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LITERATURE REVIEW

Comparative Insight into Willingness to Pay for Reducing Plastic Waste Consumption in Different Contexts

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ABSTRACT

PURPOSE: This study aims to analyse the literature on Willingness to Pay (WTP) for plastic waste across various contexts to understand public contributions to plastic waste management through WTP.

DESIGN/METHODOLOGY/APPROACH: This study adopts a systematic literature review (SLR) design to compare and critically assess relevant studies across five key areas of WTP for plastic waste, including specific products, alternatives, pollution, and waste management systems.

FINDINGS: WTP varies across countries and contexts. Developed nations generally exhibit higher WTP and prefer policy instruments, whereas developing nations exhibit lower WTP and favour visible reductions. Key determinants include cost, awareness, socio-economic, and spatial factors; however, much of the literature remains fragmented.

ORIGINALITY/VALUE: This study reviews WTP for plastic waste across contexts by integrating evidence on the determinants, cross-country variations, and critical research gaps.

KEYWORDS: *Environmental Awareness; Plastic Waste; Plastic Waste Management; Sustainability; Willingness to Pay.*

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INTRODUCTION

Due to its dynamic properties and convenience, plastic has deeply reshaped human life, becoming the most widely used material in this century following accelerated production after World War II (Pilapitiya and Ratnayake, 2024). However, this massive use and indiscriminate disposal have created a significant environmental impact (Pilapitiya and Ratnayake, 2024; Walker, 2025). Extensive waste poses serious threats to sustainability (Najahi *et al.*, 2025), and plastic pollution worsens the climate crisis and contributes to biodiversity loss by degrading habitats (Schmidt *et al.*, 2024). Without effective waste reduction and management measures, global food security and biodiversity will be threatened (Najahi *et al.*, 2025).

Plastic waste management presents significant challenges due to the diverse characteristics of plastics, as some are biodegradable while others require multiple processes to degrade (Herdiansyah *et al.*, 2021; Pilapitiya and Ratnayake, 2024). The complex composition of plastics, worsened by poor policies and infrastructure, limits the effectiveness of current management efforts (Anwar *et al.*, 2025).

Furthermore, existing options are not inherently safe. Landfilling risks, the release of toxic chemicals and microplastics into the environment, and poor handling can cause pollution leaks (Walker, 2025). Incineration releases hazardous atmospheric pollutants (Walker, 2025), and plastic materials' short lifespan and low quality hinder their recycling capacity. These combined challenges necessitate the development of more comprehensive and sustainable solutions for plastic waste (Anwar *et al.*, 2025).

The hazardous impacts of plastic waste can be mitigated through preventive actions aligned with Sustainable Development Goals (SDGs) 12 and 14 (Fayshal, 2024). Another crucial preventive approach is the use of payment schemes for plastic waste or products that are likely to become waste, commonly known as "willingness to pay."

Although much previous research has examined willingness to pay (WTP) for plastic waste, the existing findings are fragmented and limited to isolated case studies. These findings are also contradictory across contexts, leading to a lack of understanding of how WTP levels and the determinants that influence WTP vary across countries and contexts. To address this gap, this study is presented.

This study employs a systematic literature review (SLR) to analyse the literature on WTP for plastic waste management across various contexts. This study aims to understand the public's contribution to plastic reduction and management through their WTP, identify the determinants of WTP, compare variations in WTP levels,

and identify unresolved research gaps. This review is conceptually grounded in the literature on WTP, which reflects the interaction among the factors that form the categorisation process.

LITERATURE REVIEW

Willingness to Pay in Environmental Finances

According to the logic of collective action (Mancur Olson's theory), public payments represent collective contributions to the provision of public goods without explicit individual inequalities (Hao, *et al.*, 2024). WTP, as one of the public's payments, is widely used as a measure of the value that individuals assign to goods that they do not directly own and that lack a clear market price. Although WTP is not a perfect method, it is considered the best and most manageable approach for capturing welfare effects in various relevant areas. Regarding these payments, each person has different goals and preferences when acting, so the resulting WTP will vary across individuals (Chen *et al.*, 2020). The resulting WTP can vary widely and is not uniform, extending from the individual to community groups and the "market" (Chapman *et al.*, 2024).

