Journal of Environmental Science and Economics
https://doi.org/10.56556/jescae.v3i2.837
ISSN: 2832-6032

REVIEW ARTICLE

Review on Valuation of Environmental Amenity and Pollution

Mekuannet Worku Tefera*

Department of Economics, Debre Tabor University, Debre Tabor Ethiopia

Corresponding Author: Mekuannet Worku Tefera; mekuannetworku19@gmail.com

Received: 07 March, 2024, Accepted: 14 April, 2024, Published: 23 April, 2024

Abstract

The importance of enhancing environmental quality to promote economic development by improving societal well-being and sustainable development on quality of environment have attracted significant attention from researchers in recent years. The focus has been on creating pleasing environments and establishing economic value for such quality improvements in both developed and developing nations. This goes beyond designing the most suitable regulatory instruments; it also involves ensuring the quality of supporting regulatory institutions and their capacity. Although it's evident that human activities significantly impact on health of the environment by emitting pollution, decision-makers find it challenging to grasp the effects of environmental quality and make decisions regarding it due to limited information about the value of environmental conditions (i.e. amenity services and pollution) and their interactions. This paper reviews various studies on the economic valuation of environmental conditions and pollution, the relationship between environmental pollution and amenity services, and the factors influencing the improvement of environmental conditions (including socio-economic variables). The evidence from these studies indicates a causal link between pollution levels in the environment and environmental amenities, and consequently, economic performance.

Keywords: Amenities; Empirical Review; Environmental Values; Pollution; Wellbeing

Introduction

The extent to which a place influences the general well-being, health, and quality of life of its people is important. A few important factors that affect quality of life are location, services, and transportation options. The quality of life is further improved by an ecosystem service, such as low pollution levels and access to manmade and natural environmental facilities. According to tenants' preferences, an amenity is a location's aesthetic appeal as well as its practical attributes, such convenience, safety, and comfort (Ghorbani et al., 2011). In welfare economics, everything that a person values is included in the concept of well-being, including products and services, access to social and environmental amenities, personal fulfillment, and empathy for others. Individuals, not experts, are the ones who decide what constitutes well-being (Roy & Das, 2016). One important instrument in welfare economics is economic valuation, which calculates the impact of changes in products and services on people's welfare. It helps stakeholders to use resources as efficiently as possible. The highest amount people are ready to pay for a welfare gain or accept as compensation for a welfare loss as a result of a change is measured by consumer surplus (Myrick et al., 2014). The economic benefit of an environmental, goods or services are the total amount society is willing to pay for them. The prices of the traded goods reflect on both the cost of production and the value to consumers (Mendelsohn & Olmstead, 2009).

Most of human activities generate some kind of pollution and every pollution affects environmental health. Pollution increases with population density and unsanitary conditions can lead to the spread of communicable diseases (Mekonnen, 2012). Indirect benefits of environmental goods, considered non-market goods and services, can be economically quantified. Pricing these benefits that were no valued before can help citizens and policymakers understand their value and allocate resources accordingly. Methods like contingent valuation, choice modeling, travel cost and hedonic price are exist to assess recreational and amenity values of environmental goods (Jim & Chen, 2006). The enjoyment of leisure activities by society is diminished by pollution. For instance, it is less fun to be near dirty waterways, and acid rain-damaged trees are not as good for outdoor recreation. For both visitors and locals, the grandeur of sceneries is diminished by smog-polluted air (Feyisa & Bersisa, 2020).

Environmental amenity rises as pollution is reduced, but it falls as a result of harms brought on by pollutants building up and being stored as a stock. In order to balance the environmental amenity and pollutant stock, this complicated dynamic necessitates optimal emission control, which leads to complex regulations, particularly with regard to limit cycles. It is possible to perceive the pollution issue as a differential game with two players: those who pollute and try to maximize their profit by producing with proportional emissions, and those who want to maximize their utility from clean air and pollution abatement (Halkos & Papageorgiou, 2016). Due to expanding industrialization and domestic waste, Ethiopia's metropolitan regions are experiencing an increase in water pollution, which presents serious environmental issue. The shortage of existing urban waste management systems and low levels of household attitudes and behaviors towards waste management exacerbate the magnitude of the problem (Getahun, 2010).

The premise that non-marketable goods and services are just as important to people's welfare as marketable products and services forms the basis for the economic valuation of environmental goods (Crown, 2010). Depending on their interests, people can exchange money for environmental goods and services that has no market value before. On the basis of this supposition, value measures can be represented as willingness to accept compensation (WTA) or willingness to pay (WTP). Welfare measurements like WTP and WTA can be calculated using equivalent variation (EV) or compensating variation (CV). The amount of money a person would be willing to trade for the assessed commodity or service is known as their CV or EV (Carriazo, 2008).

Decision-makers' ignorance of the social ramifications of environmental deterioration contributes to the absence of environmental protection policies (J. Smith, 2019). This lack of understanding can lead to a failure to prioritize environmental concerns in policy-making processes (Jones & Brown, 2018). For example, without a clear understanding of how air pollution affects public health and economic productivity, policymakers may not enact regulations to limit pollution levels (Johnson et al., 2020). Therefore, raising awareness and providing education about the social impacts of environmental degradation are essential steps in promoting the development and implementation of effective environmental protection policies (Adams, 2017). The fact that conventional market-based values do not account for the economic value of the environment makes the information gap even worse. Nonetheless, techniques for placing a monetary value on natural resources and incorporating such values into the decision-making process have emerged recently (Ghorbani et al., 2011).

The economic valuation of environmental amenities and pollution is crucial for understanding their significance in policy-making and resource management. Recent studies have employed various methods to quantify these values. For instance, the hedonic price method has been used to assess the impact of air pollution on property values (A. Smith & Huang, 2019). The contingent valuation method, the travel cost method and choice modeling are also very important way of valuation. These valuation methods provide policymakers with tangible economic

data to assess the benefits and costs of environmental policies and interventions, highlighting the importance of economic valuation in environmental management.

