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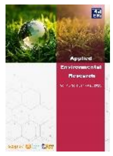

Research Article

Economic Valuation of Individuals' Preferences for Air Quality Improvement in Urban Areas of Bangladesh

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Abstract

Bangladesh is among the most polluted countries in terms of air quality, and prolonged exposure to high pollution levels has serious consequences for public health. This research aims to evaluate respondents' willingness to pay (WTP) for improved air quality via the discrete choice experiment (DCE) technique. The study employs a multinomial logistic regression model to capture the extent of WTP effectively. To carry out the study, a systematic sampling survey was conducted among households (n = 260) in Dhaka and Narayanganj, two of the most polluted cities in Bangladesh. The findings revealed that more than 80% of the respondents were willing to pay for improved air quality. The odds ratios from the model indicate that individuals with higher education, better knowledge of the impacts of air pollution, and those who have experienced airborne diseases are more likely to pay for improved air quality than those without higher education, those with poor knowledge of the impacts of air pollution, and those who have not suffered from airborne diseases over the past year. This study also proposes policy measures to mitigate the significant negative externalities of air pollution on human health.

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Introduction

Air pollution represents a critical global issue because of its detrimental impacts on public health and economic productivity (Clean Air Fund, 2022; Lohwasser et al., 2025; World Health Organization, 2016). In numerous parts of the world, air pollution has emerged as the leading threat to human health. This issue is especially severe in urban areas, where city dwellers increasingly suffer from respiratory and other airborne illnesses caused by rising emissions, contributing to a significant increase in mortality rates (Khuda, 2020). It reduces work efficiency even in service sectors that require less physical effort (Chang et al., 2019). A major contributor to air pollution is particulate matter (PM), which is present in the atmosphere (Nan et al., 2023). Fine particulate matter (PM2.5), consisting of airborne particles smaller than 2.5 micrometres, originates from multiple sources and poses significant health risks (Saha et al., 2025). Exposure to PM2.5 has been found to negatively affect cognitive performance in adults, with the most pronounced impact observed among individuals in their prime working years (La Nauze and Severnini, 2025).

In 2019, 99% of the global population lived in areas where the air quality did not meet the standards set by the World Health Organization (WHO) (World Health Organization, 2024). The WHO reported that approximately 7 million people die every year due to exposure to air pollution (Thangavel et al., 2022). In 2021 alone, air pollution caused 8.1 million deaths worldwide, making it the second leading cause of death, including among children under five. Over 700,000 deaths in this age group are attributed to air pollution, accounting for 15% of all global child fatalities (State of Global Air Report, 2024). Currently, air quality remains a major environmental issue and an ongoing challenge in many urban areas of developing countries (Tantiwat et al., 2021).

Bangladesh, one of the world's fastest-growing economies, is also among the most polluted countries, facing serious health threats from poor air quality that result in thousands of deaths each year (CREA, 2025; Nesan et al., 2025). Air pollution in Bangladesh leads to numerous premature deaths and causes billions of days of illness annually. In 2019 alone, ambient and household PM2.5 pollution was linked to more than 159,000 deaths. The economic burden of these health impacts was estimated at 8.3% of the country's GDP for that year (DoE, 2025). This severe pollution has become the top risk factor for mortality in Bangladesh, reducing average life expectancy by nearly five years (CREA, 2025). Bangladesh's annual average PM2.5 level of 79.9 µg m^{-3} is more than double the national standard of 35 µg m^{-3} and 15 times higher than the WHO guideline of 5 µg m^{-3} making air pollution the top cause of premature deaths and reducing average life expectancy (Nesan et al., 2025). In 2021, air pollution-related chronic obstructive pulmonary disease (COPD) led to 15,000 deaths, while 19,100 children under five died from lower respiratory infections (LRIs) linked to polluted air. Furthermore, more than 40% of ischemic heart disease (IHD) cases in Bangladesh are attributed to air pollution, one of the highest rates globally (State of Global Air Report, 2024). The major contributors to air pollution in the country are emissions from vehicles and industries. Dhaka, the capital and commercial hub, is experiencing this crisis with particular severity (Khuda, 2020). As reported in the air quality life index (AQLI) report (AQLI, 2024), Dhaka has an average AQI of 225, categorized as 'Very Unhealthy', whereas Narayanganj, another densely populated and commercially important city in Bangladesh, records an even higher average AQI of 345, placing it in the 'hazardous' category.

