson correlation analysis*

The Pearson correlation analysis of the variables was also tested. According to Schober et al. (2018), the Pearson correlation coefficient have different degrees of strength to be interpreted. The value of 0.00 – 0.01 (negligible correlation), 0.10 – 0.39 (weak correlation), 0.40 – 0.69

(moderate correlation), 0.70 – 0.89 (strong correlation), and 0.90 – 1.00 very strong correlation). GSE was found to have a moderately positive and statistically significant correlation with intention to participate in river cleaning initiatives ($r$ = .685, p = 0.00). Hence, H1 was supported. This indicates that a high level of GSE would lead to a high intention to participate in river-cleaning initiatives. Using Self-Determination Theory (SDT), it is evident that individuals with GSE can leverage their abilities to engage in river cleaning initiatives. According to SDT, individuals are motivated to achieve goals when their basic needs for competence, autonomy, and social connection are met (Darner, 2014; Sellers et al., 2013). It is in line with previous studies from different contexts such as the findings of Sh. Ahmad et al., (2022) who found that GSE motivates environmental action and has a positive relationship with green purchasing behavior. Meanwhile, Yusliza et al., (2021) also stated that individuals with GSE are able to reduce the impact on the environment with their positive attitude and behavior towards the environment.

Moreover, the Pearson correlation between GT and intention to participate in river cleaning initiatives was also moderately positive and statistically significant ($r$ = .452, p = 0.00). Hence, H2 was supported. This shows that a high level of GT would also lead to a high intention to participate in river cleaning initiatives. It shows that applying Self-Perception Theory (SPT) to individuals with GT shapes their attitude to participate in river cleaning initiatives, as they have previously participated and believe in its effectiveness in reducing pollution and improving river cleanliness (Arbuthnot et al., 1976; Cornelissen et al., 2008; Oturai et al., 2022). This is in line with the findings of previous studies that found that GT has a significant positive relationship with green purchasing behavior intentions (Hashish et al., 2022; Sh. Ahmad et al., 2022). Furthermore, Wasaya et al., (2021) has proven GT predicts green purchasing behavior intention, as study findings show that consumers perceive energy-saving green products as higher quality, thereby increasing their intention to buy them (refer to Table 5).

**Table 5.** Pearson correlation results

| | GSE | GT | Intention to Participate |
|---|---|---|---|
| **GSE** | 1 | | .685** |
| **GT** | | 1 | .452** |
| **Intention to Participate** | .685** | .452** | 1 |

**Correlation is significant at the 0.01 level (2-tailed)

## Study implication

This study bridges the research gap on the pivotal role of general public in implementing sustainable river cleanup initiatives by integrating structured and unstructured methods. Identifying the requisite human behavior to foster the intention to participate in river cleaning is vital for encouraging continuous participation. The study elucidates the shared human responsibility in realizing such initiatives. However, not all human behavior types examined bear equal impact across various environmental improvement initiatives.

Notably, the study contributes to developing human behavior change theories, namely Self-Determination Theory (SDT) and Self-Perception Theory (SPT), by extending their conceptual scope to the environmental context. SDT explains individuals with Green Self-efficacy (GSE), while SPT elucidates those with Green Trust (GT). The findings revealed a positive relationship between these predictors and the intention to participate in river cleaning initiatives, underscoring the essential role of behavioral and intrinsic human changes in fostering such intentions.

Moreover, the study's utilization of GSE and GT as predictors contributes to the body of knowledge, as their application has been highly concentrated in promoting and marketing green products and services in prior studies. However, this study extends their application to the context of river cleaning initiatives, substantiated by the high values of Cronbach's alpha for GSE (0.861) and GT (0.919) and their positive association to participate in river cleaning initiatives.

Furthermore, the study offers practical implications for practitioners in the environmental sector, including local authorities, government agencies, corporate bodies, non-governmental organizations, academics, and particularly the local community. The comprehensive findings raise awareness among various stakeholders about their collaborative role in achieving sustainable river management. Consequently, this study demonstrates the crucial general public involvement in implementing effective and ongoing river cleaning initiatives.

## Conclusion

In conclusion, integrating river cleaning initiatives by combining structural and non-structural measures has shown more sustainable effectiveness than focusing on just one of them. This is because both methods involve human functions as key factors and are crucial for effective and efficient implementation. Various joint ventures and initiatives have been carried out by the Federal administration, State administration, Local Authorities, Government agencies in collaboration with Corporate Bodies, Non-Government Bodies, and Academic Institutions to implement structural and non-structural river cleaning initiatives. The need for this collaboration highlights the importance of raising awareness at every level of society to create an intention to participate in these initiatives, whether structural or non-structural measures. This study addresses the current issue of combating floating debris pollution at Klang River by examining human behavior such as GSE, and GT, which all contribute to the intention to participate in river cleaning initiatives.

Overall, this study has successfully answered all the research questions and hypotheses. The study results have accepted the hypothesis that GSE and GT have a positive relationship with the intention to participate in river cleaning initiatives.

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