CURRENT ISSUES IN
SUSTAINABILITY

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INTRODUCTION: CURRENT ISSUES IN SUSTAINABILITY

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One of the laudable paradigms of the 21st century is sustainability, which is increasingly cutting across the global discourses of different disciplines and sectors. Indeed, a better understanding of these pervasive aspects of sustainability will prove more necessary than ever. Climate change, resource depletion, socio-economic inequalities, and rapid technological advances are some of the most pressing challenges facing the world today. Current Issues and Sustainable Contexts now begins to seek multidisciplinary approaches to discussing these outstanding problems, with an integrated and nuanced view of sustainability as a central constructive factor in shaping a resilient future.

The notion of sustainability became popular across the whole world through the Brundtland Report of the year 1987, which stated that "sustainable development is that which meets the needs of the present without compromising the ability of future generations to meet their own needs." Since its, the application of sustainability in both research and practice has broadened over different fields including environmental science, economics, education, tourism, and governance (Hopwood, Mellor, & O'Brien, 2005). It indicates the urgent recognition of the interdependence and interrelations between human system and ecological system in integrating sustainability into these areas.

It essentially aims at balancing the three aspects: environment effects, economic growth, and social equity. Thus, environmental sustainability would be keeping ecosystems and biodiversity while reducing climate change; economic sustainability would be the practices that provide for the long-term economic resilience, correcting inequities, and promoting inclusive growth; and social sustainability would be equity, accessibility, and the welfare of communities. These dimensions provide a holistic approach to their solution by emphasizing interconnectedness and long-term thinking (Geissdoerfer et al. 2017). In this context, economic growth is seen as sustainable when it supports environmental preservation, promotes social equity, and fosters resilience, creating a balanced framework for long-term development (Yıldız & Demirdizen-Çevik, 2017).

This book, *Current Issues in Sustainability*, builds upon this multidimensional understanding, offering a comprehensive exploration of sustainability's most pressing challenges and opportunities. Structured into four sections, it delves into environmental, economic, social, and practical dimensions of sustainability, reflecting the breadth and complexity of the field.

The first section, *Current Issues in Environmental Sustainability*, addresses critical environmental challenges, such as chemical pollutants and the impacts of climate change. These discussions highlight the necessity for integrated approaches, including technological innovations and policy measures, to ensure the long-term viability of ecosystems and human societies (Rockström et al., 2009).

The second section, *Current Issues in Tourism Sustainability*, examines the tourism sector's potential to foster sustainable development. From community-based tourism initiatives to renewable energy adoption in tourism hubs, this

section explores how environmental conservation and socio-economic benefits can coexist (Hall, 2019; Gössling & Hall, 2021; Koç & Erkin 2011).

The third section, *Current Issues in Economic Sustainability and Economics*, explores the intersection of economic growth and environmental stewardship. Topics such as cryptocurrency, e-commerce, and the economic effects of environmental degradation provide insights into fostering economic resilience while addressing ecological constraints (Costanza et al., 1997; Daly & Farley, 2010).

The final section, *Case Studies in Sustainability: Education, Heritage, Accounting, and Politics*, presents practical applications and localized efforts in sustainability. Case studies on education reforms, sustainability accounting, and energy policies illustrate how targeted strategies can contribute to broader sustainability goals (UNESCO, 2020; Gray, 2010).

As a collection of multidisciplinary perspectives, this book aims to contribute to ongoing global dialogues on sustainability. By addressing diverse issues through academic rigor and practical insights, it underscores the importance of collaboration and innovation in creating a sustainable future.

This book is organized into four sections, each addressing critical dimensions of sustainability. The book, Current Issues in Sustainability, delves into pressing topics in sustainability through 17 chapters. Here's a brief summary of these chapters:

In the first chapter *Ramanayaka* views Sri Lanka's efforts in balancing economic growth and sustainability in its environmentalism against emerging ecological crises. Despite success in Sustainable Development Goals (SDGs) such as poverty alleviation and education, the country faces biodiversity loss, ecosystem degradation, and poor environmental policies. The study emphasizes an urgent need for transformative change, which calls for enhanced environmental education, responsible policymaking, and grassroots initiatives for promoting sustainable practices. Sri Lankan challenges reflect only a small part of the sustainability challenges playing their role on a larger level, giving the world much to learn and inspire from their modeling of a development goal in harmony with ecological preservation.

Second chapter of the book discusses the theme of environmental sustainability in the light of Buddhist philosophies and teachings. Accordingly, sustainability is what is vital to our addressing global concerns such as climate change, resource depletion, loss of biodiversity, and social inequality- meeting the needs of the present without compromising those of future generations. Buddhism brought to the world over 2,500 years ago principles that articulate equilibrium between society and economy, and the environment, which the author has cited in this chapter. Through a thorough study of primary sources such as Pali Canon and Dhammapada as well as secondary literature on the subject, the chapter seeks to elucidate Buddhist strategies to environmental challenges. This chapter reveals the ways in which Buddhist doctrines encourage harmony with nature, dignity in relation to it, and long-term commitment to safeguarding the environment, thereby underlining the relevance of such teachings to addressing today's ecological crises.

Third chapter introduces PFAS (Per- and Polyfluoroalkyl Substances), forever chemicals throughout war chemicals, found persistent in the environment and having grave risks to human beings as well as ecosystems. They are extensively-known with much popularized contamination of air, soil, and water due to their usage in various industrial and consumer products, resulting in high water treatments costs, growing food safety concerns, and public health crises. It highlights their pressing needs for innovative solutions, that is, advanced filtration technologies, the development of completely biodegradable alternatives, and policies for extensive reforms along with global governance. It discusses the sustainability issues related to PFAS through interdisciplinary collaboration and long-term monitoring for environmental and human health, economy sustainability, and a feather toward a PFAS-free future.

Fourth chapter of the book discusses the potential of Ayurveda-based Wellness Tourism (AWT) in the context of Sri Lanka's tourism economy, as well as the various issues that hinder its sustainable development. The chapter is based on in-depth interviews with industry professionals, which reveal the contributions to the whole process made by three key players, namely tourism authorities, the Ayurveda-related authorities, and service-providing companies. Gaps found in policy support, inefficacies by the Ayurveda authorities, and bureaucratic hurdles preventing small and medium-scale service providers are discussed. This chapter outlines a strategic roadmap for the sustainability of AWT, covering long-term

action measures, such as national policy frameworks, marketing strategies, and reforms of Ayurveda education. Mid-term solutions include developing infrastructures and streamlining institutions, and urgent measures to address therapist shortages and regulatory inefficiencies. In its comprehensive analysis, this chapter shows how wellness tourism based on Ayurveda can transform the tourism sector in Sri Lanka in a sustainable manner and be competitive in the flourishing international wellness tourism economy.

Khatri, Sharma & Şimşek's in their chapter titled *A Paradigm Shift in the Tourism Industry: Emerging Trends* discusses the new realities of tourism according to the emerging shift in paradigms of modern tourists vis-a-vis changing values and preferences. Tourists of modern era are no longer like their predecessors in that they attest to sustainability, culture, and personal experience as the main driving forces of contemporary niche tourism forms, birth to adventure tourism, eco-tourism, medical tourism, among others. This transformation has also been caused by advances associated with communication technologies that would have an increased understanding of these tourists' demands and market flexible, dynamic services suitable for them. Additionally, it shows diagonal integration across other economic sectors which would prove both quickening and matching the pace of flow to new emerging waves in tourism. The chapter elaborates on novelty in the forms of tourism such as War Tourism, Smart Tourism, Indigenous Tourism, Accessible Tourism, Catamaran Tourism, Experiential Tourism, Bleisure Tourism, Silver Tourism, and Atomic Tourism. By documenting the above-offered trends in tourism, the chapter convincingly portrays how the tourism industry continues to supersegregate its products for modern travelers. The analysis strongly underlines the need for sustainability and adaptability for a successful future in the emerging world of tourism.

The sixth chapter engages with the complexity that ties sustainable development goals (SDGs) into an economy of tourism, taking Mirissa-the famous tourist locality in Sri Lanka-as an example. In its core, sustainable tourism stands for using resources so that the future generations may also enjoy its benefits, but minimizing damages from impacts on the environment, preservation of cultural heritage, and benefits to the local community. Mirissa, the most famous destination for whale watching, white sand beaches, and rich culture, contributes a large chunk of the economy of Sri Lanka, roughly USD 4.5 billion per annum, while offering direct and indirect jobs. The increasing numbers in tourism have,

however, brought the area some sustainability challenges - waste management issues, noise pollution, damaging marine life through polythene usage, loss of green space, unequal income distribution, and erosion of local culture. The chapter documents possible ways to these challenges using qualitative and quantitative approaches with field visits, interviews, and secondary data analysis. The critical strategies include awareness programs, enforcement of environmental regulations, protection of marine life, and establishment of equitable income distribution mechanisms. The findings would lay an emphasized balance of tourism development and sustainability to enjoy long-term economic and environmental dividends to Mirissa and its community.

In the seventh chapter, wildlife tourism has been investigated as a sustainable development potential for Sri Lanka's national parks regarding Yala, Udawalawe and Wilpattu. Sri Lanka is a land blessed with exemplary diversity of flora and fauna. It is, therefore, an important wildlife destination worldwide. Yet, common threats such as overcrowding, over-visiting, habituation feeding, roadblocks, traffic congestion, and poor regulatory practices, besides their manifested effects, have adversely changed visitor satisfaction and conservation standards. This study employed an investigation through qualitative research and thematic analysis of stakeholder interviews to reveal the top emerging issues in wildlife tourism operations such as irresponsible safari practice, illegal activities, and weak regulatory enforceability. The chapter thus recommends action strategies as follows: Education and Training: Train safari guides and service operators comprehensively. Regulatory Enforcement: Strengthen monitoring mechanisms and the rule enforcement through the Department of Wildlife Conservation. Visitor Management: Implement access controls in sensitive areas, reissue ticket prices, and put in place codes of practice for all stakeholders. Such actions would improve the visitor's experience while conserving the natural resource. This would enable Sri Lanka's national parks to evolve as a model for sustainable wildlife tourism with the promise of making a significant contribution to an alternative future in permitting tourism growth with ecological integrity.

Faxina & Nunes in the eight chapter explore sustainability assessments as strategic instruments in planning the rehabilitation of Community Based Tourism (CBT) in the wake of COVID-19. Using Mem de Sá Island, Brazil, as a case study, the data collected from 61.4% of households adopted from CBT sustainability indicators showed medium-level overall sustainability. Out of the important

dimensions, the social dimension was mostly adversely affected, thus indicating the pandemic's deep-seated effects on the community's cohesion and livelihood. Findings underscore how sustainability assessments open up opportunities for setting recovery priorities and directing stakeholders toward targeted resilience-building actions. This study brings to light the need to deal with social vulnerabilities while promoting a sustainable tourism recovery agenda to make it equitable. Further visits are urged to develop a deeper understanding between level of sustainability, community resilience, and tourism recovery for more informed post-crises planning on the contexts of CBT.

Within the ninth chapter, a big data approach is used to comprehend tourists' sustainability concerns in Sri Lankan hotels looking into user-generated reviews on Booking.com and TripAdvisor. Structural Topic Modeling (STM) is applied on the 934 reviews for the ten sustainable hotels, which would reveal some major traveling-related themes, including: "Better Location," "Peaceful Atmosphere," and "Wildlife Experience." They show strong favor of travelers towards environmental sustainability. The results indicate that the relevance of green areas and peaceful environments is increasing regarding their importance to tourists' choice of places to visit, with online reviews demonstrating the extent and direction of such attitudes, subjective norms, and perceived behavioral control concerning the Theory of Planned Behavior (TPB). Although the analysis considers potential biases and translation limitations of language of the reviews, it will help the hospitality sector in Sri Lanka best. This study proposes an argument for reaching and achieving the traveler's expectation towards environmental care by integrating sustainability factors into hotel operations and marketing strategies. Such recommendations for enhancing the already existing knowledge are batched into data that stress the best way of communicating sustainability efforts, thus enhancing guest satisfaction while enabling sustainable tourism development.

Fatmi & Ameer's chapter talks about the integration of SDGs into the museum sector of Uttar Pradesh concerning heritage conservation and community engagement, with a focus on State Museum, Lucknow. The analysis brings to surface the museum's vast collection of natural and cultural artifacts, including the recent re-identification of a critically endangered pink-headed duck during the RE-ORG project by ICCROM. It emphasizes the role of the study in presenting the fact that heritage can be preserved through curatorial and

collection management practices. Examines problems of government museums in Uttar Pradesh like limited resources, under-staffing, infrastructural gaps, and oppurtunities such as the establishment of theme-based museums: Natural History Museum, Tribal Museum, and Freedom Struggle Museum which are advocating within the frame of reference for education, life-long learning, and equitable access to cultural heritage even in far of reaches. Indeed, these museums surely make a considerable contribution to SDGs as they address challenges and leverage government strategies. In fact, such museums would undoubtedly help in fulfillment of inclusive societies by areas specific and conserve the nature and culture assets of the region for generations to come.

The third section of the book begins with the chapter by Şimşek & Ceylan, and they present an in-depth theoretical analysis of the cryptocurrency system with special reference to bitcoin, the most popular and widely used virtual currency today. After a conceptual framework with well-defined notions about cryptocurrencies, the authors look into the structural and functional aspects of the bitcoin system through a critical examination of national and international literature. This study fills some research gaps, throwing light on the dynamics of virtual currencies, thus serving as a source of value not only for academicians and professionals but also for anyone who wants to keep up with the transforming world of digital finance.

T The twelfth chapter provides an in-depth comparative analysis of the income distribution of a few selected developed and developing countries over the last eight years (2015-2022), but with special reference to the socio-economic upheavals caused by the Covid-19 pandemic (2020-2021). It brings in facts collected through the World Inequality Database about household incomes classified into ten income groups across ten countries, in which country groups included developed nations, among them France, Germany, and the UK; and developing countries such as Czechia, Turkiye, and Greece. It was found out that most of the developed countries managed to restore income levels pre-Covid through well-designed social programs; however, for developing countries, such elevation in income was not accompanied by maintenance of equality in income distribution. The evidence provided is clear on the levels of income inequality-while the top 10% in a developing country earn 14.8 times more than the lowest 10% in the same country, developed nations show a 6.2 times disparity in earnings. This would thus serve as an important reference for discussions on the

dynamics of global income inequality and the consequences of economic crises on wealth allocation on a long-term basis.

Teker et.al in the thirteenth chapter examines the remarkable growth and transformation of Türkiye's e-commerce sector in the aftermath of the COVID-19 pandemic. The study highlights the pandemic's role as a catalyst for shifting consumer behaviors, leading to an accelerated adoption of digital commerce. Key drivers of this growth include increased internet and smartphone usage, advancements in digital payment technologies, and the surge in online shopping during lockdowns. Türkiye's e-commerce market has emerged as one of the fastest-growing globally, with a projected compound annual growth rate (CAGR) of 11.6% between 2024 and 2029. The chapter also explores the strategic opportunities for Turkish businesses in cross-border e-commerce, underscoring the importance of digital transformation, improved logistics, and government support. By analyzing key trends and data, the authors present Türkiye's potential to expand its influence in global trade, stimulate economic development, and foster innovation within its digital economy.

The role of economic growth and environmental degradation in Turkey from 1990 to 2022 is the subject of the fourteenth chapter. This part of the study examines the relationship between such indicators as GDP (2015 base year), CO_2 emissions, and population growth by involving time series analysis techniques through the Augmented Dickey-Fuller (ADF) test and the Autoregressive Distributed Lag (ARDL) model. Results show a significant negative impact of economic growth on CO_2 emissions to validate the Environmental Kuznets Curve (EKC) hypothesis, which holds that environmental degradation increases in its nascent stages with economic growth but later declines as economic maturity is achieved. On the other hand, the analysis proves that there is no significant relationship between population growth and environmental degradation. Therefore, this chapter provides empirical evidence from Turkey's economy and its environmental data for the challenges and implications of sustainable development, with useful information for policymakers and researchers interested in balancing economic growth and environmental conservation.

The fifteen chapters, authored by Demirkan and Erkol, explore how artificial intelligence (AI) is transforming education by focusing on the intersection of

innovation and sustainability. Considering educational organizations as dynamic, open systems, the authors analyze the way these institutions undergo changes in adapting to external environmental shifts with regard to meaningful and sustainable outcomes with respect to transformed inputs. The chapter accentuates the very powerful impacts that digital technologies and social demands have on the evolution of education. Integrate learning processes as one critically important feature of AI, alongside the alignment of practices in the educational sector toward these sustainability goals in the long run such as equity, environmental consciousness, and accessibility. Illustrative on this case include some programs such as the Open Exploration Area (OEA) and the AKA transformation support system, which show the ability of AI in enabling flexible, innovative, and student-centered educational experiences. But the authors do not lose sight of the challenges entailed with AI integrating its work, like how technological advancements need balance with the irreplaceable value of human mentorship. This change from product-centrism to process-centrism paradigm helps address, as stated in the chapter, ethical considerations and sustainability principles under which future-ready educational ecosystems are developed. This chapter finally provides an exhaustive view of AI-driven transformational processes in education, proving significant for stakeholders interested in forming and managing inclusive, adaptable as well as sustainable learning wells within the future demands.

The sixteenth chapter, written by Hasan Gül, examines what is really emerging at present - the field of sustainability accounting towards an integration of economic, environmental and social dimensions for traditional approaches to financial valuation. Based on the "Triple Bottom Line" thinking, sustainability accounting promotes accounting in respect to transparency and accountability. It matches corporate business activities and the further sustainability goals. The chapter provides a very broad perspective regarding conceptualizing and evolving sustainability accounting as well as its critical relationships, the constrain inherent to it, and challenges in data standardization and measurement, as well as the increasing importance as a means for long-term resilience and value creation in the corporate world. The chapter, which presents an extensive discussion focusing on Turkey, reviews critical regulatory progresses such as BIST Sustainability Index, TSRS 1 and TSRS 2, representing the country's alignment with global trends toward sustainability. Through detailed analysis, the chapter highlights the strategic importance of sustainability accounting in corporate responsibility and

sustainable development. This chapter would be beneficial for scholars, practitioners, and policymakers inclined toward integrating sustainability into accounting practices through international frameworks as well as local applications within Turkey.

The last chapter of the book is a comparison of the energy policies of political parties in Turkey and written by Önver, examines the energy policy approaches of Turkish political parties within the framework of climate change and sustainable energy transition. In this chapter, a qualitative content analysis method was used to analyze the programs of 15 political parties represented in the Turkish Grand National Assembly after the last general elections of 2023. These are renewable energy and fossil fuels, nuclear energy and climate change policies among others. Based on the findings, the parties under study vary on their priorities; many parties would be supportive of renewable energy sources such as solar and wind, while many supported domestic fossil fuels and even the nuclear energy option. A strong divide was evident between those advocating ecological sustainability, like the Workers' Party of Turkey (TİP) and the Labor Party (EMEP), and those whose priorities lie on energy security and reduced dependency on foreign sources like the Justice and Development Party (AKP), Nationalist Movement Party (MHP), and Yeniden Refah Partisi (YRP). The chapter notes differences in the level of engagement with climate change mitigation by different parties, ranging from detailed policies to treating the issue of little importance. It emphasizes how political parties would influence Turkey's energy and climate strategies on public awareness and engagement in energy policy debate. This chapter adds a rich understanding of the energy landscape of Turkey, giving a significant insight into the possible scenarios for transitioning and aligning energy use towards global climate commitments.

By presenting a diverse array of perspectives and research findings, Current Issues in Sustainability serves as a valuable resource for academics, policymakers, and practitioners. Each chapter offers unique insights into the challenges and opportunities associated with implementing sustainable practices, providing readers with actionable knowledge to foster positive change. This book not only aims to inform but also to inspire readers to engage with sustainability as a dynamic, evolving field of inquiry and practice. It emphasizes that sustainability is not a singular goal but a continuous process of balancing human aspirations with the planet’s limits, ensuring a just and equitable future for all.

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PART I

CURRENT ISSUES IN ENVIRONMENTAL SUSTAINABILITY

1

SRI LANKA'S GREEN BALANCING ACT: NAVIGATING THE TIGHTROPE BETWEEN EMERGING ENVIRONMENTAL CRISES AND SUSTAINABLE DEVELOPMENT GOALS

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Abstract

Sri Lanka, a country of stunning natural beauty, faces a delicate balancing act between development and environmental sustainability. This research, titled "Lanka's Green Balancing Act," explores the challenges and contradictions of pursuing economic growth while protecting the environment. Despite progress toward Sustainable Development Goals (SDGs) in areas like poverty reduction, education, and healthcare, unplanned developments and weak environmental oversight have taken a toll on the nation's biodiversity and ecosystems.Forests, rivers, and air quality are deteriorating, reflecting the consequences of unsustainable practices. Environmental awareness and action remain insufficient among policymakers and citizens, hindering progress toward long-term ecological stability. The study emphasizes the need for transformative change, advocating for education that fosters environmental consciousness and policies that balance ambition with responsibility. It also highlights the power of grassroots movements and individual actions in driving sustainable practices.Sri Lanka's journey mirrors global struggles with sustainability, serving as both a cautionary tale and a source of hope. The research calls for urgent action to reconcile progress with preservation, positioning Sri Lanka as a potential leader in sustainable development.

Keywords: *Biodiversity, Conservation, Development, Sustainability, Sustainable Development Goals (SDGs)*
JEL classification: *Q2, Q3, Q5, O2*

1. Introduction

Amid the unfolding drama of today's environmental trials, Sri Lanka takes center stage as both the hero and a poignant symbol—an island precariously poised on the fine line between advancement and preservation. While the global community wrestles with the rising tides of ecological decay, Sri Lanka's tale strikes a unique chord. Its once-pristine rainforests and sunlit shores now bear the indelible marks of unchecked ambition and an ever-growing population. This delicate dance between natural splendor and environmental strain forms a compelling narrative, one woven with challenges and aspirations, all intricately tied to the quest for achieving Sustainable Development Goals (SDGs).

The world finds itself at a pivotal juncture of environmental degradation, where swift and imaginative solutions are no longer optional but imperative. Visionaries like Bakshi and Kumar (2013) have raised the alarm, cautioning that unfettered destruction threatens to obliterate essential environmental lifelines—biodiversity, ecosystems, and habitats. Nakicenovic et al. (2015) contend that this downward spiral is fueled by a complex web of forces—economic expansion, urban sprawl, aggressive agriculture, soaring energy demands, and sprawling transport systems. At its core lies the heavy hand of human activity. A ballooning population and relentless resource exploitation strain nature's limits, triggering a vicious cycle that erodes the foundation of sustainable progress (Asheim, 1987).The notion of unsustainable development starkly opposes the dream of meaningful progress. Barbier (1987) and Robert et al. (1997) paint it as a grim reality that jeopardizes the future of generations yet to come. Reckless urbanization, overexploitation, and unbridled waste generation have unleashed pollution and ecological destruction, leaving scars that may never heal. To escape this cycle of devastation, a profound shift in mindset is vital—a vision that harmonizes economic growth with ecological stewardship. Chatterjee (1997)and Lu et al. (2015) advocate for this transformative approach, calling for unified efforts to align development goals with the preservation of natural balance.Sri Lanka's odyssey toward sustainable development is both a beacon of hope and a somber reminder of the stakes at hand. Since the 1980s, the nation has celebrated remarkable strides in economic and social progress, fueled by rapid industrialization and ambitious development initiatives. Yet, this progress has exacted a steep environmental toll. Industrial expansion and agricultural intensification have unleashed a chain reaction of ecological challenges—pollution, deforestation, soil erosion, and

biodiversity loss. These unsustainable consumption patterns threaten to derail Sri Lanka's race to meet the SDGs by 2030. Adding to these woes are limited public awareness and ineffective enforcement of environmental policies. This stark contrast—where prosperity is shadowed by ecological decline—urges a closer look at Sri Lanka's environmental journey.