Improvements in air quality bring numerous economic advantages, such as higher gross national income per person and lower healthcare expenses related to illness (Tantiwat et al., 2021). As a result, placing value on environmental goods and services in developing and transitional economies is crucial, especially since rapid economic growth often results in significant environmental degradation (Barbier and Cox, 2003). The long-term cost of environmental degradation can be substantial, particularly when its impact on future generations is considered. This underscores the importance of using economic valuation methods, such as the state preference technique, particularly the discrete choice experiment (DCE) technique (Quah and Tan, 2021; Navrud and Mungatana, 1994; Rakotonarivo et al., 2016).

Several studies using the revealed preference (RP) and stated preference (SP) approaches have explored the economic and health advantages of reducing air pollution. Among these methods, state preference techniques are generally considered the most appropriate for the economic evaluation of air pollution because they can assess both market and nonmarket goods and services (Mariel et al., 2022). The following studies have been conducted worldwide to address air pollution via the DCE technique.

A study in South Delhi used attributes such as premature mortality among children, hospitalization, and price per capita to represent the welfare consequences of exposure to air pollution (Mariel et al., 2022). Similarly, Bartczak et al. (2024) and Huang et al. (2018) incorporate attributes such as premature death, nonfatal morbidity, and morbidity-related indicators and reported that decreases in health risks have a major effect on individual preferences.

The findings in urban China also support that households are willing to pay positively to decrease mortality as well as illness due to air pollution (Huang et al., 2018; Tang et al., 2016). In addition to effects on health, several studies highlight indicators of air quality that are observable and that households directly experience. For example, clean air days and haze days are often used as attributes in research on the preferences of air quality improvement policies in China, with an emphasis on the significance of perceptible changes in the environment in the formation of preferences (Mao et al., 2020; Tang et al., 2016). Reduced visibility days are also used as a nonhealth attribute, and quality-of-life losses are associated with air pollution (Mariel et al., 2022).

Other research studies have taken a wider view, as they include composite air quality indicators and socioeconomic aspects. The Klang Valley case, Malaysia, demonstrated that the preferences of households are dependent not only on the number of sick days and medical spending but also on air pollution indices and personal factors, including income, education, and respiratory symptoms (Sarabdeen et al., 2020). Another study conducted in Korea utilized a choice experiment framework to quantify improvements in fine particulate matter and other environmental stressors, such as water quality and heat waves, in terms of annual house-hold charges as payment vehicles (Kim and Lee, 2022) [27].

In other contributions, a more disaggregated or multilevel approach is used for the valuation of air quality. To illustrate, the willingness to pay (WTP) of improvements against various levels of air quality, such as excellent to severely polluted air quality, is estimated, thus covering the valuation of households to incremental changes in air quality status (Yao et al., 2019). In addition, a multipollutant approach involving attaching importance to both particulate matter (PM2.5 and PM10) and gaseous pollutant (NO_x, SO_x and volatile organic compounds) reduction provides insights into preferences regarding each of these pollutants (Moon et al., 2021).

In terms of methodology, all past research studies emphasize the importance of policy design characteristics such as delays in implementation, policy impacts permanency, and payment mechanisms. Some studies indicate that people attach high importance to the earlier actualization of air quality gains by specifically including policy delay characteristics in the selection spaces (Bartczak et al., 2024; Mao et al., 2023) [22, 23, 28]. The annual costs and alternatives of the status quo are invariably included in all the studies to estimate the welfare-consistent WTP (Bartczak et al., 2024; Huang et al., 2018; Kim and Lee, 2022; Mariel et al., 2022; Mao et al., 2023; Moon et al., 2021; Sarabdeen et al., 2020; Tang et al., 2016; Yao et al., 2019).

Given the importance of this topic, this study aims to assess the WTP for improved air quality in Dhaka and Narayanganj, Bangladesh, via the DCE method. To the best of our knowledge, studies employing the DCE approach are rare in the context of Bangladesh. This study contributes to the economic valuation literature by providing policy-relevant evidence on households' willingness to pay for improvements in air quality.

Materials and methods

1) Case study

To estimate respondents' WTP for air quality improvement, the study focused on areas in Dhaka and Narayanganj, Bangladesh, which are located near major industrial zones, construction sites, and high-traffic areas (Figure 1). These locations were selected to examine the extent of WTP for better air quality among respondents. Questionnaire surveys were conducted with a total of 260 households across Dhaka City, Tejgaon Industrial Area (West Nakhalpara and East Nakhalpara, Ward No. 25), and Narayanganj City (Jalkuri, Ward No. 9, and Chasara, Ward No. 12). A systematic sampling method was used to select 65 households from each of the four distinct areas in Dhaka and Narayanganj.