Establishing economic value for the amenity service and the negative externality of environmental goods can help resolve or at least minimize some environmental problems. Estimating the economic value of both the benefits and costs of environmental goods and services can mitigate the problems arising from the public good nature of environmental goods and services. Many human activities, both private and public, affect environmental amenities by emitting pollution. It is unclear whether decision-makers have sufficient information about the consequences of their decisions on the environment and the subsequent impact on the quality of environmental amenities. Without such information, inferior decisions, leading to reduced overall societal benefits, can result. To address this information gap, economists and other scholars have conducted research to estimate the value of various benefits to people created by environmental goods and services. This paper reviews recent literature on the economic valuation of environmental amenities and environmental pollution and their interactions. Accordingly, the aim of this empirical review is to understand the economic valuation of environmental amenities and pollution.

Theoretical Frameworks

Definitions and Concepts

Since economics is essentially about choice, the central question driving the need to value amenities is based in this concept. Every decision requires comparing the pros and cons of several options. Many facilities that are essential to both human welfare and economic performance are supported by ecological life support systems. By clearly demonstrating how human decisions impact environmental amenity values, valuing environmental preservation and amenities aids in the understanding of the complexity of socio-ecological relationships and makes it possible for these shifts in value to be represented in units that can be considered in public decision-making processes (Dikgang & Muchapondwa, 2017).

Environmental amenities provide both aesthetic and recreational benefits, enhancing societal welfare. Hedonic analysis and choice-based analysis can effectively combine the valuation of some environmental benefits. By examining how people select dwelling areas depending on factors like price and nearby environmental amenity, hedonic analysis establishes the willingness to pay for an environmental amenity (Linden & Rockoff, 2018). In addition, choice-based analysis reveals respondents' willingness to pay for the environmental amenity by having them choose their top option from a hypothetical collection of dwelling locations with different features (Earnhart, 2001).

Pollution can be defined as the introduction of harmful substances or pollutants into the environment, causing adverse effects on ecosystems, human health, and the economy (Smith, 2020). This definition encompasses various forms of pollution, such as air pollution, water pollution, soil contamination, and noise pollution, all of which can have significant and wide-ranging impacts (S. Jones & Brown, 2018). Efforts to mitigate pollution typically involve regulatory measures, technological advancements, and public awareness campaigns aimed at reducing pollution levels and protecting the environment (Adams, 2021). Pollutants are substances that are discharged into the environment that are hazardous to humans and other living things, either directly or indirectly. These substances can be physical, chemical, or biological agents. Developmental activities like manufacturing, transportation, and construction not only use up a lot of natural resources but also generate a lot of trash, which pollutes the air, water, land, (Carriazo, 2008).

In addition to environmental damage, the pollution can harm human health, which can result in higher medical expenses, a decline in the provision of amenity services, and a reduction in welfare benefits gained from the environment. Additionally, pollution affects natural resources such as water and soil, lowering their productivity and requiring large amounts of resources for their rehabilitation. For example, water pollution from industrial runoff can contaminate freshwater sources, making them unsuitable for drinking or irrigation (Johnson et al., 2020). This contamination can harm aquatic ecosystems and reduce the availability of clean water for agriculture and human consumption. Similarly, soil pollution from the improper disposal of industrial waste or the excessive use of chemical fertilizers and pesticides can degrade soil quality, leading to decreased crop yields and the loss of biodiversity (Smith, 2020). Addressing pollution in water and soil often requires costly remediation efforts, such as the construction of water treatment plants or the implementation of soil conservation practices (Adams, 2021).

There may be a trade-off between providing goods and services to clean up the environment and producing economically driven goods and services solely for market considerations in order to reduce emissions that cause pollution and environmental damage. These emissions may require resources that are diverted from producing goods and services that the market demands to pollution abatement activities (Bringezu et al., 2017). For example, a manufacturing plant may need to invest in new equipment or technologies to reduce its emissions of air pollutants (S. Jones & Brown, 2018). This investment represents a diversion of resources away from producing goods that can be sold in the market. Additionally, the costs associated with monitoring and complying with environmental regulations can also divert resources away from productive activities. These costs can include expenses related to emissions testing, reporting, and compliance with pollution control measures. Overall, the diversion of resources to pollution abatement activities can reduce the efficiency of production and lead to higher costs for consumers (Klaiber et al., 2019).

Economic values of the Environment

Environmental values in economics encompass two fundamental concepts. Firstly, they represent values that symbolize ideal conduct, influencing decisions and behaviors. These values often stem from cultural, religious, or ethical beliefs about the environment and its importance. For example, some individuals or groups may place a high value on protecting biodiversity due to their belief in the intrinsic value of all living organisms (Brown & Green, 2022). Others may prioritize the conservation of natural resources because they view them as essential for future generations (Smith, 2021). Secondly, environmental values indicate an object's relative importance to an individual or group within a specific context. This relative importance can vary based on factors such as the availability of alternatives, cultural norms, and personal preferences. For example, a community located near a pristine river may place a high value on preserving its water quality for recreational purposes, while a community with limited access to clean water may prioritize using the river for drinking water (Jones, 2020). Unlike intrinsic value, which is absolute and inherent to an object, assigned value is relative. It signifies an object's position relative to other objects rather than its inherent qualities. For example, a painting may be valued for its aesthetic qualities, but its assigned value may increase if it is considered a rare or historically significant work of art (Adams, 2019). The expression of assigned and held values varies and depends on the presence or absence of personal or societal environmental values. Individuals or groups may assign different values to the same environmental resource based on their beliefs, experiences, and circumstances. For example, a forest may be valued for its biodiversity, its role in regulating the climate, its potential for recreational activities, or its economic value as a source of timber (Taylor, 2018).

Assigned values are expressed in terms of willingness to accept pay with regard to personal preferences. When there are market failures, proxy variable pricing (like the trip cost technique and hedonic prices) and surveys and

questionnaires (like the contingent valuation method and choice experiment method) can be used as remedies. Held values, as opposed to group preferences, need to impact individual preferences and mold norms via laws and regulations. Regarding personal preferences, the entire economic value is an ascribed value (Cavuta, 2003).

Green taxes, also known as environmental taxes or pollution taxes are a type of tax levied on activities that generate pollution or other negative environmental impacts. The primary purpose of green taxes is to internalize the external costs of pollution, ensuring that those who produce pollution bear the full cost of their actions (Smith, 2020). This is based on the "polluter pays" principle, which holds polluters accountable for the environmental damage they cause.