In this light, the present research aims to untangle the intricate web connecting Sri Lanka's environmental crises to its aspirations for sustainable development. By delving into critical environmental trends since the advent of the Millennium Development Goals (MDGs) in 1990, this study seeks to illuminate the forces shaping the nation's ecological narrative. Additionally, it explores Sri Lankans' understanding, attitudes, and awareness of sustainability and climate change, offering vital insights to guide policymakers and stakeholders toward a more balanced and sustainable future. The roots of environmental decline are intricately tangled in the web of socio-economic growth, institutional dynamics, and technological advancements. Chatterjee (1997) aptly observes that the very engines driving progress—economic expansion, urbanization, industrialization, and rising energy demands—often double as forces disrupting ecological harmony. In Sri Lanka, this paradox unfolds vividly. Expanding cities strain finite resources, industrial fumes poison the air and waterways, and intensified agriculture, while vital for feeding the population, strips the soil and devastates habitats. These challenges serve as a clarion call for policies that harmonize development with environmental preservation. A holistic lens is essential for tackling these issues—one that embraces the collective wisdom of all stakeholders. It's not enough to focus solely on economic growth or social upliftment; the ecological foundation that underpins them must be shielded and nurtured. Nakicenovic et al. (2015) emphasize the power of united efforts, urging governments, communities, and individuals to coalesce in restoring and protecting natural systems. For Sri Lanka, this means crafting adaptive strategies that marry resource utilization with conservation, embedding environmental stewardship at the heart of its development agenda.

However, a glaring void exists in Sri Lanka's environmental discourse—a dearth of comprehensive studies that provide actionable insights for decision-makers. While the problems are well-documented, data-driven narratives capturing the full spectrum of environmental degradation and its socio-economic impacts remain scarce. This research endeavors to bridge that gap, presenting an in-depth

exploration of environmental dynamics and public perceptions. Through survey data, it seeks to reveal the collective mindset of the nation—the awareness, attitudes, and behaviors shaping its response to sustainability and climate resilience. These findings will serve as a compass for policymakers, ensuring their strategies resonate with the aspirations of the people.The study paints a sobering picture of Sri Lanka's environmental trajectory. Despite commendable strides in poverty alleviation, education, and healthcare, the environmental cost of progress looms large. Urban sprawl proceeds unchecked, enforcement of regulations falters, and monitoring systems fall short, exacerbating the degradation of ecosystems. Forests, once vibrant sanctuaries of biodiversity, now lie fragmented, while rivers and skies bear the scars of unchecked pollution. Such realities demand a transformative shift—a development paradigm where sustainability forms the cornerstone of progress. Education emerges as a pivotal force in this transformation. By weaving environmental awareness into curricula and fostering a culture of ecological responsibility, Sri Lanka can shape future generations who see conservation not as a burden but as a moral imperative. Policymakers must adopt a forward-thinking vision, crafting policies that balance ambition with accountability. Rigorous enforcement and robust monitoring systems are critical to turning these aspirations into tangible results. Equally important is the empowerment of local communities, whose grassroots efforts can ignite meaningful change. Grassroots movements carry the seeds of hope for Sri Lanka's environmental revival. Simple yet profound acts—planting trees, reducing waste, conserving water—can unite a nation in its quest for sustainability. The potential for change lies not only in the hands of policymakers but also in the daily actions of individuals. By fostering a shared sense of responsibility, Sri Lanka can rally its people toward a collective vision of ecological harmony that transcends economic and social divides.

Sri Lanka's environmental saga echoes the broader global challenge—the quest to reconcile progress with preservation. The choices made today will ripple far beyond the island's shores, shaping its contribution to the global environmental narrative. Will Sri Lanka succumb to the allure of unsustainable practices, or will it rise above, charting a course of growth that honors its natural heritage? This research aims to illuminate that path, serving as both a reflection and a roadmap for the journey ahead. Ultimately, Sri Lanka's delicate balancing act between development and sustainability is not merely a tale of adversity—it is a testament to the nation's resilience and untapped potential. Through informed policies,

collective willpower, and innovative solutions, Sri Lanka can shift its environmental destiny from a cautionary tale to a beacon of sustainable hope. The tightrope is perilous, and the stakes are high, but the rewards of achieving balance are profound. The time to act is now, as every step forward is a stride closer to a sustainable future.

2. Literature Review

For over two decades, the ideals of sustainability and sustainable development have blazed like twin stars in the boundless night sky, their radiant beams guiding the way for scholars and policymakers alike. These eternal truths are intricately woven into the very marrow of global progress, standing steadfast at the crossroads where human brilliance meets the tender care for the Earth's fragile soul. They call to humanity to compose a grand symphony, where the ever-quickening beat of society's advancement harmonizes with the delicate song of nature's heartbeat. In the storm-tossed seas of policy, the whirlwinds of climate change, the magnetic pull toward renewable energies, and the promises of circular economies have stirred the winds of urgent action (Aven, 2020; Leal Filho et al., 2019; Ozili, 2021; Wackernagel, & Lin, 2017). Meanwhile, within the sacred halls of academia, the relentless drumbeats of inquiry echo, as researchers, like fearless explorers, navigate the uncharted wilderness of uncertainty, their eyes seeking glimpses of clarity through the fog.

Now is the hour of reckoning, a time for renewal and redirection. Scholars must retrace their steps, shining light on the lingering shadows of unanswered questions, and chart a bold course toward a future unknown. By weaving together these scattered insights, a harmonious melody of understanding will rise, transforming sustainability from an ethereal dream into a living, breathing reality. Though the path ahead is daunting, the rewards it promises are immeasurable: a future where humanity flourishes in perfect harmony with the Earth, the timeless cradle of its existence.

3. Method

This study adopted an analytical approach, drawing primarily from secondary data, complemented by primary sources. The secondary data was gathered by reviewing a mix of published and unpublished reports. Primary data, on the other

hand, was collected through surveys, interviews with key informants, and focus group discussions. In 2017, a survey was conducted to assess the public's knowledge, attitudes, and awareness of sustainable development and environmental issues in Sri Lanka. The survey spanned 9 districts, representing each of the 9 provinces in the country. In each district, 60 households were interviewed—30 from rural areas and 30 from urban settings—gathering a wealth of insights. The questionnaire, simple yet comprehensive, spanned two pages and covered areas such as participants' understanding of sustainable development, their attitudes toward environmental issues, and socio-economic background. The final dataset included responses from 260 urban households and 265 rural households. The questionnaire consisted of 26 questions, grouped into three main categories: participants' knowledge of sustainable development, their suggestions on mitigation and adaptation, and their demographic details.

These questions were designed to gauge the level of awareness regarding sustainable development, identify contributing factors, explore potential mitigation strategies, and solicit recommendations.

3.1 Data Collection

Data collection was meticulously carried out by enumerators under the careful supervision of the research coordinators, ensuring accuracy and consistency. Enumerators received continuous feedback during the process, and completed questionnaires were thoroughly checked by researchers to confirm the reliability of the information. Once data collection was complete, the data was cleaned through cross-checking and field verification. Descriptive statistical techniques, including frequency, percentage, ratio, and mean analysis, were employed, with tables used for presenting the findings. All respondents were fully informed about the study's nature, objectives, and the confidentiality of their responses. Verbal consent was obtained from each participant before they were enrolled in the study. Only those who voluntarily agreed to participate were interviewed, and they were reminded of their right to refuse participation or withdraw at any point. The participants represented various sectors of the population, including farmers, government and non-government employees, students, self-employed individuals, and the unemployed, with ages ranging from 20 to 65. The sample was balanced, with 50% from rural areas and 50% from urban areas, and slightly more female respondents (52%) than male (48%).

In terms of socio-economic conditions, the average monthly income for households was approximately Rs. 47,500, with the family income averaging around Rs. 84,800. A notable variation in income levels was observed among the households. Education-wise, 62% of household heads had completed an advanced level of education. The average Sri Lankan household consisted of about 3 members, which closely mirrored the composition of the sample.

4. Results

The Government of Sri Lanka envisions reaching the Sustainable Development Goals (SDGs) by 2030, striving to meet the basic needs of its people, lift them from the shadows of poverty, erase all forms of discrimination and inequality, and forge a society rooted in social justice and human security (Department of Census and Statistics, 2017). While Sri Lanka has made commendable strides in advancing toward these goals, a storm of environmental challenges has taken root, fueled by a lack of commitment and understanding in preserving the nation's natural resources. Among the many growing environmental woes, the most destructive and pressing are deforestation, the loss of biodiversity, habitat degradation, water contamination, and air pollution, which continue to cast dark clouds over the country's future.

Table 1: Environmental Performance Index

Country	2018		2014		2010	
	EPI ranking	EPI Index	EPI ranking	EPI Index	EPI ranking	EPI Index
Bhutan	131	47.22	103	46.86	40	68.0
India	177	30.57	155	31.23	123	48.3
Maldives	111	52.14			48	65.9
Nepal	176	31.44	139	37.00	38	68.2
Pakistan	169	37.5	148	34.54	125	48.0
Sri Lanka	70	60.61	69	53.88	58	63.7

Source: EPI, 2018.

Forests serve as the lungs of a nation, breathing life into biodiversity and acting as a sponge to absorb the ever-growing clouds of carbon dioxide. While many tropical countries find themselves caught in the relentless grip of deforestation, a few have managed to shift the tides, transitioning from net deforestation to a

resurgence of reforestation. South Asia, a region rich in environmental and geographical diversity, pulses with dynamic ecosystems. Thus, we turned our focus to the forest trends in these countries since 1990. Table 3 encapsulates the story, with Table 2's figures revealing a stark reality: over the past two decades, Nepal, Pakistan, and Sri Lanka have seen a negative net change in their forest cover.

Table 2: Forest area as a percentage of land area in selected South Asian countries

Country Name	1991-1995	1996-2000	2001-2005	2006-2010	2011-2015	Net Change
Bhutan	57.35	64.98	67.82	70.45	71.75	25.12
India	21.63	21.90	22.54	23.19	23.65	9.37
Maldives	3.33	3.33	3.33	3.33	3.33	0.00
Nepal	32.08	28.54	25.92	25.36	25.36	-20.94
Pakistan	3.14	2.85	2.55	2.30	2.02	-35.73
Sri Lanka	35.54	34.48	33.63	33.11	33.14	-6.77
South Asia	16.52	16.55	16.82	17.18	17.42	5.42

Source: World Bank, 2018.

Sri Lanka, with its varied rainfall, altitudes, and soils, is a land blessed with a rich tapestry of forests. From the lofty montane forests to the subtropical sub-montane forests and the vibrant lowland rainforests, the country boasts a stunning array of green sanctuaries (FAO, 1997; Bogahawatta, 1999). In contrast, the dry and intermediate zones cradle sparse forests, mangroves, riverine dry forests, and monsoon woodlands, while the hills and lowlands teem with diverse grasslands, nurtured by both wet and dry climates (Lindstrom, 2011). Yet, over the past few decades, these verdant landscapes have suffered at the hands of both legal and illegal deforestation. The dry zone has felt the pressure of cash crop cultivation, grand development projects, and shifting cultivation, all taking their toll on the natural forests (Lindström et al., 2012). Meanwhile, the mangrove ecosystems—vital coastal guardians—are under siege from land reclamation, urban expansion, and the growing prawn culture. Agriculture, though essential, has led to the degradation of Sri Lanka's natural environments as farmers convert forests and grasslands into cropland, stripping away the quality of the once-pristine landscapes.

Sri Lanka, a jewel of biodiversity in Asia, harbors some of the richest ecosystems on the continent (IUCN, 2007). The island's isolated geography, combined with its varied topography and climate, has created a sanctuary for a wealth of species, many of which are found nowhere else on Earth (Di Falco and Chavas, 2009; Karunarathna and Wilson, 2017). The wet zone rainforests are particularly crucial, housing 94 percent of the country's endemic woody plants and 75 percent of its endemic animals. Many of these species are unique, shaped by the island's long separation from the Indian subcontinent, particularly mammals, amphibians, reptiles, and flowering plants (IUCN, 2007; Karunarathna and Wilson, 2017). This rich diversity of ecosystems has cultivated habitats brimming with genetic variety, making Sri Lanka the proud holder of the highest biodiversity per unit area in Asia—especially in flowering plants and all vertebrate groups, with the exception of birds (Kotagama, 2002). However, as human populations grow and the need for more land for habitation and development intensifies, this precious biodiversity is under increasing threat. The destruction of these ecosystems is expected to accelerate in the coming decades, fueled by poor land use planning, unchecked resource exploitation, weak enforcement of environmental laws, and the absence of a cohesive conservation strategy (Karunarathna and Wilson, 2017).

5. Conclusion

The seventeen Sustainable Development Goals stand as a collective promise, forged by world leaders, to steer humanity toward a brighter, more sustainable future. Sri Lanka, with unwavering resolve, has embraced this global vision and committed itself to the pursuit of the United Nations' Sustainable Development Goals (SDGs). The nation's dedication to fulfilling these goals by 2030 is evident, as it has made notable strides in overcoming challenges from the previous Millennium Development Goals (MDGs). Sri Lanka has slashed its poverty rate by more than half, provided universal primary education, reduced child mortality, and enhanced maternal health—surpassing many of its neighbors along the way. Yet, the road ahead remains fraught with environmental obstacles, crucial facets of the SDGs. Goal 15, which addresses the health of ecosystems, land, forests, and biodiversity, takes center stage in this discourse. This study zeroes in on this goal, seeking to uncover the hurdles Sri Lanka must navigate to make meaningful strides toward it by 2030.

For years, environmental degradation has cast a shadow over Sri Lanka, and recent indicators suggest a troubling decline in the quality of the country's environment. The pressing challenge now is to uncover straightforward, effective solutions to these environmental dilemmas. The Sri Lankan government must take swift, decisive action. One key approach could be educating the population about sustainable development and the critical role they can play in its success. Strengthening governance structures, fostering better policy coordination across institutions, bolstering institutional capacities, and ensuring decisions are based on solid evidence—these are vital steps that lay the groundwork for future success. Additionally, addressing existing constraints head-on will pave the way for achieving the SDGs. To guide this process, the introduction of a national monitoring framework, encompassing the entire country, will be essential to assist relevant departments in the SDG implementation journey.

Careful monitoring and evaluation will serve as the compass to determine whether these efforts are bearing fruit, offering measurable outcomes that help Sri Lanka stay on course toward meeting the SDGs within the designated timeframe. Furthermore, the country must establish a national-level planning and review mechanism to steer the SDGs to successful implementation, ensuring they are not just aspirations, but tangible accomplishments for a sustainable future.

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SOLUTIONS FOR THE ISSUES OF ENVIRONMENTAL SUSTAINABILITY: A STUDY WITH REFERENCE TO THE BUDDHISM

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Abstract

The concept of Sustainability can be defined as "which meets the needs the present without compromising the ability of future generations to meet their own needs." Accordingly, it is meaningful to further create, develop and protect the world's natural resources. But world has experienced the worst form environmental destruction in recent years, all of which can be linked to the unsustainable effort in development. The major sustainability issues around the world can be broadly categorized into environmental, social and economic challenges. Especially, Sustainability should be implemented by creating a balance between society, economy and environment.The concept of Sustainability is so important because of addressing global environmental challenges like climate change, resource depletion, bio diversity loss, social equity and poverty reduction, improving public health and well-being, inspiring innovation and technical advancements, supporting policy and global cooperation, building resilience to future challenges and promoting economic development with environmental responsibility etc. Studying the Buddha's doctrine, it can be appreciated that the Buddha had presented ideas about the concept of Sustainability more than two thousand five hundred years before this. This paper deals with the Environmental Sustainability and Buddhism. Today, we speak about the Sustainability as a western concept. But firstly, this concept was introduced by the Buddha. In this research paper analyze the solutions for the issues of Environmental Sustainability with reference to the Buddhism. This research paper is carried out using the primary source like Pali canon, Dhammapada and other secondary source like books, journal articles and internet resources as research methodology. There are many Buddhist teachings related to Sustainability and environmentalism. That is what the presenter is going to point out by this research paper.

Keywords: *Sustainability, Buddhism, Environment, Issues*

1. Introduction

We are now in the present. We all aspire to spend our life smoothly. That's why we want to concept of Sustainability to this society. Sustainability refers to the ability to maintain or support a process continuously over time. Sustainability seeks to prevent the deterioration of natural or physical resources. This concept is broken down into three pillars. Such as, economic, environmental and social. Sustainability needs to all human beings and non-human beings. Non-human beings are animals, birds, fish, reptiles and insects etc. Therefore non-human beings expect to live like human beings, so the term of sustainability needs to them also."Deliberate constant endeavour to utilize human and other resources, and natural environment to meet needs of current human beings as well as non-human beings while maintaining and if possible enhancing human and other resources, and natural environment to meet needs of future human beings and non-human beings".

Furthermore, above definition has been described natural environment and other resources want to human beings as well as non-human beings. A definition of Sustainability Sustainability helps that all systems remain healthy and this concept improve all chances of well-being of societies and organizations. We can think that this concept has a wide focus on economic, social and environmental activities. There are many benefits of sustainability, both short term and long term. We can't maintain our Earth's ecosystem or continue to function as we do if more sustainable choices are not made. Sustainability includes taking into account three aspects: Economic Growth: Sustainable development promotes economic activities that provide jobs and improve living standards while ensuring that resources are used efficiently.Social Inclusion: It emphasizes the importance of equity and social justice, ensuring that all individuals have access to essential services, opportunities, and a voice in decision-making processes.Environmental Protection: This aspect focuses on safeguarding natural ecosystems, conserving biodiversity, and addressing climate change through responsible resource management and sustainable practices. Sustainability is far from a new concept. The understanding of the sustainability is very important because of the deep knowledge regarding this concept, we can know the relationship between people and ecosystem like plants, animals, natural phenomena, landscapes and timing of events in a specific ecosystem. Our future generations needs to be sustained. Unfortunately, there is no good natural environment to be sustained. There are various complex environmental issues in the twenty first century. This situation

aspect to business organizations also. Because of business organizations cannot attempt to get profits as much as possible. The major sustainability issues around the world can be broadly categorized into environmental, social and economic challenges. Environmental Sustainability issues are climate change, deforestation, water scarcity and pollution etc. Social Sustainability issues are health and well-being, inequality and poverty community engagement and education etc. Economic sustainability issues are resource depletion, sustainable development and responsible consumption and production etc. The concept of Sustainability is so important because of addressing global environmental challenges like climate change, resource depletion, bio diversity loss, social equity and poverty reduction, improving public health and well-being, inspiring innovation and technical advancements, supporting policy and global cooperation, building resilience to future challenges and promoting economic development with environmental responsibility etc. Sustainability is crucial for several reasons:

- Resource Preservation: With the growing global population and increasing consumption, natural resources are under significant pressure. Sustainable practices help ensure that these resources remain available for future generations.

- Climate Change Mitigation: Addressing climate change is a key aspect of sustainability. Transitioning to renewable energy, reducing carbon footprints, and enhancing resilience to climate impacts are essential for maintaining a stable environment.

- Economic Resilience: Sustainable economic practices can help communities adapt to changing conditions and recover from economic shocks, ultimately leading to more stable and equitable societies.

- Health and Well-Being: A sustainable approach to development supports healthier environments, leading to improved physical and mental well-being for individuals and communities. Despite its importance, achieving sustainability faces numerous challenges: Political Will: Effective policies and regulations are needed, but political interests often hinder meaningful action on sustainability.

- Economic Constraints: The transition to sustainable practices can require significant investment, which may be difficult for some economies, particularly in developing regions.

- Cultural Resistance: Changing long-standing habits and mindsets can be challenging, as people may resist altering their lifestyles or business practices.

- Global Disparities: Different countries and regions face varying levels of resources and capabilities to implement sustainable practices, leading to disparities in progress.

The concept of sustainable development was created by combining the human-centric view of physical development and the bio-centric view of environmental conservation. Studying Buddha's doctrine, it can be appreciated that the Buddha had presented ideas about the concept of sustainability more than two thousand five hundred years before this. But imparting that concept to the world as a sermon of the Buddha is not an easy task. Religion-centric concepts are much less accepted in the world today. However, so far no attention is paid to the aspect of environmental development as reflected in Buddhist philosophy. This misnomer is due to a misinterpretation or the Buddha is teaching that everything is impermanent. In fact, sustainable does not mean making something permanent in the philosophical sense. Moreover, development is only possible in a context of impermanence. One might think it is meaningless to try to discuss the permanent state of the environment in that context. However, it seems that information regarding sustainable environmental development has been presented in the Buddhist tradition through Buddha's sermons and the commentaries as well as in the Buddhist tradition coming from Buddha's living period also emphatically justify this concept. Therefore, it can be clearly identified that they have been maintained in the Buddhist tradition from beginning to date. For example, in the Kasībhāradvāja Sutta, the Buddha having not accepted the milk rice given to him, told Kasībhāradvāja to throw it into water where there are no living creatures or the ground where there is no growing grass. It is very clear that he gave his answer considering environmental sustainability. Although he did not mention sustainable development or ecological sustainable development, it is revealed that it is applicable to ecological sustainable development as well. In the Vattakkhandaka of Cullavaggpali, it is

also possible to identify how the information related to sustainable environmental development has been presented in Buddhism. In particular, Vaccakutivatta, Senāsanavatta, Jantāgharavatta, vāsikavatta etc. can also be consulted here.

In the suttās such as Vanaropā Sutta on the environment, in the teachings of the concept of non-violence and Mahākarunā, in the perfections (Pāramitās) such as perfections of Viriya (Viriya Pāramitā) and in the Bojjhaga Dhammās also some relevant information could be found.

The Maha Mangala Sutta, states the necessity of living in a suitable and pleasant locality (Patirūpa-desa vāso ca). Buddhism emphasizes that living in a suitable environment is essential. The term "proper place" refers to a location that is well suited to its surroundings. A comfortable house is not sufficient to meet this requirement, one's surroundings must also be safe both socially and environmentally are two aspects emphasized in the concept of Sustainable Development. The Aggañña Sutta of Pātika Vagga Pali of Dīgha Nikaya provides how mother nature, being displeased with the exploitative behaviour of the selfish people, inflicted mild punishments on them including the withdrawal of bounteousness and generosity. The Sutta stresses out the need for sustainable use of the environment and possible adverse consequences of the over-exploitation of Earth's resources. The Sadāparibhūta Bodhisattva Sutta explains how Bodhisattva lived extremely carefully not to harm the Earth, how he disposed of his garbage, walked and talked with ultimate respect to the mother Earth. The Kūtadanta Sutta points out that the state administration should provide protection to flora and fauna.

The necessity of living in harmony with nature has been emphasized throughout all three chapters (pitakas) referred to by the Buddhists; Sutta Pitaka, Vinaya Pitaka and Abhidamma Pitaka. One of the Thun Suttas (three scriptures) embodied in Sutta Pitaka, Karaniya Metta Sutta emphasizes certain qualities that shall be possessed by human beings; contented (Santhussako) and easily satisfied (Subharo) which fundamentally coincide with the idea of rationale, prudent and wise use of natural resources emphasized by the principle of Sustainable Development.

The Lord Buddha always admire the environmental purity and beauty as well as the hygienic conditions of the environment. Vinaya Pitaka, which contains rules

of discipline for bhikkhus and bhikkhus, imposes several rules on the conduct of the monks to make them respect the environment and all its constituents while encouraging harmonious living with nature. According to Bhūtagāmavagga Pacittiakanda in Pācittiya Pali, monks are prohibited from cutting trees, excreting stool and urine in green grass and into the water, and spitting into and discharging garbage on waterways. Bhikkhunis are prohibited from throwing dust and waste from windows or in the fields full of crops.These rules of conduct clearly establish a sustainable living in accordance with the nature. The Buddha explains how a monk should go on alms round, just the way "a bee gathers honey from the flower without injuring its color or fragrance". This clearly explains that one's being shall not be a burden to the Earth.

The Dhammapada states: "Cut down the forest (lust), but not the tree; from the forest springs fear. Having cut down the forest and the underbrush (desire), be passionless, O monks" and thus envisages that the man shall attempt the destroyance of forest named kleshas and not deforestation. Too many stanzas in the Dhammapada are dedicated to lovely natural items. The flower is the most universal symbol of environmental beauty. The Puppa Vagga, the Danda Vagga, the Buddha Vagga as well as the Bāla Vagga are mentioned about the environmental protection. The Buddhism supports sustainable environmental development by emphasizing mindfulness, compassion, interdependence as well as non-harming.

Accordingly, it could be factually claimed that Buddha had recognized this concept about two thousand five hundred years ago. There are many Buddhist teachings related to sustainability and environmental sustainability. It is extremely important to introduce them to the modern world as Buddhist environmental sustainability concepts instilled by the Buddha. Because the sustainable concepts presented by him are not harmful to any living being or the environment. They were introduced thousands of years ago, but imparting those concepts to today's world would be extremely beneficial as the world is facing various environmental problems today as a result of not following them.