2) Study design and selection of a valuation approach for WTP analysis

In addition to the Contingent Valuation Method (CVM), another stated preference technique named the DCE is also popularly used to reveal the hidden utility of individuals. Mogas et al. (2002) noted that the CVM has been used to calculate the value of a wide range of natural resources. However, it has been criticized for not being able to provide dependable and reliable estimates of willingness to pay. However, in DCEs, respondents are presented with a series of choice sets, each including two, three, or more alternative options, which forces them to reveal the true hidden value of the alternative items.

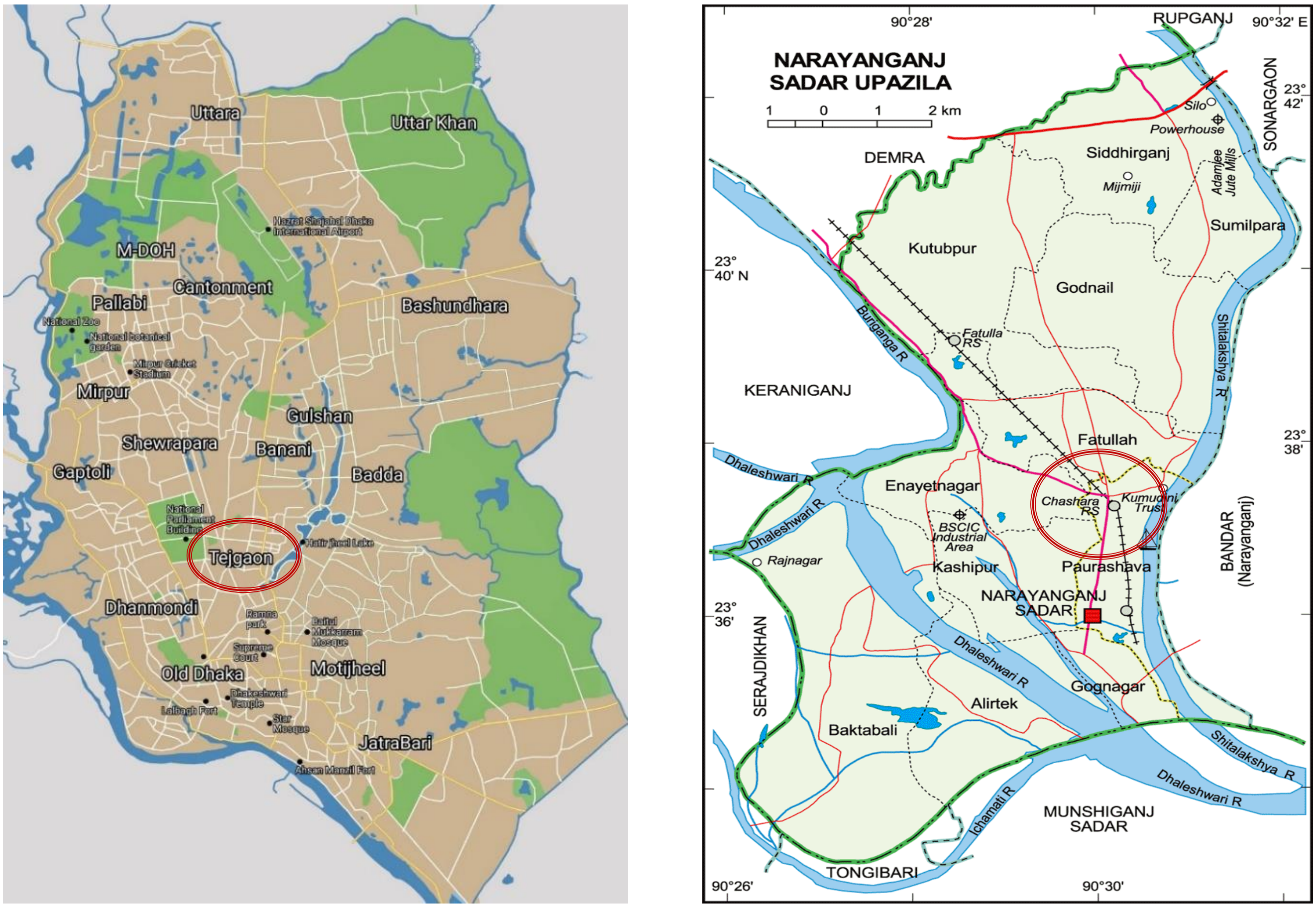

Figure 1 Locations of the study areas in Dhaka (left side) and Narayanganj (right side).