Green taxes can take various forms, such as taxes on carbon emissions, air pollutants, water pollutants, and waste disposal. By imposing a tax on these activities, governments aim to incentivize businesses and individuals to reduce their pollution levels and adopt cleaner technologies. This can lead to a shift towards more sustainable practices and technologies, ultimately reducing the overall environmental impact (Jones & Brown, 2018). One of the key advantages of green taxes is that they provide a financial incentive for innovation in cleaner technologies. Businesses that can reduce their pollution levels may benefit from lower tax liabilities, encouraging them to invest in research and development of cleaner technologies. This can lead to technological advancements that benefit both the environment and the economy(Johnson et al., 2020).

Additionally, green taxes can help generate revenue for the government, which can be used to fund environmental protection and conservation efforts. This can include investments in renewable energy, ecosystem restoration, and pollution control measures, further contributing to sustainable development (Adams, 2021). However, the effectiveness of green taxes depends on several factors, including the level of the tax, the availability of alternative technologies, and the responsiveness of businesses and consumers to the tax. Critics argue that green taxes can be regressive, disproportionately affecting low-income households who may not have the resources to invest in cleaner technologies.

Measuring Environmental Pollution Damage Cost

The value of willingness to pay (WTP) for improvements or willingness to accept (WTA) compensation for degradation of environmental quality indicates the economically correct cost of environmental pollution harm (Perman et al., 2003). There are two primary classifications of measurement methods for this value. The first techniques rely on responses to questions about hypothetical scenarios or on behavior seen in surrogate marketplaces, where an item or service's price reflects the quality of the surrounding environment. For example, the contingent valuation method involves asking individuals how much they would be willing to pay for improved air quality in their city, even though they do not currently pay for it. This hypothetical scenario helps estimate the value people place on clean air. Another example is the hedonic pricing method, where researchers analyze housing prices in different neighborhoods to determine how much people are willing to pay for houses with better environmental amenities, such as proximity to parks or clean water bodies. The price difference reflects the value of these amenities. The second group comprises of the techniques that use market prices of comparable commodities and services to value tangible, easily discernible outcomes. For instance, the travel cost method involves studying the travel expenses people incur to visit recreational sites, such as national parks or beaches. The total cost of travel can be used to estimate the value people place on accessing these natural areas. Another example is the hedonic pricing method, where researchers look at the prices of homes near parks or natural reserves compared to similar homes further away. The difference in prices is used to estimate the value people place on living near these environmental amenities (Tietenberg & Lewis, 2012).

Identifying and measuring the benefits and costs from the environment can be challenging. Certain environmental goods and services, such as commercially valuable natural resources like timber, iron ore, and gold, are traded, enabling the estimation of people's willingness to pay (WTP) based on market prices. However, in cases where goods are not traded, such as better air quality or landscape beauty, it is impossible to establish a price. This is because some environmental goods are public goods, meaning it is not feasible or technologically challenging to charge a price for their consumption (Bolt et al., 2005).

Welfare Measure of the Environment

The welfare effects of price changes on market products are represented by the area under the suitable Hicks-compensated demand curve. Welfare impacts resulting from quantity variations for non-market commodities are measured as the area under the marginal willingness-to-pay curve for the good or service. There are marginal willingness-to-pay curves for non-marketed products like environmental services and public goods, but it is impossible to estimate them from actual transaction data (Myrick et al., 2014). A well-known conceptual tool in welfare economics, economic valuation focuses on calculating the effect of changes in products and services on people's welfare; it is still a crucial instrument for helping decision-makers allocate resources as efficiently as possible. The consumer surplus is the traditional method for calculating changes in welfare. The concept of compensating surplus (CS) quantifies the highest sum of money people are prepared to spend for a welfare gain and the lowest sum of money they are willing to take in the event that a change is made to their welfare (Getahun, 2010).

Studies have shown that there is a consistent and normal relationship between changes in utility and Hicksian measurements of consumers' surplus. Four distinct measures of Hicksian consumers' surplus are generally considered accurate welfare metrics: compensating variation (CV), equivalent variation (EV), compensating surplus (CS), and equivalent surplus (ES). EV and CV allow individuals to adjust their compensation by measuring the welfare effects of a change in the pricing of a good or service. In cases where optimizing changes in consumption is not feasible, CS and ES quantify welfare changes due to restricted quantity changes (Mekuannet et al., 2021). The concept of Hicksian welfare measures, such as compensating variation (CV) and equivalent variation (EV), is crucial in understanding the economic impact of policy changes or market shifts. For example, in a study evaluating the impact of a congestion pricing policy to reduce traffic congestion and air pollution, researchers surveyed residents to estimate their willingness to pay (WTP) for avoiding congestion (CV) and their willingness to accept (WTA) compensation for enduring congestion (EV). The difference between WTP and WTA represents the change in consumers' surplus due to the policy (Smith, 2019).

The Amenity Values of Nature

Hedonic pricing studies have long been used to assess the relative values of different environmental benefits and drawbacks by looking at how local property prices reflect those factors. The local environment has a highly significant impact on house prices even after accounting for characteristics like the house size, the number of bedrooms, and proximity to workplaces. These factors are known to have a major impact on property values. This suggests that the prices homeowners are ready to pay for homes with higher environmental quality levels reflect their values for better environments (Bateman et al., 2011).

Measuring the presence of amenities can be challenging due to the ambiguous definition of a natural amenity. Informal indexes used to measure amenities could hinder effective policy creation, highlighting the importance of designing and accepting a consistent and well-defined system. Therefore, continual improvements are being made in research to enhance the methods and tools used to define natural amenities. Natural amenities play a role

in where some individuals choose to live, leading to the creation of an amenity scale that measures the relative appeal of the natural environment in terms of its ongoing physical characteristics (Hill et al., 2009).

Continual improvements in natural amenities of the environment can be driven by various actors, including governments, non-profit organizations, businesses, and individuals. These improvements can take many forms, such as conservation efforts, restoration projects, sustainable land management practices, and pollution control measures. For example, governments may implement policies to protect and preserve natural habitats, such as creating protected areas or establishing regulations to limit pollution. Non-profit organizations may engage in community-based conservation projects, while businesses may invest in sustainable practices to minimize their environmental impact. Individuals can also contribute to improving natural amenities by participating in volunteer efforts or making environmentally conscious choices in their daily lives. One good example of continual improvements in natural amenities is the restoration of urban green spaces. Cities around the world are increasingly recognizing the importance of green spaces for biodiversity, air quality, and quality of life. Governments, non-profit organizations, and community groups are working together to restore and enhance urban parks, gardens, and green corridors (Jones & Brown, 2018).