2. Literature Review

Cullavaggapali II, 2006, Buddhajayanti TripiTaka Grantamala, Colombo. Information regarding sustainable development can be detected in the

description of farming practices in Chullavaggapali. Buddha has also preached how to act for the future use of goods, paying attention to their safety and durability especially when using them. No information directly related to sustainable development is presented here. Using the facts available here, our study examines the attitude of Buddhism towards the practice of environmental sustainable development.

Suttanipāta, (2006), Buddhajayanti TripiTaka GrantamAlA, Colombo. In the Kasībhāradvāja Sutra, Buddha has preached to Kasībhāradvāja Brahmin that food should be thrown away, referring to the harm to the environment and the animals living there. It can be considered as a point to focus on in terms of sustainable development. No information directly related to sustainable development is presented here. Using the facts available here, this study examines the attitude of Buddhism towards the practice of environmental sustainable development.

Saṃyuttanikāya I, (2006), Buddhajayanti TripiTaka GrantamAlA, Colombo. In the Vanaropa Sutra, Buddha has explained how to protect the environment. He has explained there that planting forests is a virtue that grows day and night. Even-though no information directly related to sustainable development is presented here, using the views available here, one may evaluate the attitude of Buddhism towards the practice of environmental sustainable development.

Jātakapali, (2006), Buddhajayanti TripiTaka GrantamAlA, Colombo. Some verses of Jātaka Pali reveal many occasions where animals and the environment should be protected. Also, it is revealed in the Jātaka Pali that Buddha valiantly continued his life journey during the Bodhisattva stage until his final goal, Buddhahood. No information directly related to sustainable development is presented even here. However, using the facts available here, this examines the attitude of Buddhism towards the practice of environmental sustainable development.

Sunderlal Bahuguna, Vandana Shiva and M.N. Buch, "Environmental Crisis and Sustainable Development", 1992 have commented about the Environmental Crisis. Furthermore, it has mentioned the global Environmental Crisis. The book includes about global development and environment, atmosphere and climatic changes, food and agriculture, biodiversity, media and the environment, industry and the environment, water resources, health and environment and law and

environment etc. but it has not mentioned about the Sustainable Environmental Development as Revealed in Buddhism. I received the ideas from this book about that what the Environment Crisis is.

Prof. Dr. Henarath H.D.N.P. Opatha, "Sustainable Human Resource Management", 2019 reviews the Sustainability and Human Resource Management. This book has mentioned about the meaning of sustainability and importance of Sustainability. Specially, about the barriers for sustainability. This book plays a key role in determining the success and progress of success of sustaining the environment, the society and the organizations. According to this book Sustainability is the most important issue that we have to deal with now and will have to deal with in the future too. Some ideas from this book on a systematic and rational understanding of Sustainable Environment were gathered for the research purpose. But there are no directly relevant facts about the Sustainable Environmental Development as Revealed in Buddhism are found.

C.J. Barrow, "Environmental Management for Sustainable development", 1999 describes on the nature, scope and role of environmental management with a strong focus on sustainable development. This book explores the subject's core themes and principles which include a goal of sustainable development. But it hasn't paid attention to environmental problems addressed by sustainable development. It is used for collecting information about environmental management and sustainable development. But it does not mention about the Sustainable Environmental Development as Revealed in Buddhism.

A.K.Jain, "Ecology and Natural Resource Management for Sustainable Development", 2001 mentions about legislation for Environment and Sustainable Development. This book was used for collecting details on human development and environment. This book positively helps to understanding of environmental problems. It doesn't mention about the Sustainable Environmental Development as Revealed in Buddhism. That is going to be addressed by this research.

Sarath K. Jayekodi, "Tirasara Sanwardhanaya SankalpanAtmaka Nyāya hā VyavahArikathwaya", 2000 reviews the complete description about sustainable Development. It has mentioned about eco-development, the origin of the concept of sustainable development, nature of the sustainable development, over

development and concept of underdevelopment, definitions of sustainable development. But it has not provided details about the usage of sustainable environmental development as revealed in Buddhism. Which is the research interest in the project.

Thisara Kumarapeli, "Thirasara Sanwardhanaya Hā Sannivedanaya", 2016 has mentioned regarding the usage of fundamentals of the theory of sustainable development and its historicity. Mainly this book provides important information about communication and the relationship between sustainable developments. Unfortunately, it hasn't mentioned anything about the relationship between Buddhism and Sustainable Development.

3. Methodology

This research is conducted using qualitative research methodology. That is, the research is carried out by using the primary source books like Buddhist cannon, commentaries, sub commentaries and other secondary sources as well. This methodology is used in this study to compare the sustainability issues and Buddhist solutions.

4. Conclusion

The concept of Sustainability aims to balance economic, environmental and social objectives ensuring that the needs of the present are met without compromising the ability of future generations to meet their own needs. However, studying the concept of Sustainability is so important because of addressing global environmental challenges like climate change, resource depletion, bio diversity loss, social equity and poverty reduction, improving public health and well-being, inspiring innovation and technical advancements, supporting policy and global cooperation, building resilience to future challenges and promoting economic development with environmental responsibility etc. At the present, this planet is facing severe environmental crisis such as global warming, pollution, over population, loss of bio diversity, deforestation, acid rain and public health issues.

Studying the Buddha's doctrines, he has presented ideas regarding the concept of sustainability more than two thousand five hundred years before. Buddha's

teachings, though not framed in modern terms of ' Sustainable Development' of profound insights that align with the principles of sustainability, particularly in the reals of environmental stewardship,ethical behaviour and dependant origination. Buddha's teachings offer a profound ethical foundation for Sustainability. His emphasize on dependant origination, mindfulness, ethical living provides a framework that promotes ecological balance, social equity and spiritual well-being. According to the Buddha's teachings everything is impermanent. But the development is only possible in a context of impermanence. In this research paper, the researcher points out about the relation between Buddhism and Environmental Sustainability.

As environmental concerns are becoming more prevalent by the day, The Lord Buddha's teachings are more important today than ever. Noise pollution, air pollution, water pollution, soil pollution and deforestation are all issues that world is dealing with. Environmental devastation and pollution, which have triggered a severe catastrophe, must be addressed quickly by individuals living in the twenty first century. This dilemma, which is caused by a variety of factors such as urbanization, industrialization, overpopulation and so on, can be successfully addressed by religious teachings that take the role of pride in man's ancient wisdom. Buddhist teachings can be used to find a solution to the contemporary issues.

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3

FOREVER CHEMICALS, THE UNSEEN THREAT OF PFAS: CURRENT ISSUES IN SUSTAINABILITY

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Abstract

Chemical pollution is silently poisoning our planet, by contaminating air, water, and soil, and threatening ecosystems and human health in ways we are only beginning to understand. Per- and polyfluoroalkyl substances (PFASs), widely known as "forever chemicals," are a class of synthetic compounds characterized by their chemical stability, and resistance to heat, water, and oil. These substances have been used extensively in industrial and consumer products such as non-stick cookware, textiles, food packaging, and firefighting foams. However, their widespread presence in the environment and potential risks to human health and ecosystems have raised significant concerns. PFASs are associated with various health issues, including cancer, immune system suppression, hormonal disruption, and developmental effects, with vulnerable populations, such as children and pregnant women, at higher risk. The persistent nature of PFASs in environmental media air, water, and soil raises challenges for environmental sustainability, impacting clean water access, and food safety. From an economic perspective, PFAS contamination imposes substantial costs on water treatment and site remediation. Regulatory frameworks remain fragmented, with a growing need for comprehensive global governance to address both existing and emerging PFASs. Innovative technological solutions, such as advanced filtration systems, and the development of safer, biodegradable alternatives are critical for mitigating PFAS contamination. This chapter explores the multifaceted sustainability issues associated with PFASs, emphasizing the need for interdisciplinary research, long-term monitoring, and policy reforms to transition toward a PFAS-free future, ensuring environmental, human health, and economic sustainability.

Keywords: *fluoropolymer, fluoropolymer alternatives, Hazardous Industrial Pollutants, Environmental Pollution, PFOA, PFOS*

1. Introduction

Per- and Polyfluoroalkyl Substances (PFASs) are a vast group of synthetic chemicals characterized by the presence of carbon-fluorine (C-F) bonds, which are among the strongest in chemistry (Evich et al., 2022). These substances are designed to be chemically and thermally highly stable, electrically non-conductive, flame retardant, and water-repellent, making them useful for a range of industrial and consumer applications (Jacobs et al., 2024). PFASs are composed of a carbon chain to which fluorine atoms are attached, forming a unique molecular structure that imparts their chemical durability (Glüge et al., 2020). This distinctive property has made them indispensable in numerous sectors, but also a source of environmental and health concerns due to their persistence (Singh et al., 2023). PFASs can be divided into two broad categories: per-fluoroalkyl substances, which have fully fluorinated carbon chains, and poly-fluoroalkyl substances, where some of the carbon chain's hydrogen atoms may be replaced by fluorine atoms (Cousins et al., 2020). PFASs are a group of more than 4,700 individual chemicals that share the common feature of being fluorinated (Cousins et al., 2020). The most well-known and widely studied PFASs include Perfluorooctanoic acid (PFOA) and Perfluorooctanesulfonic acid (PFOS) (Lei et al., 2023), both of which have been extensively used in manufacturing processes such as electronic industry, consumer products such as Cosmetics and personal care, Building and construction industry, and firefighting foams and many more (Gaines, 2022).

Despite their useful properties, PFASs pose significant environmental risks due to incredible persistence, a characteristic that has led to their nickname: "forever chemicals." Due to their high chemical stability, PFAS compounds like PFOA and PFOS' half-life in human bodies can range from 2.3 to 5.4 years (Lei et al., 2023). Once released into the environment, they do not degrade easily, leading to their accumulation in soils, groundwater, and surface water, as well as in wildlife and humans. The history of PFASs dates back to the mid-20th century when these chemicals were first synthesized and tested. As the decades passed, the use of PFASs expanded rapidly across industries. By the 1960s and 1970s, they were widely adopted in a variety of consumer products, including Teflon-coated cookware, waterproof clothing, and fast-food packaging. Firefighting foams, particularly aqueous film-forming foam (AFFF), became another major source of widespread PFAS contamination. These foams, used extensively at military bases

and airports for firefighting, contributed significantly to the release of PFASs into the environment (Travis, 2024).

However, in the early 2000s scientists began to recognize the potential hazards associated with PFASs. Research revealed that these chemicals were accumulating in human bodies, animals, and the environment, leading to concerns about their potential health effects. Studies showed that PFAS exposure was linked to a variety of health issues, including kidney lesions, cancer (Zhang, et al., 2023), liver damage (Wang et al., 2022), thyroid disease, and immune system disruption (Bonato et al., 2020). This prompted increased scrutiny and calls for regulation, as well as efforts to phase out certain PFASs, such as PFOA and PFOS (Purohit, S. S. 2023).

2. Chemical Structure and Types of PFAs

The defining feature of PFASs is their unique chemical structure, where the carbon atoms in the backbone are bonded to fluorine atoms (Saeidi et al., 2019). This structure provides exceptional stability, making PFASs resistant to degradation in natural environments. The carbon-fluorine bond is one of the strongest in organic chemistry, contributing to the persistence and mobility of these substances in the environment. High-energy carbon-fluorine bond renders PFAS resistant to hydrolysis, photolysis, and microbial degradation, and PFAS can persist in the environment for long periods (Qi et al., 2022). PFASs can be divided into two main categories based on their carbon chain length: long-chain and short-chain PFASs. These categories differ in environmental persistence, toxicity, and bioaccumulation ability (Shi et al., 2018).

Long-chain PFASs typically have carbon chains containing equal or more than eight carbon atoms (Zhao et al., 2016). Two of the most well-known and widely studied long-chain PFASs are PFOA and PFOS (Lei et al., 2023). Long-chain PFASs are typically more bioaccumulative and toxic than short-chain variants (Shi et al., 2018), which has led to increased regulatory attention on substances like PFOA and PFOS. Nevertheless, PFOS shows higher toxicity and bioaccumulation than PFOA (Mao et al., 2023). Short-chain PFASs, which have less than eight carbon atoms (Zhao et al., 2016), have been developed as alternatives to long-chain PFASs due to concerns over the persistence and toxicity of the latter. Examples of short-chain PFASs include Perfluorobutanoic acid

(PFBA) and Perfluorobutanesulfonic acid (PFBS) (Li et al., 2019). While short-chain PFASs are considered to be less persistent than their long-chain counterparts, they are still bioaccumulative and can have toxic effects on both human and environmental health.

3. Global Distribution and Persistence of PFAs

PFAS migration in the environment can proceed at a local or regional level via surface water and groundwater (Hu et al., 2016), and at a global level through long-range oceanic and atmospheric transport (Young and Mabury, 2010). For example, airborne PFASs can settle on soil and water bodies, spreading contamination over a wide area (Hepburn et al., 2019). In water, PFASs can dissolve, forming stable aqueous solutions that can flow through rivers and groundwater systems, affecting a large geographical region (Kissa, 2001). PFASs are known to bioaccumulate and biomagnification in food chains, which means that they can accumulate in the tissues of organisms over time. As these chemicals enter the food web, they can be absorbed by plants and animals, ultimately affecting humans who consume contaminated food products (Miranda et al., 2020). This bioaccumulation raises concerns about the long-term health risks for both wildlife and humans, particularly in regions with high PFAS contamination.

4. Environmental Sustainability Issues of PFASs

The widespread use of PFASs since the mid-20th century has led to their contamination of ecosystems around the globe. These chemicals have been detected in remote areas, including the Arctic region (Lohmann et al., 2024), rainwater (Kim et al., 2022), and even the blood of wildlife (Witt et al., 2024) far from industrial centers. The persistence of PFASs in the environment means that contamination can continue to spread over time, as they are transported through air, water, and soil. One of the most concerning aspects of PFAS contamination is its ability to affect both urban and rural environments. While industrial areas and military bases were initially identified as major sources of PFAS pollution, their presence in consumer products like non-stick cookware, clothing, and food packaging has made PFAS contamination widespread. Once these chemicals enter the environment, they can travel vast distances, impacting ecosystems far from their source (Kissa, 2001).

One of the most significant impacts of PFASs on environmental sustainability is their contamination of drinking water supplies (Domingo & Nadal, 2019). PFASs have been found in drinking water systems worldwide, including both municipal and private wells (Smalling et al., 2023). The chemicals can enter water sources through industrial discharges (Sun et al., 2024), landfill leachate (Bolan et al., 2021, Garg et al., 2020), and the use of firefighting foams (Pozo et al., 2022) that contain PFASs. As water travels through contaminated aquifers and surface water systems, PFASs spread, affecting not only local populations but also communities downstream. Groundwater is particularly susceptible to PFAS contamination, as these chemicals can easily infiltrate aquifers and persist for decades. Contaminated groundwater can seep into rivers, lakes, and other surface water bodies, compounding the problem of PFAS pollution. Studies have shown that high concentrations of PFASs in drinking water are linked to several serious health risks, including cancer, liver damage, immune system disruption, and developmental harm in infants and children (LaKind et al., 2022). This contamination poses a significant threat to public health and access to clean water.

The presence of PFASs in drinking water highlights a broader environmental sustainability issue related to SDG 6: Clean Water and Sanitation. Access to safe, clean water is a fundamental human right, and the widespread contamination of water supplies by PFASs undermines this goal. As governments and water utilities struggle to develop effective remediation strategies, PFAS contamination threatens the availability of clean water, particularly in underserved or rural communities, further exacerbating water inequality and access issues (Banwell et al., 2021). According to the World Health Organization, over 2 billion people worldwide lack access to safely managed drinking water services. Clean water access is one of the most pressing sustainability challenges of the 21st century, and PFAS contamination is intensifying this problem.

Beyond water contamination, PFASs are widely distributed in soils and ecosystems. The chemicals can accumulate in soil through the application of contaminated water, atmospheric deposition, or the leaching of chemicals from waste sites. Once in the soil, PFASs can persist for years, slowly contaminating the broader ecosystem (Mahinroosta & Senevirathna, 2019). In aquatic environments, PFASs accumulate in both water and sediment (Bai & Son, 2020), leading to significant ecological consequences. Aquatic organisms, such as fish

(Munoz et al., 2022) and amphibians (Abercrombie et al., 2019), can absorb PFASs through their skin or gills, leading to bioaccumulation in the food chain. As these chemicals move up the food chain, they concentrate in higher trophic levels (De a Miranda et al., 2022), such as invertebrates, fish, amphibians, reptiles, birds, and mammals worldwide (De Silva et al., 2020), causing harm to wildlife populations and disrupting biodiversity. The long-term effects of PFAS contamination on wildlife are still not fully understood, but studies suggest that exposure to PFASs can interfere with reproduction, growth, and development in various species. The persistence and mobility of PFASs in ecosystems mean that once they are introduced, the impact can last for generations, leading to the disruption of entire ecosystems.

PFAS contamination poses a significant threat to biodiversity. As these chemicals accumulate in wildlife, they can disrupt reproductive cycles, reduce fertility, and cause abnormal growth or development in animals. For example, studies have shown that PFAS exposure in fish can impair their ability to reproduce, leading to population declines (W. Shi et al., 2024). In ecosystems, the contamination of key species, such as aquatic organisms or wildlife can have cascading effects, disrupting food webs and destabilizing entire ecosystems. The loss of biodiversity caused by PFAS exposure can weaken ecosystems' resilience to other environmental stressors, such as climate change or habitat loss, thereby affecting ecosystem services like pollination, water purification, and climate regulation.

PFAS contamination in soil can extend to crops and livestock, leading to concerns about food safety and agricultural sustainability. Thus, PFAs rarely cause physiological damage in plants (J. Li et al., 2021). Nevertheless, PFASs in contaminated water can be absorbed by plants, resulting in the uptake of these chemicals into the food chain. Some crops, such as leafy vegetables and root crops (Xu et al., 2024), are particularly susceptible to PFAS contamination through their root systems. And, livestock, including cattle and poultry, can also be exposed to PFASs mainly through contaminated water, and feed (Lupton et al., 2022). This bioaccumulation can lead to the presence of PFASs in animal tissues, including meat, and eggs, (Hlouskova et al., 2013) potentially affecting human food consumption. The long-term effects of consuming PFAS-contaminated food are still under investigation. Still, existing research suggests that PFASs may have adverse effects on human health, including immune system suppression and developmental toxicity.

5. Social Sustainability Challenges: The Impact of PFAS on Human

The presence of PFASs in agricultural systems poses a threat to food safety and security. Contaminated crops and livestock (Lupton et al., 2022, Hlouskova et al., 2013) reduce the quality and safety of food, leading to potential health risks for consumers (Brown et al., 2020). Additionally, as PFASs accumulate in soils and water, diminish the ability of farmers to produce safe, sustainable food and, threaten global food security. PFAS contamination can also lead to socio-economic consequences for farmers. For example, regulatory bodies may impose restrictions on the sale of contaminated agricultural products, leading to financial losses for producers. In the worst-case scenario, entire regions could face agricultural collapse if soil and water resources are heavily contaminated by PFASs.

Per- and polyfluoroalkyl substances (PFASs) pose significant risks to human health, contributing to a growing public health concern globally. As these chemicals persist in the environment and accumulate in human tissues, their long-term health effects are becoming increasingly apparent (Brase et al., 2021). The impacts of PFAS exposure are particularly concerning when viewed through the lens of human health and social sustainability. This includes understanding the direct health effects, the disproportionate impacts on marginalized communities, and the broader social and economic implications of PFAS contamination.

PFASs have been linked to a range of serious health issues, including cancer. Studies have shown that exposure to certain PFASs, particularly PFOA and PFOS, can increase the risk of developing cancers such as kidney cancer, and testicular cancer (Seyyedsalehi, M. S., & Boffetta, P. 2023). Significant differences in PFOA and PFBS concentrations were found in liver cancer patients (Liu et al., 2021). PFOA, in particular, has been classified by the International Agency for Research on Cancer (IARC) as a potential human carcinogen, highlighting its serious health risks (PFOA, PFOS, and Related PFAS Chemicals, n.d.). In addition to cancer, PFAS exposure is also associated with immune system suppression, which can reduce the body's ability to fight infections and illnesses. PFASs are known to interfere with the production of antibodies, leaving individuals more vulnerable to diseases (Ehrlich et al., 2023). The immune system disruption can also lead to chronic conditions, as the body may become less effective at responding to pathogens or vaccines.

Meantime, PFAS exposure has been linked to hormonal disruption, particularly affecting the thyroid and reproductive systems (L. Li et al., 2023, Ding et al., 2020). These chemicals can interfere with the production and regulation of hormones and alter sexual development in children. It can be concluded that PFASs may reduce fertility in both men and women, complicating family planning and reproductive health. Another major concern is the developmental issues associated with PFAS exposure. Children exposed to PFASs may experience delays in physical and cognitive development. Studies have shown that prenatal exposure to PFASs such as perfluorononanoic acid (PFNA) can affect birth weight, increase the risk of birth defects, and potentially lead to long-term developmental and behavioral problems (Luo et al., 2020). The vulnerability of children and pregnant women underscores the importance of addressing PFAS contamination, as these groups are particularly sensitive to its harmful effects.

6. Economic Sustainability Challenges: The Impact of PFAS Pollution

The economic sustainability of communities and industries is increasingly challenged by the presence PFASs. These persistent pollutants not only create environmental and health concerns but also impose significant economic costs. The financial burden of PFAS contamination extends across various sectors, including water treatment, industrial regulation, and local economies. From the costs of cleaning up contaminated sites to the financial strain on industries and, the economic complications of PFAS pollution are profound.

One of the most significant costs associated with PFAS contamination is the financial burden of cleaning up affected water sources and contaminated sites. Water utilities across the globe are facing increasing costs to remove PFAS from drinking water supplies. Technologies such as granular activated carbon, ion exchange resins, reverse osmosis and nanofiltration, and advanced oxidation processes are commonly used to treat PFAS-contaminated water (Yadav et al., 2022), but these methods are expensive and energy-intensive. Additionally, the need for continuous monitoring and testings: further drives up costs, as PFAS levels in water sources may fluctuate, requiring assessing ongoing treatment efforts. The cleanup of contaminated sites, including industrial facilities, military bases, and firefighting training areas, is another significant financial challenge. There are a few promising destructive solutions for PFAS in soil, such as thermal treatment and ultrasound, but scaling up will need to overcome low efficiency

and high cost (Y. Wang et al., 2023). The costs of site remediation can run into the millions of dollars, and these financial burdens often fall on local governments or taxpayers.

The manufacturing industry faces significant challenges due to the widespread use of PFASs in consumer and industrial products. These chemicals are used in a variety of applications, including non-stick cookware, water-repellent textiles, and firefighting foams, due to their durability and resistance to heat, water, and oil. However, as the negative environmental and health effects of PFASs become more apparent, governments worldwide are pushing for the phase-out of these substances, leading to major changes in production processes. For industries that have relied on PFASs for decades, such as the textile and automotive sectors, the transition to safer alternatives is complex and costly. Finding replacements for PFASs that offer the same level of performance and durability is a significant hurdle (Glüge et al., 2021). Additionally, the transition may result in short-term disruptions to production and increased costs for businesses, particularly smaller companies that may struggle to absorb these financial burdens. Industries that have benefited from the use of PFASs for economic reasons are now confronted with the challenge of balancing the benefits of these chemicals with the growing environmental and health costs.

7. Regulatory Framework for PFAS

Regulatory frameworks remain fragmented, with a growing need for comprehensive global governance to address both existing and emerging PFASs. Despite efforts by some nations to regulate per- and polyfluoroalkyl substances (PFAS), inconsistencies persist across jurisdictions. For instance, the European Union has proposed a comprehensive PFAS ban under the REACH regulation (2025 REACH Revision to Introduce Stricter EU Chemical Regulations, PFAS Restrictions, and Essential Use Criteria - Foresight, n.d.), while the United States follows a state-by-state approach alongside proposed federal standards by the Environmental Protection Agency (Key EPA Actions to Address PFAS | US EPA, 2024). However, innovative technological solutions, such as advanced filtration systems, and the development of safer, biodegradable alternatives are critical for mitigating PFAS contamination. Filtration methods like granular activated carbon, ion exchange resins, and reverse osmosis have shown promise in removing PFAS from drinking water. Simultaneously, research into

biodegradable PFAS alternatives is underway to replace persistent compounds in various industries.

