THE RISKS OF ENVIRONMENTAL VALUATION IN DEVELOPING COUNTRIES: BETWEEN MONETARY INTERESTS AND CAPITAL DEGRADATION

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Abstract

Policymakers increasingly aim to integrate nature's value into economic decisions, encouraging organizations to recognize "natural capital" — a challenging goal, especially in developing countries. These nations face greater difficulty than developed ones in valuing environmental resources, raising the risk of irreversible environmental degradation. This study examines the risks and challenges of economic and financial valuation of environmental resources in developing countries, focusing on Iran. A systematic review of Iranian literature from 2000 to 2024 identified 324 articles, narrowed to those addressing valuation methods and empirical applications. Findings reveal that estimated values for natural resources often fall short of their true worth, with urban parks frequently assigned higher value than significant natural or historical sites. Factors such as inadequate valuation methods and limited public awareness of natural resources' real value contribute to this disparity. Even high, sometimes exaggerated, estimates based on market valuations for natural resources rarely rival industrial revenues, such as those from petrochemicals. Even when similarly valued, natural resources often lose out to industrial alternatives due to delayed returns and intangible benefits, leading to the prioritization of resource-based industries over environmental protection. This study advocates moving beyond valuation-centrism toward a holistic approach integrating ecological, social, and ethical considerations essential for sustainable development.

Keywords: Environmental Valuation, Financial and Economic Valuation, Developing Countries, Capital Exploitation Risks, Sustainability

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1. INTRODUCTION

In recent decades, research has increasingly explored the human-environment connection, revealing its influence on health, well-being (Nieuwenhuijsen, 2020; Willberg et al., 2023), economic conditions (Yao et al., 2019), and sustainable development (Hanna & Comín, 2021). However, despite this recognition, environmental goods and services remain undervalued in economic systems. Characterized by non-excludability and non-rivalry, they differ from typical products as they extend beyond individual control and lack direct market valuation. This absence of clear economic recognition often leads to market failure, resulting in resource overexploitation and environmental degradation (Quah & Tan, 2019).

Furthermore, traditional economic growth models, which prioritize rapid development over sustainability, have historically driven environmental harm. Industrialized nations like the UK, USA, and Germany expanded at the cost of ecosystem depletion and excessive resource consumption, exacerbated by weak environmental awareness and cost-driven, unsustainable production methods (Jianping et al., 2013).

Policymakers attribute environmental issues like climate change and biodiversity loss to market failures, where nature's value is not fully considered in economic decisions (Martin et al., 2024). The United Nations (UN) highlights this omission as a major driver of ecosystem degradation (The Economics of Ecosystems and Biodiversity [TEEB], 2010), prompting efforts to integrate nature into economic decision-making (Deegan, 2017). Strategies include assigning economic values to natural capital, promoted by organizations like the Association of Chartered Certified Accountants (ACCA), Flora and Fauna International (FFI), and the Natural Capital Coalition, and generating financial incentives for conservation (Cuckston, 2018).

However, purely economic valuation fails to address systemic issues rooted in capitalism and global inequality. This approach treats the environment as a resource for economic expansion rather than a shared domain, suggesting that meaningful solutions require structural changes beyond monetary assessments (Jianping et al., 2013; O'Neill, 2007).

Accounting literature warns that assigning monetary value to nature may undermine conservation efforts. Hines (1991) argues that framing nature in economic terms can justify its exploitation rather than its protection. Similarly, financial mechanisms like biodiversity offsetting raise concerns that accounting practices may obscure environmental damage (Sullivan, 2013).

In developing countries, recognizing environmental goods and services is particularly challenging due to poverty and limited government resources (Hearne, 1996). The tension between economic growth and environmental preservation underscores the need for interdisciplinary policies that integrate ecological, social, and economic factors (Barbier & Cox, 2003; Söderholm, 2001).

Many nations, including Iran as a developing country, continue to prioritize economic growth through resource exploitation, leading to increased environmental pollutants (Alam, 2006). As one of the top 10 global carbon emitters (Providas, 2021), Iran faces pressing environmental challenges, including global warming, resource depletion, and pollution. Despite constitutional commitments to environmental protection, weak regulatory frameworks and inadequate management hinder effective solutions (Ebadi et al., 2020). This study examines literature and empirical data from Iran to highlight the limitations of economic and financial valuation in achieving sustainability, particularly where capital exploitation risks arise from prioritizing short-term monetary gains over ecological and cultural preservation. Instead of promoting conservation, valuation practices may inadvertently justify environmental degradation, reinforcing harmful policies rather than preventing them.

This study addresses the gap in existing literature regarding the limitations and risks of applying economic and financial valuation methods to environmental resources in developing countries. Focusing on Iran as a case study, this research aims to analyze how these valuation practices may contribute to environmental degradation and the prioritization of short-term monetary gains. Building on the conceptual frameworks of market failure and valuation-centrism, this paper applies a systematic review of Iranian literature from 2000 to 2024. The findings demonstrate that environmental sites in Iran are consistently undervalued, which in turn justifies industrial expansion at the expense of ecological and cultural preservation. These insights contribute to the ongoing discourse on sustainable development by emphasizing the need to integrate ecological, social, and ethical considerations into environmental decision-making.

The structure of this paper is as follows. Section 2 reviews the relevant literature on environmental valuation, its conceptual foundations, valuation approaches, and the specific challenges and risks faced in developing countries. Section 3 presents the research methodology, detailing the systematic review conducted on Iranian literature and the criteria used for selecting studies. Section 4 discusses the results, highlighting key valuation findings, site categorizations, and comparisons with industrial revenues. Finally, Section 5 concludes the study by summarizing the main insights, emphasizing the risks of economic valuation in developing countries, and proposing directions for more sustainable and holistic decision-making.

2. LITERATURE REVIEW

2.1. Valuing the environment: Concept

The roots of today's environmental crises stem from human interactions with the natural world, now commonly referred to as the environment (Goudie, 2018; Leichenko & O'Brien, 2015). Throughout history, nature has been central to human evolution, influencing cultural and spiritual perspectives. Early societies viewed the natural world as divine and superior to human creations, perceiving it as more enduring and all-encompassing (Cronon, 1996; Steiner & Lucht, 2022). Communities have long sought to understand nature's interconnections to navigate environmental challenges (Johnson, 2010). As the foundation of human existence, environmental protection has become a widely accepted global principle. With the transition to a post-industrial society, there is increasing recognition of the need for a more balanced relationship with nature in later stages of development (Jianping et al., 2013).

Amid growing environmental crises, the world is facing an increasing number of ecological conflicts, with severe social and economic consequences resulting from environmental degradation (Rist et al., 2024; Tavakolnia, 2024). These conflicts often arise from competing values among interest groups, where unequal representation in decision-making leads to the marginalization of certain stakeholders (Villegas Palacio et al., 2016). Environmental valuation has been proposed as a tool to mediate such conflicts by integrating diverse perspectives on value.

As a framework, environmental valuation facilitates stakeholder engagement by recognizing the interconnectedness of economic, social, and environmental factors. By assessing trade-offs in ecosystem services, it fosters a shared understanding of sustainability's significance for both present and future generations (Hanley & Shogren, 2002; Randall, 2002). Traditionally, environmental valuation assigns monetary value to non-market environmental resources, aiding policy and management decisions (Nyborg, 2000; Christie et al., 2012). The concept of total economic value (TEV) captures the combined economic worth of environmental assets, quantifying well-being changes resulting from environmental gains or degradation (Sartori et al., 2014).