WTP is linked to attitudes, environmental awareness, and behavioural control (Hao *et al.*, 2024). WTP has been widely applied in environmental research, including studies on waste management improvement (Vassanadumrongdee and Kittipongvises, 2018), deposit refund systems (Cheng *et al.*, 2023), and plastic alternatives in food services (Fischbach *et al.*, 2022). Price consistently emerges as a major factor in decision-making across these studies (Maesano *et al.*, 2025). Society comprises individuals who are highly sensitive to price, so price continues to play an important role in their behaviour (Maesano *et al.*, 2025). Decision-making in this study refers to various issues related to plastic waste.

Plastic Waste and Environmental Challenges

Global plastic production has reached 280 million tonnes in the past 50 years, with a 47% increase over the last 13 years (Maesano *et al.*, 2025). This rapid growth reflects the short life cycle of plastics, leading to an increasing accumulation in the environment (Pilapitiya and Ratnayake, 2024). Plastics degrade slowly and eventually break down into microplastics that spread through air, water, and soil due to their high durability (Utari and Herdiansyah, 2020; Pilapitiya and Ratnayake, 2024). Microplastics are recognised as pollutants that are harmful to health and the environment and act as carriers of other toxic pollutants (Najahi *et al.*, 2025).

Given these challenges, understanding WTP in this context is becoming increasingly important. Although the number of studies examining WTP for plastic waste is increasing, the findings are scattered across various contexts and are not homogeneous. Therefore, a systematic review is needed to synthesise the existing evidence and identify patterns in WTP to support the reduction of plastic waste consumption.

RESEARCH METHODOLOGY

In this study, an SLR was conducted to analyse the general conditions of WTP regarding plastics, plastic waste, and plastic waste management. This approach was used to collect, integrate, critically evaluate, and present findings from various studies. This study relies on secondary data from published literature; therefore, ethical approval was not required, as no primary data collection involving human participants was conducted.

Source and Collection of Data

A literature search was completed in September 2025 using the Scopus database as the primary bibliographic data source. The search query applied was 'willingness to pay' and 'plastic waste' or 'plastic waste management'. The initial screening, supported by the Publish or Perish software, applied specific inclusion criteria, such as studies that had to be published between 2020 and 2025, had to focus on the environmental and economic aspects of the central theme, had to be research articles, reviews, or analyses written in Indonesian or English, and had to address WTP, plastic waste management, environmental impacts, and environmental economics. Articles published before 2020 or lacking sufficient methodological details were excluded from the selection process.

Data Quality

Several quality control measures were implemented to ensure data reliability. Only studies with clearly stated, transparent methodologies published in reputable, indexed journals were included; those lacking sufficient methodological detail were excluded. The reported parameters were standardised to enable accurate cross-study comparisons. All payment amounts were converted to Indonesian rupiah and US dollars to minimise variation arising from currency reporting standards.

Data Analysis

The final stage involved an in-depth analysis of the selected articles to compare WTP across cities and countries and to develop a more comprehensive interpretation of the findings. Following the article selection process and ensuring data quality, structured data extraction was conducted. The analysis was explicitly guided by the research objectives. First, the findings on the determinants of WTP were extracted and grouped into five key areas: specific products, alternatives, pollution, and waste management systems (plastic waste and general solid waste). Second, after the literature had been collected, it was analysed. This phase aimed to organise the collected literature. The collected papers were organised to investigate the following objectives:

- Analysis of WTP determinants, exploring the factors that influence WTP levels. The results of this analysis are intended to identify the most frequently emerging patterns of determinants influencing WTP.
- Analysis of WTP levels to explore how they differ across contexts and countries. This analysis compares various WTP levels to identify patterns.