8. Conclusion

PFAs (per and poly-fluoroalkyl substances) pose significant challenges to global sustainability due to their persistent nature, toxicity, and widespread presence in the environment. The durability that makes PFAs useful in manufacturing also leads to their accumulation in water, soil, and living organisms, contributing to long-term ecological and health hazards. Current efforts to mitigate PFAs include stricter regulations, the development of safer alternatives, and increased public awareness of these "forever chemicals." However, addressing PFAs fully will require multi-faceted approaches, including advanced remediation technologies, circular economy models, and global cooperation to limit production and pollution. Sustainable solutions depend on innovation, corporate responsibility, and policy frameworks that balance industrial progress with environmental and public health. Moving forward, eliminating or replacing PFAs with non-toxic alternatives is crucial for safeguarding ecosystems and promoting a healthier, more sustainable future.

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PART II

CURRENT ISSUES IN TOURISM SUSTAINABILITY

4

CHALLENGES AND STRATEGIES OF AYURVEDA-RELATED WELLNESS TOURISM SUSTAINABILITY IN SRI LANKA

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Abstract

Tourism is one of the key economic activities in the world. Sri Lanka is a country that relies deeply on tourism income. Hence, identifying new horizons to develop the tourism sector is vital. Since Wellness Tourism is a trending concept in world tourism, this study aimed at Ayurveda-based Wellness Tourism and ways to uplift the existing outfit. To achieve objectives, the researcher conducted nineteen in-depth interviews with industry professionals to collect qualitative data inputs. Results showed that the actions of three main stakeholders impact Sri Lankan AWT; tourism-related authorities, Ayurveda-related authorities, and service providers. Tourism-related authorities identified the importance of AWT to some extent but, can contribute more to the sector. The actions of Ayurveda-related authorities are insufficient or bottleneck the industry's sustainable development. The quality of the services is proportionate to the scale of the service provider. Further, authorities' bureaucracy prevents AWT's expansion through medium or small-scale service providers. The results suggest that Sri Lankan AWT requires three-plied corrective actions. In that, setting up a national-level policy, strong marketing policy, actions to change the mindset of people, reforms in the Ayurveda education system, and branding are the long-term actions whilst development of infrastructure, value addition of AWT, streamlining of government institutions, and implement feedback system are mid-term actions. Immediate actions for therapist shortage, removal of parasites in the industry, and energizing of existing regulatory/ standardization mechanisms are considered immediate actions.

***Keywords**: Ayurveda Wellness Tourism (AWT), Ayurveda, Sustainability, Challenges, Strategies, Sri Lanka*

1. Introduction

Tourism is one of the key contributors to economics for most countries as well as for the world. In 2019, tourism contributed 10.3% of the global GDP and 4.3% of the world's total investment, offering 330 million jobs and becoming 1 in 10 jobs around the world. (*Economic Impact | World Travel & Tourism Council (WTTC)*, n.d.). Within the wide spectrum of tourism, there are sub-sectors which focus on different tastes and wellness tourism is one. Wellness tourism aims to improve and balance all the main domains of human life including physical, mental, emotional, occupational, intellectual, and spiritual. The primary motivation for wellness tourism is to engage in preventive, proactive, lifestyle-enhancing activities such as fitness, healthy eating, relaxation, pampering, and healing treatments. As per the research, the level of promotion being undertaken to attract wellness tourists to Sri Lanka is currently quite limited when compared with Kerala and Thailand, although Sri Lanka has several wellness destinations.(Pollard et al., 2020). Though the segment is forecast to grow at an average annual rate of 7.5% until 2022 – considerably higher than the 3.2% growth seen for tourism overall, still the contribution of health tourism is as low as 0.9 % of overall tourism income. (*Sri Lanka Tourism Named a Top Travel Destination for 2019*, 2020).

1.1 Objectives of the Research

Having known of all the above, the objectives of this research were:

a) To understand the present status of Sri Lankan Ayurveda Wellness Tourism,

b) To find out the challenges and strategies in developing Ayurveda Wellness Tourism in Sri Lanka.

1.2 Significance of the Research

The outcomes of the study provided recommendations to alter the national-level strategy for promoting health and wellness tourism that would contribute to the overall increment of foreign income through the tourism sector. As a theoretical significance, the outcome of this study filled the gap in areas of Ayurveda health

tourism, in which further studies could be conducted to uplift the standard of the knowledge base about Ayurveda Health Tourism in Sri Lanka. This study is significant as it envisages finding out what are the issues that have been faced in promoting Ayurveda health tourism in Sri Lanka. With that, it would be possible to steer wellness tourism promotion and sustainment drives in more effective and efficient ways. At present, there is a rapid tendency of the global population toward indigenous medicine and other specific medical practices in the country such as Ayurveda, Yoga, Chinese therapies, and *Hela wedakama*. Therefore, this study unveils the impacts of changing perceptions of the global community toward indigenous medicine. Through those findings, it would be possible to tackle trending requirements and developments that would be needed to promote Ayurveda tourism in Sri Lanka in a solid and lasting manner. The outcomes of this study help to assess deployment options of Ayurveda-related professionals in the industry. This is not only towards the medical officers but also all other staff such as nurses, therapists, masseurs, and attendants. Through this, a comprehensive idea can be drawn about the staffing gaps in the industry which are directly related to the quality and standards of the service provided.

2. Literature Review

2.1 Health and Wellness Tourism

There is no clear and universally accepted definition of tourism. According to the UNWTO (1995), Tourism is defined as "the activities of persons travelling to and staying in places outside their usual environment for not more than one consecutive year for leisure, business, and other purposes". As per UNWTO, wellness tourism is “tourism associated with travel to health spas or resort destinations where the primary purpose is to improve the traveller’s physical well-being through a regiment of physical exercise and therapy, dietary control, and medical services relevant to health maintenance” (Peršić & Janković, 2013). Health and medical tourism are not the same. Health tourism is often seen as being the umbrella term for wellness and medical tourism. However, health tourism is used as a synonym for medical tourism. Hence health tourism is a broader concept than medical tourism and should not be applied interchangeably. The essential difference is that medical tourists travel because

they want to treat/cure medical conditions, while wellness tourists travel because they want to maintain or improve their health. (Peršić & Janković, 2013).

Wellness is multi-dimensional rather than focused. According to the Asia Pacific Spa and Wellness Coalition; dimensions of wellness can be categorized as Physical wellness, Emotional wellness, Social wellness, Occupational wellness, Spiritual wellness, Environmental wellness, financial wellness, Intellectual wellness, and Academic wellness. (Jacka, 2020). Wellness leaned toward the psychological than the physical state of an individual. Therefore, wellness tourism should focus not only physical but also on the spiritual state of the guests.

2.2. Trending Concepts in Ayurveda Health Tourism

Connell (2006) and Smith et al. (2007) describe that global healthcare service has been booming recently. In the international Healthcare Tourism Industry, nearly thirty countries including Thailand, Malaysia, Singapore, Korea, Hungary, Poland, Jordan, India, Turkey, and the U.S. are considered the major players in the international health tourism market (Bookman & Bookman, 2007; Eissler & Casken, 2013; Merrell et al., 2008; Pollard, 2013). According to a study on healthcare tourism in the U.S. carried out by Deloitte (2009), the most popular destinations for U.S. healthcare travellers were India, Thailand, Mexico, Philippines, Korea, Taiwan, Malaysia, and Singapore. These countries are experiencing growth in healthcare tourism that is greater than their overall economic growth. For instance, health tourism revenues in India are expected to increase by 30% annually compared to a 7% increase in national GDP (Deloitte, 2009; World Bank, 2014).

In India, government support for medical tourism is in a remarkable stage. They provide visa facilitation, hospital accreditation, and public-private sector partnership (PPP), including marketing. The government improved airport infrastructure to smooth the arrival and departure of medical tourists. It has championed a PPP model at both central and state levels to improve healthcare infrastructure to provide efficient services and innovative delivery models (Medical and Wellness Tourism – lessons from Asia, 2014).

In the contemporary world, the healthcare tourism component is not new. It has existed for many centuries in many countries of the world, including Switzerland,

Germany, Austria, Jamaica, Hungary, the United States, and the United Kingdom. It is a good concept to approach health tourism with a deliberate marketing strategy. Healthcare tourism can be the basis of a positioning strategy for some hotels or resorts in a world that is becoming more health-conscious.

2.3. Health and Wellness Tourism in Sri Lanka

(Arachchi & Kaluarachchi, 2019) conducted research about customer satisfaction in the wellness tourism sector in Sri Lanka. It was identified that satisfaction towards Ayurveda medical tourism was high when the tourists' perception of tangibility, responsiveness, and empathy was high. It possibly should be enhanced by providing more attention to the dimensions of service quality which indicated a significant and positive influence on the medical tourists' satisfaction. (Samarathunga, 2020), discussed post-COVID challenges and the way forward in the Sri Lankan tourism sector. There, it is identified that the promotion of Ayurveda and indigenous medicine boosts immunity; and promotes distress and counseling programs with the Eastern way of thinking embedded with the Buddhist philosophy, Hinduism, and Ayurveda.

According to the International Medical Travel Journal, Sri Lanka Tourism has also been in discussion with the European Union (EU) office in Colombo, they offered a grant help to recover from the crisis. This grant would be used to support and promote wellness tourism, including Ayurveda and Sri Lanka's own Indigenous traditional medicine, *hela wedakama*. Sri Lanka Tourism has agreed with the EU to use the money on product development, branding, marketing, and certification of wellness resorts, focusing on Ayurveda and *hela wedakama*. As per the said report, Sri Lanka Tourism is working with the Ministry of Health to finalize regulations relating to Ayurveda and *hela wedakama*, and capacity building, after which, a product development and promotional campaign will be launched. (Pollard et al., 2020).

The government of SL, through the National Export Strategy (2018–2022), has implemented strategies to promote wellness and medical tourism, including economic incentives and simplified project approval procedures for companies investing in wellness-related developments. The expected goals of this strategy are to coordinate the development of traditional and modern health and medical tourism, establish a quality assurance system for wellness and traditional health

systems, and provide an information system for the Sri Lankan health tourism sector and its target markets. To achieve these goals Export Development Board (EDB) has planned to establish the Sri Lanka Wellness Tourism Association comprised of Western medicine companies, Indigenous Ayurveda practitioners, and many others engaged in wellness tourism-related activities. (Wayne, 2020). Through an extensive literature review, it was identified that sufficient research was not conducted/ published in connection with Ayurveda in the tourism sector in Sri Lanka. Therefore, it was evident that there is a clear knowledge gap in Ayurveda-based wellness tourism in Sri Lanka.

3. Method

The researcher adopted the post-positivist philosophy since the study envisaged exploring the meanings of the observed phenomenon. An inductive approach has been used in this study whilst mono- the qualitative method is used. (Creswell & Creswell, 2018) (Saunders et al., 2019). Further, the study was conducted as a case study with a cross-sectional time horizon. The researcher has selected the whole of Sri Lankan tourism as one case where special attention was given to the Southern, Western and Eastern coasts; and Central province as those four areas were the active tourism strongholds in Sri Lanka. Primary data sources were the interviews whilst secondary data sources were the published researcher, reports and other electronic media.

As per the literature review and preliminary studies, the researcher has identified three distinct categories in the total population; a) The expertise of the field of Ayurveda who are in the higher management level such as Ayurveda Commissioners, directors of Ayurveda research institutes, teaching hospitals, training institute key appointment holders of government Ayurveda medical officers' associations, members of Hospital and Education committee. b) Expertise in the tourism sector such as Directors of Tourism Development Authority, and members of the Export Development Board (EDB). c) Economic expertise in the hotel sector related to AWT such as key appointment holders in recognized hotel groups. The purposive sampling technique was adopted to ensure quality and the accuracy of the data gathered from three segments. Interviewees' recommendations were considered for the selection of the next interviewee since it was the best way to reach the most suitable resource persons for this kind of research. Altogether nineteen semi-structured, in-depth

interviews were conducted covering all three segments of the total population. The researcher has conducted this study amidst COVID 19 pandemic, therefore only three face-to-face interviews were conducted and others were done through a virtual platform. The researcher adopted the qualitative data analysis method. All the interviews were transcribed and coded. After the coding, sub-categories and categories were generated. As per the nature of this study, analysis was completed without generating themes but with categories arranged according to logical order.

4. Results and Discussion

As per the methodology stated above, the researcher analyzed nineteen interviews through the qualitative analysis method. In that, there were six categories were generated to well describe the findings of this study. Those were; a) Ayurveda in Sri Lankan Tourism, b) Contribution from Tourism Related Authorities, c) Contribution from Ayurveda Related Authorities, d) Contribution of AWT Service Providers (Hotels/Resorts), e) Challenges for Sri Lankan AWT, f) Suggestions to Overcome Challenges. The following paragraphs depict the findings concerning those categories.

4.1 Ayurveda in Sri Lankan Tourism

It was found that Ayurveda was one of the strengths of Sri Lanka tourism possessed. Due to world trends in tourism, standards of the Sri Lankan Ayurveda wellness sector, geographical setting, and culture; the field seems to be developing gradually. During data analysis, it was found that changing world tourism trend toward wellness tourism, Sri Lankan tourism operators also identified the fact that Ayurveda wellness is one of the force multipliers in tourism. Therefore, most service providers are keen on converting to providing Ayurveda wellness or adopting wellness principles for their strategic developments. The transition of designation from 'Hotel' to 'hotel and spa' and further to 'Ayurveda resort' indicates this trend in the Sri Lankan hotel industry. Though the present trends are positive, findings affirmed that mismanagement and misuse of Ayurveda in past scenarios incur negative impacts on the sector. The bad image created by such activities is posing high resistance for the AWT in the present-day context, mostly towards the perception of society. This is one of the reasons dragging the expansion of the sector in rural but high-potential localities. Community

resistance against setting up new ventures and staffing issues are the outcomes of such a bad image created in past. Non-identification of real potentialities of Ayurveda by authorities is another adverse factor in the present context, which diverted the due attention. Despite negativities, all respondents were very optimistic about the future of the AWT and Sri Lankan tourism in general. This is a good sign of prosperity in the field since optimism could be converted to good trust to boost the field by all stakeholders and with necessary support from authorities.

4.2. Contribution from Tourism-Related Authorities

Findings have shown that authorities have understood that AWT is an important sector but, necessities have not been properly identified. This distracted the focal point of authorities where centres of gravity are not addressed. The researcher, based on such findings, opined that this is the reason for operators'/ doctors' dissatisfaction with authorities.

4.3 Contribution from Ayurveda Related Authorities

Findings revealed that authorities were fully absent mind about the sector and it is astonishing to state the unconsciousness in supporting this important generator. Though tourism authorities were not fully focused on the sector, their actions helped to sustain the industry. But Ayurveda authorities are concerned; their contribution is negligible and absentminded about AWT. Without a proper understanding of the AWT, its core functions, and the responsibility of Ayurveda authorities; support from Ayurveda authorities cannot be expected and findings proved such misunderstanding on the part of Ayurveda authorities. Due to these reasons, vast resources and capabilities that are wasted by Ayurveda authorities are not utilized for the betterment of the AWT. In addition, being the authorities, necessary policy support concerning the sector is not met further degrading the international legality of AWT as a means of healthcare service.

4.4 Contribution of AWT Service Providers

One of the interesting facts revealed was the inter-relationship between the scale of the business and service quality. In that, service quality is proportional to the scale of the business. Large-scale service providers maintain the exceptional

quality of overall service whereas quality is degraded when coming down to being small-scale. The researcher identified several factors in this regard. The capital requirement was one of the reasons why small-scale operators were facing difficulties in meeting such expenses. On the other hand, issues in two authorities (Ayurveda and tourism authorities) made small-scale operations difficult due to the reasons discussed in the above paragraphs. Generally, these small-scale operators find it difficult to meet the specifications demanded by those two authorities, hence trying to fulfil all requirements with limited funds/ resources thereby degrading the service quality. Another revealed fact was that there is a tendency to immerging small to medium centres owned by foreigners where such centres threaten the local operators in the industry.

4.5 Challenges for Sri Lankan AWT

Challenges were identified from three different perspectives; conceptual, resource-based, and practical. Out of those, conceptual challenges were mostly dealt with by tourism-related authorities and Ayurveda-related authorities. Furthermore, it was understood that those were critical in developing the sector. Those challenges emerged due to the non-identifying of the real context in the AWT sector by aforesaid two authorities and incurred various other challenges. Non-availability of strong national policy, loopholes in the education system, and work in isolation by two authorities were the critical challenges and could not be recovered by any other stakeholders such as operators or doctors. Even, this diluted effort was made by individual actors for the betterment of the sector. Social issues were highlighted during the research. In that, human resources management is in a critical situation, mainly because of the perception of the people towards the sector. Lack of attendance by authorities has led to diluting the quality of the service by several means and again the blame goes to authorities because necessary actions were not taken by them. Generally, challenges were concentrated around four aspects; unavailability of national policy, unavailability of proper regulation, lack of education opportunities, and staffing. All the issues could be considered as an extension of these challenges.

4.6. Strategies to Overcome Challenges

During the analysis, the researcher found suggestions made by respondents. However, it is to be noted that those respondents were from different professional

backgrounds and different levels. Therefore, it is necessary to evaluate such suggestions to generalize them to the Sri Lankan AWT scenario. To get a holistic understanding of the suggestions, the researcher view, that those suggestions are to be viewed on a long-term, mid-term, and short-term basis. Setting up a national-level policy, strong marketing policy, actions to change the mindset of citizens, and reforms in the Ayurveda education system can be taken as long-term where study and workout are needed. Suggestions related to the mid-term were the development of infrastructure, value addition of AWT such as Yoga/heritage/culture, streamlining of government institutions, and implementation of a feedback system to the industry. Immediate actions for therapist shortage, removal of parasites in the industry, and energizing existing regulatory/standardization mechanisms are considered short-term suggestions. Considering the workability and reality of suggestions, all suggestions provide creative solutions for existing issues and most of them met strategic level expectations in the development of AWT.

5. Recommendation and Conclusion

5.1 Recommendations

Based on the findings of the study, the researcher has formulated several recommendations. Proposing government universities to include AWT and the use of indigenous medicinal practices in the wellness sector as an academic discipline, was one of the recommendations through which, a solid foundation is sought for future developments. Appointing an executive committee with industry experts to conduct a comprehensive study about AWT in Sri Lanka should be done. It must be appointed with proper authority and be covered with required legal protection. The objectives of this committee are to propose a national-level policy on promoting/ facilitating AWT in Sri Lanka. Further, the initiation of an awareness campaign should be done to educate Sri Lankans' on the benefits of AWT to the country as a whole.

The proposal for establishing proper education institutes to produce qualified supporting staff in the AWT sector would provide easy expansion in the sector. Conducting a feasibility study to utilize Indigenous medicinal practices in the AWT sector and include Eastern province in the AWT sector to grab a Middle

Eastern customer base would enhance the scope of AWT. Further, increasing local drug production through government support and research-based drug production methodology would facilitate both depth and breadth-wise expansion of the industry.

Government intervention is important, so setting up a separate government body comprised of both Ayurveda and tourism professionals to handle the general operation of the industry and provide immediate support in difficulties; and streamlining regulatory procedures which facilitate fast and quality expansion of AWT are the rest of the recommendations. Finally, the researcher proposes to initiate a social media-based promotional campaign to boost guest attraction.

5.2. Recommendations for Future Research

The researcher recommends to study of small-scale Ayurveda Wellness service providers focusing on challenges, effectiveness, and overall contribution to the sector as one of the areas for future studies. Further, the study on therapists employed in the AWT sector focuses on job proficiency, adequacy, and social challenges faced while on the job; the study on Ayurveda-related authorities focuses on their readiness to shoulder challenges in AWT and the way forward; and the study on indigenous medical systems in Sri Lanka and their adaptability in AWT are the rest of areas for future works.

5.3 Conclusion

Ayurveda-related Wellness Tourism is a niche market which is trending in the present-day context. Sri Lanka also provides AWT services but, it was found to be disorganized due to some reasons. This causes to drag the quick development in the sector. This study was conducted to evaluate the present context and find out the challenges and strategies to develop the Sri Lankan AWT sector to compete with other counterparts. Through the study, the researcher tried to provide timely recommendations which would help thrive Sri Lankan AWT sector into a higher position in future.

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5

A PARADIGM SHIFT IN THE TOURISM INDUSTRY: EMERGING TRENDS

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Abstract

The modern concept of tourism has been influenced by the collective experiences of modern tourists who showed a paradigm shift in their values and intentions towards tourism experience. This new generation of tourists brought the prospect of including cultural preferences along with economic factors that influenced the tourism space. Hence, from mass tourism emerged many different types of tourism like adventure tourism, agrotourism, medical tourism, eco-tourism, etc. Essentially the modern tourist values sustainability which is quality-conscious, flexible in its approach and more experienced than the previous generation of tourists. To match the momentum and demand of modern tourists, the tourism industry is engaging in transforming the landscape with sustainability in mind. This transformation is enabled by the communication technologies that inform the industry of the nature, values and demands of the tourists and make the services readily available, thereby making the new forms of tourism more dynamic and flexible than its previous model. Furthermore, in this transforming tourism space, there has been a diagonal integration of the other economies with integrated values that permit quick adaptation to the dynamic needs of modern tourism. This chapter will discuss modern tourists and how the tourism industry has super-segmented the demands to create distinguished products and new forms of tourism. In the subsequent subsections, the new forms of tourism will be discussed in detail that will includingWar tourism, Smart tourism, Indigenous tourism,

Accessible tourism, Catamaran tourism, Experiential tourism, Bleisure tourism, Silver tourism and Atomic tourism etc.

Keywords: *Modern tourism, Agrotourism, Experiential Tourism, Silver Tourism, Tourism types.*

1. Introduction

The old norm in tourism was Mass tourism which was focused on recreation and was aided by rail travel. In the late 19th century and early 20th century, the nature of the destination became important and garnered more attraction. By the 21st century, the new economy heralded tourism that included overnight stays, visits to attractive spots, luxurious experiences during the stay and air travel. The focus shifted from destination to the full tourism experience. However, this mass tourism has seen a paradigm shift as it has transcended the influence of money and has become more interested in cultural inclusion. The tourism experience nowdemands cultural globalization as the Fordian tourism or mass tourism model does not suffice the demands and competitiveness instigated by globalization.

Further, this paradigm shift has been triggered by the side effects of conventional tourism on the economy and ecology. Conventional tourism has led to water pollution, natural habitat exploitation and soil erosion. Religious activities like bathing, washing and other coastal activities like rafting, fishing and other activities impact the quality of water. Meanwhile, the untreated human wastes from hotels and resorts near these tourist spots were delivered right onto the rivers while the increasing number of vehicles has been disrupting the ecology. In fact, the tourist facilities have witnessed increased runoff of water thereby losing nutrients, oil and gas affecting the quality of the water in the water bodies. Similarly, the flora and fauna have been impacted due to tourist visits that have been disrupting the stability and growth of the species (Haysmith & Hunt, 1995). A few negative impacts of conventional tourism include nest failure and lack of reproductive success among birds. Furthermore, the socio-economic rifts have been instigated by the tourism inflows into the host communities despite positive economic shifts created in these places. The traditional values and norms of the host culture have been undervalued by the tourists making these places environmentally polluted and turning them into conflict hotspots. Hence, the conventional tourism issues have become apparent and sustainability has looked

promising for this industry. This led to a paradigm shift in the collective consciousness of the tourists who started exhibiting sensitivity towards culture, ecology and society and wanted to preserve it for longer periods, thereby giving rise to a new generation of tourists called the"modern tourists".

2. Modern tourists

"Modern tourists" are travellers who are not solely interested in travel for recreation purposes. Their allocentric-mid-central preferences according to Plog's model of tourist behaviour are in sharp contrast to the old tourists with psychocentric preferences (Leksakundilok, 2004). Their travel preferences are demanding and pose a challenge to the tourism industry which is why the most successful businesses in tourism and travel are the ones that employ technologically equipped staff who actively engage with these tourists via communication technologies and provide access to innovative tourism marketing plans on whim and demands.