TEV of an environmental asset encompasses both use and non-use values[1]. Use value reflects the social value derived from the direct or indirect use of an environmental good or service, either presently or in the future. Non-use value, on the other hand, refers to the value assigned by individuals to the environmental asset independent of any direct use or consumption. The general approach of TEV involves combining all these different values, which are grouped according to the service provided by the environmental good (Admiraal et al., 2013; Guijarro & Tsinaslanidis, 2020; Wadström et al., 2023).

It should be noted that several typologies are used to describe the values of nature, each differing in focus and scope (Palola et al., 2022; Stålhammar & Thorén, 2019). This is not limited to the TEV. As noted earlier, the TEV is widely used in environmental valuation to capture the full value of natural resources, including use and non-use values (Lopez-Becerra & Alcon, 2021).

While TEV is a widely used framework in environmental valuation, multiple typologies exist to categorize nature's value, each differing in focus and scope (Palola et al., 2022; Stålhammar & Thorén, 2019). TEV remains a central approach in capturing the comprehensive value of natural resources, encompassing both use and non-use components (Lopez-Becerra & Alcon, 2021).

The Economics of Ecosystems and Biodiversity (TEEB) initiative advocates for informed policy decisions by emphasizing the economic case for conservation and sustainable ecosystem use (Admiraal et al., 2013). Similarly, the Intergovernmental Science-Policy Platform on Biodiversity and Ecosystem Services (IPBES) provides policymakers with scientific insights on biodiversity loss, ecosystem degradation, and their societal impacts, integrating diverse knowledge systems to support effective decision-making (Gustafsson & Lidskog, 2023; IPBES, 2015; Jacobs et al., 2018).

While TEV remains a valuable framework for understanding nature's economic values despite its monetary/microeconomic focus, IPBES assessments emphasize the need to expand beyond instrumental values to include social, ecological, and ethical considerations. Although IPBES provides a framework for integrating these broader values into decision-making, its implementation remains complex, requiring solutions for capturing and incorporating diverse perspectives. The following section further explores these typologies in understanding nature's value.

Valuation plays a crucial role in natural resource decision-making by assigning importance to nature (Boeraeve et al., 2015). This process involves considering multiple value dimensions (Jacobs et al., 2018), but a key challenge is capturing the full range of stakeholder perspectives (Small et al., 2017). To address this, diverse valuation approaches beyond economic or financial metrics are needed (Martín-López et al., 2014; IPBES, 2015).

Maechler and Boisvert (2024) argue that valuation-centrism, reducing ecological and social issues to monetary terms, oversimplifies conservation strategies and marginalizes non-economic values. It also often overlooks structural constraints and the diverse human impacts on ecosystems. Integrating broader ecological, social, and ethical considerations beyond economic metrics is essential for capturing the multifaceted values of nature and fostering genuinely sustainable conservation practices.

The valuation of natural resources is a highly complex and challenging task, owing to the inherent difficulties involved in capturing the multiple dimensions of value that nature provides. Moreover, the diverse perspectives and interests of stakeholders further exacerbate this challenge, making it difficult to arrive at a consensus regarding the true value of environmental goods and services.

2.2. Valuing the environment: Approaches

The debate on nature's value underscores its complexity and multidimensional nature (Londres et al., 2023; Vidal et al., 2024). This discourse explores what constitutes nature's value, revealing its inherently intricate and diverse dimensions. Over the past seven decades, research on non-market goods and services has grown significantly (Newbold & Johnston, 2020; Petrolia et al., 2021), with a surge in studies on ecosystem services (Palola et al., 2022; Stålhammar & Thorén, 2019). Researchers have developed various methods for valuing environmental and ecosystem services that lack market prices (Dominati et al., 2014; Froger et al., 2015). At the same time, there is increasing recognition of the need for interdisciplinary approaches to fully capture nature's multiple values. This has led to growing advocacy for integrating and refining valuation tools to enhance environmental decision-making (Jacobs et al., 2016; IPBES, 2015).

As noted, the TEV approach, while pragmatic and widely used, has been criticized for neglecting the sustainable use of natural capital. Admiraal et al. (2013) argue that TEV alone is insufficient for guiding sustainable ecosystem use and must be integrated with ecological theory for a more holistic valuation. Similarly, Stålhammar and Thorén (2019) propose relational value (RV) as a third category, alongside intrinsic and instrumental values, to enhance TEV-based nature valuation. They suggest that RV provides an epistemological lens to address complexities in environmental ethics, ecosystem service valuation, and environmental psychology. These perspectives highlight TEV's limitations and advocate for a multidisciplinary approach that incorporates ecological theory and relational value to better capture nature's full worth.

To achieve a more comprehensive environmental valuation, Jacobs et al. (2016) advocate for integrating diverse values of nature and fostering a plural valuation culture to challenge

[1] It can be categorized into four categories: 1) direct use values; 2) indirect use values; 3) option values; 4) bequest values (Jacobs et al., 2018).

ineffective single-value approaches. Similarly, Small et al. (2017) emphasize the need for better recognition of non-material ecosystem services lacking direct market values. Jacobs et al. (2018) highlight how method selection shapes the assessed value dimensions, stressing the need for an integrated approach to capture nature's full worth. Additionally, Lopez-Becerra and Alcon (2021) critique hypothetical valuation methods for biases, recommending incentivized approaches like the inferred valuation approach (IVA) to better align with real-world values. Collectively, these studies call for a multidisciplinary framework that embraces nature's diverse values, addressing the shortcomings of single-value models.

In a critical assessment of financial valuation, Cuckston (2018) challenges the notion that assigning monetary value to nature leads to an instrumental mindset that alienates people from it. Instead, he suggests reconfiguring socio-technical arrangements to counter alienation rather than opposing financial valuation itself. However, this perspective overlooks that financial valuation is often driven by market incentives, which are difficult to change without addressing the broader economic system.

In a bibliometric analysis of environmental valuation literature, Guijarro and Tsinaslanidis (2020) examined research published in the Web of Science (1987–2019), finding a steady increase in environmental valuation studies. Their analysis highlights the growing prominence of the choice experiment method (CEM), which has surpassed the contingent valuation method (CVM) as the preferred approach for estimating the economic value of non-market goods and services.

CEM is a survey-based method that assesses consumer preferences through hypothetical markets, involving attribute development, alternative definition, and modeling to forecast behavior and inform policy (Koemle & Yu, 2020). It has been widely used to estimate economic values for multiple environmental attributes. However, CEM faces key challenges, including hypothetical bias, where stated preferences may not reflect actual behaviors, and cognitive fatigue from complex evaluations, which can skew results. Additionally, its reliance on hypothetical markets raises concerns about hypothetical bias, where stated preferences may not reflect actual behaviors. Designing and implementing these experiments can also be resource-intensive, often requiring careful framing to ensure data reliability (Koemle & Yu, 2020; Melo Guerrero et al., 2020).

To measure non-market value, willingness to pay (WTP) frequently supplements CEM and is typically assessed through CVM. WTP is a useful concept for assessing the value consumers place on non-market goods using CVM (Toldo Moreira et al., 2024). However, critics raise concerns about the reliability and validity of stated WTP values, which may be subject to systematic biases (Venkatachalam, 2004). Previous studies on WTP have been limited to specific fields or demographics (Wasaya et al., 2021; Xu et al., 2022), failing to comprehensively measure differences in WTP across various environmentally conscious behavior categories (Chen & House, 2022; Galati et al., 2022). CVM is also a practical approach to measuring preferences for environment (Carson, 2012) where markets do not exist, or prices do not reflect actual costs. While CVM is one of the most commonly used environmental assessment method, it has limitations, such as hypothesis (Kang et al., 2024), initial, and information bias (Cooper et al., 2019), which may lead to potential overestimation or underestimation of WTP values[2] (Geng et al., 2023).