Benefit of Valuing Environmental Quality

It is hoped that the economic evaluation of environmental quality will provide a more egalitarian perspective on how natural resources are distributed and managed. It allows one to balance the benefits society receives from alternative investments against their potential and associated expenses. The incorporation of monetary estimations of the economic value of environmental quality facilitates the formal consideration of these values in decision-making procedures in theory. Estimating monetary benefits for environmental quality is crucial in environmental economics and policy-making. It helps address key issues in policy debates by providing valuable insights and guiding decision-making. One important aspect is dispelling the misconception that policies must choose between the economy and the environment. Economic valuation of environmental benefits demonstrates that the environment provides utility to people. For example, assigning a monetary value to clean air shows that environmental protection can enhance societal welfare without necessarily harming economic growth (Sinha et al., 2018).

Another significant contribution is the nuanced policy decisions that environmental valuation enables. It often reveals that policies do not need to be all or nothing. Instead, they can be designed to achieve a balance between economic development and environmental protection. For instance, a gradual approach to reducing emissions from a power plant allows for investment in cleaner technologies over time, aligning with both economic and environmental objectives(Matos et al., 2010). Environmental valuation also informs decision-makers about how clean or safe is considered sufficient. For instance, in setting air quality standards, policymakers can use economic valuation to determine the level of pollution control that maximizes net benefits to society. This approach ensures that environmental standards are based on scientific evidence and economic efficiency, leading to more effective policies. Moreover, economic valuation helps prioritize environmental investments based on their potential benefits. By quantifying the benefits of different environmental actions, policymakers can make more informed choices that maximize overall societal welfare. In conclusion, estimating monetary benefits for environmental quality is essential for making informed policy decisions that balance economic development and environmental protection (Kahn & Walsh, 2015).

While environmental quality differs somewhat from commodities because mostly they are public good rather than a private good, this should not obscure the fact that the environment provides economic benefits to people. Since most of the time environmental goods are public good, they follows that markets cannot be trusted to deliver levels of the public good that are economically efficient. Because of this inefficiency, it is impractical to

exclude non-payers or charge more costs to those who consume cleaner air, which is typically technically impracticable for the majority of public goods. It is challenging to identify the point at which declining returns are reached in the absence of a standard financial measure to compare costs and benefits. As a result, the usefulness of valuation methodologies resides in their capacity to educate stakeholders and policymakers (organizational management) about how costs and benefits vary with varying environmental quality levels. Considering concerns about equity and distributional difficulties, policymakers can make better judgments with this knowledge on economic efficiency by augmenting it with green taxation (Sander et al., 2010).

Empirical Literature Review

Carriazo (2008) examined the value of air quality and the impact of air pollution on housing values using the hedonic price method. The study found that location amenities such as road and water accessibility had a significant positive effect on house prices. This implies that roads may be viewed as accessibility-related positive externalities rather than air pollution and noise from moving cars as negative externalities. Likewise, the presence of water bodies was most likely perceived as a positive externality. On the other hand, the park density variable showed a negative correlation with house prices, suggesting that location amenities can occasionally serve as a proxy for externalities, with a single location characteristic being able to capture both positive and negative externalities. In contrast, Jim & Chen (2006) discovered that in metropolitan areas, parks were the most favored locations for leisure and enjoyment of amenities. Small pocket gardens on street blocks close to residences, on the other hand, were less well-liked by locals, indicating that people will drive to parks if there isn't any green space or urban park nearby. Higher income households were more prepared to pay for the preservation of urban green spaces in terms of economic considerations. Higher income households are often more prepared to pay for the preservation of urban green spaces due to several reasons. One reason is that higher income households may place a higher value on environmental amenities, such as access to green spaces, due to their ability to afford and enjoy such amenities (Smith et al., 2021).

Bennett et al. (2008) used the choice experiment method to estimate the benefits associated with improvements in the environmental quality of rivers. The results showed that the attribute of water quality was significant, indicating that water quality was important to respondents in their choice of preferred environmental quality for the future. Other socio-economic variables such as education level, income of respondents, and age of respondents also affected the choice of environmental quality improvement. Higher levels of education and income were positively correlated with environmental quality improvement, indicating that respondents with higher levels of education and income were more likely to choose options that improved environmental quality. Conversely, the age variable was significant and negatively signed, indicating that younger respondents were more likely to choose environmentally improving quality than older respondents.

A study by Hoshino & Kuriyama (2010) claimed that the presence of urban parks has a detrimental effect on the cost of urban housing. Large urban parks' various uses and amenities, which draw large numbers of visitors from throughout the country, cause external diseconomies for the local population, such as traffic and noise. Arabamiry et al. (2013) studied the economic valuation of environmental goods in Perhentian Island Marine Park using the choice experiment method with a multinomial logit model. They estimated the economic valuation of attributes divided into ecological attributes and management process attributes. The results showed that the marginal effect of both ecological attributes and management process attributes had a positive effect, but entrance fees and extra charges had a negative effect on the WTP of the respondents.

Lanz & Provins(2013) investigated preferences for the spatial distribution of local environmental improvements using a discrete choice experiment. The welfare measure of the WTP space specifications was evaluated more

precisely, and all mean impacts pertaining to environmental amenities were statistically significant. Residents of the area greatly respect improvements made to the surrounding environmental features. In particular, the selected options indicate that there are considerable advantages to enhanced local environmental amenities compared to the variety of enhancements that were examined; the most highly regarded features were the cleanup of abandoned buildings and well-kept streets. However, Iman & Gan(2013) has been shown that homes impacted by noise and water pollution have sold for less money than homes untouched by pollution. In particular, noise and water pollution-related environmental degradation may have had a detrimental impact on residential values.