A modern tourist is ready for adventure. He/she is educated and a variety of packages are offered to him/herin a single touch. He/she is fully aware of what he/she seeks and is time and money-bound. He/she usuallyis thought to hail from a middle-class economic status and travels solo or in groups purposively. He/she is well-healed and well-informed in advance from his/her friends and previous tourists. Hence, the modern tourist is goal-oriented all the while optimizing money and time along with leveraging the technology. He/she is not a spectator like the old tourist rather intends to experience, actively participate and learn from the tourism experience.This quality-conscious generation of tourists has been showing an environmentally sensitive side. They have been sensitive to the host culture and environment which is why they have been flexible during their travel.

Simultaneously, the definition of adventure has undergone a transformation and is replaced by "active participation in the authentic culture, people and destinations" as the renewed definition of adventure. These "real tourists" who can be regarded as true and genuine travellers do not simply stay as spectators consuming novelty. There is more inclination towards gate-away vacations and cultural tourism than sightseeing. This indicates that the tourism industry has to brace itself for a more demanding and discriminating tourism consumer and stay

competitive in the market. Poon (1994) mentions that new tourists are wary of glossy marketing methods and rely on first-hand and second-hand experiences only. They research their destinations beforehand and gain considerable insight regarding the destination experience and this is why they are tough to please. Top products and services come second in their preferences. This new tourist can be called a "REAL tourist" which refers toa "Rewarding", "Enriching", "Adventuresome", and "Learn Experience-seeking"new tourism for the new tourists

Recognising the shift in the interest of this new generation of tourists, the tourism industry has understood specific needs and included the 'human element' in itsstrategies.It has engaged tour guides, seasoned travel guides and local people to provide authentic experiences. Staying relevant and competitive in the market is ensured by making the authenticity of the experience "the primary product" and this is how the tourism industry is working on their unique practice rather than focusing on the destinations. These practices necessitate involving authentic practices of the place, and interactive and educational experiences withsustainable goals to avoid the technology-aided interpretation of these destinationsbecoming obsolete. This is why the new tourism incorporates experiential tourism with sustainability so that it is preserved for generations to come. Furthermore, this experience cannot afford to be an externalised or reproduced setting, rather has to be internalized so that the interpretation of the experience remains authentic and preserved.

3.1 Features of New Tourism

This new trend of tourism is attuned to the variegated tourism needs of the new tourists and has inspired the demand for super-segmentation and flexibility in the supply and distribution of products and services.

1. The tourism industry has been able to cater to the new tourists by diagonally integrating economies that shared integrated values towards the tourism market, thereby digressing justifiably from the economies of scale. This paradigm shifts from Fordian tourism opened the tourism space to offer products and services that are adapted to the dynamic demands of the tourists not only made the product mix interesting but also helped make it unique, complex and distinguished from the

competitors. Meanwhile, the tourism industry had new consumers of customized products that required new strategies and management styles aided by new and advanced technologies (Poon, 1994).

2. The super-segmentation of tourism services demanded the tourism industry to do in-depth research on the cluster of consumer behaviour, traits and needs so thata customized product mix can be formulated. Components of comfort and flexibility are vital ingredients in this new era of tourism. The flexibility in booking, product distribution, payment technologies and systems and the ways the tourism product is consumed by the new tourists are fundamental aspects of the tourism industry.

3. The diagonal integration of economies enabled the tourism industry to compete in more than one activity. It spreads a wider net of influence in the market, attaining profits based on system economies where synergetic interactions of more than one product and services make new tourism feasible and unique under a shared value system.

4. Types of New Tourism

4.1. Silver Tourism

The concept of silver tourism has roots in the "silver economy" that emerged in 1970 in Japan and is more associated with marketing than in the tourism industry. It was also known as a 'mature market' for being directed at the availability of product facilities for senior citizens. These special services adapted to the ageing workforce involved age-friendly operators who offer special solutions with universal and transgenerational designs to people with physical and cognitive challenges. Aimed at social integration, an offshoot of the silver market started trending as silver tourism due to the increasing commitment of senior citizens towards tourism. The silver market is driven and composed of the telecommunication sector, financial institutions, transport, tourism, local services, housing and infrastructure that collectively help to adapt to the medical, social and religious interests of the heterogeneous senior citizens (Kohlbacher,

2008). Silver tourism is distinct from other forms of tourism due to its age-specific tourists and the features of the silver tourists are delineated below.

4.1.1 Features of Silver Tourists

The senior tourists can be segregated into heterogeneous groups of four. The 51-64 years are "mature silver tourists", the "young-old tourists" are in the 65-74 years age range, the "old-old silver tourists" fall in the range of 85-94 and the "very old tourists" are above 95 years of age. The general features of silver tourists are listed below.

1. They have disposable income that is invested in safety due to which they avoid risky destinations for tourism purposes.

2. They have enough free time in any season and hence they choose to travel multiple times if they can and are willing to expand their duration.

3. Curiosity is key to their tourism experience for which they require frequent and barrier-free communication, especially for health and medical services.

4. They require customer-centred services and tend to prefer classic travel brands and agencies rather than browsing the internet for information.

5. Tourism becomes feasible for silver tourists when accessibility is ensured along with personal care from the tourism staff.

The most popular silver tourism includes luxury trips, bucket list trips, wellness and rehabilitation trips, visiting relatives and friends, celebrating anniversaries, religious and spiritual tourism, trips to avail anti-ageing services, organ transplantation trips, visiting holiday clubs, medical and health tourism, etc.

4.2. Bleisure

In the sophisticated tourism era, modern businessmen travelling to far-away places are seeking a work-life balance by adding recreation while travelling.

Visiting museums and other tourist spots has become a leisure activity for the business traveller. The companies are also promoting this trend in business travel as it promotes work-life balance. Amid this growing trend of blended travel in Europe, the Future laboratory coined the term "Bleisure" joining business with leisure. The lines have been blurred between business and leisure as more and more professional travellers started extending their travel to a leisure trip not only solo but also started bringing their family to enjoy the culture of the destinations. This bridging of the gap between professional and personal reasons for visiting a place became cost-savvy as the company often bears the cost of business class travel. It is cheaper to avail of a business ticket for two than for one, so professional travellers started touring along with their family. The family members started getting the option to enjoy along with their partners without affecting the business.

The travellers who would have to travel back with the workload now get the time to diffuse it and have recreation in their leisure all the while enjoying their evenings with family or friends. The rush to go back home dissipates when leisure time is scheduled along with professional obligations.

4.2.1 Features of BleisureTourists

1. Professional travellers looking for tourism during leisure time look for the same places over and over again to familiarize themselves with the culture and norms of the destination.

2. They prefer to take their family or friends along with them to avoid boredom and relax.

3. The companies partially or fully cover the trip and stay charges, so they are willing to spend more and extend their stay to enjoy their tour.

4. Millennials are a major segment of the Bleisure travellers along with Baby Boomers.

5. They prefer recreational, cultural and sightseeing experiences that can enrich their business travel with entertainment. However, these destinations are supposed to be popular and known worldwide.

6. Bleisure tourist prefers to save time for the tour beforehand by searching for tourism spots and packages on the internet and seeking cutting-edge digital services along with travel consultants.

7. The travel consultancies and booking platforms that use data analytics and provide hyper-customized tour options are preferred by Bleisure travellers. Once they browse through the options, they check the reviews on different websites to finally decide.

According to research in India, business travellers are found to take at least 7 trips in a year while half of these travellers are likely to extend their stay. Further, 85% of travellers spend more than 5 hours researching their travel destination and tourist spots nearbywhich influences their decision-making process (Ramgade, 2021).

4.3. Agro-tourism

The last century witnessed drastic changes in socio-economic and environmental changes that were in opposition to technological advancements. The rift between the economy and environment was drastic enough to highlight the growing gap between the rich and the poor countries where the poor countries were environmentally exploited and the rich countries didn't have the luxury of nature. Amid the planetary imbalance, the UN meeting discussed the "leave no one behind" principle under which the 2030 Sustainable Development Goals were established. During this time, several researchers were able to identify the contribution of agri-food in sustainable development in rural areas even though many farmers were opting for economically advanced ventures away from the farms (Tew & Barbieri, 2012).The supply and demand side of agro-tourism went through evolution patternsdue to which many farming entrepreneurs started capitalizing on it by developing variegated business models to create their own market niches. These farms are the true representative of sustainable development that preserves the rural culture of farming. Gradually, agro-tourism became the subset of rural tourism where the tourists were given the opportunity to visit these farms and take part directly or indirectly in agricultural practices while touring these places. Extended tourism services like meal provisions, picking certain activities to participate in, helping with processing of the agricultural products etc. have become the new trend.

4.3.1 Features of Agro-tourists

1. Agro-tourists are looking for agricultural areas that offer participatory experiences in these farms and also want to benefit from these adventures.

2. They are more often foreign travellers or people who come from different lifestyles.Thus, they want to have an alternative cultural or lifestyle experience along with a different set of values and preferences.

3. They are stimulated by an urban desire to experiment or deal with traditional lifestyles.

4. Some agro-tourists may seek farm tourism as they want to stay close to nature or value countryside living.

4.4. Dark Tourism

This is another form of adventure tourism where the tourists are interested in the dark side of humanity that is associated with macabre events, deaths, mass graves, prisons and places that have seen misery, tragedy and heinous crimes. Due to its destructive spirit, this type of tourism is also known as thanatourism. Dark Tourism came to exist after it was coined by John Lennon and Malcolm Foley who were exploring the fascination of people with death sites and its commercialization by media. In Cu Chi, the dark tourists are encouraged to purchase ammo and shoot a few rounds towards a target to experience war. This fascination is motivated by cultural, psychological and, at times, personal reasons or simply for entertainment. Some tourists who visit these dark places have a desire to learn about past events as remembrance or for self-discovery purposes and sometimes for the sake of nostalgia and contemplation. Researchers have identified that guilt, the need to reinforce the sense of responsibility and having heritage experiences are also some of the few curious reasons behind the dark tourists' motivations (Sharpley & Stone, 2012). In fact, it is mentioned that curiosity, attraction to horror, and desire to identify with the victims, are three main reasons behind the dark motivation of the tourists (Ashworth & Hartmann, 2005). The curious types have a morbid attraction towards the evil and tragic museums while trying to cognitively experience and learn about the site. Some visit these places for pilgrimage, to have malicious joy, or to salve their desire for

inner purification and to have this "ghoulish titillation" while others are seeking relevance for the gaps in their family history. However, not all dark tourists assign a dark experience to these sites and hence they cannot be grouped with others. They must be acknowledged for their subjective experience even though the sites visited are associated with dark history.

4.4.1. Features of Dark Tourists

1. Deaths and conflict are major sources of attraction and motivation for dark tourists.

2. They seek to experience the reality behind the informed media images and narratives for which they visit these sites and try to connect with the intense inhumanity witnessed by these places.

3. They are different from war tourists as they do not participate in the conflict but rather observe it from a safe distance and try to gain knowledge regarding the events and precursors of these tragic places like prisons, mass crematories etc.

4. According to some authors, the dark tourist may be recognized with certain personality characteristics or dark traits, i.e. psychoticism, Machiavellianism and narcissism. They have found that Holocaust tourism enthusiasts exhibit a complex set of characteristics that are centralised to self-hatred, psychological vulnerability, and rumination (Nørfelt et al., 2022).

4.5 Atomic Tourism

In the early 1950s, former U.S. President, Harry Truman, opened the Nevada desert for nuclear weapon tests so the effects could be studied before they were being used. The risks of nuclear explosions were huge but the government publicity campaign was instrumental in eradicating any misconceptions regarding the tests. This campaign gained popularity and the people of Las Vegas started marketing the atomic explosions in order to promote the city. This is how the very first atomic craze came to exist and this trend has been adopted by tourism of nuclear sites that bore history of such detonations which impacted the

humanity. After the end of the Cold War, atomic sites associated with World War II were opened for tourism purposes. The Trinity, Manhattan Project and other top-secret projects associated with nuclear sites are popular among atomic tourists. The atomic tourists show a keen interest in the global political rifts which is influenced by nuclear powers. Since the Nuclear Non-proliferation Treaty was signed in 1970, 189 countries have decided to limit nuclear proliferation. Amidst this, India, North Korea, and Pakistan have already tested their nuclear weapons openly. This indicates that since the end of the Cold War, the global political scenario pertaining to nuclear powers has become increasingly complex. Consequentially, atomic tourism and its role have transformed as well (Driskel, 2012). Atomic tourism is also known as Nuclear tourism or Energy tourism. Some energy centres promote STEM education and invite schools for an organizational visit to delve into nuclear activities and phenomena. Scientific information regarding radiation, ionization and health, robotics, atoms etc. are part of the educative visits.

4.5.1. Features of Atomic Tourists

1. The atomic touristsare fascinated with the history that has shaped the current geo-political scenarios.

2. They prefer sites that are educative regarding the science and technology behind nuclear weapons and their effects. The places of radioactive contamination offer atomic tourists fascinating evidence of wildlife that is returning and still thriving in these areas. Gaining knowledge related to the history and construction of the power plants along with getting awareness of nuclear waste disposal and landscape impacts are favoured by atomic tourists.

3. Most importantly, the atomic tourists are driven by curiosity more than nostalgia as the Cold War and other war sites harboured secrecy and mystery that is now exposed to be explored and understood.

4. Atomic tourists are seeking the thrill and adventure of being part of a historic moment and are often drawn by tragedy, death and destruction associated with nuclear history.

5. The atomic tourists seek to experience the darkness of the historic place and seek to be moved or impacted by something that has not been accessible to them before.

Nuclear tourism or Atomic tourism in India has patriotic inspirations as nuclear power is an asset of India. But the first nuclear test site Pokhran, Rajasthan is forbidden for tourism purposes.The energy sites attract experience-based tourists who are eager to salve their curiosity and avail special feelings regarding nuclear power. So apart from learning purpose, a vast majority of atomic tourists are driven by emotions that they seek to experience at these historic sites and energy power plants.

4.6. War Tourism

War sites are popular tourist destinations and this subset of dark tourism seeks thrill from visiting the forbidden and dangerous places. The tragedy and horror that befell economies killed people and exemplified the bad side of human civilization is in sharp contrast to a holiday that is celebratory in nature and filled with fun and adventure. This contrast drives the war tourists to feel the barbarism of humans by visiting the war sites and battlefields.The films, theatrical re-enactments, literature and TV programs are evident enough of its popularity. The army, military memorabilia and war-associated products are singular interests of war tourists. Generally, the war sites are opened to tourists after the region has gone 'cold' which means the landscape is allowed to recover and people have returned to their daily normal post-war. On the other hand, the 'hot war tourism' sites are gaining traction due to their recognition of being a conflict zone. People are flocking to these conflict sites to experience sadness, empathy, disgust etc. The rawness and visual aesthetics of the signs of battle provide emotional arousal and cognitive dissonance, making the experience of complex emotions along with thrill possible. These conflict zones meanwhile earn profits from tourism and several tourism companies in these areas seek war tourists for the same purpose.

4.6.1. Features of War Tourists

1. The thrill of experiencing the war and its casualties in the conflict zones triggers feelings of empathy and disgust sought by war tourists.

2. They participate in the active conflict and unrest, live in the combatant units and find motivation and personal fulfilment.

3. War tourists generally continue travelling and return home once they are done participating in a conflict zone.

4. These war tourists are not necessarily armed but they participate in the riots.

5. They are driven by purpose and put heavy emphasis on finding meaning in their routine life and have adventure through adrenaline highs.

4.7. Catamaran Tourism

A catamaran is a multi-hulled boat that is one of the luxurious commodities in the market as it is capable of high-end income. Catamarans can be of 4.5m to 30.5 m luxury boat. There are two designs in Catamaran boats namely the Pontoon Boat and Water-Plane area boat which have two hulls also known as (SWATH).The SWATH is a luxury boat with space for living cabins used for international tourism. They are used as carriers and rescue boats that can carry hundreds of passengers easily (Sharma & Arora, 2023). The Cruise catamaran only ferry in the country and provides the highest comfort to its passengers. The Sailing type Catamaran is used for recreation and used as a yacht.

The Catamaran market is growing faster by providing sports, passenger transport, cruising and even for military purposes. What makes the Catamaran popular for such diversified use is its broad beam, powerful engine and two hulls allowing it to speed through, better than a sailboat. Depending on the purpose and application, the catamaran is designed in different ways. Catamaran tourism is only a one-day trip, unlike cruising which allows the tourists to stay abroad. Still, due to its sporty vibe, it is gaining attention from tourists from Croatia, France, India, Greece, Australia, Turkey and Thailand.Recently, catamaran tourism has been evolving a swell asthe Great Cup 32 racing tour in Southern Europe allowed contestants for a five-event circuit in which venues and facilities for sailing were provided.

Catamaran tourism is now packaged as sustainable tourism equipped with solar power. There are government initiatives towards the expansion of marine tourism since tourists who want uninterrupted time with their families are actively seeking catamaran tourism spots to regain their spark and strength. Some of the Catamaran market players are- Outremer Yachting, Catana Group, World Cat, Fountain Pajot, Lagoon and Robertson & Caine.

Catamaran tourism has avenues for onboard music, meals and drinks all the while checking out the shipwrecks and surroundings.Even though cruising, technical developments and impending product introductions are becoming a trend, weather instability and other regulatory effects are limiting the Catamaran market growth. During Covid-19, the import and export of boat-building equipment and other subassemblies were interrupted. Due to this, there were lengthy waiting times for the new customers and the lockdown forced the small third-party merchants to close their business.

4.7.1. Features of Catamaran Tourists

1. Tourists who are fond of marine and want to experience life as a sailor prefer Sailing Catamaran.

2. They are looking for the privacy and luxury of cruising and sailing to exotic marine locations. Some customers book Catamarans for pre-wedding shoots, honeymooning, and business or private parties.

3. Catamaran tourists are seasonal in their taste as their need for a vacation is coming out of boredom or interest in experiencing water-related activities like deep sea fishing, playing water sports etc.

Catamarans in Bhitarakanika and Mahanadi of Odisha, in Guptar ghat and Naya ghat to reach Ram Mandir located in Ayodhya, Goa, Cochin and Agra etc. are some of the famous for Catamaran tourism in India.

4.8. Indigenous tourism

The sustainability aspect of tourism is interested in fostering the cultural diversity and integrity of cultures across the globe. In this regard,Indigenous tourism has

taken centre stage. As when cultural identity is gaining recognition, the tourism industry has started commodifying the indigenous lifestyle and knowledge actively. In yet another way, the UN sustainability goals are aimed at empowering these communities that have been neglected and disregarded before. This marginalization has been countered because the socioeconomic value of indigenous communities has been recognized globally.The host community gets to act as a cultural broker that can transform the tourist's ideas and expectations of the community. Unfortunately, there have been instances where these indigenous communities have been transformed by the neoliberal economic systems and regulations forcing them into a hybrid existence where they have a real life and another fabricated lifestyle to suit the tastes of the tourists like that of the Vedda community of Sri Lanka (Ranasinghe & Cheng, 2018). On the positive side, Indigenous tourism serves its purpose where the community members are involved and hold some control over the tourism procedures and regulations where they actively advocate and express their interests in product development and experiences. The government is acknowledging the need to involve and share ownership of Indigenous communities in policy making and product development gradually. Although the progress is taking time, the indigenous tourism market is popular among tourists and it is estimated to garner US $67.05 billion by 2024 (Indigenous Tourism Market, 2024).

4.8.1. Features of Indigenous Tourists

1. Indigenous tourists who are serious about experiencing the authentic lifestyle of the indigenous communities take part in farming life, learn traditional hunting, and arts and crafts, and interact with the locals.

2. They bear positive feelings towards indigenous cultures and are looking for opportunities to satisfy their curiosity.

3. They value host communities and often preselect the destination spots.

4. They participate in cultural recreational programs like folk dances and intend to collect souvenirs (Tsung-Chiung, 2012).

5. Nowadays they are becoming aware of their environmental and social responsibility towards the host community and this is reflected in their travel behaviour.

6. They actively seek out online travel platforms and social networks where indigenous products and information are showcased.

5. The Role of AI in New Tourism

AI is a technique that creates a mixed reality by incorporating virtual objects and pictures over the real environment generated by computers (Arora & Atalay Şimşek, 2024). AI has been instrumental in advancing new tourism and making it accessible to tourists that require prompt communication and faster delivery of services right from choosing the destination to navigating the place. The incredible features of AI that have helped the tourism industry meet the demands of the new generation of tourists are listed below.

1. AI-enabled personalization of tourism products and services from a list of options. The active use of recommendation systems in technology allows tourists and companies to interactively provide the best match in service.

2. The communication assisted by Chatbots freed the skilled staff and allowed them to focus on more important tasks while the NLP-abled and speech recognition technologies took care of communication.

3. The forecasting tools utilise contextual data along with historical data to provide a future estimate regarding the weather, and human resources, detect scams and help in the management of the tourism facilities.

4. Most importantly, the translation apps have been beneficial in dismantling language barriers while choosing the destination to navigate the places so that there is an opportunity to explore the various facilities in a foreign destination.

6. The Forms of New Tourism based on the type of transformation

New tourism has been reinforced using ICT (Information and telecommunication technology) so that it is available to the new generation of tourists. This has created the new tourism into three new types of tourism based on the type of transformation i.e. Accessible, SMART, and Experiential tourism.

6.1. Accessible Tourism

The tourism industry is trying to establish barrier-free tourism where the destinations are accessible to tourists of all ages and physical abilities (Buhalis& Darcy, 2010). This is why the recreation spaces and activities are strategically designed to be enjoyed by everyone. There is differentiation in these tourism spots and activities to attract all types of tourists. Further, the tourism industry is focusing on physical accessibility by enhancing the infrastructure of the environment to allow people to move freely. Communication accessibility is enforced by employing trained staff while keeping the communication flowing between them and tourists for faster assistance through tools and technology. To make this achievable, web accessibility is ensured in these areas so that booking services and other website access are easier and interruption-free. Providing tourists and travellers with disabilities with accurate information is more than a social responsibility and an entrepreneurial demand in the technologically connected era.

6.2. SMART Tourism

With the advent of Smart cities, Big Data and 5G, human experiences can be connected with smart technologies. In tourism, when there is an active use of smart technologies to facilitate tourism practices, it is called as SMART Tourism. Its primary aimis to optimize resources in a field ridden with competition while being interested in sustainability to make the industry flexible, fast and smart in its interactions. Starting from payment methods to destination access, a series of seamless interactions between humans and technology make innovative strides in changing times (Buhalis& Amaranggana,2013). There is state-of-art infrastructural development in smart cities that guarantees equitable accessibility and sustainability. The free access to Wi-Fi, having electric trains as an alternate transport, real-time information regarding the traffic on the way to the

destination and interactive cultural activities paired with sustainability give it a futuristic edge.

6.3. Experiential Tourism

Modern tourists are experience-seeking and as travellers, they indulge in the culture of the destination they are visiting. The new tourism model is experiential in nature where the tourists get the opportunity to enrich themselves socially, emotionally and culturally. Eno-gastronomic tourism allows tourists to try different parts of the region by visiting the local farms (agri-tourism) and learning about the production and tradition related to the product. Naturalistic tourism offers camping facilities to engage with nature and let go of the stress of the city (Wubook, 2022). Taking the old paths to reach the river and living the country life provides the necessary rejuvenation and escape from mundane life to the tourists. Sports tourism ensures there is walking, hiking, river rafting, boat trips and other activities that are adventurous and sporty. Similarly, health tourism focuses on immersing the tourists in a personal care activity like yoga, pilates, thermal spas etc. amidst nature.

7. Conclusion

New tourism is a dynamic space, thanks to AI and the increasing exploration and addition of human experiences. The innovative meeting of technology with human experience for the noble purpose of fostering sustainability opens up a different world to tourists. Furthermore, the super-segmented demands of the tourists keep feeding the impetus to the tourism industry to stay on their toes to differentiate the tourism spots and attract all kinds of travellers. It is no coincidence that this generation is moved by environmental, social and economic values that are sustainable when there is a dire need to preserve our planet. In a way, this new trend is demanding the political and economic rifts to be shelved and start unifying economies, policies, markets and industries to serve the collective good.Joining hands with other sectors to make the vision of sustainability in tourism practices throughout the glove is becoming more than a motto and is transcending the socio-economic barriers. It doesn't only provide a chance for all sectors to grow but also to emerge as a superpower while redeeming the human race during a volatile time like this.