Third, limitations inherent in previous studies were analysed to identify recurring gaps in the literature. This approach allowed the review to move beyond descriptive summaries and towards a more analytical approach.

RESULTS

Mapping of Articles

The SLR results were obtained following the data collection and analysis processes. The search identified 200 publications, of which 100 were excluded during the initial screening, leaving 50 for eligibility assessment. Finally, 10 studies that were most relevant to the research objectives were included (Figure 1). Data from these studies were analysed across five domains described in the Methods section. The extraction focused on three aspects: WTP determinants, variations across countries and contexts, and research gaps. These aspects were compared to identify patterns. Publication trends show a gradual rise in WTP related to plastic waste and waste management. The selected articles were then reviewed and analysed.

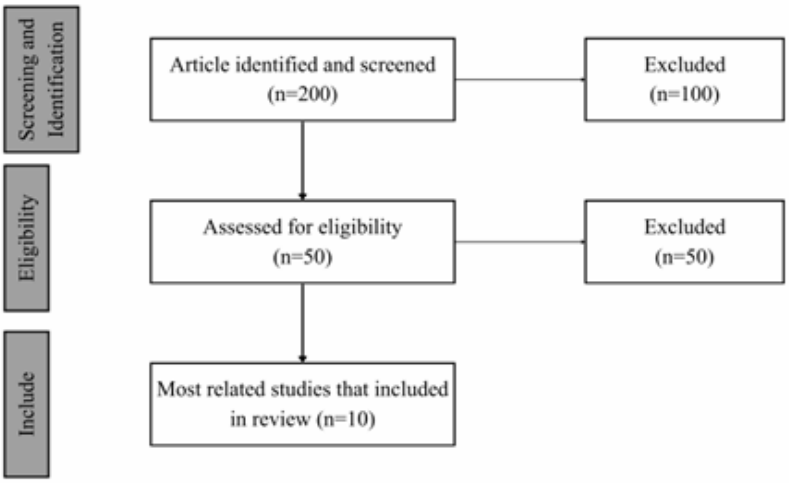

Figure 1: PRISMA flow diagram

Source: Constructed by author

The literature shows a relatively balanced distribution of studies across WTP categories for plastic waste. However, research more often focuses on WTP for general solid waste management (which includes plastic) than on plastic-specific topics. The categories include: (1) WTP for taxes or fees on specific plastic items, (2) WTP for eco-friendly alternatives, (3) WTP for addressing environmental issues related to plastic waste, (4) WTP within organised plastic waste management systems, and (5) WTP for general solid waste management.

Table 1: Review of WTP

No	Researcher	Method	Key Findings
1	Vassanadumrongdee and Kittipongvises (2018)	Questionnaire Surveys	WTP exceeds current waste fees; mistrust and inconvenience limit participation.
2	Cheng *et al.* (2023)	Payment Card and Contingent Valuation Methods: Heckman Two-Step Model	Deposit–refund systems receive higher WTP than price increases.
3	Phan *et al.* (2023)	Choice experiment	Cooperation, policy, awareness, and residence shape preferences.
4	Fischbach *et al.* (2022)	Descriptive Statistics, Regression, and exploratory factor analyses	WTP for plastic alternatives increases with education and environmental concerns.
5	Mohamed *et al.* (2024)	Questionnaire Survey (Contingent Valuation Method)	Age and education influence the WTP for biodegradable bags.

No	Researcher	Method	Key Findings
6	Friedrich, (2022)	Quasi-experimental Study	73% accepted private income tax for plastic damage.
7	Hao *et al.* (2024)	Empirical Analysis	Respondents hold positive WTP for APWM.
8	Hao *et al.* (2024)	Randomised controlled trial	WTP can be increased by targeting normative and control beliefs.
9	Zwicker *et al.* (2021)	Preregistered experimental manipulation	Information and education significantly increase WTP and correct misconceptions.
10	Jati *et al.* (2024)	Multiple regression analysis	The WTP for biodegradable plastic is influenced by sociodemographic factors.

Source: Constructed by author

Comparative Insights into WTP across Plastic Waste Contexts

Based on the findings of various studies, WTP for plastic waste is consistently determined by four main clusters: cost, awareness, socio-economic factors, and spatial dimensions. Regarding cost, previous research shows a contradictory pattern, as some studies report relatively high WTP (Zambrano-Monserrate and Ruano, 2020; Friedrich, 2022), while others report low WTP (Chen *et al.*, 2020; Mohamed *et al.*, 2024; Chapman *et al.*, 2024). High WTP is often associated with strong environmental awareness, in which paying for plastic waste management or related taxes is viewed as a moral and financial contribution to environmental improvement (Zambrano-Monserrate and Ruano, 2020; Friedrich, 2022).

However, indirect benefits, such as lower health insurance costs or more affordable disposal services, are also expected (Friedrich, 2022). In contrast, low WTP is mainly driven by concerns over plastic prices in daily consumption rather than by a lack of environmental concern (Chen *et al.*, 2020; Mohamed *et al.*, 2024). The low price of plastic bags maintains high demand and limits behavioural change, highlighting the need for persuasive education and incentives to support sustainable waste management (Chapman *et al.*, 2024).

Previous studies have shown that variations in WTP are influenced by environmental awareness. Individuals with higher environmental awareness generally demonstrate higher WTP (Vassanadumrongdee and Kittipongvises, 2018; Zambrano-Monserrate and Ruano, 2020; Zwicker *et al.*, 2021; Friedrich, 2022; Fischbach *et al.*, 2022; Mohamed *et al.*, 2024; Hao *et al.*, 2024). This awareness increases concern about the environmental impacts of conventional plastic bags and encourages a

preference for eco-friendlier alternatives (Noor, Matthew, and Puan, 2024). Exposure to environmental education is also associated with a higher probability of WTP compared with that of individuals without such exposure (Zambrano-Monserrate and Ruano, 2020).

However, the influence of awareness is not always linear in relation to WTP, as individuals who feel they have the knowledge and ability to sort and manage waste may think that they do not need additional management services, thus tending to reduce their WTP (Vassanadumrongdee and Kittipongvises, 2018; Hao *et al.*, 2024). However, increasing WTP should be accompanied by education to maintain positive attitudes and prevent misconceptions (Zwicker *et al.*, 2021; Prabawati and Frimawaty, 2025).

Previous literature indicates that socio-demographic factors play a role in the development of WTP. Several studies have confirmed that age, gender, and education level influence the decision to participate (Vassanadumrongdee and Kittipongvises, 2018; Friedrich, 2022; Tyllianakis and Ferrini, 2021; Fischbach *et al.*, 2022; Mohamed *et al.*, 2024; Jati *et al.*, 2024). Younger age groups tend to have higher WTP, indicating an intergenerational gap in attitudes towards environmental issues (Vassanadumrongdee and Kittipongvises, 2018; Jati *et al.*, 2024; Tyllianakis and Ferrini, 2021; Friedrich, 2022; Mohamed *et al.*, 2024). In terms of gender, women have higher intentions and WTP levels than men, which is often associated with higher levels of environmental sensitivity and concern (Vassanadumrongdee and Kittipongvises, 2018; Friedrich, 2022). Studies have shown that individuals with higher levels of education tend to have higher WTP. Lower WTP is more common among lower-income groups, which are often less educated (Noor, Matthew, and Puan, 2024).

Education also operates through environmental knowledge and concern, both of which significantly increase WTP (Fischbach *et al.*, 2022; Jati *et al.*, 2024). More educated respondents evaluate plastic bag prices based on environmental impacts rather than purely economic considerations (Noor, Matthew, and Puan, 2024). This suggests that both formal and non-formal education play an important role in shaping more sustainable WTP preferences (Pramiati, Soesilo, and Agustina, 2024; Auralia *et al.*, 2026).