The experienced preferences (EP) approach estimates utility from non-market goods using self-reported life satisfaction, contrasting with traditional revealed and stated preference methods. However, its heavy reliance on subjective well-being data raises concerns about accuracy, as cognitive biases and affective forecasting errors can distort results. Moreover, methodological challenges in isolating environmental impacts on well-being further undermine the reliability of EP valuations (Ferreira et al., 2024).

Despite scholarly calls for a more comprehensive environmental valuation that integrates ecological theory and relational value, financial and economic valuation remains dominant in both research and practice. The shift toward a multidisciplinary approach has gained traction in academic discourse but has yet to be fully implemented in practice. Mendelsohn and Olmstead (2009) and Kill (2015) assert that economic valuation methods remain the only widely recognized tools for assessing environmental harm and determining compensation. Legal frameworks, including the Environmental Liability Directive of the European Union (EU) and USA laws such as the Clean Water Act, Superfund, and the Oil Pollution Act, reinforce the legitimacy of these methods. Additionally, some nations have begun incorporating natural resources and environmental amenities into their economic output calculations.

Given the absence of a fully developed comprehensive valuation framework, economic and financial valuation remains the most feasible and widely applied approach, as policymakers and legislators understand and utilize it in decision-making. When comprehensive, high-quality information is unavailable, policymakers typically rely on whatever data they have, usually quantitative indicators, to guide and justify their actions. This tendency is evident in budgetary decisions influenced by incomplete or flawed data, leading to sudden and often detrimental policy adjustments (Randall & Rueben, 2017); social policies justified by statistical associations rather than robust causal evidence (Woolf, 2022); and environmental regulations evaluated predominantly through monetized proxies for nature's value, despite their inherent limitations (Kemp-Benedict & Kartha, 2019). In this context, the McNamara fallacy highlights the risks associated with policymakers' overreliance on quantitative data while ignoring critical qualitative aspects (Thomson, 2024). As Stiglitz et al. (2009) emphasize, what we measure profoundly influences our actions; if our measurements are flawed or incomplete, the resulting policy decisions can become dangerously distorted. This reliance on monetary and economic valuations thus constitutes a fundamental challenge, as the process of quantifying environmental value carries profound and far-reaching consequences, implications that will be further explored in subsequent sections.

[2] The reliability of WTP and WTA (willingness to accept) in non-market value analysis is debated due to several limitations. Hypothetical bias may cause respondents to misrepresent their true preferences in non-real scenarios, while incentive compatibility issues affect response authenticity. Psychological factors such as the endowment effect and status quo bias further distort economic values. Additionally, the complexity of choice experiments can lead to strategic bias and attribute non-attendance, raising concerns about the validity of WTP and WTA in accurately capturing consumer valuation (Koemle & Yu, 2020).

2.3. Environment economic and financial valuation: Weaknesses and defects

The use of economic and financial valuation techniques in environmental assessment remains highly contested. A key debate arises from differing views on monetization, with some arguing that certain environmental assets are "priceless" and should not be subject to monetary valuation (Pearce & Seccombe-Hett, 2000). Despite significant advancements in economic valuation approaches for natural resources (Barredo et al., 2019), several limitations persist, including ecosystem interdependence, marginality issues, double counting risks, and spatial and temporal challenges. Additional concerns involve environmental limits, uncertainty management, data transfer issues, knowledge gaps, and sensitivity to valuation methods and assumptions, making cross-study comparisons difficult (Barredo et al., 2019).

Navrud (2019) highlights critical flaws in economic valuation frameworks, emphasizing the difficulty of accurately assessing environmental impacts due to the complexity of ecosystem dynamics. Methodological challenges often lead to oversimplification of ecological damages, failing to communicate their true extent. Cultural and behavioral biases further hinder effective valuation, leading to misinterpretations. The report calls for a comprehensive overhaul of valuation methods, stressing the need for interdisciplinary collaboration to address these shortcomings. Moving beyond siloed approaches is crucial to achieving a more robust and holistic valuation framework.

Vardakoulias (2013) highlights the inherent difficulties of accurately valuing natural resources economically, given the complex and nonlinear nature of ecosystems. Monetizing natural assets raises critical ethical concerns, such as equating species extinction with consumer gains or applying market-based valuation to nature. Additionally, incorporating environmental valuation into cost-benefit analysis (CBA) often promotes a "weak sustainability" perspective, assuming that natural capital can be substituted with manufactured capital. This can lead to market benefits overshadowing environmental losses, as only aggregate costs and benefits are considered. For instance, a project that depletes £50 of environmental capital but generates £70 in economic capital may be approved, disregarding long-term ecological harm (Vardakoulias, 2013).

Although economic valuation is often used to inform policy decisions, existing methods often fail to capture species' ecological significance and unpredictable ecosystem behavior, which are crucial for sustainability (Knights et al., 2013). This underscores the need for valuation frameworks that extend beyond narrow economic metrics, integrating ecological and social dimensions to support ecosystem services (Liekens & De Nocker, 2013). However, cultural, methodological, and political barriers continue to limit the broad application of monetary valuation in policymaking. Although these approaches enrich decision-making, they remain only one component of a complex process. Effective valuation must rationally integrate economic, ecological, and social dimensions (Barredo et al., 2019), a challenge that remains largely unaddressed.

The economic valuation of the environment is fraught with weaknesses, many stemming from false assumptions. For instance, the belief that money serves as a neutral measure of preferences can lead to deficiencies in economic valuation. Monetary measures such as WTP or WTA fail to capture the complex relationships between humans and nature. Moreover, framing nature in monetary terms can be seen as a betrayal of intergenerational responsibility, disregarding the interests of future generations in preserving natural assets. Prioritizing monetary valuation risks overshadowing the non-economic and intrinsic values that people attribute to nature (Knights et al., 2013). Additionally, valuation methods often rely on assumptions that do not hold in real-world settings, leading to biases and inaccuracies, necessitating a broader consideration of non-economic factors for a more comprehensive assessment of environmental values (Cooper et al., 2019).

Expanding on these critiques, Maechler and Boisvert (2024) argue that while economic valuation has been promoted for three decades to frame nature as manageable capital, it has neither been widely adopted in practice nor led to significant conservation outcomes. They challenge its portrayal as a universal solution despite limited evidence of its effectiveness. Drawing on Gibson-Graham's (2006) concept of "capitalocentrism", they introduce "valuation-centrism", a discourse that funnels all ecological solutions into valuation frameworks, reinforcing capitalist views of nature and hindering alternative environmental perspectives.

Thus, applying economic and financial valuation in environmental assessments presents significant challenges, ranging from methodological constraints to ethical dilemmas. Current approaches must evolve to encompass ecological, social, and cultural values alongside economic metrics to ensure holistic and sustainable decision-making. Failing to do so could jeopardize our natural heritage for future generations, as these approaches often overlook the intrinsic value of nature beyond mere monetary assessments.