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6

SUSTAINABLE DEVELOPMENT GOALS AND TOURISM ECONOMY (BY MIRISSA TOURISM DESTINATION IN SRI LANKA)

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Abstract

The concept of sustainability began with the Brundtland Report in 1987. According to this concept, communities should focus on conserving resources for future generations. By 2030, sustainable tourism goals aim to minimize environmental impact, benefit local communities, preserve cultural heritage, and contribute to the economy. The tourism industry and sustainable development have a close relationship. This industry significantly impacts a country's economy, boosting the Sri Lankan economy by USD 4.5 billion annually. Mirissa is a popular tourism destination for both local and international tourists, attracting thousands of visitors annually, especially during the peak seasons of August, October, and December. Known primarily for whale watching, Mirissa also offers attractions such as beaches, Turtle Point, Coconut Tree Hill, Parrot Rock, sailing, and snake farms. The area is crucial for economic development, providing direct and indirect employment opportunities related to tourism. Today, Mirissa is a bustling tourism hub that has generated numerous economic opportunities for its residents. However, the objective of this study is to investigate the challenges facing sustainable tourism in the Mirissa area. The mixed methodology approach was used, gathering both primary data through field visits, direct observations, and interviews, as well as secondary data from administrative and written reports and central bank reports. The area's primary sustainable economic challenges have been identified as problems with waste disposal, noise pollution from businesses operating at night, problems with polythene usage that endangers marine life, loss of

green space, an unequal system of income distribution, and the disappearance of local culture. To achieve sustainable economic goals through tourism development in Mirissa, it is essential to implement awareness programs, enforce laws and regulations, take steps to protect the environment and marine animals, and establish fair income distribution systems to reach sustainable economic goals through tourism development in the Mirissa area.

Keywords: *Sustainable development, Tourism, Mirissa, Destination, Economy*

1. Introduction

Tourism is a major global industry with numerous advantages, influencing societies social and economic behavior. Sri Lanka is a popular destination for international tourists, renowned for its natural beauty and hospitality. The country's diverse landscapes, including its coastal areas and central hills, enhance its appeal, attracting both local and international visitors. Annually, around two million tourists visit Sri Lanka, generating approximately USD 4 billion in revenue for the tourism industry. There are 15 proposed tourism zones in Sri Lanka, with the majority located along the coastline, which stretches 1,340 kilometers. The coastal areas offer significant diversity, with attractions such as spectacular sunrises, beautiful beaches, and opportunities for surfing. On average, tourists spend USD 164 per day in Sri Lanka and stay for approximately 8.4 nights (SLTDA report 2023). Travel and Tourism industries directly contributed around USD 1.4 trillion and 9.1 percent of the global gross domestic product (UN Tourism Report 2023). The United States and China were the leading travel markets in the world in 2023, and the French had the highest number of inbound tourists worldwide, with 100 million tourists. Tourism arrivals to worldwide destinations increased by 34% compared with the previous year. According to the annual review report by the Sri Lanka Tourism Development Authority, 1,487,303 international tourists visited Sri Lanka in 2023, generating approximately USD 2,067.96 million in tourism revenue. The average length of stay per tourist was 8.4 nights, with an average daily expenditure of USD 164.40. Tourists from Europe accounted for approximately 757,327 visitors, while those from the Middle East numbered around 27,830. In terms of gender, the majority of tourists were male, making up 53% of visitors, while females accounted for 47%. The largest group of travelers belonged to the 30-39 age category. The top five source markets for tourism in 2023 were India, Russia, the United Kingdom, Germany, and China.

The Ceylon Tourism Board was established in 1965 through Act No. 10 of 1966 and the Ceylon Hotels Corporation Act No. 14 of 1966. In October 2007, under Section 2 of the Tourism Act No. 38 of 2005, the Ceylon Tourism Board was replaced by the Sri Lanka Tourism Development Authority (SLTDA). The Sri Lanka Tourism Development Authority has classified Sri Lanka into several resort regions suitable for tourism development, including the Colombo and Greater Colombo Resort Region, South Coast Resort Region, East Coast Resort Region, West Coast Resort Region, High Country Resort Region, Ancient Cities Resort Region, and other resort regions.

The tourism industry is a major source of foreign income for the island, with significant potential to achieve growth by utilizing tourism zones, as well as natural and manmade resources. As a tropical destination, the country's biodiversity and natural beauty present great opportunities to promote tourism. The coastal areas, in particular, play a key role in the tourism industry, attracting both foreign and local tourists who prefer to visit and engage in activities along the coast.

2. Literature Review

Under the topic of the economic and environmental impact of tourism on coastal areas in Mirissa, a study by Dharmasena M.D.M., Dharmarathna D., Lankeshwari, and Siriwardena S. (2024) was conducted. The study used an exploratory approach, with data drawn from the Sri Lanka Tourism Development Authority (SLTDA) website, various publications, newspaper articles, and other online sources. The objective of the study was to identify the economic and environmental impacts of tourism in the coastal areas of Mirissa. The study identified both positive and negative economic and environmental impacts using secondary sources. The findings of the study show that implementing an online booking system is necessary to avoid overcrowding on excursions. Furthermore, the study suggests the establishment of an awareness program and continuous monitoring systems to minimize negative environmental impacts. It also recommends that a competent authority take the initiative to formalize informal sector entrepreneurs by regulating them and offering subsidies to help grow their businesses and improve their living standards.

Thirukeswarn S. and Jayawardena N.K.R.N. (2024) conducted an investigation on the topic of Sustainable Coastal-Based Tourism in Southern Sri Lanka: Assessing the Potential of Blue Flag Certification Criteria. The study aimed to evaluate the feasibility and effectiveness of integrating Blue Flag certification into the development of sustainable coastal-based tourism. Unawatuna, Polhena, and Mirissa beaches were selected for this study, and primary data was collected through field visits. According to the study, it was found that Unawatuna has fully or partially achieved 13 out of 30 criteria, while Mirissa and Polhena achieved only nine and seven criteria, respectively. All three beaches met most of the criteria under the environmental management category but showed limited progress in the safety and services category. The study confirms that meeting all Blue Flag certification criteria will help enhance the region's coastal tourism potential while preserving its unique and pristine coastal ecosystem. Furthermore, the findings provide valuable insights and a comprehensive approach for policymakers, local councils, and tourism development stakeholders to implement the necessary strategies to fulfill all the criteria.

In 2019, Nuskiya M.H.F., Kaldeen, and Mubarak conducted a study on the topic The Socio-Environmental Impact of Coastal Tourism, The Socioeconomic Impact of Pasikuddah on the East Coast of Sri Lanka. This paper highlights tourism as one of the major economic sectors in Sri Lanka, with the country's natural beauty meeting the needs of travelers. Using both primary and secondary data, the study identified the key issues and challenges facing tourism in Pasikuddah and the surrounding settlement areas. Primary data was used to assess the positive and negative impacts, while secondary data was used to explore the relationship between tourism and the integration of tourist sites. The study emphasizes that sustainable tourism in Pasikuddah is still an opportunity to be realized and that transforming the tourism industry through eco-tourism in the Pasikuddah region would be the best solution.

Weerasekara Y.N. and Amarawicrama S. (2016) conducted a study on the topic of Place-Based Coastal Tourism Impacts and Residents' Quality of Life: The Case of the Mirissa Coast, Sri Lanka. The objective of the study was to examine how the effects of selected social dimensions and environmental factors impact the quality of life of the community. Both descriptive statistics and spatial interpolation methods were used to measure the impact of tourism on the quality of life. Data was obtained through a questionnaire survey, interviews, and

observations. The research found that coastal tourism has a positive impact on the quality of life of residents in the early stages of tourism development.

The study Potentials of Promoting Beach Tourism in Kalpitiya, Sri Lanka by Bhagya R.M.P. and Mustafa A.M.M. (2019) aims to identify both the benefits and negative impacts of beach tourism on the socio-cultural, economic, and environmental aspects of the region. The study seeks to provide a clear understanding of whether this proposed tourism zone can benefit the local community, as estimated and predicted by the government. The research focuses on observing the current state of the tourism industry in the Kalpitiya region, including its attractions, activities, accommodations, and hospitality services. The target population for this study was people from the Kalpitiya beach area in the Puttalam district. A random sampling technique was used to select a sample of 100 tourists from the area. The study primarily relied on primary data, which was collected through questionnaires. Secondary data was gathered from websites, published reports, journals, informal discussions, and interviews with tourists. Descriptive and inferential statistics were used to analyze and present the data. The study's recommendations include increasing tourist flow, improving entertainment facilities for nighttime activities, introducing sailing experiences with special events like private sailing tours, and promoting water sports. The study also suggests implementing kite trips, kite surfing competitions, and expanding facilities for dolphin watching. Additionally, it emphasizes the importance of addressing environmental issues in the region.

Nuskiya M.H.F. and Rewathy K. (2019), considering tourism as one of the major economic sectors in Sri Lanka, conducted a study on the topic The Environmental Impact and Social Challenges of Coastal Tourism in Pasikuddah. The study focused on the Pasikuddah tourist destination in Batticaloa. Primary data played a key role in identifying both the positive and negative impacts, while secondary data was used to explore the relationship between tourism and the integration of tourist sites. Descriptive and simple statistical methods were used to present the study's data. According to the conclusion of the study, coastal tourism in Pasikuddah has both positive and negative consequences. Some people are suffering due to migration and displacement, while others benefit economically. The area has also changed and urbanized due to tourism development. The study identified both positive and negative environmental and

social impacts in the region. As a solution to these issues, the study suggests applying sustainable development principles to the area.

3. Method

3.2 Methodology

A mixed methodology was used in this study, incorporating both qualitative and quantitative approaches to achieve the aim of the investigation. Both primary and secondary data were collected, as relevant to the study. Primary data was collected through direct observations, discussions, and field visits. For secondary data, administrative reports and previous studies were reviewed. Thirty tourism operators and business owners, 10 foreign tourists, 8 local tourists, and 10 residents of the Mirissa area participated in the discussion, sharing their views and experiences related to sustainable tourism development in the Mirissa coastal area. The random sampling method was used to select the participants, and the Mirissa tourism area was the focus of this investigation. Charts and bar graphs were used to present the collected data, and a descriptive method was employed to analyze and present the findings of the study.

4. Model Results

Mirissa was the study area, and all tourism operators and business owners, both local and foreign tourists, as well as residents of the area, were included in the data collection. A convenience sampling method was used to determine the sample size. Based on this method, the sample size was decided. Among the 30 tourism operators and business owners, the sample included hotel owners, tour operators, boat owners, tour guides, and small business owners. The sample consisted of 9 hotel owners, 5 tour operators, 4 boat owners, 3 tuk-tuk drivers, 4 tour guides, and 5 small business owners.

According to the data analysis, the hotel owners emphasized the need for the implementation of policies and regulations for beach cleaning, policies for beach boys, and regulations for foreign businessmen. Foreign businessmen use local resources, but their profits do not contribute to foreign income for the country. Despite an increasing number of tourists, the income levels of hoteliers and their

contribution to the gross domestic product (GDP) will not rise because foreign businessmen take their earnings back to their home countries. Furthermore, the hoteliers highlighted that unregistered accommodations are a major issue in the area, and these establishments pose a challenge to their businesses. They also stressed the importance of implementing policies and regulations for unregistered accommodations. The hoteliers raised concerns about garbage disposal issues in the area, which have affected the area's beauty. The stench of garbage has become an inconvenience for tourists and disrupts daily tourist activities. They mentioned that the cleaning services provided by the municipal council are not of a standard level, and this situation has created issues for the tourism industry in the Mirissa area.

Normally, many tourists who visit Sri Lanka choose the southern beach area, with Mirissa being their main destination. However, the tour operators mentioned that tourists prefer clean coastal areas, but due to various human activities, the beauty of the coastal area is disappearing. This is one reason why tourists are reducing the number of nights they spend in Mirissa and the frequency of coastal activities. Mirissa is the primary whale-watching destination in Sri Lanka, and both foreign and local tourists enjoy this experience. The boat service plays a significant role in whale-watching tours. When sharing their perspectives, the boat owners pointed out that some boat operators take their boats very close to the whales, which is harmful to the natural behavior of the animals. Additionally, during whale-watching tours, some tourists throw plastic and garbage into the sea, which causes problems for the natural behavior of marine life, including fish and sea plants.

According to the tour guides, they shared their perspectives on a few issues. Tour guides are considered the ambassadors of the country, and their education in the tourism industry and knowledge of the local culture are crucial for their role. However, some tour guides lack proper knowledge or understanding of the tourism industry, which can lead to misleading impressions among tourists. Asking for more money than the agreed price is also an issue in the Mirissa area. Additionally, some tour guides skip certain places on the itinerary for various reasons but still expect to receive the full payment for the tour.

The Tuk drivers stated that charging unfair prices for special nighttime journeys is a problem for the industry, and engaging in illegal activities is another issue.

Unplanned parking areas for tuk-tuks cause traffic problems, contributing to the disorganized and crowded appearance of the coastal area. Both local and foreign tourists typically prefer a clean and well-organized environment, but this is compromised due to the lack of proper parking arrangements. Careless driving and the violation of traffic rules are additional concerns among tuk-tuk drivers. Furthermore, there is no visible regulation or information provided to tourists regarding the drivers. The main issue faced by small businessmen is competition with each other and unstable prices in the area. Additionally, foreigners have started small businesses, and the money generated from these businesses flows back to their home countries. According to the small businessmen, unplanned business locations are creating problems in the Mirissa area.

The residents belonged to various age groups, with some being senior citizens and others being young. Three respondents were female, and seven were male. Four respondents were employed in the public sector, three in the private sector, two were housewives, and one was a fisherman. According to the views expressed by the residents, beach parties, illegal businesses, cultural issues, environmental pollution, and noise from parties are problems in their daily lives in the Mirissa area. Additionally, some young people are abandoning their education to join the tourism industry, which is creating socio-cultural problems in the area. The noise from night parties disrupts students and the general atmosphere in the area. Foreigners are staying in unregistered accommodations and engaging in illegal activities with the help of local people. Some foreign tourists have created apps that include information about accommodations, itineraries, and other services provided by foreigners. Drug trafficking, sexual activities, and other unethical socio-cultural activities are taking place in coastal areas, posing significant challenges to the community. Foreigners have begun to occupy coastal areas in Sri Lanka after visiting the country on tourist visas, and they are establishing their businesses using Sri Lankan resources. The 10 foreign tourists in the study came from 4 countries: 3 from Russia, 2 from France, 4 from Germany, and 1 from Switzerland. There were 4 female tourists and 6 male tourists. Two of the tourists were information technology engineers, three were businessmen, two were farmers, two were housewives, and one was a taxi driver in their home countries. Their main concerns included insufficient cleaning, the lack of proper garbage disposal systems, mosquito problems, unpleasant odors, varying prices for goods and services, issues with sanitary facilities, and the presence of polythene.

The local tourists provided insights from various areas of the island. Among the respondents, 5 were female and 3 were male tourists. Two were businessmen, 3 worked in the private sector, 2 were in the public sector, and 1 was unemployed. Regarding their native areas, 3 were from Colombo, 2 were from Gampaha, 1 was from Hambantota, and 2 were from Trincomalee. They highlighted issues such as sanitation problems in Mirissa, environmental pollution, and the influence of foreign businesses in the area. Furthermore, they expressed concerns about hoteliers privatizing the beach area, which they viewed as restricting the freedom of local tourists. They also mentioned that some people involved in the tourism industry do not pay attention to local tourists, which has contributed to the decline of the local tourism industry and the loss of local visitors to the Mirissa area.

5. Conclusion

Sustainability is generally defined as the practice of conserving current resources for future generations. In the tourism industry, it is crucial to use available resources wisely to ensure they are preserved for future use, as the industry depends on both natural and man-made attractions. Mirissa, a popular tourist destination, can benefit from applying sustainable tourism practices to create an effective and enduring tourism industry in the region. The investigation of the Mirissa coastal area suggests that sustainable tourism practices should be implemented to address various challenges within the local tourism industry. Key areas of focus include environmental cleanliness, reducing traffic congestion, preserving the natural behavior of whales, and enforcing rules and regulations. These measures are critical to maintaining a sustainable tourism industry in the coastal area. The following suggestions are the most important for this investigation.

Implementing the awareness programs

It is essential to introduce awareness programs in the Mirissa coastal area, as many individuals involved in tourism services may not fully understand the concept of sustainable tourism. While most people in the area are directly or indirectly engaged in the tourism industry, many lack a clear understanding of the importance of sustainability and why it is vital for Mirissa. Those directly involved in tourism, in particular, shape tourists' perceptions of the country.

Educating local stakeholders is key to fostering a sustainable tourism environment in the region.

Manipulating laws and regulations

Laws and regulations play a crucial role in the tourism industry by helping to reduce illegal activities and promoting legal and sustainable practices. There are over 20,000 accommodations in the Southern Province, but fewer than 4,500 are registered. Registered accommodations receive benefits such as bar licenses and a 25% reduction in electricity bills, but laws and regulations are not enforced against unregistered accommodations. Especially during the tourism season, many illegal accommodations are built with minimal facilities, violating coastal rules and regulations. Registered hotels and service providers pay all taxes to the government, along with applicable charges, but unregistered hotels and service providers avoid paying taxes, allowing them to offer lower prices than formal establishments. This creates unfair competition between formal and informal tourism businesses, ultimately harming the formal tourism sector in the area. Enforcing laws and regulations would help reduce the number of unregistered accommodations and prevent inappropriate activities associated with these businesses.

Developing the sanitary facilities

There are insufficient sanitary facilities in the Mirissa coastal area, and when tourists visit the destination, the authorities do not provide proper amenities for them. Mirissa Harbor is busy for various reasons, but there is no place to meet basic human needs. Furthermore, the Udupila Canal is filled with garbage, which contributes to the spread of mosquitoes and unpleasant odors around the hotel complex. Tourists face mosquito issues in the evening, making it difficult for them to enjoy their leisure time outside the hotel.

Power cuts are another major issue at the destination, with the electricity board implementing power cuts one or two times per week for maintenance over several months. This situation negatively impacts businesses in the area and increases complaints about the power cuts. To mitigate this problem, hoteliers rely on generators, which results in higher prices for their services. Giragala, a popular tourist destination in the Mirissa area, is accessed via a bridge, but the bridge is

not in a suitable condition for travel and poses a safety risk, potentially leading to accidents.

Activating the training programs and providing certificates to the tour guides

In 2024, there will be approximately 2,887 licensed tour guides in Sri Lanka, and they are considered unofficial ambassadors of the country. Tourists learn about the social and cultural situation, the economic environment, the behavior of the people, the country's vision, traditional arts and customs, and more from these guides. Therefore, tour guides should possess extensive knowledge about tourist attractions, current events, culture, the natural environment, flora and fauna, international news, and more. When categorizing tour guides, the four-category training programs play a significant role. However, tour guides operating without certificates, licenses, or proper training can damage the tourism industry. Especially, there are several unofficial and untrained tour guides, and steps should be taken to train them and provide proper certification. If not, legal action should be taken against them.

Implementing a road and vehicle planning system

The Mirissa coastal area is located near the Matara-Colombo main road, which poses an issue for tourist behavior and freedom. Vehicles travel at high speeds, and some dangerous areas with sharp bends exist. It would be beneficial for the coastal area to be designated as a tourism zone, which would enhance tourist activities and help move the Matara-Colombo main road farther from the coastal area. Additionally, Tuk-Tuks and other vehicles are informally parked on both sides of the road, causing traffic issues in the area. Establishing proper parking areas and implementing legal measures to enforce a well-organized road and vehicle system in the Mirissa tourism area is necessary. There are several types of Tuk-Tuks in the Mirissa area, including regular Tuk-Tuks, cabrio Tuk-Tuks, electric Tuk-Tuks, and customized Tuk-Tuks. The presence of various vehicle types on the roads has led to an unplanned system in the area.

Not disturbing the natural behavior of the whale

The main reason Mirissa is popular as a tourist destination is its whale-watching opportunities. There are around 52 whale-watching boats in Mirissa, attracting

several thousand local and foreign tourists. However, some boats approach the whales too closely, disturbing their natural behavior. Whales prefer to live without interference, and when disturbed, they move away from their natural environment, which negatively impacts the whale-watching experience. Mirissa is renowned for blue whales and sperm whales, making it one of the best places in the world for whale watching. Although there are about six whale-watching locations in Sri Lanka, Mirissa stands out as the best destination for this activity.

Implementing a Cleaning and garbage disposal system

Non-disposable garbage is a major issue in the Mirissa area, with people collecting trash in a few places near the main road and inside the villages. The areas are full of polyethylene, and when it rains, the water overflows, spreading a bad smell and creating a negative experience for tourists. The Weligama local authority should give prompt attention to protecting the clean coastal area and the coastal tourism industry in Mirissa. Regular monitoring and evaluation, partnerships with the informal sector, and public awareness campaigns can be implemented to find solutions to this issue.

Applying rules and regulations to the foreigner's business

Foreign businesses are a significant problem for the tourism industry because they send income back to their home countries, meaning the revenue does not benefit the Sri Lankan economy. This results in the loss of the economic benefits of the tourism industry for the Sri Lankan people. Specifically, many Russian and Ukrainian nationals are running tourism businesses in the Mirissa area. They have even created apps in their languages, listing all the services provided by foreigners. This is not a formal investment, and these foreigners are operating these businesses using tourist visas, which presents a real challenge to the tourism industry in the Mirissa area.

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WILDLIFE TOURISM FOR A RESILIENT FUTURE: STAKEHOLDER PERSPECTIVE WITH REFERENCE TO NATIONAL PARKS IN SRI LANKA

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Abstract

Sri Lanka is a country riches with natural assets and it is a home to thousands of iconic species such as floras and faunas. It is promoting nature tourism with bunch of value added services and wildlife tourism is significant among them. In Sri Lankan context, the popular national parks such as Yala, Udawalawe, Wilpaththu, etc are highly suffered by over-visitation and habituated feeding of human in past few decades and the traffic congestion and overcrowding in national parks were negatively effects on visitor satisfaction as well. Therefore, the main aim of this study is to examine the role of wildlife tourism as a form of sustainable development in the national parks in Sri Lanka. To achieve that, three (03) objectives have been developd namely to identify the major wildlife tourism activities conduct at the popular national parks in Sri Lanka, to explore the major issues in wild life tourism operations at popular national parks in Sri Lanka and to recommend the sustainable initiatives that can be taken to ensure the conservation effort and balancing the visitor experience of popular national parks in Sri Lanka. The different perspectives of fifteen (15) stakeholders such as the park management, service providers in three main national parks such as Yala, Udawalawa and Wilpattu have considered as the sample of this qualitative research study, selected by using purposive sampling method. Further, thematic analysis has used for the analysis of the data collected through a semi-structured interview. The findings of this study highlighted that overcrowding and over-visitation, poor regulatory framework, irresponsible behaviour of safari drivers, illegal practices

are the major issues in wildlife tourism operations. With the basis of this, some implications such as providing education and training for service providers, strictly monitoring of rules and regulations, establish a code of practice for tourist operators, service providers and visitors, revising ticket prices, limiting acess for most sensitive areas, monitoring operations through the department of wild life conservation without interference from any external sources.are recommending as practical implications and further visitor management plan can be executed for providing better wildlife tourism experiencee for the visitors.

Keywords: *Wildlife Tourism, Stakeholder perspective, Resilient Future, Sri Lanka*

1. Introduction

1.1. Background of the Study

Tourism is one of the fastest growing industries in the world. It mainly fulfils the intrinsic and extrinsic values and it will direct to the happiness and mind relation of the human. It is multitrillion dollar industry which is connect with different sub industries. This, in turn, has increased the value of tourism amenities, and many countries are investing vast resources to maintain a higher value of diversified wild flora and fauna, which serve as the principal source of attraction for tourists. Sri Lankan tourism is an umbrella industry which has highly contributed to national economy and it brings $ 3 billion to the Sri Lankan economy as a major foreign income source in the country. With its remarkable destination, Sri Lanka was recently named as number one tourist destinations for 2019 by Lonely Planet (Bozdoğan, Pyla, & Phokaides, 2022). Protected area management promotes community development while limiting depletion of natural resources through cooperative activities that encourage sustainable resource usage. Protected areas are managed for a variety of purposes, including recreation, tourism, wildlife, and forest production. As people more focus on this different type of activities, Wild life tourism estimated to generate $30 billion world-wide in revenue each year (Lindberg, 1991). Shackley (1996, p. 1). It has greater potential to promote nature tourism with bunch of value-added services and wildlife tourism is significant among them (Barnes, Burgess & Pearce, 2019).