Although spatial factors emerge as a complement to individual factors identified in the literature as determinants of WTP, their influence appears to be limited. Phan *et al.* (2023) showed that residential areas influence PWM, which is conceptually related to WTP because both reflect behavioural preferences towards waste management. This

suggests that spatial context can shape attitudes and influence WTP. Similarly, Noor, Matthew, and Puan (2024) found that other consumers' behaviour affects plastic bag use, indicating a neighbourhood effect on preferences. Together, these studies show that WTP is shaped not only by individual factors but also by the social and spatial context in which people live.

Variations in WTP levels across contexts

WTP for plastic waste management varies widely across contexts (Table 1). It relates not only to financial instruments but also to behavioural and preventive measures. People are generally more willing to pay when policies are fair, transparent, and environmentally beneficial (Hao *et al.*, 2024; Phan *et al.*, 2023). WTP patterns also depend on the focus of the intervention. Studies targeting specific types of plastic have shown that WTP levels are influenced by perceived environmental risks and the public's level of familiarity with the material (Chapman *et al.*, 2024). This pattern suggests that policies do not solely influence WTP but also how they are designed and perceived by the public.

The monetary values of public WTP exhibit wide variation across countries, intervention types, and valued objects indicating that economic preferences for PWM are highly context-dependent (See Table 2). For example, in China, WTP estimates for policy instruments systematically differ between deposit–refund systems and price escalation systems, whereas values for adaptive plastic waste management schemes are lower. However, other studies report much higher estimates for a general plastic waste management system (Hao *et al.*, 2024), placing China among the countries with the highest WTP levels. Comparatively, developing countries such as Ecuador show lower WTP for plastic pollution reduction efforts (Zambrano-Monserrate and Ruano, 2020), while Indonesia is at an intermediate level for marine plastic pollution mitigation (Tyllianakis and Ferrini, 2021).

A similar pattern is also seen for biodegradable products, where the WTP of Indonesian consumers is relatively comparable to that of Malaysian consumers but still significantly lower than that of consumers in developed countries such as Germany (Fischbach *et al.*, 2022; Jati *et al.*, 2024; Mohamed *et al.*, 2024) (Table 2). Overall, this pattern demonstrates a gradient in economic and perceived environmental value between developing and developed countries, while also indicating that previous WTP literature remains fragmented due to differences in units of analysis, making it difficult to draw standardised comparative conclusions (Syafmaini, Zulharman, and Rismawati, 2025).

Variations in WTP reflect both monetary values and broader public perceptions of environmental issues across multiple domains. Following discussions on waste management and eco-friendly alternatives, this section shifts its focus to environmental pollution. In this context, households in Ecuador are willing to pay for plastic pollution mitigation (Zambrano-Monserrate and Ruano, 2020), while Indonesians are willing to pay an average amount to support such efforts (Tyllianakis and Ferrini, 2021). Consumers are willing to pay a premium for drinking water labelled "microplastic-free" at the individual consumption level due to perceived risks (Maesano *et al.*, 2025). Information strategies have been shown to strengthen public support for plastic waste payment schemes in the agricultural sector (Hao *et al.*, 2024). Collectively, these findings confirm that WTP is a cross-contextual response to the risks of plastic pollution, although its form varies across domains.

The next WTP context concerns product-specific plastics and plastic taxes, for which policy design and personal consumer motivations heavily influence public support for plastic taxes and sustainable packaging. Previous research indicates that most respondents, particularly women and younger groups, tend to favour these fiscal instruments (Friedrich, 2022; Walker *et al.*, 2021). Furthermore, the success of such policies depends not only on the tax rate but also on effective communication and framing strategies.