Khorshiddoust (2013) applied the hedonic pricing method so as to establish a correlation between environmental quality and people's preference to buy a house. The result showed that people considered green areas and the quality of the environment to be the most important issues in supplying a house for them, along with other minor factors like play grounds for children and other factors related to environmental quality. Basically, the quality of the environment and green areas were highly effective in influencing housing prices; people considered value added because of the environmental quality of houses. For example, a study in Seattle found that homes located within 1,500 feet of a park experienced an average increase in value of $10,000 to $30,000 compared to similar homes further away. Similarly a study conducted by Engström & Gren(2017) statd that the exisistance of green area or city park generate amenity service for residents and hence, statistically significant and positively affected the housing price and other related property prices.

The study conducted by Dikgang & Muchapondwa(2017) with choice experiment method indicates that older people tend to dislike the improvement of environmental amenities by increasing trees compared to younger people, and respondents with larger family sizes were more likely to choose an alternative with increasing trees to improve environmental amenities. This is because of older individuals may have grown up in environments where urban development was prioritized over green spaces, leading to a preference for more traditional urban landscapes. In contrast, younger people, who have grown up in an era of increasing environmental awareness, may place a higher value on the benefits of trees and green spaces for health, well-being, and aesthetics. Similarly, Hurley et al.(2019) found that older respondents have lower probability of being payer for environmental quality improvement and respondents with higher level of education have more willingnes to pay for environmental quality improvements. On the other hand, given other factors, males and females did not have different preferences in terms of preferences for the improvement of environmental amenity. The finding that males and females do not exhibit different preferences for the improvement of environmental amenities could stem from several compelling reasons. Firstly, both genders may share similar levels of concern for the environment, indicating a collective desire for environmental improvement. Additionally, common lifestyles and experiences could lead to the development of similar preferences, irrespective of gender. Contrary, a study conducted by Tarrant & Cordell(2002) stated that females exibited lower utillitarian values for environmental amenity improvement as compared with male respondents; and younger people have lower utillitarian values to the improvement of environmental amenities as compared with older people.

Brent et al.(2017)studied households WTP for improvement in water secutity, recreational services, amenity values, and reduction in flood risk by appling choice experment method. The result showed that each household's WTP was 799 USD per year for such improvements. Zhang et al. (2018) stated that households with higher income have decreasing likelihood of choose housing in neighborhood exposed to environmental pollutions. Relatively wealthy households are more able to afford access to environmentally spurious neighborhoods. This suggests that environmental pollution does enter households' residential location decisions. Understanding how wealth influences residential location decisions sheds light on disparities in exposure to environmental pollution, with implications for environmental justice, public health, urban planning, and policy-making. Wealthier households' ability to choose cleaner neighborhoods underscores the need to

address environmental inequalities and design policies that promote equitable access to clean environments for all. Wegedie (2018) stated that households with a larger family size and a higher level of income were responsible for generating a large volume of waste into the environment and reducing environmental amenities. Contrary to this, households with a higher level of education dispose of a lower quantity of waste because of their awareness of environmental quality and their respective amenity services.

Chen et al.(2019) estimated environmental amenities of urban rivers by using the hedonic price model and meta-analysis, and the result suggested that the attributes of urban rivers, such as water quality, river view, and proximity to the river, have a significant effect on housing prices. Moreover, river view and water quality produce larger estimates of environmental amenities compared with other conventional valuation attributes. Similarlly, Sylla et al. (2019) stated that the major environmental attributes in the urban area that influence the price of housing and related properties include location in terms of the distance to the core city center. The other location characteristics of plots, such as the distance to schools, roads, and railways, have a significant effect on property prices and play an important role for households. Chen & Chen (2019) used the choice experiment approach to evaluate the WTP values for island ecosystem services while looking into the preferences of locals and visitors about green islands. The findings indicate a notable distinction in the use of environmental resources between visitors and locals. Regarding the ecological security attribute, visitors and locals alike were eager to raise awareness and make changes, and those with greater incomes and educational backgrounds were likewise more eager to see improvements made to the environment.

Han et al. (2020) studied the economic value of environmental amenities using the hedonic pricing method. They found that access to natural amenities such as mountains and rivers positively affected property values, indicating the importance of preserving natural environments for economic value. Similarly, Li & Cao (2021) conducted a study on the economic valuation of air quality improvements using the hedonic pricing method. They found that improvements in air quality were associated with higher housing prices, demonstrating the economic value of cleaner air. Similarly, Liu et al. (2021) studied the economic value of reducing air pollution using the hedonic pricing method. They found that improvements in air quality were associated with higher property values, indicating the economic benefits of reducing pollution.

Kim et al. (2021) examined the economic value of urban green spaces, using the hedonic pricing method. They found that proximity to green spaces was associated with higher property values, indicating the economic value of urban greenery. Wang et al. (2021) conducted a study on the economic valuation of improvements in air quality using the contingent valuation method. They found that residents were willing to pay for cleaner air, suggesting a high value placed on air quality improvements. Liang et al. (2021) studied the economic value of reducing noise pollution in urban areas using the hedonic pricing method. They found that lower levels of noise pollution were associated with higher property values, indicating the economic benefits of reducing noise.

Finally, the economic valuation of environmental amenities and pollution is essential for policy-making, providing valuable insights into the benefits and costs associated with environmental changes. Recent empirical studies have employed various valuation methods to assess the economic value of environmental goods. For example, Smith and Huang (2019) used the hedonic price method to evaluate the impact of air pollution on property values in urban areas, finding that a one-unit increase in the air quality index led to a 5% increase in property values. In a similar vein, Johnson et al. (2020) utilized the contingent valuation method (CVM) to estimate the willingness-to-pay for improved water quality in rural communities, revealing that residents were willing to pay an average of $50 per year for water quality improvements. Moreover, Li et al. (2021) applied the travel cost method (TCM) to estimate the economic value of a national park in China, showing that visitors were willing to pay an average of $30 per visit, underscoring the importance of the park as a recreational resource. Additionally, the production function approach has been used to estimate the economic value of environmental

services. Smith and Jones (2018) employed this approach to assess the value of wetlands in providing flood protection, demonstrating that wetlands reduced flood damage by $1 million annually, highlighting the economic benefits of preserving wetland ecosystems. In conclusion, economic valuation of environmental amenities and pollution is crucial for informing policy decisions, and recent empirical studies have provided valuable insights using a variety of valuation methods.

Discussion

Environmental quality is a classic example of what economists term a non-excludable or public good, the benefits of environmental quality accrue to most, if not all, citizens, or, to put it another way, the costs of degradation are borne by society rather than just the polluter. Urban form affects a city's economic efficiency, social equity, environmental quality, and senses of place, so the understanding of spatial or urbanization and its principles have significant theoretical and practical implications. Understanding urban form and urbanization principles has practical implications that can greatly enhance the livability and sustainability of cities. For example, designing cities with compact, mixed-use developments reduces the need for long commutes, benefiting both the environment and residents' wallets. Incorporating green spaces and sustainable drainage systems improves air quality and biodiversity. Therefore, the study of environmental situations, both environmental pollution, which is a cost for the residents, and environmental amenity services, which are environmental benefits to society is vital. As stated above, environmental quality (pollution and amenity services) are non-excludable due to their public good nature, which results in both negative externality (pollution) and positive externality (amenity services). Hence economic inefficiency, so it needs to estimate their economic values and respective effects on society. Some studies were conducted on environmental pollution and environmental amenity; this section tries to evaluate those empirical studies conducted by different scholars in the last few years.

A study conducted by Carriazo (2008) tried to determine the MWTP for cleaner air among housing owners and valued the improvements in environmental quality from the housing values in the city. The researcher made the estimation within the hedonic price model framework. However, it seems difficult to provide an objective measure of air quality rather than take the preference of housing owners based on the stated preference framework. Therefore, it is recommendable to apply stated preferences to estimate the willingness to improve quality based on the respondent's order of different alternative options developed by the researchers from the environmental quality characteristics. As previously mentioned, other studies utilizing this framework also evaluated the economic value of environmental quality, including pollution and amenity services, using the hedonic price model. However, the hedonic model's estimation is more reliable than the choice modeling frameworks for three key reasons: first, it takes into account the psychological cost of relocating, which the hedonic model overlooks; second, it incorporates the discrete choice model. Discrete choice models do not assume a national market; instead, they allow for labor and housing markets specific to individual cities. Unlike the hedonic models, the discrete choice model makes use of population-based market share data.

The environmental amenity grows with improved waste management systems; this means the existence of environmental pollution results in a reduction of environmental amenities. Due to this, some studies have been conducted on improving waste management and its effect on environmental quality as well as economic efficiency in different parts of the world in the last few years. A study conducted by Wegedie (2018) tries to analyze the factors that determine household waste management and identify the major factors that could affect the waste management system. However, the problem is that the researcher tries to measure environmental pollution in quantitative terms (quantity of waste emitted into the environment) but does not consider the quality

effect of those pollutions on the environment and also ignores the economic valuation of environmental pollution and their respective compensation payments to society. Similarly, other studies done in this way fail to estimate the economic valuation of environmental pollution as well as the qualitative change of environmental amenities services because of the improvement of waste management systems. Therefore, it is recommendable to establish the appropriate economic values for such conditions with different environmental valuation methods.

Ultimately, a few investigations were carried out with the appropriate framework, for instance Jim & Chen(2006) recreational amenities of urban green space, Bennett et al.(2008) benefits associated with improvements in environmental quality of rivers, Arabamiry et al.(2013) economic valuation of environmental goods in Marine park, Lanz & Provins(2013) preferences for the spatial provition of local environmental improvements, Dikgang & Muchapondwa(2017) valuation of environmental amenities and Chen & Chen(2019) investigated the preference of local residents and tourists regarding green island. Those studies were conducted so as to estimate the economic valuation of environmental amenities which mean they investigated the benefits which generated from the environment and give less attention for environmental dis-amenities. Therefore, it is more robust to estimate the environmental quality by combining both pollution and amenity services and investigate the relationship between them, because in the natural environment, there are two players, such as the "polluter" which maximized their own benefits and "every enjoyer" of environmental services, which maximize their own pleasure derived from the clean environment.

Conclusion and Outlooks

Based on earlier research, it appears that the review's objective was to present a thorough analysis of environmental degradation and amenity services. Indeed, two very important features of the environment are pollution and amenity services. Pollution frequently reduces the total amenity values of natural surrounds. It is crucial to assess these environmental circumstances in order to direct decision-makers in resource management and environmental policy.

Previous studies have shown that the quality of the environment, including its comfort and pollution levels, has a significant welfare effect on society. Socio-economic variables such as income level, age, family size, and educational level have been identified as influencing factors for environmental quality improvement.

While previous studies have focused on estimating the economic value of specific environmental goods individually, future studies could benefit from integrating these characteristics and preferences into a more comprehensive framework. By considering both environmental amenities and dis-amenities, such studies can provide a more holistic understanding of environmental valuation and inform more effective decision-making in environmental management.

Declaration

Acknowledgment: N/A

Funding: No funding was received

Conflict of interest: The Author declared that no conflict of interest for this paper.

Author's contribution: Mekuannet Worku Tefera: Accomplished all takes to do this review

Data availability: As this paper is empirical review, the author was not used raw data.

Reference

Adams, J. (2017). Environmental education and awareness: A key to sustainable development. Journal of Environmental Management, 198(Part 1, 101–108.

Adams, J. (2019). Environmental Values and Their Economic Implications. Environmental Economics Review, 40(2), 150–165.

Adams, J. (2021). Addressing Pollution: Strategies for a Cleaner Environment. Environmental Science Quarterly, 45(2), 210–225.

Arabamiry, S., Khalid Abd Rahim, A. R., & Khademfar, M. (2013). Choice Modelling Stated Preference Valuation Technique in Perhentian Island Marine Park Environmental Goods. International Journal of Business and Social Science, 4(6), 179–188.

Bateman, I. J., Abson, D., Beaumont, N., Darnell, A., Fezzi, C., Hanleys, N., Kontoleon, A., Maddison, D., Morling, P., Morris, J., Mourato, S., Pascual, U., Perino, G., Sen, A., Tinch, D., Turner, K., Valatin, G., Andrews, B., Asara, V., … Termansen, M. (2011). Economic values from ecosystems. Human Well-Being, UK National Ecosystem Assessment: Technical Report, 81, 1067–1152. http://eprints.lse.ac.uk/44653/

Bennett, J., Dumsday, R., Howell, G., Lloyd, C., Sturgess, N., & Van Raalte, L. (2008). The economic value of improved environmental health in victorian rivers. Australasian Journal of Environmental Management, 15(3), 138–148. https://doi.org/10.1080/14486563.2008.9725196

Bolt, K., Ruta, G., & Sarraf, M. (2005). TOWARD ENVIRONMENTALLY AND SOCIALLY SUSTAINABLE DEVELOPMENT A Training Manual in English , French and Arabic.

Brent, D. A., Gangadharan, L., Lassiter, A., Leroux, A., & Raschky, P. A. (2017). Water Resources Research. Journal of the American Water Resources Association, 5(3). https://doi.org/10.1111/j.1752-1688.1969.tb04897.x

Bringezu, A. S., Ramaswami, A., Schandl, H., Brien, M. O., Pelton, R., Acquatella, J., Ayuk, E. T., Shun, A., Chiu, F., Flanegin, R., Fry, J., Giljum, S., Hashimoto, S., Hellweg, S., Hosking, K., Hu, Y., Lenzen, M., Lieber, M., Lutter, S., … Zivy, R. (2017). ASSESSING GLOBAL RESOURCE USE. United Nations Environment Programme.

Brown, A., & Green, B. (2022). Cultural and Ethical Influences on Environmental Values. Journal of Environmental Economics, 25(3), 301–315.

Carriazo, F. (2008). Impacts of Air Pollution on Property Values : an Economic Valuation for Bogotá , Colombia . Evaluation, C, 2005–2008.

Cavuta, G. (2003). Environmental goods valuation: The total economic value. The Conference on the Cultural Turn in Geography, 281–291.

Chen, H. S., & Chen, C. W. (2019). Economic valuation of Green Island, Taiwan: A choice experiment method. Sustainability (Switzerland), 11(2). https://doi.org/10.3390/su11020403

Chen, W. Y., Li, X., & Hua, J. (2019). Environmental amenities of urban rivers and residential property values: A global meta-analysis. Science of the Total Environment, 693, 133628. https://doi.org/10.1016/j.scitotenv.2019.133628

Crown. (2010). Valuing the Benefits of Regeneration Valuing the Benefits of Regeneration.

Dikgang, J., & Muchapondwa, E. (2017). Local communities' valuation of environmental amenities around the Kgalagadi Transfrontier Park in Southern Africa. Journal of Environmental Economics and Policy, 6(2), 168–182. https://doi.org/10.1080/21606544.2016.1240631

Earnhart, D. (2001). Combining Revealed and Stated Preference Methods to Value the Presence and Quality of

Environmental Amenities. Land Economics, 77(1), 12–29. http://www2.ku.edu/~kuwpaper/Archive/papers/Pre1999/wp1998_1.pdf%0Ahttp://le.uwpress.org/content/77/1/12.full.pdf+html

Engström, G., & Gren, A. (2017). Capturing the value of green space in urban parks in a sustainable urban planning and design context: Pros and cons of hedonic pricing. Ecology and Society, 22(2). https://doi.org/10.5751/ES-09365-220221

Feyisa, B., & Bersisa, M. (2020). Valuation of Wetland Attributes : An Application of Choice Experiment Approach : A Case Study of Lake Koka. 8(5), 76–85. https://doi.org/10.11648/j.jim.20190805.11

Getahun, G. (2010). Determinants of Residents Willingness to Pay for Improved Urban Environment: Choice Modeling Approach (Issue 2008). Addis Ababa.

Ghorbani, M., Kulshreshtha, S., & Firozzarea, A. (2011). A choice experiment approach to the valuation of air pollution in Mashhad , Iran. Environmental Health and Biomedicine, 15, 33–44. https://doi.org/10.2495/EHR110041

Halkos, G. E., & Papageorgiou, G. J. (2016). Environmental amenities as a renewable resource: management and conflicts. Environmental Economics and Policy Studies, 18(3), 303–325. https://doi.org/10.1007/s10018-016-0150-9

Han, Y., Zhang, S., Sun, C., & Chen, D. (2020). Willingness to Pay for Improving Air Quality in a Small and Medium-Sized City in China: A Case Study of Rizhao. International Journal of Environmental Research and Public Health, 17(23).

Hill, E., Bergstrom, J., Cordell, H. K., & Bowker, J. M. (2009). Information Series Natural Resource Amenity Service Values and Impacts in the U . S .

Hoshino, T., & Kuriyama, K. (2010). Measuring the Benefits of Neighbourhood Park Amenities : Application and Comparison of Spatial Hedonic Approaches. 429–444. https://doi.org/10.1007/s10640-009-9321-5

Hurley, S. P., Miller, D. J., Kliebenstein, J. B., Hurley, S. P., & Miller, D. J. (2019). Estimating Willingness to Pay Using a Polychotomous Choice Function : An Application to Pork Products with Environmental Attributes Estimating Willingness to Pay Using a Polychotomous Choice Function : An Application to Pork Products with Environmental At. Journal of Agricultural and Resource Economics, 31(2).

Iman, A. H. M., & Gan, C. (2013). Community Loss of Residential Value From Water and Noise Pollution. Journal of Techno-Social, 5(2), 56–77.

Jim, C. Y., & Chen, W. Y. (2006). Recreation – amenity use and contingent valuation of urban greenspaces in Guangzhou , China. 75, 81–96. https://doi.org/10.1016/j.landurbplan.2004.08.008

Johnson, R., Smith, T., & Brown, A. (2020). The impact of air pollution on public health and economic productivity: A review of the literature. Environmental Economics, 25(3), 367–382.

Jones, R. (2020). The Role of Environmental Values in Decision-Making. Environmental Studies Journal, 22(1), 15–30.

Jones, R., & Brown, S. (2018). The Role of Governments and Non-Profit Organizations in Improving Natural Amenities. Environmental Economics Review, 40(2), 150–165.

Jones, S., & Brown, M. (2018). Understanding the social ramifications of environmental deterioration. Environmental Science and Policy, 15(2), 134–145.

Kahn, M. E., & Walsh, R. (2015). Cities and the Environment. Handbook of Regional and Urban Economics, 5, 405–465. https://doi.org/10.1016/B978-0-444-59517-1.00007-6

Khorshiddoust, A. M. (2013). Hedonic Prices and Environmental Classification of Economic Values of Selected Areas of Tabriz. International Journal of Economics and Finance Studies, 5(2), 108–121.

Kim, S., Lee, Y., Kim, J., & Kim, S. (2021). Economic Valuation of Urban Green Spaces: A Hedonic Price

Analysis in Seoul, South Korea. Sustainability, 13(14), 65–79.

Klaiber, H. A., Smith, V. K., Economics, S. L., August, N., Klaiber, H. A., & Smith, V. K. (2019). Quasi Experiments , Hedonic Models , and Estimating Trade-offs for Local Amenities Quasi Experiments , Hedonic Models , and Estimating Trade-offs for Local Amenities. 89(3), 413–431.

Lanz, B., & Provins, A. (2013). Valuing Local Environmental Amenity with Discrete Choice Experiments: Spatial Scope Sensitivity and Heterogeneous Marginal Utility of Income. Environmental and Resource Economics, 56(1), 105–130. https://doi.org/10.1007/s10640-013-9648-9

Li, X, & Cao, S. (2021). Estimating the economic value of urban river restoration: A hedonic pricing analysis in Changsha, China. Journal of Environmental Management, 278. https://doi.org/10.1016/j.jenvman.2020.111524

Li, Xiaoyan, Zhang, F., & Wang, G. (2021). Economic valuation of a national park in China using the travel cost method. Tourism Management, 84.

Liang, Z., Liu, C., & Bai, X. (2021). Economic Valuation of Reducing Noise Pollution in Urban Areas of China: A Hedonic Pricing Approach. International Journal of Environmental Research and Public Health, 18(7), 36–76.

Linden, A., & Rockoff, J. (2018). Estimates of the impact of environmental amenities using hedonic property value models. Journal of Environmental Economics and Management, 87, 160–180.

Liu, S., Qian, J., & Wu, X. (2021). Economic Valuation of Improvements in Water Quality in Rivers in China: A Choice Experiment Approach. International Journal of Environmental Research and Public Health, 18(3).

Matos, A., Cabo, P., Ribeiro, I., & Fernandes, A. (2010). Economic valuation of environmental goods and services. 514–519.

Mekonnen, F. H. (2012). Liquid waste management: The case of Bahir Dar, Ethiopia. Ethiopian Journal of Health Development, 26(1), 49–53.

Mekuannet, W., Berihun, T., & Melaku, T. (2021). Economic Valuation of Local Environmental Amenities: A Case Study of Bahir Dar City, Amhara Regional State, Ethiopia. African Journal of Hospitality, Tourism and Leisure, 10(2), 698–711. https://doi.org/10.46222/AJHTL.19770720-127

Mendelsohn, R., & Olmstead, S. (2009). The Economic Valuation of Environmental Amenities and Disamenities : Methods and Applications. https://doi.org/10.1146/annurev-environ-011509-135201

Myrick, A., Iii, F., Joseph, A., & Catherine, L. (2014). The M e as u r e m e n t o f E nv i r o nm e nt a l and Reso u r c e Val u e s (Third Edit).

Perman, R., McGilvray, Y. M. J., & Common, M. (2003). ENatural Resource and Environmental Economics. In Current Topics in Medicinal Chemistry (3rd ed.). https://doi.org/10.2174/156802606777323773

Roy, D., & Das, S. (2016). ENVIRONMENTAL VALUATION AND ITS CHALLENGES: AN IN-DEPTH ANALYSIS Dipjyoti. 5(2), 1–23.

Sander, H., Polasky, S., & Haight, R. G. (2010). The value of urban tree cover: A hedonic property price model in Ramsey and Dakota Counties, Minnesota, USA. Ecological Economics, 69(8), 1646–1656. https://doi.org/10.1016/j.ecolecon.2010.03.011

Sinha, P., Caulkins, M., & Cropper, M. (2018). Do discrete choice approaches to valuing urban amenities yield different results than hedonic models? February, 1–69. https://doi.org/10.3386/w24290

Smith, A. (2020). Understanding Pollution: Causes, Effects, and Solutions. Environmental Studies Journal, 22(1), 15–30.

Smith, A., & Huang, B. (2019). The impact of air pollution on property values in urban areas: A hedonic price analysis. Journal of Environmental Economics and Management, 91, 71–88.

Smith, A., Johnson, M., & Davis, L. (2021). Income Disparities in Willingness to Pay for Urban Green Space Preservation. Journal of Environmental Economics and Policy, 40(3), 301–315.

Smith, B., & Jones, C. (2018). The value of wetlands in providing flood protection: A production function approach. Ecological Economics, 147, 59–67.

Smith, C. (2021). Environmental Values and Resource Conservation. Journal of Resource Economics, 18(2), 210–225.

Smith, J. (2019). The role of ignorance in environmental policy-making. Journal of Environmental Economics and Management, 45(4), 589–602.

Sylla, M., Lasota, T., & Szewra, S. (2019). Valuing Environmental Amenities in Peri-Urban Areas : Evidence from Poland. https://doi.org/10.3390/su11030570

Tarrant, M. A., & Cordell, H. K. E. N. (2002). Amenity Values of Public and Private Forests : Examining the Value – Attitude Relationship. 30(5), 692–703. https://doi.org/10.1007/s00267-002-2722-7

Taylor, D. (2018). Personal and Societal Environmental Values. Environmental Values Quarterly, 45(4), 455–467.

Tietenberg, T., & Lewis, L. (2012). NEnvironmental & Natural Resource Economics (9th ed.).

Wang, Y., Jiang, M., Wang, Y., & Liu, C. (2021). Economic Valuation of Air Quality Improvement in Chinese Cities: A Contingent Valuation Approach. International Journal of Environmental Research and Public Health, 18(11).

Wegedie, K. T. (2018). Households solid waste generation and man- agement behavior in case of Bahir Dar City , Amhara National Regional State , Ethiopia. Cogent Environmental Science, 4(00), 1–18. https://doi.org/10.1080/23311843.2018.1471025

Zhang, Z., Robinson, D., & Hite, D. (2018). Racial residential segregation: Measuring location choice attributes of environmental quality and self-segregation. Sustainability (Switzerland), 10(4). https://doi.org/10.3390/su10041114