Wildlife tourism, as defined in the introduction, has experienced rapid growth in demand and a corresponding world-wide growth in the supply of wildlife tourism

products to cater for this demand. It is now estimated to generate $30 billion world-wide in revenue each year (Lindberg, 1991). Shackley (1996, p. 1). As per the different authors in the history conducted the studies that identify the different perspectives in the wildlife tourism of the different settings of the country (Gavinoll et al, 2021; MacLellan, 1999). According to the Gavinoll et al (2021) wild life tourism mainly connects with the viewing or encountering the non-domesticated animals in the natural environment or in captivity (Gavinoll et al, 2021, p. 98; Newsome et al., 2004; Rodger et al., 2007; Higginbottom and Scott, 2004). It mentioned regarding the activities which can be classified as nonconsumptive activities which is including the photography in this wild life setting, wildlife watching, feeding the animals and interact with the wild animals within their environment (Lovelock, 2007). Same time it highlighted the 'consumptive activities as killing the animals, hunting and shooting the animals (Lovelock, 2007). Since there are consideration on the wild life tourism activities in the countries, academic literature having with time-to-time updates with the given scenarios of the identified settings.

Wildlife tourism in Sri Lanka has enormous economic potential. Sri Lanka is regarded as one of the premier wildlife tourism locations. National parks were established to conserve and preserve wild creatures, resulting in a diversified wildlife population. These natural environments attract tourists who want to watch and study a variety of wildlife species. Wilpattu, Udawalawe and Yala National Parks are the most popular tourist destinations. According to various opinions in the literature, wild animals at most of the country's popular wildlife parks were tormented and chased out due to overcrowding and over-visitation. (Mitthapala, 2020)

1.2. Problem Identification

Visitor experiences is most important when considering on the wild life tourism in Sri Lankan national parks. They have faced with different challenges when providing with experience to traveller while considering the conservation. After the Covid 19 pandemic, it become benefit that environment has impact with minimum damage as temporary relief from the involvement of the human activities which can be consider as consumptive activities. It become opportunity to initiate the sustainable practices (Sumanapala & Wolf, 2021). According to the literature that highlighted the visitor satisfaction can be affect by diversity of

the animal, visitor number and the quality of the guide. The research conducted in the popular type of national parks in Sri Lanka such as Yala (Egresi & Lahiru, 2019). Sustainability is foremost important factor since after the re visitation of the visitors as post pandemic period, it is important to reconsider the issues arise the previously. According to another research highlighted that in the national parks such as Udawalawe need consider the carrying capacity calculations need to apply with considering the elephant disturbance (Hettiarachchi et al., 2021). Therefore, over-visitation is most considerable factor, while considering with the capacity management of the national parks of the country.

In Sri Lankan context, the popular national parks such as Yala, Udawalawe, Wilpaththu, etc are highly suffered by over-visitation and habituated feeding of human in past few decades and the traffic congestion and overcrowding in national parks were negatively effects on visitor satisfaction as well. Management efforts in Ruhuna National Park (Yala) include stakeholder meetings and educational materials, but increased funding and attention to religious tourists' impacts are needed for long-term sustainability (Buultjensa et al., 2005).

Overall, sustainable wildlife tourism in Sri Lanka requires balancing visitor experiences with conservation efforts and addressing various environmental and management challenges. Therefore, the purpose of this article is to examine the role of wildlife tourism as a form of sustainable development in the national parks in Sri Lanka.

1.3. Research Questions & Objectives

This study addressed the following questions and achieved the research objectives mentioned below.

Research questions

1. What are the current activities conducted in the popular national parks in Sri Lanka?

2. What are the major issues of wild life tourism operations in Sri Lanka?

3. What are the sustainable initiatives which can be taken to ensure the conservation effort and balancing the visitor experience of popular national parks in Sri Lanka?

Research Objectives

1. To identify the current activities conducted in the popular national parks in Sri Lanka.

2. To explore the major issues in wild life tourism operations at popular national parks in Sri Lanka.

3. To recommend the sustainable initiatives that can be taken to ensure the conservation effort and balancing the visitor experience of popular national parks in Sri Lanka.

1.4. Significance of the Study

In the study mainly contribute to understand the current activities that conduct in the national parks in Sri Lanka and issues that arise within the area. This may provide the insight to understand the sustainability practices that can be used. This will create the visitor attraction to the destination. Theoretically this study fills the gaps that identify the current issues faced by visitor and it will direct to the identify the satisfaction of the visitor. The importance of identify the visitor satisfaction studies are recommended for high visitation national parks in Sri Lanka since it is timely requirement and it will provide the better understand weak-links in the way the wildlife tourism industry operates and the nexus between tourism and conservation (Prakash et al, 2019). The study provide insight to the policy makers, tourism marketers, management companies, other tourism stakeholders and park authorities to implement the strategies, policies that provide with the satisfaction to visitor, stakeholder and conservation to the national park to develop the sustainable initiative to the area of wild life tourism. Moreover, the findings can inform global best practices in sustainable wildlife tourism, highlighting Sri Lanka's potential as a leading destination.

1.5. Limitation of the Study

In the study limit in to the popular national parks only. According to the SLTDA annual report in 2019 selected the sample and among highest values select the Yala, Udawalawa and Wilpattu national parks as the selected national parks for the study. In this study limited to collect data from this selected national parks only and exclude with other wildlife sites also. In the study target only the stakeholder feedback only but need to capture with the visitor perspective also. Furthermore, due to specific ecological and cultural characteristics, the findings may not be applicable outside of Sri Lanka. Time and resource restrictions also restrict major fieldwork and longitudinal studies.

2. Literature Review

2.1. Sustainability

The term sustainability is a holistic term which includes economic, environmental and socio-cultural dimensions. On the other hand, tourism refers to resources, which are useful for the present tourists but has in mind the needs of the future tourists. The United Nations World Tourism Organization (UNWTO) interprets sustainable tourism as "tourism that takes full account of its current and future economic, social and environmental impacts while seeking to satisfy the needs of visitors, the industry, the environment and the host communities" (UNWTO, 2021). Sustainability is an important aspect in wildlife tourism as it affects ecotourism, its economic efficiency and the welfare of the local people. Unsustainable modes of tourism activity would cause destruction of the flora and fauna, abuse of wildlife, and a mixing of cultures where local cultures would tend to lose their identity. On the other hand, sustainable tourism management practices tend to promote conservation and bring money to the communities (Lugoda, 2020). For example, well managed and well-organized wildlife tourism promotes feeling of ownership and control to the users of these resources, and therefore encourages protection of the resources and their habitats. In light of growing understanding of climate change and environmental decline, increased focus has been placed on the aspects of sustainability in tourism in particular. As part of that, with the current trend of tourists becoming more aware of their footprint, there is additionally an increase in need for sustainable alternatives for travel. Such change in consumer behaviour can be a way of

looking at countries seen as potential markets like Sri Lanka, who are looking to expand sustainable wildlife tourism and best suit to the international demand while still maintaining their own environmental diversity (Meyer et al., 2021).

2.2. Tourism

Tourism is not only crucial for the economy of the world but also for job availability and growth of local economies. According to the 2019 report of the World Travel and Tourism Council (WTTC), the travel and tourism industry contributed about 10.4 % of the GDP across the globe and provided employment to over 330 million population in the entire world 2019 (WTTC, 2020). In Sri Lanka, with the end of 2009 civil conflict, tourism emerged as one of the key drivers of the economy. The history, beauty and variety of the country appeal a large number of tourists. With the various forms of tourism, wildlife tourism is one of the fastest developing market segments. Sri Lankan national parks include rich flora and fauna, including endemics a Sri Lankan leopard and purple faced langur. The unique wildlife that the country boasts of is a good attraction for both local as well as international tourists to national parks in Sri Lanka (Sri Lanka Tourism Development Authority, 2019). However, the rapid growth alongside these advantages also creates problems such as environmental degradation, overpopulation in some famous parks and clash with residents of the area. In order to solve these challenges, it is crucial to apply the principles of sustainable tourism that adheres to the idea of maximizing benefits while protecting the environment. This involves formulating regulations that limit visitation to national parks, provide guidelines for eco-friendly facilities, and promote responsible tourism practices (Meyer et al., 2021). Adopting sustainable tourism practices would also improve the image of Sri Lanka as an environmentally responsible travel destination.

2.3. Wildlife Tourism

The practice of wildlife tourism, which is a kind of tourism that aims to observe wild animals by travelling in their natural habitats, is termed as wildlife tourism. As noted, (Buckley et al. 2018), such tourism could also be beneficial to conserving efforts by earning funds that facilitate efforts to protect animals and the local community. In Sri Lanka, wildlife tourism is also present with a focus on national park safaris such as those of Yala and Minneriya, which are home to

a multitude of elephants, leopards and bird species. The rapid development of wildlife tourism in Sri Lanka is commended. According to the Sri Lanka Tourism Development Authority (2019), about 30% of tourist arrivals in recent years come from wildlife activities. National wildlife experts hope that increased wildlife tourism can help the local economy and support wildlife habitat conservation. However, if proper measures are not taken, the fast growth of wildlife tourism may lead to overuse and damage to wildlife habitats. While there is much literature on the effects of wildlife tourism in places like Mozambique and tropical rainforests (Lugoda, 2020), studies focusing on large pedlands are limited. Also, unregulated safaris can be harmful since animals might be chased away or crowded by people trying to take photographs. However, appropriate guidelines geared towards minimizing adverse impacts are needed and such guidelines should be valid also for wildlife viewing. Training tourists and indeed operators on respectful nature behaviour enhances their enjoyment while minimising negative impacts on wildlife (Buckley and others, 2018). Moreover, local communities can be enthralled by wildlife tourism projects that increase the sense of stewardship and concern for preservation.

2.4. Sustainability in Wildlife Tourism

Sustainable Wildlife Tourism (SWT) seeks to establish a harmonious relationship between conservation goals and economic development. It aims to enhance conservation results and, through responsible visitor engagement, provide tangible benefits to local communities (SCIRP, 2023). The strategies for promoting the sustainability of wildlife tourism include the following; Eco-friendly accommodation, the development of eco-lodges that minimise ecological footprints and offer unique wildlife experiences can attract environmentally conscious travellers. These accommodations often include renewable energy sources and sustainable waste management practices. Community participation involvement by engaging local communities in wildlife tourism initiatives, they ensure that they benefit economically from conservation efforts. Community-based tourism models give locals the opportunity to participate in guiding tours or managing accommodation (Soulful Concepts, 2023). Responsible tourism operators play an important role in promoting sustainable wildlife tourism practices. The implementation of responsible behaviour guidelines during a visit, such as maintaining a safe distance from animals, can help protect wildlife and improve the experience of visitors. To promote responsible behaviour during

wildlife tourism, training and consciousness elevating amongst vacationers about the importance of keeping biodiversity are crucial. Education packages highlighting local ecosystems and species can growth site visitors' know-how of nature (SCIRP, 2023). Studies have shown that powerful management strategies are critical for the sustainability of ecological integrity and monetary viability of natural world tourism (Lugoda 2020). For instance, research have shown that nicely-maintained parks with clean traveller rules tend to have much less environmental effect than parks without such measures.

2.5. Wildlife Tourism and National Parks in Sri Lanka

Sri Lanka's national parks are important additions to its biodiversity conservation strategies. They are habitats for many species even though they offer the possibilities of wildlife tourism. The parks attached to Yala National Park are known for their abundance of rhinos and leopards; Large numbers of tourists are attracted every year seeking unforgettable encounters with nature (FAO, 2023). However, the sustainability of wildlife tourism in these parks faces several challenges. Overcrowding popular parks frequently revel in overcrowding during height seasons, which ends up in accelerated strain on ecosystems. This can bring about habitat degradation because of trampling flowers or worrying animal conduct during important breeding intervals.

The trend of unusual safaris which raises concerns about the ethical treatment of animals in foreign endeavours. There have been several examples suggested by which vehicles follow animals and ignore street signs and symptoms (SCIRP, 2023). National parks' expansion sometimes leads to tensions between park officials and nearby businesses over land use rights or access to the resources. There is a need through inclusive management method so as to solve and avoid conflicts for the sustainability of tourism in long run.

As such, adopting a holistic framework that effectively encourages tour operators to adopt sustainable practices while simultaneously improving the overall traveller experience is critical to addressing these challenges (Lugoda, 2020). Strategies involving collaborative management that weigh in with a wide range of stakeholders, from governmental agencies to local organizations, NGOs, and including tour operators greatly enhance the decision-making processes in the park management. Through the strengthening of collaboration and dialogue

among these groups, a more integrated approach to tourism is possible that balances environmental conservation with the needs of both operators and visitors. This inclusive approach is critical for establishing sustainable tourism practices that support the ecological integrity of destinations while simultaneously providing enriching experiences for travellers. The sustainability approaches in wildlife tourism involves conservation of the tremendous biodiversity conservation existing in Sri Lanka while helping local communities to benefit economically. For a country that depends on its tourism industry to recover from the COVID-19 pandemic, the focus in the recovery should be on sustainable practices that minimize damage and destruction to ecosystems and national parks.

In order to function as a responsible global leader in wildlife tourism, Sri Lanka needs to place emphasis on its community involvement in decision-making processes that are focused on its tourism. This would not only improve conservation efforts but would also improve the experience of visitors to the country. This requires development of real relations with nature, which in turn promotes a new way of thinking within the wildlife tourism industry. In this way, the country would be able to promote ecological integrity and economic security, protecting the environment and local communities at the same time.

3. Methodology

This study takes a qualitative approach to investigating sustainable wildlife tourism solutions in Sri Lanka's national parks. The research focuses on the three most popular parks: Yala, Udawalawe, and Wilpattu. These areas were chosen because of their importance to the country's wildlife tourism economy and the substantial issues they face, including as overpopulation, over-visitation, and other unsustainable behaviors.

According to the annual report of the Sri Lanka tourism development authority (2019) among top highest arrivals had identified Yala, Udawalawe and Wilpattu. Then select the sample by using the Purposive sampling as a sampling technique for the study in order to select the participants. Data collected by 15 participants including park administration authorities, safari service companies, and Department of Wildlife Conservation personnel. In this study mainly target the stakeholder perspective which can developed to understand the multidimensional

character in wildlife tourism of the national parks in Sri Lanka. Data were gathered through semi structured interviews. The interview conducted in the flexible capacity in order to provide the concentration of experience, issues and challenges and sustainable solutions that can be suggest on wildlife tourism and sustainability. The interview guide developed based on the using the important areas including existing management techniques, legislative frameworks, visitor behavior, and the impact of tourist activities on park ecosystems. The research used open-ended questions to foster in-depth talks, allowing participants to share comprehensive thoughts and suggest practical solutions. The semi-structured style also allowed for the examination of unexpected themes and concerns, enriching the data and offering a full comprehension of the topic. In this method describe stages as

Thematic analysis used for the study in order to analyze the gathered data. This method included multiple stages which are becoming acquainted with the data through repeated readings of interview transcripts, coding crucial pieces of information, recognizing patterns and themes. Finally, themes refining to ensure coherence and relevance to the research aim. It is important consider the ethical aspect of this type of research and prior to data collection, informed consent was obtained from all participants, ensuring that they understood the purpose of the study and their role in it. Participants were assured of confidentiality and anonymity, with their responses being used solely for research purposes.

Overall, this methodology allowed for a thorough investigation of the constraints and prospects for sustainable wildlife tourism in Sri Lanka's national parks. The findings provide actionable insights and highlight the need for improved regulatory frameworks, stricter rule enforcement, and the creation of a visitor management strategy tailored to the specific concerns of overcrowding and over-visitation in these parks.

4. Study Results

Based on the analysis of data on research objectives, the study results are discussed in below in related to each research objective of the study.

4.1. Objective 01: To identify the current activities conducted in the popular national parks in Sri Lanka.

According to the interview responses, the major activities conducted in wildlife tourism in Sri Lanka are safari at national parks, wildlife watching including leopard watching, bird watching, Sloth bears safari, Loris watching, Elephant safari and soundscaping, etc.

4.2. Objective 02: To explore the major issues in wild life tourism operations at popular national parks in Sri Lanka.

When analysing the data, it shows that many of them highlighted the issues related to irresponsible behaviour of safari drivers, overcrowding, poor regulatory framework, illegal practices are major issues in wildlife tourism operations in Sri Lanka.

Irresponsible behaviour of safari drivers

All respondent noted that there is an issue with wildlife tourism vehicles including safari jeeps regarding the quality of jeeps. The less quality old jeeps impact on pollutions and disturb the wild animals reducing the probability of viewing by tourists. Further, majority of respondents comments that off track driving of wildlife vehicles to capture the animals closely also becoming a major issue related to its operations.

> *Respondent 01: "Actually, due to the irresponsible behaviour of safari drivers, wild animals in most of the popular wildlife parks in the country were being harassed. They used old jeeps with low quality and comfort and going off tracks by chasing leopards and other rare animals for gaining tips from tourists. But it really disturbing animals.*

> *Respondent 11: "Tourists are abundantly complaining about the quality of service they provided. They used very old safari jeeps, which makes huge noises and it scares wild animals"*

Overcrowding

As per the findings of the study, another major issue is overcrowding or over-visitation at the wildlife tourists' destinations in Sri Lanka. Study reveals that high visitation to the national parks reduce it carrying capacity and sustainability. All most all the respondents have highlighted that overcrowding is a major issue with wildlife tourism in Sri Lanka. Especially in some popular national parks such as Yala, there are blocks which are too crowded by entering huge no. of safari jeeps per day. The findings reveal that overcrowding is negatively impact on visitor experiences as well.

Respondent 03: "On one day more than 1,000 vehicles entered the Yala National Park. It's ridiculous,"

Respondent 10: "There are too many vehicles, so that area get really crowded in some blocks such as Palatapuna gate"

Poor regulatory framework

Based on the data provided by the majority of respondents, poor regulatory framework could be identified as another major issue in wildlife tourism in Sri Lanka. The existing rules by the department of wildlife conservation (DWC) are useful to protect wildlife but those rules create resistant to the change and to develop wild life and safari as an effective and competitive field in Sri Lanka. Further, the existing service standards are insufficient and the respective regulatory body must strengthen the legal framework to ensure the quality standards of safari through ensuring safe and security aspects of travellers.

Respondent 07: "There are no proper stand of operations for operating national parks and they are really getting mess during peak season."

Responsible 10: Unfortunately, the rules and regulations regarding the maximum number of visitors allowed are not practicing properly.

External Interference

The independence for the DWC to regulate tourism is less due to political interferences to the process. The political authorities related to wildlife unwantedly interfere in issuing safari jeep licences, entry permissions, ticketing, etc. using their political power.

Respondent 05: "You know, the former DWC Director-General has resigned due to political interference preventing him from performing his duties, and continued political interference disturb the operations of wildlife conservation in national parks."

Respondents 12: There are many safari jeep owners who have taken their operation licence with political support.

Illegal practices

The study findings identified that illegal practices are another issue related to wildlife operations. Illegal entry permits, changing allotted road tracks, pauching animals and their habitats. Further, visitors will try to camp near the borders of national part which also identified as an illegal practice.

Respondents 15: "Most of the safari service providers use illegal entry permits for safari jeeps. And also, visitors also doing unauthorized practices while the pure visitors had their mind-set for being responsible."

4.3. Objective 03: To recommend the sustainable initiatives that can be taken to ensure the conservation effort and balancing the visitor experience of popular national parks in Sri Lanka.

As per the findings of the study, these practices were recommending for the sustainability of wildlife tourism operating in national parks in Sri Lanka. The respondent recommended to strengthen the regulatory framework to monitor the safari jeep services and suggesting to wildlife officers to random monitoring during the safari operations at the parks.

As the education is most prominent strategy in retaining wildlife destination as sustainable, short- and long-term training programmes can be provided to major stakeholders such as visitors, tour guides, Safari jeep drivers, wild life officers, etc for being a responsible person while they are visiting the destinations and engage with the wildlife tourism activities for better experience.

The standard code of practice should be developed for both tourists and service providers regarding their behaviours while engaging with the wildlife tourism and it is required to monitor the fulfilment of legal obligations continuously. Further strict rules and regulation should be imposed and practising penalties for the misbehaviour of jeep driers and visitors as well. In addition to that, overcrowding should be addressed by implementing proper visitor management plan at the national parks. Further, with the help of technology, continuous monitoring and controlling should be done at the destination. Technology advancements such as AI, QR scanning, Automatic vehicle counting system, detection cameras, etc can be utilized to monitor and control crowd to eliminate over- crowding.

The ticket prices for entry the national parks should be revised. It should be increased and standardised where it retains the visitors who have pure expectation of experiencing wildlife with the sense. It limits the access of unwanted visitors who are not purely interesting and damages they made to the eco-system can be reduced with this strategy. In addition to these, the relevant authorities should identify the highly sensitive areas and the access should be limit to these boarders especially in peak seasons. These recommendations will practically assist in maintaining wildlife tourism in more sustainable way.

5. Conclusion and Recommendation

Sri Lanka is a nature lover's paradise, rich in biodiversity with an unusual number of endemic species. The country's network of protected reserves is relatively well-funded and contains good facilities for visitors with a properly trained guide. This study aims to investigate the issues of wildlife tourism operations in Sri Lankan national parks and to provide recommendations for sustainable operations of wildlife tourism in national parks in Sri Lanka. Based on the research findings, major activities conducted in wildlife tourism are safari at national parks, wildlife watching, soundscaping, etc. Further, study reveals that major issues such as irresponsible behaviour of safari drivers, overcrowding, poor regulatory

framework, external Interference and illegal practices are challenging wildlife tourism in Sri Lanka. Moreover, as recommendations, this study recommend some practical implications such as training and awareness on environmentally responsible behaviours for both visitors and service providers, strictly monitoring and controlling of operations with the support of technology, developing standard regulatory framework, revising ticket prices and limiting acess for most sensitie areas. Further, this study has some limitation related to its sample and specified for the perspectie of stakeholders. Therefore, its direct future researches to conduct researches on this area for another geographical areas, and perspective of visitor can be considered.

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8

SUSTAINABILITY ASSESSMENT OF COMMUNITY-BASED TOURISM AND THE RECOVERY FROM COVID-19 CRISIS

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Abstract

This paper explores the sustainability assessment of Community-Based Tourism (CBT) as a planning tool to support community recovery from the Covid-19 pandemic. A literature review and a case study were conducted on Mem de Sá Island, Brazil, where data was collected from 61.4% of families using a questionnaire based on CBT sustainability indicators. Results showed a medium level of sustainability, with the social dimension being most affected, indicating the pandemic's negative impact on the community. The study emphasizes the importance of sustainability assessments and indicators in guiding recovery efforts, enabling stakeholders to identify priorities and take targeted actions. Further research is recommended to explore the relationship between CBT sustainability levels, community resilience, and tourism recovery in post-crisis contexts.

Keywords: *Planning, Sustainable, Recover, Local.*
Jel Codes: Z32, Z38, Q01, Q56, R11.

1. Introduction

Tourism has long been recognized as a driver of economic growth and community development, yet its benefits are often unevenly distributed, particularly in the face of crises. Theoretical frameworks for tourism

planning emphasize the importance of involving local communities, but their implementation is frequently undermined by economic priorities and structural inequalities. The Covid-19 pandemic exposed and intensified these challenges, as recovery efforts largely prioritized short-term economic gains over sustainable, community-centered approaches. Against this backdrop, Community-Based Tourism (CBT) emerges as a vital strategy to promote inclusive, resilient, and sustainable development. By leveraging localized data and prioritizing community perspectives, CBT observatories and sustainability assessments offer essential tools to navigate crises, enabling tourism-dependent communities to recover while fostering long-term social, environmental, and economic well-being.

Although tourism planning approaches involving local communities have a solid theoretical foundation, their practical application remains limited due to structural forces dominated by economic interests. During crises, such as the Covid-19 pandemic, these challenges intensify as economic recovery efforts prioritize short-term results over social, environmental, and cultural goals. Previous crises highlight the need for proactive strategies to mitigate negative impacts and promote integrated, long-term development (Raki et al., 2021). CBT observatories play a key role in this process by providing essential data for understanding crisis contexts, facilitating quicker and more effective recovery actions (Sánchez-Cañizares & Castillo-Canalejo, 2014).

Effective crisis management in tourism requires relevant indicators to identify and monitor crises. While tour operators possess rapid access to data for such indicators (Sausmarez, 2013), the CBT approach emphasizes collecting and analyzing information from local communities to ensure their perspectives are included.