Table 1 Preferred options for the respondents in the choice set (valuation task) for WTP analysis

Attributes	Improvement level-2	Improvement level-1	Status quo (current situation)
Reduction in life expectancy	6 months	2 years	4.8 years (AQLI, 2024)
Premature death	15,000 people annually	40,000 people annually	102,456 people annually (CREA, 2025)
Emergency admission in the hospital due to airborne diseases	40,000 patients annually	250,000 patients annually	670,000 patients annually (Dhaka Tribune, 2025)
Average air quality rating	Good (AQI Range, 0-50) (Department of Environment, 2024)	Moderate (AQI Range, 51-100) (Department of Environment, 2024)	Unhealthy (IQAir, 2025) (AQI Range, 151-200) (Department of Environment, 2024)
Use of face mask	No need to use	Use if the AQI is near to 100	Need to use
Cost to you (BDT per month)	BDT 300	BDT 250	BDT 0/Currently no amount is paid for improved air quality

The choice experiment is a stated preference method that has been used for over two decades in developing countries (Walelign et al., 2019). The design encompasses the particular attributes and levels of attributes. One of the major design stages of this study is the construction of DCEs, which involves defining the attributes and levels that describe alternative options for improved air quality. The first step involves defining the important attributes that characterize environmental goods. The second step establishes the appropriate attributes, and the final step establishes the level for each attribute. The questionnaire has been divided into two broad categories. The first section addresses socioeconomic data, and the second section addresses valuation tasks regarding the willingness to pay for improvements in air quality. The interviewer explained the variables to the respondents and presented them with a choice set (Table 1).

A choice set consists of the alternatives available for choice (Bennett and Blamey, 2001). The following choice set (Table 1) proposes two hypothetical alternative options (Improvement level-1 and Improvement level-2) along with the current situation (Status Quo). It is up to the respondent's choice which option they want to choose and pay for air quality improvement for better health, with a monthly cost of BDT 0 (don't want to pay), BDT 250 for Improvement level-1, and BDT 300 for Improvement level-2. Through the following choice set, this study aimed to investigate which options respondents are willing to choose for better air quality. The results of the multinomial logistic regression model are consequently interpreted with odds ratios of Improvement level-1 and Improvement level-2 with respect to the status quo (base category).

3) Model specification

The multinomial logit regression model was used to estimate the extent of WTP. To estimate the model, the authors used the maximum likelihood method. People's willingness to pay for improved air quality is expected to be influenced by many factors: respondents' socio-economic background, demographic characteristics, existing air quality conditions, and environmental and health awareness. Since a choice experiment involves the selection of one alternative from among several kinds of policy alternatives, it can be formularized as follows. When the i^{th} respondent chooses j from among J options, the utility (U) is expressed as Eq.1:

$$U_{ij} = V_{ij} + \varepsilon_{ij} \quad \text{(Eq.1)}$$

where V is the deterministic component of the utility and where ε is the stochastic component of the utility. Therefore, when respondent i chooses j, the utility is greater than when choosing other options.

Results and discussion

1) Phenomenon of using a face mask

Owing to polluted air, nearly half of the respondents (46%) reported that they regularly wear masks to protect themselves, whereas 34% stated that they have used masks occasionally. In contrast, 20% of the respondents had not used masks at all, which may indicate a lack of awareness of the health impacts of air pollution and its long-term consequences (Figure 2). In support of these findings, Tabassum et al. (2020) reported that 44% of respondents in Lahore, Pakistan, regularly wear masks to avoid airborne diseases during smog events. Similarly, a study by Quan et al. (2017) reported that approximately 49% of respondents in Ningbo, China, wear masks when they leave.

2) Visibility during the winter season

Numerous studies evaluating environmental quality have similarly emphasized that the increasing number of hazy days each year reflects worsening air pollution and serves as a key indicator of environmental degradation (Quan et al., 2017; Sarabdeen et al., 2020; Tang et al., 2016). In this study, air quality was assessed by asking respondents about outdoor conditions on most days during the winter season (November–February). Only 12% of the respondents had experienced clear weather, whereas 29% described it as somewhat clear. In contrast, the majority of the respondents (59%) characterized the environment as hazy during the winter season (Figure 3), highlighting growing public concern over air pollution in the winter season. A previous study by Ubreath (2024) in India reported that PM2.5 levels in the winter season are 59% higher than those in summer, which aligns with our findings of significantly reduced visibility during winter (Ubreath, 2024)

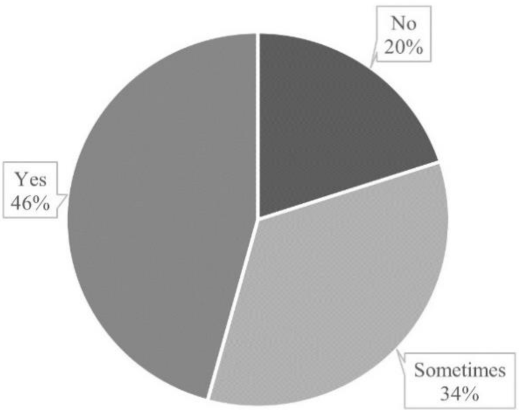

Figure 2 Use of face masks.

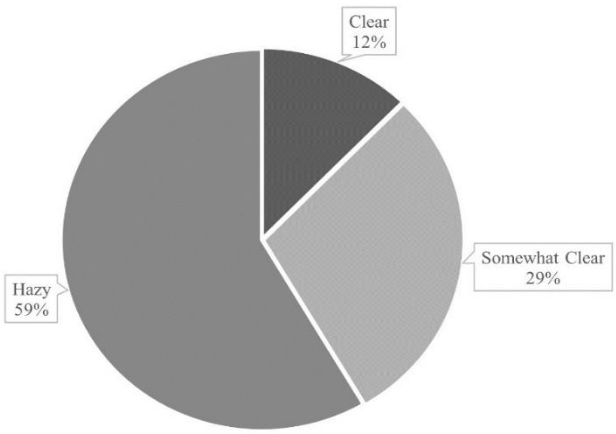

Figure 3: Visibility in the Winter Season (Nov to Feb)

3) Knowledge regarding the impact of air pollution

Evaluating respondents' knowledge of the impacts of air pollution is essential for understanding how they value environmental policies (Gerking and Harrison, 2006). To assess awareness levels, respondents were asked whether they had knowledge about the impacts and adverse effects of air pollution. More than half of the population (56.5%) reported that they had knowledge of the adverse impact of air pollution on health, whereas 43.5% of the respondents had no knowledge of the adverse effects of air pollution on health (Figure 4). This finding is consistent with the study by Quan et al. (2017), which revealed that approximately 65% of the respondents in Ningbo, China, are aware of the negative health impact of air pollution.

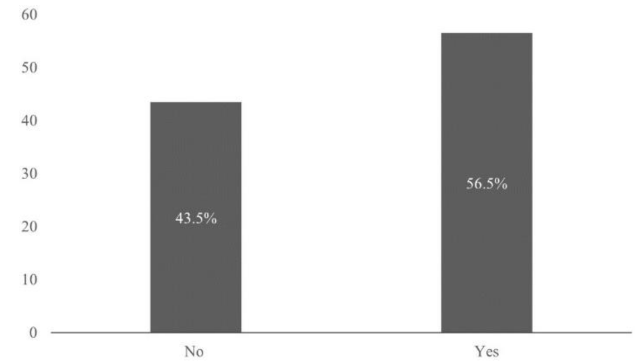

Figure 4 Knowledge of the impact of air pollution on health.

4) Experienced airborne diseases

As part of the survey, the respondents were asked whether they had experienced any airborne diseases over the previous year, including the common cold, dust allergies, asthma, pneumonia, chickenpox, or other illnesses (COVID-19, mumps, and influenza). Approximately 44.6% of the respondents had suffered from the common cold, followed by dust allergies and asthma (39.6%), pneumonia (5.8%), chickenpox (2.3%), and other illnesses (7.7%). Overall, nearly half of the respondents primarily suffered from the common cold and dust allergies/ asthma (Figure 5). To support these findings, a study by Aslam et al. (2023) in Lahore, Pakistan, reported that 64% of asthma patients visit the hospital during the winter season (Aslam et al., 2023). Another study by the World Bank (2022) reported that in Bangladesh, on average, 13.9% of respondents experienced a lower respiratory tract infection, with the highest proportion (16.1%) living near brick kilns, followed by respondents living in construction sites and areas with major construction and traffic (14.2%) and those who were exposed to persistent traffic (12.4%).

In this study, 5.8% of the respondents were diagnosed with pneumonia over the previous year, which is also classified as a lower respiratory tract infection disease. Given that our study was conducted in industrial areas and major construction and traffic sites, the incidence of such diseases may increase in the future if air pollution continues to worsen. If a household member falls ill due to an airborne disease, the family's income may be used to cover medical expenses, which can negatively affect their disposable income. While it cannot be definitively confirmed that these diseases are caused solely by air pollution, it is possible that polluted air may be a contributing factor. Therefore, the risk perception and sociodemographic characteristics of households play a vital role in determining the priority of attributes for which households are willing to pay for air quality improvement in Dhaka and Narayanganj cities. Therefore, the government should take proper measures to address air pollution and reduce airborne diseases.

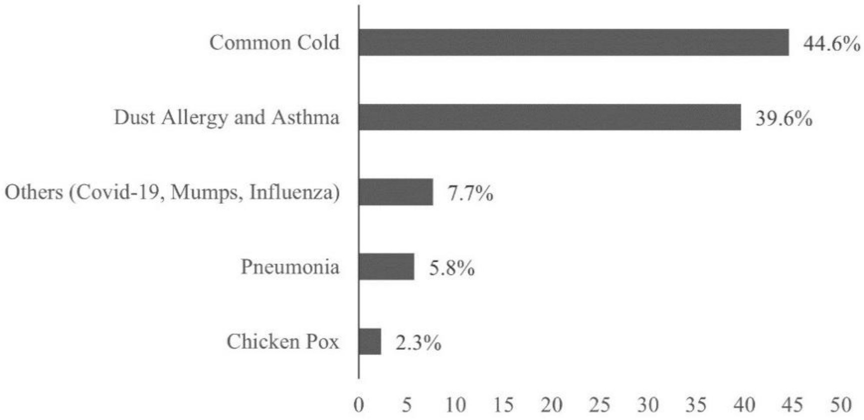

Figure 5 Airborne diseases reported by the respondents.

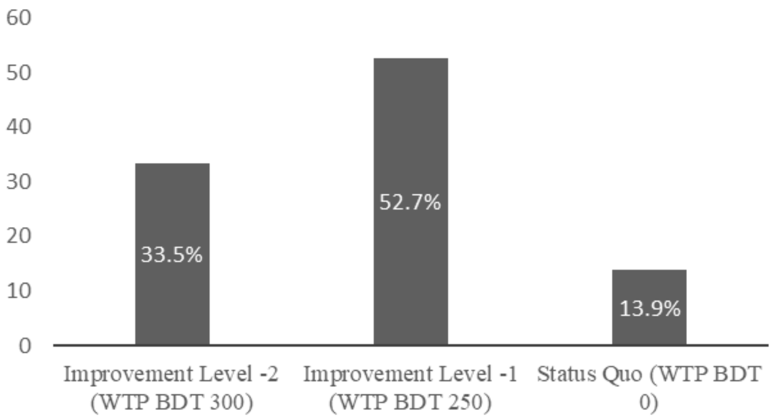

Figure 6: Willingness to pay for improved air quality.

5) Willingness to pay for air quality improvement

Considering the adverse effects of air pollution, the respondents were asked about their WTP for improving air quality within the framework of our choice experiment model. The respondents indicating a positive WTP were classified into either Improvement Level-1 or Improvement Level-2. Those who have chosen Improvement Level-1 are willing to pay BDT 250, whereas those who have chosen Improvement Level-2 are willing to pay BDT 300 for better air quality. The findings reveal that more than half of the households (52.7%) preferred to choose Improvement Level-1, followed by 33.5% who chose Improvement Level-2, whereas only 13.9% chose the status quo option, indicating zero willingness to pay (Fig. 6). Therefore, approximately 86.2% of the respondents were willing to pay for air quality improvement, whereas only 13.9% expressed zero interest. To support our findings, a study by Ndambiri et al. (2015) in Nairobi, Kenya, mentioned that 85% of the respondents were willing to pay for air quality improvement, whereas 15% reported zero willingness to pay.

6) Interpreting the results of multinomial logistic regression in terms of improvement level -1 (WTP BDT 250) and improvement level-2 (WTP BDT 300)

The WTP analysis in this study highlights the following two major findings. First, the respondents who have been surveyed have shown a consistent inclination toward improved air quality compared with the current air quality. This indicates that there is a desire for the proposed improvements. Second, household heads with higher education and income levels want to pay more for improved air quality. In addition, respondents who have experienced airborne diseases and have better knowledge of the impact of air pollution on health are willing to pay more for improved air quality. In this study, an odds ratio (Table 2) significantly greater than 1 implies that an increase in the value of the explanatory variable significantly increases the probability of having a higher incidence of WTP.

The odds ratio among respondents who had experienced airborne diseases was 22.46 times greater than that among those who had not experienced any airborne diseases during the previous year. In other words, people who have experienced airborne diseases are 22.46 times more likely to choose improvement level-1 or pay BDT 250 for improved air quality than those who have not experienced any airborne diseases over the previous year, which is statistically significant at the 1% level. This finding is consistent with Ahmad et al. (2025), who noted that individuals' willingness to pay significantly increases when they are more aware of the health risks associated with air pollution. Their study revealed that, after receiving information about smog and its health consequences, the proportion of respondents' willingness to pay has increased. This aligns with our study's finding that those who have experienced airborne diseases are substantially more likely to pay for improved air quality, emphasizing that health concerns are a critical determinant of willingness to pay.

People who have better knowledge about air pollution are more willing to pay for air quality improvement. Although the results for choosing improvement level-1 are not statistically significant, for the results of choosing improvement level-2, the odds among respondents who have better knowledge of the impact of air pollution on health is 2.66 times greater than those who have no knowledge of the impact of air pollution on health. In other words, people who have better knowledge of the impact of air pollution on health are 2.66 times more willing to choose improvement level 2 or pay BDT 300 for improved air quality than those who have no knowledge of the impact of air pollution on health, which is statistically significant at the 1% level. To justify these findings, one study by Tantiwat et al. (2021) noted that respondents with greater knowledge of air pollution are more likely to be WTP for improved air quality.

The odds ratio among respondents who have tertiary education is 2.75 times higher than that among those who have less than tertiary education. In other words, people who have tertiary education are 2.75 times more likely to choose improvement level -1 or pay BDT 250 for improved air quality than those who have less than tertiary education, which is statistically significant at the 9% level. On the other hand, in terms of improvement level 2, the odds ratio among respondents who have tertiary education is 4.68 times higher than that among those who have less than tertiary education. In other words, people who have tertiary education are 4.68 times more likely to choose improvement level 2 or pay BDT 300 for improved air quality than those who have less than tertiary education, which is statistically significant at the 9% level. This finding is also consistent with Ahmad et al. (2025), who reported that individuals with higher education levels demonstrate considerably greater willingness to pay for self-protection and smog management than do those with lower or elementary education levels. The results align with our study's evidence that respondents with tertiary education are more likely to pay for improved air quality, emphasizing the strong influence of education on WTP.

Table 2 Results of the multinomial logistic regression model for WTP analysis

Dependent variables		Odds ratio	P value
Status Quo[a] = WTP (BDT 0)		-	-
Improvement level-1 = WTP (BDT 250)	Airborne Diseases		
	No[a]	-	-
	Yes	22.4612	0.000
	Knowledge on Impact of Air Pollution		
	No[a]	-	-
	Yes	1.58	0.209
	Education		
	Below Tertiary[a]	-	
	Tertiary	2.75	0.097
Improvement level-2 = WTP (BDT 300)	Airborne Diseases		
	No[a]		
	Yes	11.66	0.001
	Knowledge on Impact of Air Pollution		
	No[a]	-	-
	Yes	2.66	0.102
	Education		
	Below Tertiary[a]	-	-
	Tertiary	4.68	0.031
Number of observations = 260 Prob > chi^2 = 0.0000 Pseudo R^2 = 0.25			

Remark: [a] represents 'Reference Category'

Policy recommendations

The Bangladesh National Air Quality Management Plan (NAQMP) was formulated to provide a structured roadmap and identify the necessary actions for Bangladesh to achieve the WHO's guidelines for annual PM2.5 concentrations, as well as the country's own air quality standards, in alignment with the South Asia Clean Air Vision 2030. The NAQMP targets a wide range of stakeholders, including government bodies across different ministries and agencies, development partners, and the general public involved in its implementation. The Ministry of Environment, Forest and

Climate Change (MoEFCC) and the Department of Environment (DoE) bear the primary responsibility for managing air quality, whereas the National Committee on Air Pollution Control (NCAPC) oversees the coordination of NAQMP implementation among various government institutions. In addition, several other government agencies contribute to the execution of the NAQMP and the attainment of its intended outcomes, particularly through emission reductions in key sectors. To track progress toward its goals, the NAQMP introduced a monitoring and evaluation framework that outlines implementation timelines, expected outputs, the agencies responsible for carrying out targeted interventions, and the indicators used to assess results (Department of Environment, 2024). In addition to existing government strategies to reduce emissions, this study further proposes the following policy recommendations.

1) Considering WTP as benefits for both city residents and authority

The estimated results from the multinomial logistic regression clearly show that the urban population has a statistically significant WTP to improve the quality of air, especially at higher levels of improvement. As revealed in Table 2, individuals with airborne diseases are significantly more inclined to support improvements in air quality, and the odds ratios of improvement level 1 (BDT 250) and improvement level 2 (BDT 300) are 22.46 ($p < 0.01$) and 11.66 ($p < 0.01$), respectively. This finding shows that perceived health weakness is a very powerful indicator that a person will pay more to have cleaner air. Moreover, tertiary-educated respondents are much more likely to prefer improved air quality options, particularly at improvement level 2, which has an odds ratio of 4.68 ($p < 0.05$). According to such findings, WTP estimates should be considered by policy makers and city officials as an advantage in a cost–benefit analysis when considering projects related to air pollution. This will not only benefit authorities but also improve social welfare by decreasing health and other issues linked to air pollution. Therefore, prioritizing the welfare of urban inhabitants by improving air quality is crucial for authorities. Investing in such enhancements will be economically viable, and no regret decision will maximize benefits for both parties.

2) Allotment of specific funds in the national budget for air quality improvement and management

The empirical findings show that people with direct experience with air pollution-induced health issues are much more ready to pay for air quality improvement. The high degree of correlation between airborne diseases and increased WTP (Table 2) indicates that there is a high level of private defense and medical expenditure on air pollution by households. These expenditures constitute an implicit economic cost that is presently transferring expenses to the population. The positive and significant WTP of both levels of improvement means that the air quality improvement is evaluated by the residents as a public good and that they are ready to invest their finances in it. This offers an economic rationale as to why the government should internalize air pollution externalities by setting aside a certain amount of funds in the national budget to help improve and manage the quality of the air. Inappropriate and insufficient budgets exacerbate damage costs.

3) Regulating emissions from brick kilns, industries and construction sites

The empirical findings of the study show that there is a high need to improve air quality, especially among the respondents who reported negative impacts on their health and those who were highly educated. Although the pollutant concentrations and the source-specific emissions are not directly measured in the analysis, the WTP estimates are significant, meaning that the residents feel that the current air quality situation is unsatisfactory and harmful. Brick kilns, industries, and construction sites are three of the leading sources of air pollution in Dhaka, releasing large amounts of emissions, dust, particulate matter, and volatile organic compounds into the atmosphere. Emissions from heavy machinery, land clearance, and open waste burning significantly deteriorate air quality and pose risks to public health. To address these challenges, policymakers should enforce strict regulations on brick kilns, industries and construction activities by promoting the use of cleaner and more efficient machinery and encouraging sustainable building practices. In addition, the government can impose the effective implementation of the polluter payments principle (3P) to reduce and regulate the enormous production externalities of brick kilns, industries and construction sites. Reducing air pollution from these three sectors is crucial for authorities to protect both the environment and the health of urban residents. The odds ratios for airborne diseases indicate that policies that affect major sources of emissions can lead to significant improvements in welfare.

Conclusions

This study quantified the WTP for air quality improvement via the DCE technique in Dhaka and Narayanganj, Bangladesh. The survey focused on areas with high industrial activity, construction, and traffic congestion to understand people's preferences for better air quality. The study revealed a substantial demand for air quality improvement, with WTP significantly influenced by socioeconomic status, demographic characteristics, environmental consciousness, and awareness of health risks. Research has also revealed that household heads with higher education and income levels, those who have suffered from airborne diseases, and individuals with better knowledge of the health consequences of air pollution are willing to pay more for better air quality. The study highlighted that enhancing air quality in line with public preferences would not only improve health and overall well-being but also yield economic and social benefits, as people are willing to pay for improved air quality. In light of these observations, Dhaka is recommended as a sustainable urban city to achieve Sustainable Development Goals (SDGs) 3 (good health and well-being) and 11 (sustainable cities and communities).

Data availability statement

Information and data used in the study will be disclosed upon request.

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Md. Mominul Islam: Conceptualization, Software, Validation, Formal analysis, Investigation, Resources, Data curation, Writing – Original draft, Writing – Review & editing, Visualization, Supervision,
Sazeda Akter: Validation, Formal analysis, Resources, Writing – Original draft, Writing – Review & editing, Visualization
Suthirat Kittipongvises: Validation, Formal analysis, Writing – Original draft, Writing – Review & editing

Conflicts of interest

The authors declare that there are no conflicts of interest in competing financial or personal relationships that could have appeared to influence the work reported in this work.

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