2.4. Valuing the environment: Developing countries

Valuing the environment is particularly crucial in developing countries, where balancing economic growth and environmental conservation remains a major challenge. Economic development in these nations often comes at the cost of natural resource depletion and environmental degradation (Barbier & Cox, 2003; Kwak & Russell, 1996). Expansion frequently relies on inefficient energy and water use, destruction of renewable resources, and overall deterioration of ecosystems (Alam, 2006). Beyond the ethical concerns of monetizing nature, Whittington (2002) highlights that many environmental valuation studies in developing countries suffer from poor administration, inadequate scenario design, and a lack of result verification. Additionally, Alam (2006) identifies challenges in applying CVM in these regions, including high survey costs, limited technical expertise, and low confidence among decision-makers. Alam (2006) notes that economic activities in developing countries are often incompletely monetized, complicating the translation of respondents' preferences into monetary values and increasing the likelihood of capital degradation through unchecked resource exploitation.

Moreover, environmental policies in developing countries face major obstacles (Ursavaş & Apaydın, 2024), often hindered by political structures that limit public involvement and accountability (Carayannis et al., 2021; Kim et al., 2019). These challenges are exacerbated by higher levels of corruption (Cevik & Jalles, 2023; Olken & Pande, 2012), which significantly compromise environmental quality and sustainable development (Akalin et al., 2021). Corruption weakens environmental regulation enforcement, leading to unmet environmental targets (Balsalobre-Lorente et al., 2019; Ozsoy & Ozpolat, 2024) and hindering Sustainable Development Goals [SDGs] (Arib, 2018). It also fuels informal sector growth, increases non-compliant production (Ouédraogo, 2017; Sekrafi & Sghaier, 2018), undermines government oversight (Tawiah et al., 2024), and drives over-exploitation of natural resources (Lisciandra & Migliardo, 2017). This contributes to ecosystem degradation (Tawiah et al., 2024), and enables illegal wildlife trade (Wyatt & Cao, 2015). Weakened regulatory frameworks attract environmentally harmful foreign direct investment (Akalin et al., 2021), while lower environmental awareness, particularly among communities near natural resources, further limits conservation efforts (Taylor et al., 2024; Nahar et al., 2023).

Thus, applying economic and financial valuation to environmental resources in developing countries carries significant risks. Weak environmental regulations and vested interests may allow governments and corporations to manipulate valuations to justify environmental degradation. By reducing nature to economic metrics, decision-makers may prioritize short-term financial gains over long-term sustainability, leading to irreversible ecosystem damage. Additionally, such practices can undermine local communities' rights and widen socio-economic disparities, exacerbating environmental injustices.

Building on this, Iran provides notable examples of how environmental valuation has been used to justify industrial projects at the expense of ecological health. Politicians often manipulate valuations to promote short-term economic benefits, such as job creation, to gain public favor, even when it leads to severe environmental harm. For instance, the Iranian government approved a petrochemical plant on agricultural land, despite local opposition. The environment department justified this decision by comparing the plant's $1 billion annual revenue to the land's $60,000 agricultural value, arguing that economic logic favors industrial expansion[3]. This reflects how valuation frameworks can be exploited to prioritize industry over conservation.

Similarly, oil extraction has severely polluted Iran's wetlands, including Hoor al-Azim and Shadegan, despite their potential to sustain 30,000 jobs in fisheries and related sectors. Industrial interests justify their destruction by citing the greater economic benefits of oil production[4]. Another example is the Bakhtagan region, where an iron sponge factory was approved despite concerns that its environmental costs far exceed economic benefits[5]. In remote areas, such valuation methods enable politicians to assign monetary values to natural resources, using them as justification for industrial expansion while marginalizing environmental advocates.

3. RESEARCH METHODOLOGY

This study builds on theoretical foundations and critiques by analyzing key environmental valuation methods applied in Iran, along with their calculated values. Iran presents a compelling case for examining the risks of economic valuation, given its significant environmental challenges, heavy reliance on resource-based industries, and underdeveloped regulatory mechanisms. These factors make Iran an important case study for understanding broader valuation issues in developing economies. The objective is to validate and expand prior arguments using numerical data and empirical evidence beyond theoretical discourse. To identify relevant research, databases including the Scientific Information Database (SID), Noor Specialized Magazines Website (Noormags), the Islamic World Science Citation Center (ISC), Elmnet, and Magiran were systematically searched. The search targeted articles published between 2000 and 2024 that discuss economic and financial valuation methodologies for environmental and natural resources. Conducted between November 2023 and October 2024, this search yielded 324 articles. From these, studies were selected that specifically addressed valuation methods, applied these methods in empirical research, and produced calculated values for their focus areas. Each study was categorized based on its primary valuation approach, the type of resource assessed, and its main findings. The monetary values were converted to US dollars using the average exchange rate at the time of each study's publication. A complete list of reviewed research studies is presented in Table 1 (see Appendix).

4. RESULTS

4.1. Valuation findings from previous studies

The main valuation methods used in assessing environmental and historical sites include WTP, travel cost method (TCM), market value, use value, and choice modeling. Market-based methods like market value and choice modeling often show extremely high valuations in certain cases. For example, Darband in Tehran is valued between $17 and $73 million annually, Arjan-Parishan Lake is valued at $2.5 billion, Kouhestan Park in Yazd at $263 million, and Alisadr Cave in Hamedan at $245 million. These methods reflect major economic assessments based on the physical resources or economic activities tied to the areas, often highlighting the potential financial benefits from tourism or resource extraction.

The WTP method, on the other hand, shows a wide range in values, with some sites receiving high valuations, like Karoon River ($37 million) and Kouhestan Park in Yazd ($88 million). However, many other sites are valued much lower. For example, Dalab Forest is valued at just $2,003, and Nematabad Dam at $565. These lower values suggest that WTP significantly underestimates the real economic, social, or environmental importance of these areas, particularly when individuals' willingness to pay is not an accurate reflection of the site's true value. This may be due to income disparities, lack of awareness, or public undervaluation. Similarly, use value and TCM show moderate valuations, but in many cases, they still

[3] https://borna.news
[4] https://www.khabaronline.ir
[5] https:// khabarban.com/

undervalue highly significant environmental or historical areas. Environmental valuation methods and calculated amounts are presented in Table 2 (see Appendix).

The WTP method reflects personal opinions and economic constraints rather than the true ecological or intrinsic value of the environment. In countries like Iran, where low environmental awareness or economic limitations restrict people's ability to express their preferences, WTP often undervalues critical natural resources. If decision-makers rely on these values, they risk misrepresenting conservation priorities and underestimating the actual need for protection.

The TCM method assumes that travel costs reflect site value, but it only captures recreational and tourist aspects, overlooking ecological, cultural, and historical significance. Consequently, it undervalues remote but environmentally or culturally important sites.

The market value method measures the financial worth of a resource (e.g., land, minerals) but ignores non-market values. This approach risks commodifying nature, potentially promoting resource exploitation over conservation. Similarly, use value focuses on direct, tangible uses (e.g., timber, water) while neglecting indirect benefits such as carbon sequestration, ecosystem services, and biodiversity, leading to undervaluation of areas with intangible benefits.

Despite their ecological and historical significance, many natural and cultural landmarks in Iran receive inadequate valuations. For instance, Dalab Forest is valued at only $2,003, despite its role in biodiversity conservation and carbon storage. Similarly, Salasel Castle, a site of immense historical and cultural importance, is valued at just $9,890 annually, while Jiroft Konar Sandal Hill, a key archaeological site, is assessed at only $1,362, clear examples of severe undervaluation.

In contrast, urban parks receive disproportionately high valuations due to their recreational appeal and accessibility. Parks such as Chitgar Forest Park ($10.69 million), Pardisan Park ($3.13 million), Lavisan Park (2.14 million), El Goli Park ($633,481), Mellat Park ($477,837), and Saee Park ($247,479) hold high monetary values because they attract large numbers of visitors. However, while these green spaces contribute to urban life and public well-being, they lack the historical and ecological depth of Iran's natural and cultural heritage sites.

For instance, Shushtar's Ancient Waterfalls, a UNESCO World Heritage site renowned for its ancient water management system, is valued at $12.71 million, a figure comparable to Chitgar Forest Park, despite its global historical significance. Likewise, Jiroft Konar Sandal Hill ($1,362) and Salasel Castle ($9,890) remain undervalued because valuation methods rely on public willingness to pay (WTP) and visitor numbers, rather than historical, cultural, or ecological importance.

Further disparities exist in natural recreational areas like Khafr Waterfall ($16,434) and Mishan Plain ($36,620), which receive lower valuations than urban parks, despite their scenic beauty and ecological value. Ganjnameh, an important historical site in Hamadan, is valued at $581,427, a higher amount than most historical sites, yet still falls short of reflecting its true cultural and environmental huge significance.

These discrepancies stem from valuation methods that prioritize public accessibility and recreational use over cultural and environmental preservation. WTP and TCM disproportionately favor urban parks, as their valuations are directly linked to visitor numbers rather than the intrinsic value of the site. Consequently, less accessible but historically and environmentally crucial locations are undervalued and neglected.

This skewed valuation system creates a false perception of value, where popular locations appear more important while culturally significant sites receive minimal attention. Sites like Khafr Waterfall or Salasel Castle, which require protection for future generations, risk being overlooked due to their low economic valuation. This issue is exacerbated by a market-driven approach, where nature's value is only recognized when financial benefits, such as mineral resources, are involved, while purely ecological and historical assets remain severely undervalued.

To accurately reflect the true, long-term value of Iran's natural and historical sites, valuation methods must go beyond market mechanisms. A comprehensive approach should be implemented to ensure that key environmental and heritage sites receive the protection and recognition they deserve.

4.2. Categorization of sites by type

The first classification (Figure 1) categorizes sites based on their primary significance, recreational, environmental, or historical-cultural, prioritizing the locally most relevant aspect. The classification into these three groups (Figures 2 and 3) reveals that:

- Recreational sites exhibit the widest range and highest values, reflecting their popularity and visitor numbers.
- Environmental and historical-cultural sites are consistently undervalued, despite their crucial roles in biodiversity conservation and cultural heritage preservation.

The second classification (Figure 4, outliers excluded) divides sites into two groups: parks and other locations. This categorization shows that parks tend to have higher average annual valuations due to their accessibility and recreational use, even though they often lack significant ecological or cultural importance.

These findings indicate that current valuation methods disproportionately emphasize public access and recreational use, resulting in the systematic undervaluation of ecologically and culturally significant sites.

Figure 1. Classification of studies based on topic

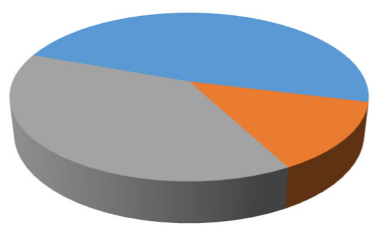


Figure 2. Distribution of annual values

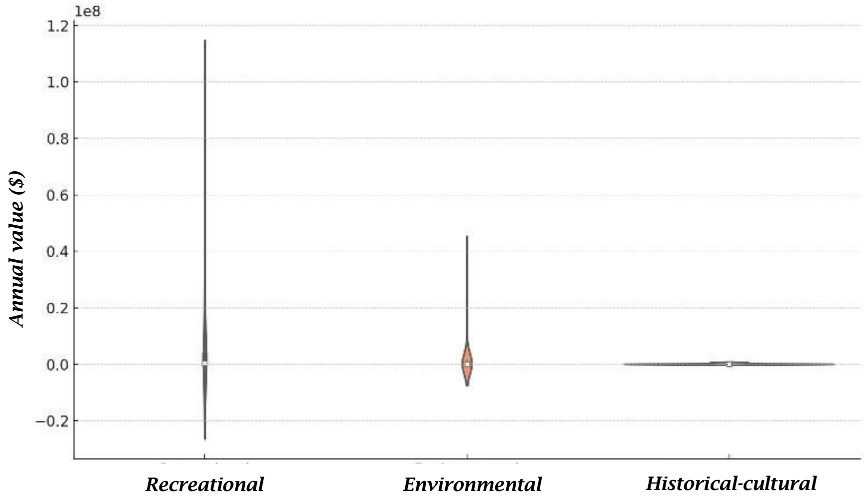


Figure 3. Comparison of and comparison of average annual values

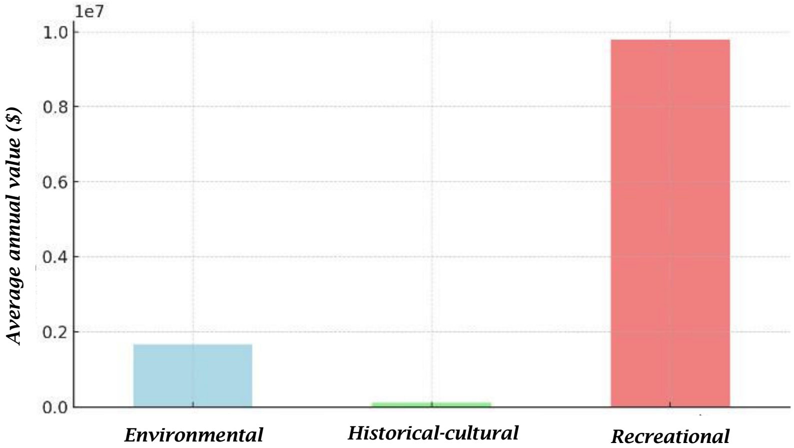
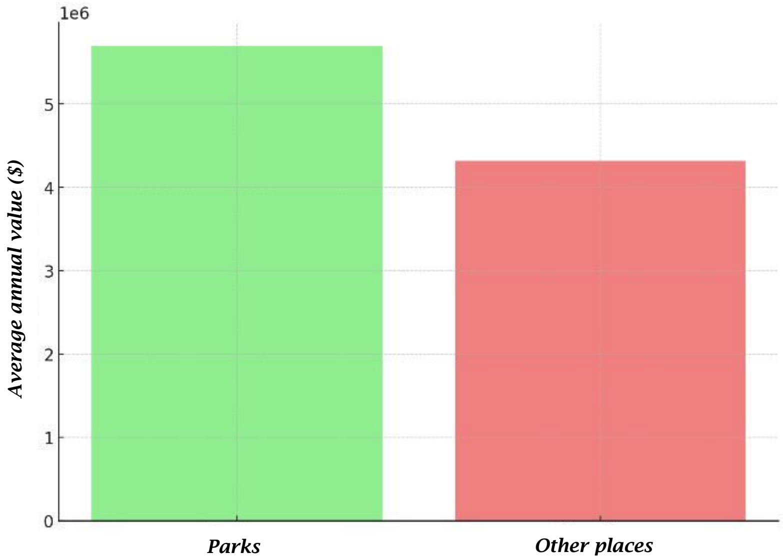


Figure 4. Comparison of average annual values: Parks vs other places



4.3. Comparison with industrial revenues

The issue extends beyond valuation methods or whether certain sites are overvalued or undervalued. Ultimately, all valuation approaches, whether assessing recreational benefits, marine resources, or mineral deposits, produce numerical values. These numbers then become tools in the hands of decision-makers, who are often political figures capable of manipulating them to achieve their own goals, typically driven by economic or financial interests.

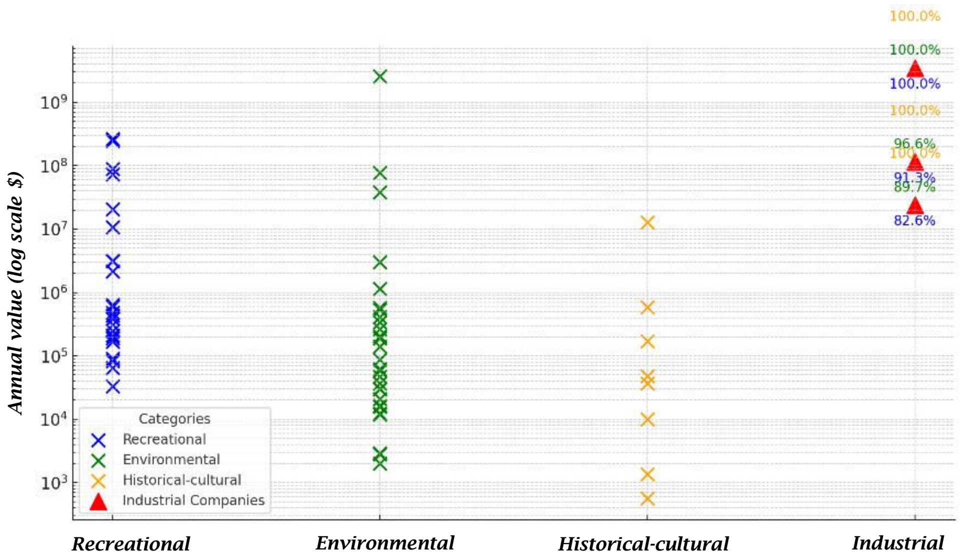
Figure 5 illustrates this comparison. For instance:

- Petrochemical companies in Iran can generate up to $115 million annually (calculated based on the 5-month rial-based revenue report of the Noor Petrochemical Company, converted to dollars and annualized, https://ava.agah.com).
- Cement companies can produce approximately $24 million per year (calculated based on the 5-month rial-based revenue report of the Tehran Cement Company, converted to dollars and annualized, https://www.sedayebourse.ir).
- Refineries can yield as much as $3.5 billion annually (each active refinery in South Pars of Iran earns about 10 million dollars a day, adding up to around 3.5 billion dollars per year, https://www.irna.ir).

This dynamic further emphasizes how monetary interests systematically overshadow sustainability considerations, facilitating environmental exploitation through valuation frameworks that inherently prioritize financial outputs. The logarithmic scatter plot in Figure 5 visually represents these disparities:

- Blue points represent the logarithmic values of recreational sites.
- Green points represent the logarithmic values of environmental sites.
- Yellow points represent the logarithmic values of historical-cultural sites.

Figure 5. Logarithmic scatter plot with percentages



The comparison reveals stark disparities:

- The cement industry sample surpasses 100% of historical-cultural values, 89.7% of environmental values, and 82.6% of recreational values.
- The petrochemical industry exceeds 91.3% of recreational, 96.6% of environmental, and 100% of historical-cultural values.
- The refining industry surpasses 100% of all values presented.

This highlights the immense economic dominance of industrial revenues. Natural resource-based industries, such as oil and gas, hold significantly higher monetary value, often outcompeting all other sectors in economic assessments. Moreover, these industrial revenues are presented despite sanctions and export restrictions in Iran, if lifted, their earnings would be substantially higher, making the gap even more pronounced.

Additionally, industrial revenues are cash-based and immediate, whereas environmental site valuations are often intangible, long-term, and non-cash. This leads to systematic undervaluation of environmental resources, as decision-makers prioritize immediate financial returns over long-term sustainability.

This demonstrates that the monetization of environmental resources cannot be a long-term solution. Rather, it provides politicians with an excuse to pursue short-term economic gains, often at the expense of environmental preservation.

5. CONCLUSION

This study highlights the complex challenges environmental valuation presents, especially in developing countries like Iran. Typically, the monetary values assigned to environmental sites fall short compared to the substantial economic output of industrial projects. Recreational and accessible green spaces often receive higher valuations than ecologically or historically significant but less-visited sites, leading to a skewed prioritization favoring public use over ecological or cultural importance. This outcome reflects broader capital exploitation risks, where economic valuation practices indirectly legitimize the degradation of vital natural and cultural assets in favor of immediate financial returns.

Moreover, where industrial projects such as petrochemical plants and refineries produce immediate, tangible revenues, the valuation of environmental resources is notably disadvantaged. Industrial outputs are cash-based, delivering quantifiable and immediate returns, while environmental values, even when fully accounting for ecological or cultural aspects and reaching high theoretical values, remain often non-cash, intangible, and yield returns over the long term. This dynamic facilitates and encourages policymakers to prioritize short-term economic returns over environmental preservation, especially in countries facing economic challenges and regulatory limitations.

Therefore, the nature of environmental values, with their indirect and often non-market benefits, means that they rarely compete favorably with industrial revenues. So, while economic valuation apparently provides a useful framework for emphasizing the importance of natural resources, relying on financial metrics to justify environmental protection is inadequate. Instead, policymakers need to integrate broader ecological, social, and ethical considerations and in fact, the natural value of nature into decision making processes. Only by addressing these factors can a more balanced and sustainable approach to development be achieved.

The valuation of the environment through economic and financial means is susceptible to significant weaknesses, rooted in the false assumption that money serves as a neutral measure of people's preferences. Relying solely on monetary measures fails to capture the diverse interactions between humans and nature. Moreover, monetary valuation can be perceived as a betrayal of our legacy to future generations, as prioritizing monetary values may overshadow intrinsic motivations to value non-human nature.

This study calls for an urgent shift in current academic trends toward economic and financial valuing the environment and how environmental resources are valuing, urging academics to move beyond purely economic and financial metrics to protect the environment. They surely have positive insights and interests toward achieving sustainable development, but decision-makers in many developing countries like Iran never incorporate ecological, social, and ethical dimensions into the decision. This reflects a pattern noted by Maechler and Boisvert (2024) who argue that while economic valuation aims to make the ecological crisis more tangible by framing nature as manageable capital, it has yet to yield effective conservation outcomes. This "valuation-centrism" frames ecological solutions in monetary, and risks marginalizing the intrinsic value of nature. Embracing a holistic approach that acknowledges the natural and cultural worth of the environment is crucial for balanced growth, a growth that values nature beyond financial metrics.

While this study is limited by its focus on a single country and its reliance on published valuation cases, it provides a unique and comprehensive overview of environmental valuation practices in developing contexts. By combining theoretical critiques with extensive empirical evidence, the research offers a valuable basis for future studies to investigate how valuation frameworks influence policy decisions, sustainability trade-offs, and resource prioritization. It invites further comparative research across regions and supports the development of more holistic valuation approaches that better integrate ecological, social, ethical and cultural dimensions into environmental governance.

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APPENDIX

Table 1. A complete list of reviewed research studies (Part 1)

Author(s)	*Year*	*Title*	*Journal*
Abasi et al.	2022	Estimation of recreational value in rangeland ecosystem using Contingent valuation method (Case study: Alamut-e sharghi rangelands)	*Management of Natural Ecosystems*
Abbaspour et al.	2013	Economic valuation of market functions of environmental resources in Arjan-Parshian Lake with an emphasis on aquatic species	*Environmental Science and Technology*
Abedi and Riahi Dorche	2018	Estimated willingness to pay for value of recreation and conservation of garden flowers in Karaj with contingent valuation method (CVM)	*Journal of Environmental and Natural Resource Economics*
Abolfathi et al.	2013	Estimation of economic-recreational valuation in the Nahavand Forest and Mirage	*Scientific-Research Quarterly of Geographical Data*
Aledavod et al.	2022	Estimation of conservation value of Khoor-o-Biabank area with conditional valuation approach	*Management of Natural Ecosystems*
Amini and Shahbazi	2015	Estimating the recreational value of oak forest in Sirvan and Chardavol Townships using contingent valuation method (CVM)	*Spatial Planning*
Amirnejad and Amirtaimoori	2017	Comparison of two approaches (double-bounded and one-half bounded dichotomous choice methods) in valuation of recreational resources: Case study of Jiroft Konar Sandal hill	*Journal of Agricultural Economics Research*
Amadeh and Abdollahi	2018	Estimation the recreational Value of Eram Botanical Garden using the contingent valuation method	*Tourism Management Studies*
Attarroshan et al.	2021	Economic valuation and estimation of willingness to pay for Baghestan recreational and tourist village in Karaj using contingent valuation method (CVM)	*Journal of Tourism and Development*
Azizi et al.	2014	Valuation of tourism in Alisadr Cave, Hamedan, using the zonal travel cost method	*Tourism Geography Quarterly*
Balali et al.	2019	Determination of the recreational value of Mishan plain using contingent valuation method	*Journal of Tourism and Development*
Danaeifar et al.	2019	Recreational value estimation of Salasel Castle in Shushtar using contingent valuation method and individual travel cost	*Journal of Tourism and Development*
Danayi Far et al.	2020	Estimation of the ecotourism Value of Tang-e Takab Area in Behbahan County using the contingent valuation method	*Quarterly Journal of Development Strategy*
Dizaji et al.	2010	Estimation of tourism value of El Goli Park in Tabriz using contingent valuation method	*Applied Economics Quarterly*
Ebrahimi et al.	2014	Estimation of the recreational value of Mellat Park in Zahedan City using the contingent valuation method and logit model	*The Journal of Geographical Research on Desert Areas*
Emami Meibodi and Ghazi	2008	An estimation of the recreational value of the Saee Park in Tehran using the contingent valuation method (CV)	*Iranian Journal of Economic Research*
Eskandari Nasab et al.	2021	Assessing the conservation value of Rig Ishaqqabad rangeland of Sirjan using contingent valuation method	*Marta Scientific Journal*
Faal Dastgerdi et al.	2024	Estimating the recreational value of Wetlands using the contingent valuation method (Case study: Chaghakhor Wetland of Chaharmahal and Bakhtiari Province, Iran)	*Tourism Management Studies*
Ghanbari and Hashemi Amon	2017	Estimating the willingness of visitors and tourists of Zaribar Lake to pay and review the influential factors by using the contingent valuation method (CVM)	*Geography and Territorial Spatial Arrangement*
Ghorbani and Sadeghi Lotfabadi	2011	Determinants of willingness to pay and ecotourism value of national parks (Case study of Tandoreh Park)	*Journal of Agricultural Economics and Development*
Hashem nejad et al.	2011	Determining the recreational value of Nour Forest Park (NFP) in Mazandaran, using contingent valuation	*Journal of Environmental Studies*
Jafari et al.	2014	Economic valuation of Kahman outdoor recreation using contingent valuation method	*Arid Regions Geographic Studies*
Jozi et al.	2011	Economical valuation of Karoon 3 Dam Lake limits for presentation ecotourism development strategic planning via A'WOT method	*Journal of Natural Environment*
Karami et al.	2021	Estimating the outdoor recreation value of the Dalab forest area in the Ilam Province using the contingent valuation method	*Iranian Journal of Forest and Poplar Research*
Keikha et al.	2023	Economic evaluation of Birk protected park in Sistan and Baluchistan province	*Journal of Environmental Science Studies*
Khaksar Astaneh, Daneshour, et al.	2011	Estimation of the recreational value of Mashhad's forest parks using the contingent valuation method (CVM)	*Agricultural Economics Research*
Khaksar Astaneh, Kalate Arabi, et al.	2011	Estimating the willingness to pay of visitors of Shahre Sukhte historical collection, using conditional valuation method (CVM)	*Tourism Management Studies*
Khatoony and Kolahi	2022	Economic valuation of Arghavandareh forest's ecosystem goods and services	*Iranian Journal of Forest and Range Protection Research*
Khosh Akhlaq et al.	2014	Economic valuation of recreational sites using the individual travel cost approach: Case study of Darband, Tehran	*Journal of Economic Sciences*
Kiani Salmi	2016	Estimation of recreation value and recognition of effective factors for willingness to pay for urban natural parks by using contingent valuation method	*Urban Management Studies*
Madani	2014	Comparing the consumer surplus for recreational value by using a contingent valuation method and travel cost method	*Journal of Iranian Economic Development Analyses*
Mahmoodi et al.	2010	Recreational value estimation of Anzali Wetland using contingent valuation method	*Journal of Environmental Studies*
Manafi Mollayousefi and Hayati	2010	Estimating the outdoor recreation value of Maharloo Lake of Shiraz with the use of contingent valuation method	*Journal of Natural Environment*
Mojabi and Monavari	2005	Economic valuation of Pardisan and Lavisan parks	*Environmental Sciences*

Table 1. A complete list of reviewed research studies (Part 2)

Author(s)	Year	Title	Journal
Mojarad Ashna Abad and Karavani	2023	Economic valuation of natural medicinal plants collected from forests and pastures of Urmia County and its environmental effects	*Journal of Environmental Science and Technology*
Molaei et al.	2009	Estimation of the recreational value of Sardar Maku Castle and determining the factors affecting visitors' willingness to pay	*Economic Modeling Quarterly*
Montazer-Hojat et al.	2018	Economic valuation of tourist attractions of Shushtar's ancient waterfalls	*Tourism Management Studies*
Montazer-Hojat et al.	2021	Economic benefits of Karoon River; Does society have willingness to pay to conserve it?	*Quarterly Journal of Quantitative Economics*
Moradi et al.	2022	Estimating the economic value of tourist attractions using travel cost method	*Tourism Management Studies*
Moradi et al.	2012	Estimation of recreational value of Yasouj forest park using contingent valuation method	*Journal of Agricultural Economics Research*
Moradi and Mahmoudi	2022	Economic-recreational valuation of Koohestan forest park of Kermanshah using Zonal Travel Cost Method (Z.T.C.M)	*Human and Environment*
Morsali et al.	2020	Recreational economic valuation of the Pirsalman wetland of Hamedan province using the travel cost method	*Journal of Wetland Ecobiology*
Mostofi Almamaleki and Hosseini	2016	Estimation of the value of recreational great parks in Mashhad City using contingent valuation method and the logit model	*Human Geography Research Quarterly*
Mousavi	2015	Estimation of economic-resort valuation of Khafr Waterfall and recreational area by determining effective factors on willingness to pay using CVM	*Journal of Regional Planning*
Rafat and Mousavi	2013	Estimating recreational value of Hasht Behesht Park using contingent valuation method (CV)	*Journal of Environmental Studies*
Raheli et al.	2011	Estimating the outdoor recreation value of band village: Application of contingent valuation method	*Agricultural Economics Research*
Rahli et al.	2013	Estimating recreational value and investigating factors influencing tourists' willingness to pay for Asiyab Kharabe Waterfall using the contingent valuation method	*Geographical Research and Urban Planning*
Rezaee et al.	2013	The determination of recreation values of Jamshidieh Park in Tehran by using contingent valuation method	*Journal of Environmental Studies*
Sajadi et al.	2016	Estimation of economic value of tourism regions (Case study: Rudbar-Qasran)	*Tourism Management Studies*
Samdeliri and Mohammadian	2023	Application of speculative valuation method to reduce social desirability bias in economic valuation of environment: A case study of recreational value of Nematabad Dam in Asadabad County of Iran	*Quarterly Journal of Agricultural Economics and Development*
Seif Al-Din Asl et al.	2021	Economic-recreational valuation of Tehran's Chitgar forest park using the zonal travel cost method	*Shabak*
Servati et al.	2016	Estimation of the economic-touristic value of Geomorphosites in Qeshm Island and analysis of factors affecting visitors' willingness to pay using the contingent valuation method (CVM)	*Studies of Human Settlements Planning*
Sharzehi and Jalili Kamjoo	2013	Choice modeling: A new approach to valuation of environmental commodity (Case study: Ganjnameh, Hamadan)	*QJER*
Ya'vari and Asadi Bazardeh	2016	Comparison of contingent valuation and travel cost methods in estimating the recreational value of Kouhestan Park, Yazd	*Economic Analysis of Iranian Development*
Yeganeh et al.	2015	Estimating the recreational value of Taham Watershed rangelands in Zanjan using a contingent valuation method	*Agricultural Economics*

Table 2. Environmental valuation methods and calculated amounts (Part 1)

Author(s)	Year	Subject	Method	Annual value ($)
Faal Dastgerdi et al.	2024	Chaghakhor Wetland	TCM	3,016,393
Samdeliri and Mohammadian	2023	Nematabad Dam	WTP	565
Mojarad Ashna Abad and Karavani	2023	Medicinal Plant	Market value	573,883
Keikha et al.	2023	Birk Protected Park	Use*	266,027
Keikha et al.	2023	Birk Protected Park	WTP	2,794
Abasi et al.	2022	Eastern Alamut Rangelands	WTP	2,893
Aledavod et al.	2022	Khoor-o-Biabank area	WTP	16,247
Moradi and Mahmoudi	2022	Koohestan Forest Park	TCM	20,772
Moradi et al.	2022	Namir Garden	TCM	12,417
Eskandari Nasab et al.	2021	Rig Ishaqabad Rangeland	WTP	338,400
Karami et al.	2021	Dalab Forest Area	WTP	2,003
Montazer-Hojat et al.	2021	Karoon River	WTP	37,848,484
Khatoony and Kolahi	2022	Arghavandareh Forest	Use, WTP, & TC	532,322
Attarroshan et al.	2021	Karaj Garden	WTP	47,529
Morsali et al.	2020	Pirsalman Wetland	TCM	77,324,060
Seif Al-Din Asl et al.	2021	Chitgar Forest Park	TCM	10,690,610
Danayi Far et al.	2020	Tang-E Takab Area	WTP	20,440,931
Balali et al.	2019	Mishan Plain	WTP	36,620
Danaeifar et al.	2019	Salasel Castle	TCM	9,890
Montazer-Hojat et al.	2018	Shushtar's Ancient Waterfalls	WTP	12,714,285
Amadeh and Abdollahi	2018	Eram Botanical Garden	WTP	204,519
Abed and Riahi Dorche	2018	Karaj Flowers Garden	WTP	381,280
Amirnejad and Amirtaimoori	2017	Jiroft Konar Sandal Hill	WTP	1,362
Ghanbari and Hashemi Amon	2017	Zaribar Lake	WTP	29,922
Sajadi et al.	2016	Rudbar-Qasran	WTP	90,356

Table 2. Environmental valuation methods and calculated amounts (Part 2)

Author(s)	*Year*	*Subject*	*Method*	*Annual value ($)*
Ya'vari and Asadi Bazardeh	2016	Yazd Kouhestan Park	WTP	88,421,052
	2016	Yazd Kouhestan Park	TCM	263,157,894
Kiani Salmi	2016	Soffeh Mountain Park	WTP	434,969
Mostofi Almamaleki and Hosseini	2016	Koohsangi Park	WTP	188,845
	2016	Mellat Park of Mashhad	WTP	477,837
Servati et al.	2016	Qeshm Island in Geomorphosites	WTP	1,144,223
Yeganeh et al.	2015	Taham Watershed Rangelands	WTP	15,697
Mousavi	2015	Khafr Waterfall and Recreational Area	WTP	16,434
Amini and Shahbazi	2015	Oak Forest in Sirvan and Chardavol	WTP	30,367
Ebrahimi et al.	2014	Mellat Park of Zahedan	WTP	167,196
Madani	2014	Coral Reefs of Kish Island	WTP	188,383
	2014	Coral Reefs of Kish Island	TCM	408,163
Azizi and Sadeghi	2014	Alisadr Cave	TCM	245,185,688
Jafari et al.	2014	Kahman Region	WTP	57,836
Khosh Akhlaq et al.	2014	Darband	TCM	17,238,095–73,523,809
Abbaspour et al.	2013	Arjan-Parishan Lake	Market value	2,574,000,000
Sharzehi and Jalili Kamjoo	2013	Ganjnameh	Choice Modeling & WTP	581,427
Rafat and Mousavi	2013	Hasht Behest Park in Isfahan	WTP	83,286
Rahli et al.	2013	Asiyab Kharabe Waterfall	WTP	11,930
Abolfathi et al.	2013	Nahavand Forest and Mirage	WTP	32,863
Khaksar Astaneh, Kalate Arabi, et al.	2011	Shahre Sukhte Historical Collection	WTP	36,652
Moradi et al.	2012	Yasouj Forest Park	WTP	210,780
Rezaee et al.	2012	Jamshidieh Park in Tehran	WTP	64,017
Hashem Nejad et al.	2011	Nour Forest Park	WTP	308,012
Jozi et al.	2011	Karoon 3 Dam Lake	TCM	3,202,465
Ghorbani and Sadeghi Lotfabadi	2011	Tandoreh Park	WTP	62,281
Dizaji et al.	2010	El Goli Park in Tabriz	WTP	633,481
Khaksar Astaneh, Daneshour, et al.	2011	Forest Parks of Mashhad	WTP	600,000
Manafi Mollayousefi and Hayati	2010	Maharloo Lake	WTP	87,294
Raheli et al.	2011	Band Village	WTP	46,816
Mahmoodi et al.	2010	Anzali Wetland	WTP	139,513
Molaei et al.	2009	Sardar Maku Castle	WTP	168,740
Emami Meibodi and Ghazi	2008	Saee Park in Tehran	WTP	247,479
Mojabi and Monavari	2005	Pardisan Park in Tehran	TCM	3,133,185
	2005	Lavisan Park in Tehran	TCM	2,139,933

*Note: * Direct and indirect various use values of this resource.*