The Covid-19 pandemic presents an opportunity to redefine post-crisis tourism development. Hall, Scott, and Gössling (2020) suggest that some destinations may shift toward more sustainable, local approaches, though mass tourism is expected to persist due to its historical resilience. Nevertheless, under the CBT framework, the pandemic offers a chance for tourism-dependent communities to prepare for future crises while demanding a recovery that respects local interests.

This article underscores the importance of integrating sustainability assessments into CBT as a planning tool. Such assessments enable a comprehensive evaluation of tourism's role in local communities, encompassing economic, environmental, and social dimensions, thus fostering sustainable recovery from crises like Covid-19.

2. Literature Review

Tourism has historically faced crises stemming from economic, political, sanitary, natural, and war-related events. Reddy, Boyd, and Nica (2020) describe destinations facing crises as adaptive systems capable of resilience and recovery. However, there is limited research on destination recovery, particularly from a CBT perspective.

Sausmarez (2013) studied tourism recovery in Kenya after a 2007 political crisis, emphasizing the importance of coordinated actions such as marketing, data collection, and diversification of tourist activities. The study also highlighted promoting CBT services like Homestays and Bed & Breakfasts to avoid environmental strain caused by concentrated demand.

In Indonesia, Rindrasih (2018) examined CBT's recovery following the 2010 Merapi volcano eruption. While government efforts focused on disaster management, CBT recovered through external aid, diversification of products, and improved organization. Strengthened local leadership proved crucial for fostering social cohesion and resilience.

Regarding the Covid-19 pandemic, studies are emerging but primarily focus on macro-level trends and economic impacts (Fotiadis, Polyzos, & Huan, 2021; Liu et al., 2021; Kourentzes et al., 2021; Zang et al., 2021). Quiu et al. (2020) identified the social costs borne by Chinese destinations and prioritized aid packages for impacted populations due to shifting public health perceptions. Similarly, Deb and Nafi (2020) emphasized the need to complement business incentives with direct support for individuals dependent on tourism.

The pandemic has prompted calls to rethink tourism development principles. Deb and Nafi (2020) proposed a comprehensive recovery plan, while Rastegar,

Higgins-Desbiolles, and Ruhanen (2021) advocated for responsible and equitable recovery strategies, with CBT playing a pivotal role.

This study aligns with these perspectives, arguing for the integration of sustainability assessments in CBT to guide post-pandemic recovery. Such assessments can help ensure that tourism promotes economic wealth while fostering fairness, inclusivity, and responsibility.

3. Method

The methodology adopted two complementary approaches. The first was a literature review to analyze existing studies on tourism recovery after crises, with emphasis on the Covid-19 pandemic. The second was a case study focused on CBT sustainability in the community of Mem de Sá Island, located in Itaporanga D'Ajuda, Sergipe, Brazil. This community, comprising around 70 families, relies economically on artisanal fishing, subsistence agriculture, tourism, and informal services.

CBT development in the community began over the past decade, primarily driven by external agents such as NGOs and educational institutions like the Federal Institute of Sergipe. This pattern of external stimulation is consistent with findings in other CBT studies (López-Guzmán, Sánchez-Cañizares, & Pavón, 2011; Lapeyre, 2010; Sebele, 2009; Tosun, 2000). The community's tourism appeal lies in its natural landscapes—offering river and mangrove tours—as well as its cultural heritage, including the Crab Festival, Coconut Samba, and seafood-based gastronomy. Local infrastructure includes four restaurants, two inns, and boat services connecting Itaporanga D'Ajuda and Aracaju. Additionally, Silva (2019) noted residents serving meals to visitors, while Gonçalves (2017) documented Bed & Breakfast hosting services.

Tourism development has brought changes to the community's social structure, reflected in modern residences, some used as second homes or vacation rentals. In 2019, a tourist complex with berths and a riverfront was inaugurated, improving access and stimulating demand.

Data were sourced from a broader ongoing research project aiming to propose a CBT sustainability assessment model. For this study, two indicators per

sustainability dimension (economic, social, and environmental) were selected, prioritizing those with the weakest performance from the residents' perspective. The data highlight critical areas for tourism recovery to ensure it is responsible, integrated, and fair.

A questionnaire was administered to 44 respondents—61.4% of families—in December 2020. The head of each household was the primary respondent, or the second in charge if unavailable. Questions were based on CBT sustainability indicators and assessed on a five-point Likert scale, from 1 ("totally disagree") to 5 ("completely agree").

Data analysis, conducted using SPSS Statistics, involved calculating arithmetic means for each sustainability dimension, with scores ranging from 1 to 5. These scores were analyzed based on predefined parameters (Table 1).

Table 1: Sustainability level according to the score.

Sustainability level	Score
Very low	1,00 |—| 1,80
Low	1,80 —| 2,60
Medium	2,60 —| 3,40
Hight	3,40 —| 4,20
Very Hight	4,20 —|5,00

Source: Adapted from Faxina, 2014

4. Results

The results revealed a medium level of sustainability (2.7949) of CBT on Mem de Sá Island. Although there is a balance in assessment among the three dimensions of sustainability, the findings allow to highlight the social dimension as the one that presents the worst performance from the perspective of residents (2.6160), followed by economic (2.7791), and environmental (2.9898) that is the least critical in this community. In addition to this ranking, and the reflection it provides, the results by indicator allow more detailed analysis when it is intended to suggest clues to reorient tourism recovery process. With this

objective, and among all collected indicators, two worst indicators assessed by local residents in each dimensions stand out (Table 2). Therefore, they deserve more attention in the design of recovery strategies for this community.

Table 2: Worst performant indicators on each sustainability dimensions of CBT on Mem de Sá Island, Brazil, 2020.

Indicators	Score
Economic Dimension	
Dynamism of local economy in job creation	2,0930
Contribution of tourism as an income supplement	3,4651
Economic Dimension Index	2,7791
Natural Dimension	
Quality of water supply for domestic use	2,8864
Collection and treatment of sanitary sewage	3,0930
Natural Dimension Index	2,9897
Social Dimension	
Frequency and quality of health care	2,0227
Conservation of traditional fishing practices	2,9302
Social Dimension Index	2,6160
CBT sustainability index	2,7949
CBT sustainability level	Medium

Source: Research data, 2020.

The social dimension reached the worst performance, and it includes the worst indicator evaluated by local residents (2.0227), related to health services, which are expressed on the inhabitants negative opinions regarding the frequency and quality of health care provided to the community. The second worst-rated (2.9302) is related to devaluation that residents feel related to conservation of traditional fishing practices.

Regarding the economic dimension, the weak dynamism of local economy in job creation is the greatest concern for the residents, being the indicator with the second worst performance in the entire database, which score is considered low (2.0930). The indicator that evaluates the tourism as an income supplement shows a less critical performance (3.4651), being the least worrying indicator among the selected ones.

In the environmental dimension, the greatest discontent among interviewees is related to the indicator of water supply quality for domestic use, which reached a medium performance (2.8864), and suggests problems in the origin of water consumed by community. Infrastructures for collection and treatment of sanitary sewage also showed medium performance (3.0930). Despite deficiencies in these infrastructures, this problem is perceived by population as of lesser severity if comparison to the quality of water consumed in the community.

5. Discussion

The results presented on economic dimension reveal low vitality of local economy with regard to job offer. The development of tourism is failing to provide the creation of full-time jobs for members of this community, and income complement should be more relevant from the perspective of the interviewees.

Such results are justified by the drop in tourist demand caused by the Covid-19 pandemic, as it is known that the generation of occupation and income in tourism is caused by maintenance of the demand flow. Therefore, there is a recent worsening of the tourism contribution to local economy, which is notorious if compare to a previous study that, in 2014, found that the same community had a good job offer, which used to allow residents to occupy themselves on their own community. Few years ago tourism was an activity that, in addition to diversifying the job offer, used to contribute to the improvement of family income, and the enhancement of traditional activities (Faxina, Freitas & Trevizan, 2021).

However, the current data shows a different situation, which has been aggravating since the worsening of the pandemic in Brazil, after the research fieldwork. This situation intensify even more the negative effects of this crisis due to the restrictions on the operation of tourist services, the reduction of the purchasing power of the demand as a result of the economy retraction, as well as the demand insecurity and lack of confidence to return to travel.

Regarding the insecurity of demand, in addition to the current change in people's perception of relationship between tourism and public health (Quiu et. al, 2020), Zheng, Luo and Ritchie (2021) argue that this fear will influence travel behavior in the post-pandemic. For these authors, this circumstance requires strategies to

alleviate this fear seeking to increase practices that reinforce the visitors perception of health security. The community of Mem de Sá Island should pay particular attention to this matter.

The reduction of purchasing power of demand is related to increase in the unemployment rate in Brazil, after the pandemic began. The unemployment rate rose 26.36% in just one year, jumping from 11% in the last quarter of 2019 to 13.9% in the same period of 2020 (IBGE, 2021). As Mem de Sá Island receives domestic tourist, it is understandable that the increase in national unemployment was directly reflected in the reduction of tourist demand in this community. Thus, a temporary readjustment of prices is a priority, so that, as soon as sanitary conditions permit, the functioning of local tourist services can be restored, and begin the early stages of recovery process.

The indicators of economic dimension demonstrate the difficulties currently faced by the community, in order to guarantee material support of its residents. However, other results are also worrisome in relation to sustainability of the CBT and the contribution that it must seek to provide the local quality of life. It is worrying that the development of tourism on this community has been occurring alongside unsatisfactory results in environmental indicators as relevant as the quality of domestic water or the collection and treatment of sewage.

Regarding the reduced quality of the domestic water, in addition to being a persistent problem on the community, its consequences become even more serious during a pandemic, precisely because more hygiene care is required. Therefore, shortages in domestic water supply can aggravate the possibilities of contagion by the virus and other diseases. At the same time, this condition reduces the health security of tourist services offered by the community, by aggravating its vulnerability and exposure to risk. During the field research, some interviewees reported that, sometimes, they spend more than a week without water supply at home, and the water is often brackish. In these cases, they circumvent this situation by alternative routes, including use of a community cistern that stores rainwater; the goodwill and help of other residents, and even purchasing mineral water outside the community, which is a very costly option.

Similar problems with water supply had already been observed, in 2014, by Faxina, Freitas and Trevizan (2021). It is worrying, and worthy of reflection, that

even with the investment for tourism development that have been seen on this community in recent years, improvements have not been observed in basic infrastructure, which is essential for improving the welfare of this population. A community that, despite its natural characteristics, as is located in an island and therefore bordered by water, has only an abundance of brackish water because it is geographically located in an estuarine region influenced by the sea.

In this context, the improvement of drinking water supply conditions is a high priority in order to guarantee the minimum conditions to satisfy the basic needs of the community, so that it can guarantee the tourism recovery in a safe way, not only for visitors, but, primarily, for the local population. In addition, it should be noted that with the increase in visitors flow, the demand for water also increases, which may worsen local sanitary conditions. These results reflect weaknesses in basic infrastructure that guarantees local water supply, which is hardly understandable when there has been an increase in investment in tourism infrastructure, such as the tourist complex opened in 2019, as already reported. This contradiction leads to the understanding that public investment in tourism favors exclusively its economic dimension, betting only on infrastructures that are directly generating revenue, devaluing investment in the well-being of the community. However, it is reinforced that investing in basic infrastructure is also investing in tourism. It is a way to share the benefits of tourism with the community. Corroborating this idea, Okazaki (2008) argues that to increase the viability and longevity of tourism projects, plans must integrate the global development of one community.

The collection and treatment of sewage and the quality of basic sanitation infrastructures is another indicator that deserves attention, given that the improper routing of these sewers and their lack of treatment causes negative environmental impacts, such as the proliferation of diseases and pollution of natural resources. This is yet another divestment problem in the community's basic infrastructure. In this regard, some residents reported that the sewage from their homes is dumped directly into the soil, which further aggravates the occurrence of negative impacts. In addition, the attractiveness of this community depends on the richness and specificity of its ecosystems, which are also needed for maintaining the traditional practices, such as fishing. Therefore, such impacts will not only have negative impacts in environment, but also in economy, demonstrating their systemic relationship.

Finally, as for the social dimension, this is the most worrying, and incorporates the indicator with the worst performance in the opinion of residents, associated with the frequency and quality of health care. This result is especially alarming at a time when a pandemic is occurring. Although the municipality has 26 health establishments (IBGE, 2010), none are located on the community, which is limited to receive sporadic visits from health teams. Therefore, residents have to seek care in other locations, which can increase their vulnerability in situations of urgency or emergency, given the distance, time, and conditions of displacement, which involve the combination of two modes of transport: fluvial and terrestrial. In addition, this condition hamper the early diagnoses, which can lead to worsening health conditions. This result is worrying in tourism recovery, not only because the population of the community is more subject to infection risks due to the movement of people, but also because it is expected that in the post-pandemic context visitors will pay more attention to quality of a medical service in the destination.

In the social dimension, the indicator about conservation of traditional fishing activities demonstrated the little efforts that have been directed towards valorization of this practice, whose knowledge is passed on from generation to generation, and which has a strong mark on the local identity. A study by Silva and Faxina (2019) found that the community recognizes artisanal fishing as being a reason for tourist attraction, as visitors have a special interest in knowing how residents practice this craft. In addition, the same study revealed that residents are concerned with preserving their cultural values and preserving their history through creation of a community museum. This, in turn, would make local tourist offer more diverse and, consequently, increase the tourist attractiveness of the community.

The fishing has evident reflexes in local culture, that can be observed in realization of the Crab Festival and in local gastronomy. These elements contribute to characterization of local tourist attractiveness and demonstrate the relationship between artisanal fishing and CBT (Faxina, Freitas and Trevizan, 2021). Thus, in this context, the weakening of the fishing tradition may be reflect in loss of local identity, and consequently harm tourist attractiveness. As noted, this activity was already an important complement to local income and has potential to continue playing this role in the tourism recovery process. Therefore, this indicator can bring effects not only in this dimension, but also in the economic

one, which reinforces the importance of a systemic view of reality that is privileged in the sustainability assessment of the CBT. Thus, the conservation of demand drivers, like the local identity, is fundamental for sustainability of the CBT, and the need for periodic CBT sustainability assessments is reinforced.

6. Conclusion

Studies on the post-crisis recovery of communities that rely on CBT for their livelihood, have been neglected in the scientific literature, and even more neglected are the studies that relate the recovery of such communities by sustainable development perspective. Thus, this article highlights the importance of planning and monitoring in tourism recovery processes in post-crisis periods, using the CBT's sustainability assessment tool for this purpose.

With regard to the crisis caused by the Covid-19 pandemic, some studies already carried out on tourism recovery on a large scale, are useful to have an idea of general panorama of a nation, making it possible to orient public policies towards such a scale of analyze. However, they do not meet the real need of small communities, where vulnerable populations live, and are more dependent on the State's action to mitigate the negative effects caused by crises.

This research sought to evaluate the sustainability of CBT on Mem de Sá Island during the referred pandemic, in order to subsidize decision-making and public policies. The results showed a medium level of sustainability of CBT, revealing that tourism development still has a great margin of evolution to occur in an integrated and responsible way, which meets not only economic objectives, but seeks to reconcile these with goals of an environmental and socio-cultural dimensions. The results show the fragility of this community in this moment of crisis, warning about its condition of vulnerability, specifically in the indicators that obtained the worst performances from the perspective of residents, such as dynamism of local economy in creation of jobs, quality of domestic water, and frequency and quality of health care provided to its population.

The relevance of sustainability assessment of CBT lies in the fact that it guarantees a systemic and integrated view of development, in which the action suggested by the analysis of each indicator is not limited to causing positive effects in the dimension in which it was framed, but in sustainability of the community

as a whole. On the other hand, the analysis of indicators facilitates decision-making and directing actions for community leaders and local government, especially in crisis scenarios, where prioritization and precision of these actions are essential to avoid the worsening of the situation, reinforcing the confidence and security of demand in the local services and, thus, facilitating the desired tourism recovery.

For tourism recovery in communities, such as the one evaluated in this study, some suggestions are given: finding ways of compensation to guarantee the minimum material conditions for families whose livelihoods associated with CBT were affected by the crisis; promote training of health protocols for workers in tourism, in order to avoid contagion; encourage marketing actions focused on outdoor activities, since they are environments with less risk of contact, but also aimed at stimulating the demand of people already vaccinated; establishing partnerships with regional tourism agencies, in order to capture demand interested in the CBT, since the restoration of tourist demand from other states or nations is expected to take a long time; as well as promoting the diversification of tourist services focused on identity of the community, in order to help boost the local economy.

In contexts where it is intended to exploit the opportunity for a crisis to promote a break with the pattern of development of mass tourism, where the excessive role of economic growth often promotes negative effects on the quality of life of vulnerable groups, rescuing the principles of sustainability through the experience of CBT seems to be one of the ways to achieve a more responsible and fair development of local communities. Thus, it is suggested more studies in communities that depend on tourism to maintain their livelihoods, especially in those with experiences of CBT. Investigations are also needed to understand how the level of sustainability of CBT can condition the resilience of a community in a crisis situation, as well as the pace of tourism recovery in the post-crisis period.

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9

ASSESSING TOURISTS' SUSTAINABILITY CONCERNS THROUGH BOOKING.COM AND TRIP ADVISOR REVIEWS

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Abstract

This study employs a big data approach to assess tourists' sustainability concerns when selecting hotels in Sri Lanka and develop policy recommendations to enhance hotel experiences through sustainability. Using Structural Topic Modeling (STM), the research analyzes 934 user-generated reviews from Booking.com and TripAdvisor for ten sustainable hotels. The findings reveal that travelers are increasingly concerned about environmental aspects, particularly green spaces and peaceful environments. The study identifies key topics such as "Better Location," "Peaceful Atmosphere," and "Wildlife Experience," highlighting the growing importance of sustainability in tourism decision-making. The research extends the application of the Theory of Planned Behavior (TPB) in sustainable tourism, demonstrating how online reviews reflect tourists' attitudes, subjective norms, and perceived behavioral control regarding sustainability. Limitations include potential bias in online reviews and language translation issues. The study provides valuable insights for the hospitality industry in Sri Lanka, emphasizing the need to prioritize and communicate sustainability initiatives. This data-driven approach offers implications for both academia and the industry, underscoring the importance of integrating sustainability into hotel operations and marketing strategies to meet the evolving expectations of environmentally conscious travelers.

Keywords: *Sustainability, Booking.com, Tripadvisor, STM, Reviews*

1. Introduction

The tourism industry generates accountability for existing and future socio-cultural, environmental, and economic impacts while ensuring the needs of visitors and the whole industry stakeholders. Sustainability can be considered a management practice that can be applied to all types of destinations. This may lead to mass tourism in night tourism segments. Also, this balanced approach enhances principles in socio-cultural, economic, and environmental aspects. Further, these addresses developing, maintaining, and conserving essentials of ecological processes. Also, it explains how to respect the authenticity of social culture in the respective destination and how to ensure social well-being. This continuous process should be monitored with corrective and preventive actions. Furthermore, it generates a high level of visitor satisfaction in sustainable destinations (UNEP and UN Tourism, 2005). The international tourism industry has high potential, including its direct, indirect, and induced impacts, and 10.4% of global GDP contribution (US$ 10.3 trillion). Also in the year of 2019, recorded US$ 1.91 trillion in international tourist expenditure based on the tourism industry. Further, 9.1% of the global GDP is generated by the international tourism industry (World Travel & Tourism Council, 2024).

Tourism is one of the largest contributors to the global gross domestic product based on different statistical sources in the world. Furthermore, this industry contributed to nearly 77 million people getting employment opportunities, which leads to 3% of global employment. International tourism market trends help tourists to travel in different parts of the world. Long-distance travel, domestic travel, rural tourism, cultural tourism, ethnic tourism, eco- and spiritual tourism, adventure activities, etc., generate significant contributions to enhance tourists' interest in traveling to different geographical locations. UNWTO, WTTC, and other tourism industry stakeholders emphasize the importance of the industry while balancing the sustainability concept in the industry (GIDB, 2024). Based on the various scholars and sources, tourism destinations can be defined as follows. The place that is centralized with the overall trip can be determined as a destination. Also, this tourism trip focuses on the geographical location where tourists spend most of their time during the trip. Those places are identified by travellers based on different scenarios. Further, there are usually residents available in the tourist destinations (Department of Economic and Social Affairs, 2010)

Sri Lanka is a popular destination with its own rich cultural and natural attractions. This attracts tourists annually. Nature, environment, wildlife, archaeological, historical, and indigenous attractions generate tourist motivation of approximately two million annually. After the 2009 civil war, Sri Lankan voices were broadcast around the world, and the number of tourist arrivals increased, even though the COVID-19 pandemic and economic crisis affected the Sri Lankan tourism industry. (https://en.wikipedia.org, 2024).

Based on the Sri Lanka Tourism Development Authority statistics, it is recorded that there is a rapid increment of international tourist arrivals to Sri Lanka during the years 2023 and 2024 compared with the 2021 & 2022 years. Therefore, 1,487,303 international tourists arrived in Sri Lanka in 2023. Also, 1,010,249 tourist arrivals were recorded up to the June month of 2024 years from the January month. Further, India, the Russian Federation, the United Kingdom, Germany, China, France, Australia, the United States, Poland, and the Maldives are identified as top source markets for the Sri Lankan tourism industry (SLTDA, 2024)

Table 01: Tourist arrivals by month & percentage change, 2023 & 2024

Month	2023	2024	% Cha. 2024/23
January	102,545	208,253	103.08
February	107,639	218,350	102.9
March	125,495	209,181	66.68
April	105,498	148,867	41.1
May	83,309	112,128	34.6
June	100,388	113,470	13
July	143,039	-	-
August	136,405	-	-
September	111,938	-	-
October	109,199	-	-
November	151,496	-	-
December	210,352	-	-
Total	**1,487,303**	**1,010,249**	-

Source: (SLTDA, 2024)

Sri Lanka achieved international endorsements as a major tourist destination in the world from different travel guides, travel magazines, and travel websites such

as Lonely Planet, Travel Lemming, etc. In 2019, Sri Lanka won the Emerging Destination Award for Asia. I scape web site, BBC ranked Sri Lanka as one of the best places to visit in the year of 2019. Also, Travel Leisure magazine and website, Lonely Planet, identified Sri Lanka as the best destination in the world. CNN Travel was ranked in the year of 2020; Condé Nast Traveler2022; Top 2021 & 2022, 10 Most Instagram able Places in the world for 2023 by Big 7 Travel, 2023 best destination to travel in Independent list, The world's safest countries rank, Women Solo Travel Index ranked, 2022 one of best vegan travel destinations, hotspot for wellness Tourism 2021 is one of the examples of Sri Lankan destination ranks to motivate tourist arrivals (https://srilanka.travel, 2024).

Table 02: SLTDA registered accommodation establishments, 2023 & 2024 (up to June)Source: (SLTDA, 2024)

Category	2024 (Up to June)		2023	
	Number of establishments	Number of rooms	Number of establishments	Number of rooms
Boutique Hotel	38	835	41	865
Boutique Villa	49	345	51	356
Bungalow	1,052	4,390	984	4,078
Classified Tourist Hotel	**167**	**16,808**	**168**	**16,686**
1 Star	41	1,852	41	1,852
2 Star	40	2,431	41	2,499
3 Star	25	2,408	26	2,462
4 Star	31	3,834	30	3,590
5 Star	30	6,283	30	6,283
Guest House	1,647	18,445	1,679	18,622
Eco lodge	1	20	1	20
Heritage Bungalow	4	19	4	19
Heritage Home	2	2	2	2
Heritage Hotel	2	312	2	312
Home Stay Unit	1,112	3,308	1,080	3,231
Hostels	14	158	12	143
Rented Apartment	82	322	86	328
Rented Home	15	41	14	41
Themed Accommodation & Value-added Activities	1	11	1	11
Tourist Hotel	204	8,362	221	8,515
Total	**4,390**	**53,378**	**4,346**	**53,229**

Considering this recorded tourism demand, the Sri Lankan tourism industry needs to fulfil necessary tourism services, including accommodations. Therefore,

the Sri Lanka Tourism Development Authority recorded the following accommodation categories available in Sri Lanka. Those are boutique hotels, boutique villas, bungalows, classified tourist hotels (1 to 5 stars), guest houses, eco lodges, heritage bungalows, heritage homes, heritage hotels, homestay units, hostels, and rented apartments and homes. