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Assessing the influence of pro-environmental behaviour, green self-efficacy and green trust on community participation in Klang River cleaning initiatives

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Abstract

The Klang River is one of the most polluted urban rivers in Malaysia, largely due to mismanaged solid waste, low public awareness and limited community engagement in non-structural river rehabilitation initiatives. This study examines the influence of pro-environmental behaviour (PEB), green self-efficacy (GSE) and green trust (GT) on the intention to participate in river cleaning activities among small boat operators who depend directly on the river for their livelihoods. Guided by Self-Determination Theory and Self-Perception Theory, a quantitative survey was conducted involving 267 respondents and the data were analysed using Partial Least Squares Structural Equation Modelling (PLS-SEM). The findings reveal that PEB and GSE significantly and positively influence participation intention, indicating that individuals who possess strong environmental values and a high sense of personal capability are more likely to engage in river-cleaning initiatives. In contrast, GT demonstrates a weaker and less consistent effect, suggesting that trust in environmental programmes alone is insufficient to motivate active participation without a corresponding sense of agency and competence. The results further indicate that participation is driven more by intrinsic motivation and direct livelihood dependence on the river than by institutional confidence or external incentives. These findings highlight the importance of strengthening environmental self-efficacy and internalised pro-environmental values within riverine communities to sustain long-term involvement in river rehabilitation. The study contributes to river basin management and community-based conservation literature by emphasising that effective river restoration requires not only structural interventions but also the empowerment of local stakeholders through awareness, skills development and participatory governance.

Keywords: Green self-efficacy, green trust, intention to participate**,** pro-environmental behaviour, time bank

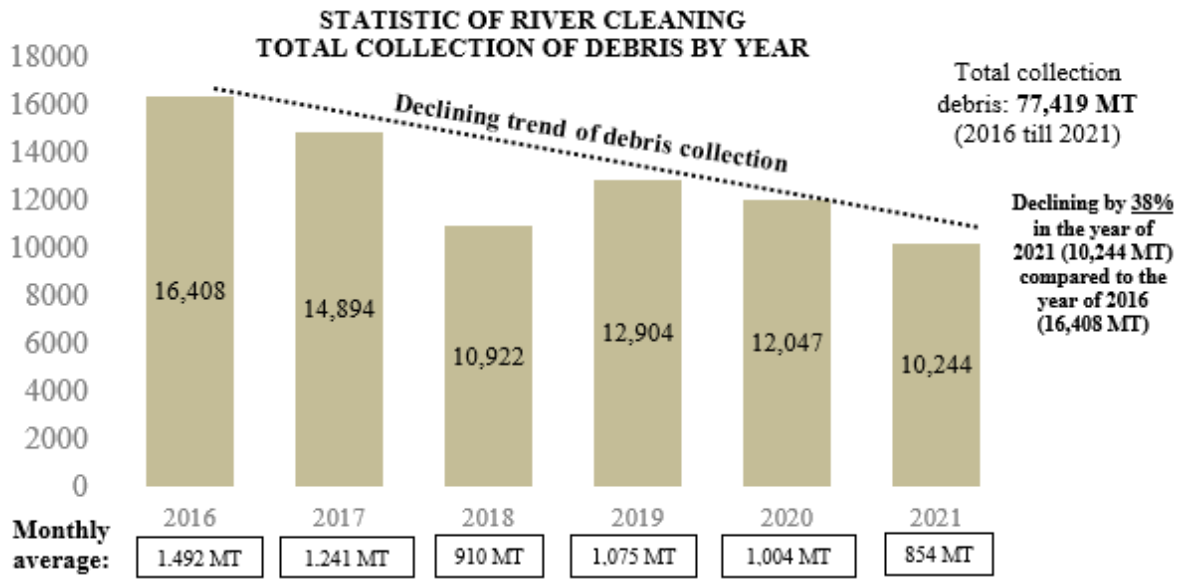
Introduction

The Klang River, which flows through densely populated urban areas in Selangor and Kuala Lumpur, is one of the most polluted rivers in Malaysia and among the major contributors to ocean-bound plastic waste. This issue stems largely from inadequate waste management, low

public environmental awareness and limited community involvement in river stewardship. Mismanaged plastic waste has become a critical environmental concern, contributing substantially to riverine and marine pollution (Azizah et al., 2020; Meijer et al., 2021). Malaysia currently ranks third among the ten countries most responsible for global riverine plastic emissions, releasing approximately 0.073 million metric tons of waste annually into the oceans (Meijer et al., 2021; Sahabat Alam Malaysia, 2021). These figures highlight the urgent need for more effective and sustainable river management strategies.