Table 2: WTP by Region/Country

Region/ Country	WTP Value	WTP value (Rp) (per October 2025)	WTP Value ($/USD) (October 2025)	Context	Source
China	¥307,2-400,5/year	Rp714.777,60-931.863,38/year	$42,93-55,97/year	The plastic waste management system	Hao *et al.* (2024)
Ecuador	$4,90-14,51/year	Rp81.256-Rp 240.453,5/year	$4,88-14,44	Plastic pollution reduction	Zambrano-Monserrate and Juan (2020)
Indonesia	£15/person/year	Rp334906,95/year	$20,12/year	Marine plastic pollution mitigation	Tyllianakis and Ferrini (2021)
Malaysia	RM0,20-0,43/bag	Rp787,32-Rp 1692,75	$0,047-0,10/bag	Biodegradable product (bag)	Mohamed *et al.*, 2024
Surakarta (Indonesia)	Rp2.214/bag	-	$0,13/bag	Biodegradable product (bag)	Jati *et al.* (2024)
Germany	€0.40/meal	Rp7.780,6	$0,47/meal	Plastic alternative	Fischbach *et al.* (2022)

Source: Constructed by author

Findings on WTP for plastic waste lack uniformity. While most studies confirm strong public support and WTP for preventive efforts (Phan *et al.*, 2023), others find lower WTP when costs are perceived as overly burdensome. This divergence can be explained by various factors such as education, income, and age (Cheng *et al.*, 2023; Zeng *et al.*, 2025). Higher education and income often lead to greater acceptance of green product prices, whereas older, low-trust groups show more resistance (Zeng *et al.*, 2025). Residence also influences preferences, with urban residents being more open to eco-friendly policies (Phan *et al.*, 2023). Beyond psychological factors, social interaction mediates the influence of emotions and expectations on payment (Cheng *et al.*, 2023), confirming that social norms and community dynamics influence WTP, rather than a purely rational economic calculation.

Research on WTP for plastic waste is complicated by an attitude–behaviour gap, where positive perceptions contradict actual behaviour. Existing findings remain fragmented and mostly context-specific, limiting the broader understanding of how WTP varies across contexts, policies, and socio-economic conditions. Little research has examined the institutional and policy mechanisms that support WTP, highlighting a gap and the need for further studies on policy environments that enable successful WTP programmes.

THEORETICAL AND PRACTICAL IMPLICATIONS

This study synthesises empirical findings to demonstrate that four key factors drive WTP for plastic waste: cost, awareness, socio-economic factors, and spatial dimensions. These findings refine theories of environmental behaviour and explain differences across research contexts. They also provide practical insights for governments in designing plastic waste policies. WTP is shaped by interconnected factors and differs across contexts, where developing countries tend to prefer visible actions, whereas developed countries favour policy instruments and taxes. Therefore, effective policies must be tailored to each community's socio-economic conditions rather than adopting a one-size-fits-all approach.

This review reveals research gaps arising from fragmented and contradictory findings on WTP determinants across contexts. Future studies should adopt standardised approaches to improve comparability, particularly in measuring WTP levels. Furthermore, the limited focus on spatial factors highlights a promising and necessary direction for further investigation.

CONCLUSIONS

This study contributes by moving beyond isolated WTP estimates. It provides findings showing that a systematic study of WTP for plastic waste yields diverse and complex results across five main research areas. WTP levels vary substantially across contexts, with developed countries generally exhibiting higher WTP and stronger preferences for policy instruments. In comparison, developing countries show lower WTP and a greater preference for visible reductions. Key determinants such as cost, awareness, socio-economic, and spatial factors shape these variations. However, the existing literature remains fragmented and often contradictory, indicating the need for more standardised and comparable approaches to measuring WTP.

Therefore, WTP reflects a complex interaction among individuals, communities, policy, and market dynamics. For countries like Indonesia, increasing WTP requires strategies that provide tangible community benefits such as improved facilities, strengthened recycling, transparent taxes, and deposit-refund schemes, alongside further research to identify the most effective mechanisms to bridge the gap between environmental awareness and action. This study also offers a review of WTP for plastic waste across diverse contexts, bringing together evidence on key determinants, cross-national variations, and gaps in the existing literature.

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