Landasan Lumayan Sdn. Bhd. (LLSB), a subsidiary of the Selangor State Government under the Selangor Maritime Gateway (SMG) Project, has been tasked with cleaning and rehabilitating the Klang River along its 56-kilometre stretch. Despite continuous efforts through both structural (technical) and non-structural (community-based) approaches, the river's condition remains unsatisfactory (Landasan Lumayan Sdn Bhd, 2022). While technical interventions such as debris traps and waste collection systems are in place, behavioural and awareness-based initiatives have not yet achieved significant community engagement.

Figure 1 illustrates the volume of debris collected and the number of awareness programmes conducted from 2016 to 2021. Although these programmes increased public visibility, they did not result in sustained behavioural change. According to previous research, successful river restoration requires both technological measures and continuous human participation through community-driven initiatives (Forgie et al., 2019; Ismail & Salim, 2013; Weng, 2005). The inclusion of local communities is especially critical in developing countries, where enforcement and infrastructure alone are often insufficient to ensure sustainable environmental outcomes.



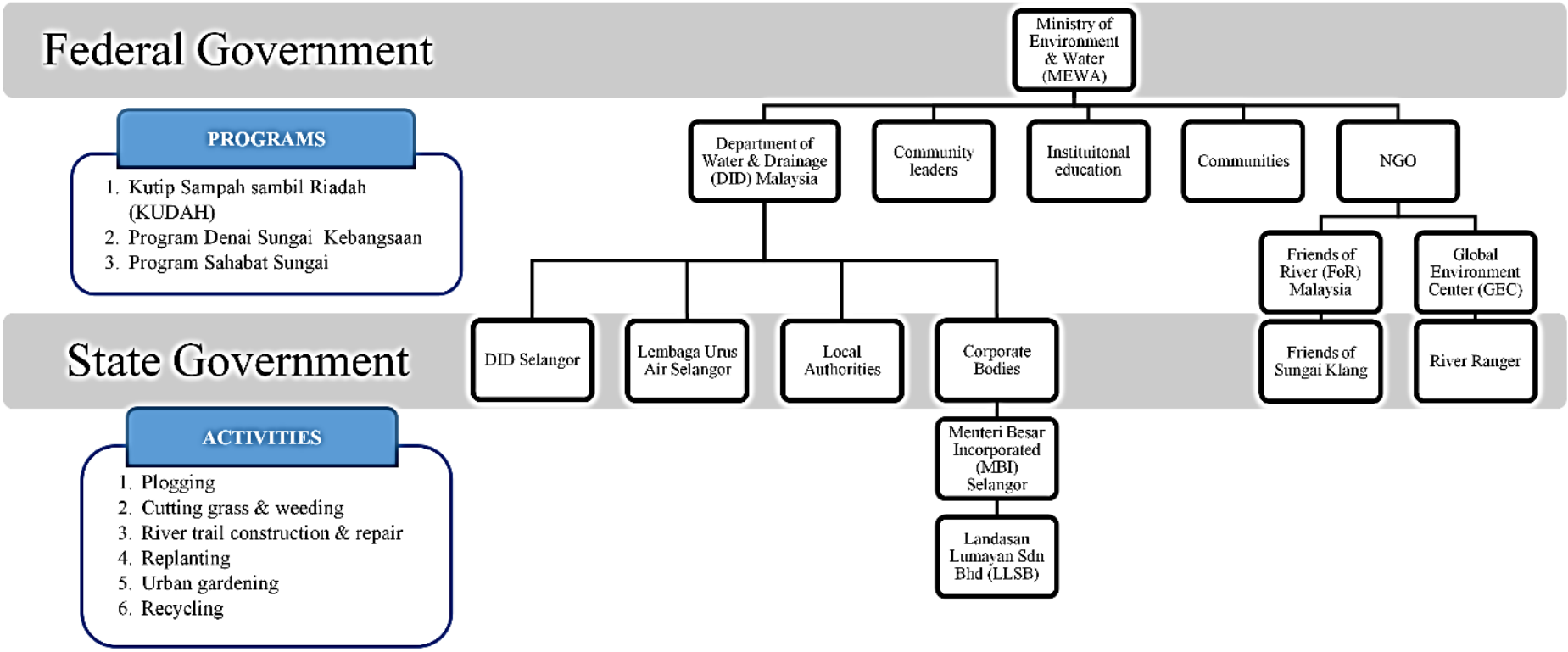
Year	Environmental awareness programs
2016	Volunteering of river patrol unit (supervising river trail).
2017	Volunteering of river patrol unit (supervising river trail).
2018	• Volunteering of river patrol unit (supervising river trail). • Townhall.
2019	• River tributary cleaning activities. • Beautification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

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

Source: Landasan Lumayan Sdn Bhd, 2022

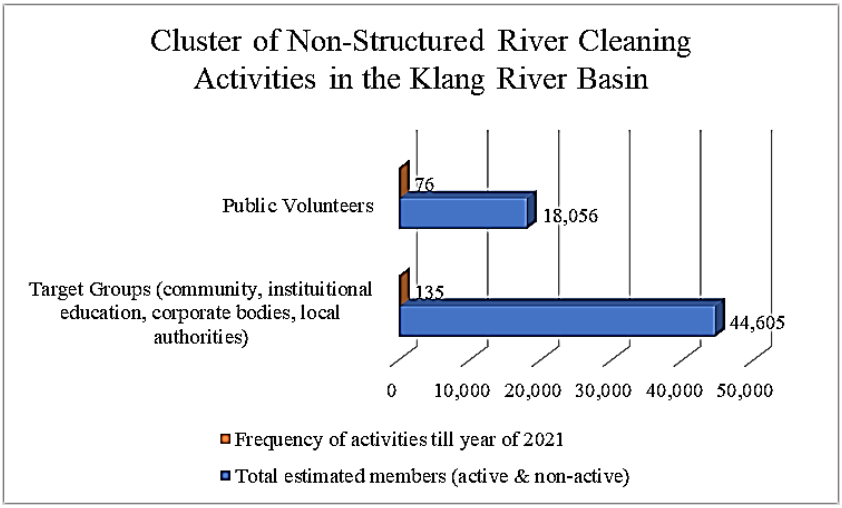
Figure 1. Total debris collection and environmental awareness programs

Figure 2 presents examples of non-structured river-cleaning activities along the Klang River Basin, jointly organized by the Ministry of Environment and Water (MEWA) which is currently known as the Ministry of Natural Resources and Environmental Sustainability (NRES), the Department of Irrigation and Drainage (DID) and non-governmental organizations such as Friends of River Malaysia (FoRM) and the Global Environment Centre (GEC). These collaborative efforts demonstrate the potential of community-based participation in complementing institutional initiatives. However, the frequency and consistency of participation remain low, with awareness and motivation emerging as key barriers. Additional data obtained from GEC (2022), summarised in Figure 3, further indicate that participation from both volunteer groups and target communities remains limited despite the presence of 18,056 registered volunteers and 44,605 active stakeholders. This evidence suggests that public awareness and engagement levels are still inadequate to achieve sustainable outcomes.



Source; Ghani, 2021; Global Environment Center, 2022; Ujang et al., 2021

Figure 2. Collaboration of non-structured river cleaning programme and activities at Klang River Basi



Source: Global Environment Center, 2022

Figure 3. Non-structured river cleaning activities in Klang River Basin

In line with Malaysia's sustainability agenda, active public participation and behavioural change are crucial in addressing the persistent pollution problem. Studies have shown that pro-environmental behaviour and self-efficacy significantly influence individuals' willingness to engage in environmental conservation (Utomo et al., 2023; Yusliza et al., 2020). Yet, the role of motivational factors particularly intrinsic motivation and perceived trust in environmental initiatives remains underexplored in the context of river cleaning.

Therefore, this study seeks to examine how pro-environmental behaviour (PEB), green self-efficacy (GSE) and green trust (GT) influence the intention to participate in river-cleaning initiatives among small boat operators along the Klang River. Additionally, it explores the moderating role of the Time Bank as a mechanism to enhance engagement through community reciprocity. By focusing on non-structured, volunteer-based participation, this study aims to provide new insights into the psychological and social dynamics that underpin effective river conservation in Malaysia.

Literature review

Intention to participate in river cleaning initiatives

The intention to participate in river cleaning initiatives refers to an individual's internal motivation or willingness to be involved in activities aimed at environmental restoration. In this study, it is defined as the individual's expressed or felt willingness to participate in river cleaning activities (Chen & Gao, 2021). Intention is a crucial precursor to behaviour, as participation rarely occurs without it (Zhang et al., 2021). Prior research highlights that effective environmental conservation depends on sustained community participation (Ahmed et al., 2020; Ramadan et al., 2016).

Both internal and external factors influence individuals' willingness to participate in environmental initiatives (Han et al., 2019; Okumah et al., 2020). Internal factors include environmental awareness, pro-environmental attitudes, perceived behavioural control and demographic characteristics such as education level (Negash et al., 2021). Education is closely linked to awareness and pro-environmental engagement, as individuals with higher education

levels tend to demonstrate stronger environmental consciousness and are more likely to participate in collective actions such as river-cleaning activities. This is consistent with the findings of Okumah et al. (2020), who emphasised that educational attainment enhances understanding of environmental consequences and fosters a stronger sense of responsibility toward sustainability.

In this study, the focus group comprises small boat operators residing near the Klang River, who depend on the river for their livelihood. Their daily interactions with the river make them key stakeholders in conservation efforts. However, their participation is often driven not solely by environmental awareness but also by economic necessity and self-interest in maintaining a navigable and clean river for work purposes. This aligns with Ahmed et al. (2020), who noted that livelihood dependency can serve as a powerful motivator for pro-environmental behaviour in resource-based communities.

In summary, individuals' intention to participate is shaped by both awareness and livelihood-related motivations. Understanding these dual influences provides a more comprehensive perspective on behavioural engagement in river-cleaning initiatives.

Pro-environmental behaviour (PEB)

Pro-environmental behaviour (PEB) refers to voluntary actions undertaken by individuals to minimise environmental harm and contribute to ecological sustainability (Alzaidi & Iyanna, 2021). Individuals exhibiting strong PEB are more likely to participate in environmental initiatives such as waste separation, recycling and river-cleaning programmes (Amoah & Addoah, 2021).

Grounded in Self-Determination Theory (SDT), PEB is driven primarily by intrinsic motivation where individuals act out of moral obligation, personal values, or environmental identity rather than external incentives (Darner, 2014). Such intrinsic motivation is critical for sustained engagement. In this study, PEB is contextualised among small boat operators whose direct dependence on river conditions exposes them to the environmental and economic consequences of pollution. Hence, their behaviour toward river conservation can be seen as both ecologically and economically motivated. Previous research has highlighted that PEB is positively associated with awareness, knowledge and environmental responsibility (Yusliza et al., 2020). However, studies specifically examining PEB in informal or community-led settings, especially among local river users, remain limited. This study addresses that gap by analysing PEB within a real-world, livelihood-based context. Thus, it is hypothesised that:

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

Green self-efficacy (GSE)

Green self-efficacy (GSE) refers to an individual's confidence in their ability to perform environmentally responsible actions effectively (Sh. Ahmad et al., 2022; Tashiro, 2022). GSE influences a person's persistence and resilience in engaging with environmental tasks, even under constraints (Yusliza et al., 2021).

Past studies have shown that individuals with high GSE are more inclined to translate environmental knowledge and awareness into concrete actions (Ahmad et al., 2021; Guo et al., 2019). For instance, Yusliza et al. (2020) demonstrated that employees with stronger environmental self-efficacy were more proactive in workplace sustainability practices, while Guo et al. (2019) found that GSE mediates the relationship between moral responsibility and

green innovation. Similarly, Alzaidi and Iyanna (2021) argued that individuals with confidence in their environmental competence are more consistent in maintaining eco-friendly behaviours.

In the context of community-based environmental initiatives, GSE plays a vital role in sustaining participation, as confidence and perceived control often determine whether individuals act on their intentions. This is particularly relevant to non-structured volunteer programmes, where formal supervision is minimal. For participants such as small boat operators who navigate the Klang River daily, higher GSE may translate into consistent behavioural engagement such as voluntarily removing debris, assisting in clean-up activities, or influencing peers to act responsibly. Their daily experience with the river provides direct feedback that reinforces their sense of competence and capability.

From a theoretical standpoint, Self-Determination Theory (SDT) posits that perceived competence is one of the three fundamental psychological needs alongside autonomy and relatedness that sustain intrinsic motivation When individuals believe they are capable of making a meaningful difference, they are more likely to maintain long-term environmental involvement. Therefore, GSE not only strengthens behavioural intention but also contributes to internal motivation, reinforcing the perception that participation in river-cleaning activities is both achievable and personally rewarding. Given these insights, it is hypothesised that:

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

Green trust (GT)

Green trust (GT) refers to an individual's willingness to rely on environmental programmes, organisations, or initiatives based on their perceived integrity, competence and benevolence (Chen et al., 2015; Wasaya et al., 2021). It represents the degree of confidence that individuals place in environmental actors and the belief that their actions will lead to genuine ecological benefits (Chuah et al., 2020). In behavioural models, trust often serves as a psychological antecedent that fosters cooperation and participation, particularly when individuals lack direct control over outcomes.

Previous studies have highlighted that GT positively influences attitudes toward environmental initiatives, purchase intentions and participation in sustainable practices (Y. S. Chen, 2010; Guerreiro & Pacheco, 2021). For instance, Chuah et al. (2020) found that trust in corporate environmental responsibility enhanced customer engagement, while Hashish et al. (2022) confirmed that green perceived quality and satisfaction directly strengthen green trust, which in turn predicts green behavioural intention. These findings suggest that trust acts as a bridge between environmental perception and behavioural response, motivating individuals to align with collective environmental goals.

However, the strength of this relationship often depends on the context of engagement. In formal, institution-led environmental programmes, high GT typically translates into compliance and cooperation because individuals perceive the institutions as capable and accountable. In contrast, in community-led or informal environmental settings such as non-structured river-cleaning activities, trust may play a less dominant role. Participants are often guided more by tangible outcomes and immediate personal relevance than by institutional assurance. For small boat operators who rely on the Klang River for navigation and income, trust in environmental agencies or NGOs may not be the primary driver of participation. Instead, their involvement is more directly influenced by livelihood dependency, personal initiative and peer collaboration.

This situational nuance explains why GT, although conceptually linked to behavioural intention, may not always yield significant predictive effects in contexts where self-motivation

and economic utility outweigh perceived institutional credibility. Such findings have also been observed by Wasaya et al. (2021) and Michel and Hudon (2015), who noted that trust-based engagement mechanisms are less effective in low-awareness or resource-limited settings unless coupled with visible results and consistent communication.

Therefore, while GT remains an essential construct in understanding environmental behaviour, its influence must be interpreted relative to contextual factors such as socioeconomic dependence and the visibility of programme outcomes.

H3. GT has a positive relationship with the intention to participate in the river cleaning initiative.

Time Bank

A Time Bank is a reciprocal exchange system in which individuals provide and receive services using time as a unit of value rather than money (Collom, 2008; Seyfang, 2004). Members earn "time credit" for each hour contributed, which can later be exchanged for other services or saved for future use, or donated (Lasker et al., 2011). Originally designed to strengthen community engagement and mutual support, the concept has evolved into a social innovation that enhances civic participation, community resilience and local sustainability (Ozanne, 2010; Whitham & Clarke, 2016).

In the environmental domain, Time Banks hold potential as behavioural enablers, encouraging voluntary participation in conservation activities through social recognition and reciprocity rather than material incentives. Previous studies have shown that Time Bank participation improves motivation and self-worth, particularly among individuals in low-income or high-dependence communities (Lee et al., 2020; Valek, 2015). However, Michel and Hudon (2015) cautioned that such mechanisms are effective only when participants perceive tangible value and clear benefits from their contributions.

In the context of river-cleaning initiatives, a Time Bank could function as a moderating mechanism that amplifies the relationship between intrinsic motivation (represented by PEB and GSE) and behavioural intention. By offering an avenue for social reward or peer recognition, the Time Bank may strengthen individuals' sense of contribution and reciprocity, thus enhancing their commitment to river conservation. For instance, small boat operators who volunteer their time to clean or monitor the Klang River could earn time credits redeemable for services or community benefits, reinforcing both self-efficacy and collective trust.

Nevertheless, the success of such a system relies on awareness, accessibility and perceived fairness. Without adequate understanding or community engagement, the moderating influence of the Time Bank may be weak or insignificant, as participants may not view it as relevant to their socio-economic reality. Hence, this study investigates the moderating role of the Time Bank in linking psychological and behavioural constructs, thereby contributing to the limited empirical literature exploring the intersection between community currency systems and environmental engagement. Thus, it is hypothesised that:

H4, H5 & H6. Time bank moderates the relationship between PEB, GSE and GT with the intention to participate in river cleaning initiatives.

Fundamental theories

This study is grounded in two psychological theories to explain the behavioural mechanisms influencing individuals' intention to participate in river cleaning initiatives: Self-Determination Theory (SDT) and Self-Perception Theory (SPT). SDT (Deci & Ryan, 1985) explains that

human motivation ranges from extrinsic to intrinsic, where sustained behavioural engagement arises when individuals experience autonomy, competence and relatedness in their actions. It provides a useful foundation for understanding why individuals voluntarily engage in pro-environmental behaviours such as river-cleaning when they perceive personal control and meaningful impact (Darner, 2014; Ryan & Deci, 2002).

Complementing SDT, Self-Perception Theory (SPT) (Bem, 1972) posits that individuals form attitudes and motivations by observing their own past behaviours. Within the environmental context, this theory suggests that individuals who have participated in conservation activities develop stronger intentions to continue such behaviours, as their past actions reinforce their environmental identity and self-perception (Cornelissen et al., 2008; Lacasse, 2015).

Together, SDT and SPT provide a theoretical foundation for this study by explaining how intrinsic motivation (through PEB and GSE) and behavioural reinforcement (through GT and experience) influence individuals' intentions to participate in non-structured river-cleaning initiatives.

Study method

This study investigates the relationships between pro-environmental behaviour (PEB), green self-efficacy (GSE) and green trust (GT) on the intention to participate in river-cleaning initiatives and examines the moderating effect of the Time Bank on these relationships. A quantitative research design was adopted, as this approach enables hypothesis testing and the examination of theoretically derived relationships through statistical analysis (Daniel, 2016).

Sampling and data collection

The population of this study comprised small boat operators residing along the Klang River, representing a group whose daily activities directly depend on river conditions. Using simple random sampling, 350 respondents were selected from members of the Selangor Recreational Boat Association (PBRS) and the Port Klang Area Fishermen's Association (PNKPK). These associations include smaller groups such as Kampung Sungai Delek Fishermen's Association (PNKSD) and Kampung Sungai Sireh Tambahan 2 Fishermen's Association (PNKSST2). The sample size was determined using the formula recommended by (Krejcie & Morgan, 1970):

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

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 minimum required was 293. Out of the 350 distributed questionnaires, 300 were returned, yielding a response rate of approximately 85.7%. After data cleaning and screening for missing values, 267 valid responses were retained for final analysis. This valid sample size satisfied the minimum threshold for PLS-SEM analysis and ensured adequate statistical power for hypothesis testing. The data collection process utilised a self-administered questionnaire distributed to respondents at the PBRS and PNKPK jetty areas.

Prior to the main survey, a pilot study involving 30 respondents was conducted to test the clarity, reliability and applicability of the instrument.

Data screening and analysis

Data were screened for missing values, outliers and normality using SPSS. Demographic data were analysed descriptively, while inferential analysis employed Partial Least Squares Structural Equation Modelling (PLS-SEM) using SmartPLS software. This method was chosen because it supports prediction-oriented research, accommodates complex models and is suitable for smaller samples compared to covariance-based SEM.

The measurement model was evaluated using internal consistency reliability (Cronbach's alpha, composite reliability), convergent validity (average variance extracted, AVE) and discriminant validity (Fornell-Larcker criterion). The structural model was assessed based on path coefficients (β), t-values and p-values to determine the significance of hypothesised relationships. Statistical significance thresholds were adopted following Fassott et al. (2016): *t > 1.28 ($p < 0.10$); **t > 1.65 ($p < 0.05$); ***t > 2.33 ($p < 0.001$).

Based on the interaction term approach in PLS-SEM, the coefficient of determination (R^2) was used to evaluate the explanatory power of the model, while effect size (f^2) and predictive relevance (Q^2) were examined to assess the strength and predictive capability of relationships. Effect size was interpreted based on Zhu et al. (2022) criteria: 0.02 (small), 0.15 (medium) and 0.35 (large). The predictive relevance of the model was further validated through blindfolding procedures to ensure $Q^2 > 0$, indicating satisfactory predictive power.

Results

Descriptive statistics

A total of 267 valid responses were analysed. The majority of respondents were male (83.5%), while females accounted for 16.5%. Most respondents were between 30 – 49 years old (58.4%), with the majority having completed secondary education (61.0%). Approximately 68% of the respondents reported that they use the Klang River daily for work-related activities such as boat operation, fishing and passenger transport.

When asked about their motivation to participate in river-cleaning activities, 42% indicated that they were self-motivated to preserve the river due to their reliance on it for livelihood, while 36% cited community encouragement and the remaining 22% were motivated by external campaigns or incentives. This suggests that intrinsic motivation and livelihood dependency are the dominant factors influencing behavioural engagement among small boat operators.

Measurement model

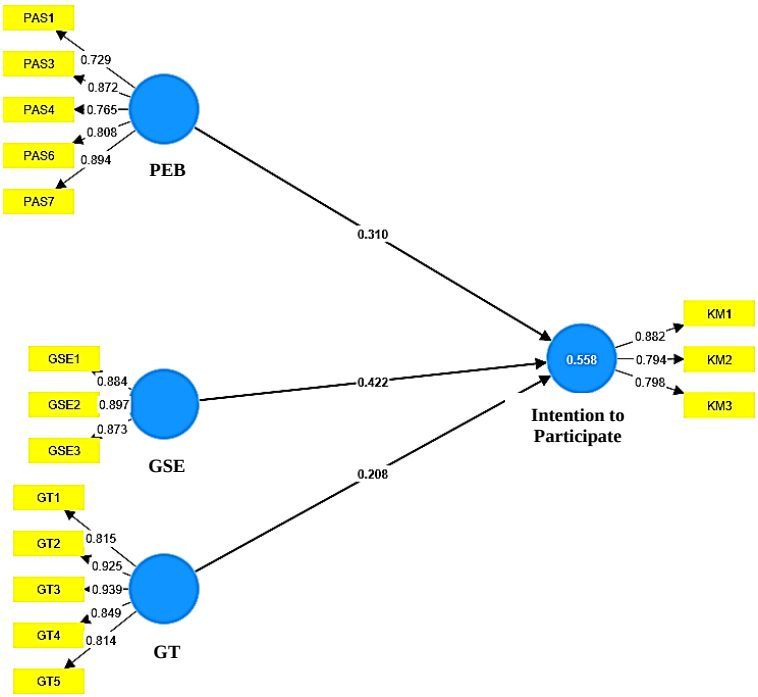
Reliability and validity tests were conducted using PLS-SEM. Table 1 presents the summary of indicator loadings, Cronbach's alpha, composite reliability (CR) and average variance extracted (AVE). All constructs achieved factor loadings above 0.70, Cronbach's alpha and CR values exceeding 0.80 and AVE values above 0.50, confirming good internal consistency and convergent validity (Hair et al., 2019).

Discriminant validity was verified through the Fornell-Larcker criterion, where each construct's square root of AVE exceeded its correlations with other constructs. These results

confirm that the constructs are distinct and measure unique concepts within the research framework.

Structural model and hypothesis testing

The structural model was evaluated to test the hypothesised relationships between variables. Figure 4 illustrates the path coefficients, while Table 2 summarises the results.



Source: Authors' own research

Figure 4. Path coefficient

Table 1. Result Summarization

Hypothesis	Relationship	Beta	t-value	p-values	Result
H1	Pro-environmental behaviour and the intention to participate	0.411	6.85	0.000	Supported
H2	Green self-efficacy and the intention to participate	0.327	5.47	0.000	Supported
H3	Green trust and the intention to participate	0.062	1.11	0.268	Not Supported
H4	Time-bank x Pro-environmental behaviour and the intention to participate	0.038	0.94	0.347	Not Supported
H5	Time-bank x Green self-efficacy and the intention to participate	0.045	1.03	0.304	Not Supported
H6	Time-bank x Green Trust and the intention to participate	0.017	0.41	0.681	Not Supported

Source: Authors' own research

The model explained $R^2 = 0.573$, indicating that PEB, GSE and GT collectively explained 57.3% of the variance in participation intention. Effect size analysis (f^2) showed that PEB (0.238) had a medium effect, GSE (0.174) a small-to-medium effect, while GT (0.011) had a negligible effect. Predictive relevance ($Q^2 = 0.376$) confirmed the model's satisfactory predictive power.

Discussion

The findings reveal that PEB and GSE significantly influence individuals' intention to participate in river-cleaning initiatives, consistent with Self-Determination Theory (Deci & Ryan, 1985) which explains that intrinsic motivation and perceived competence are key psychological factors driving sustainable behavioural engagement. Respondents who display stronger PEB are more likely to volunteer in environmental activities, reflecting actions guided by environmental concern and personal responsibility rather than external incentives.

The significant relationship between GSE and participation intention further indicates that individuals with greater confidence in their environmental abilities tend to sustain their engagement more effectively. This finding aligns with previous research by Guo et al. (2019) and Yusliza et al. (2021), who found that self-efficacy enhances persistence and responsibility in environmental behaviour. Among the Klang River boat operators, higher GSE appears to strengthen the belief that their efforts such as removing debris or promoting awareness can lead to meaningful outcomes, thereby reinforcing participation intention.

In contrast, Green Trust (GT) was not found to be a significant predictor of participation intention. This suggests that participation in informal community-based initiatives may be shaped more by direct, experience-based motivation and livelihood needs than by abstract trust in institutions or environmental programmes. For many small boat operators, engagement arises from their dependence on the river for daily income and navigation rather than perceived credibility of external organisations.

The moderating effect of the Time Bank was also not supported. Limited awareness of the system and uncertainty about its benefits may have reduced its influence on behavioural relationships. Respondents generally viewed participation as a voluntary social responsibility rather than a transaction-based activity, indicating that intrinsic motivation plays a more dominant role.

Overall, these results highlight that intrinsic drivers, specifically pro-environmental values and self-efficacy are more powerful in encouraging community participation than trust-based or reward-oriented mechanisms. The findings reinforce the importance of community empowerment strategies that emphasise environmental awareness, local engagement and personal competence development to strengthen long-term river stewardship.

Conclusion

This study offers valuable insights into the psychological factors influencing individuals' intentions to participate in non-structured river-cleaning initiatives, particularly within the context of small boat operators along the Klang River. The findings affirmed that pro-environmental behaviour and green self-efficacy significantly and positively influence the intention to participate. These results underscore the relevance of Self-Determination Theory (SDT), where intrinsic motivation rooted in competence and environmental responsibility drives meaningful engagement.

However, contrary to prior research, the hypothesized relationship between green trust and participation intention was not supported. Although respondents expressed general

confidence in environmental efforts, this trust alone did not translate into a direct desire to engage, suggesting that belief in the effectiveness of environmental initiatives is insufficient without deeper personal connection or perceived relevance. This challenges the generalizability of Self-Perception Theory (SPT) in contexts involving routine environmental exposure without clear individual benefits.

The study also highlights the limitations of the Time Bank concept as a moderator. Although the system offers a promising framework for incentivising community engagement, the low level of awareness and limited perceived relevance among the target population hindered its effectiveness. These findings suggest that future research should explore the potential of Time Bank as a mediating variable or develop more tailored applications that address the socio-economic realities and behavioural drivers of specific groups.

From a practical standpoint, the results have significant implications for environmental policymakers and practitioners. Interventions should prioritize empowering communities through education, fostering self-efficacy and enhancing intrinsic motivation rather than relying solely on external incentives. Furthermore, future initiatives should consider alternative applications of Time Bank potentially as a mediating mechanism or long-term behavioural reinforcer only after adequate outreach and contextual alignment are ensured.

Ultimately, the sustainability of rivers like the Klang River requires integrative approaches that combine structural measures with community-driven, non-structured initiatives. Through collaboration, environmental stewardship can be cultivated not only as an obligation but as a shared responsibility for future generations.

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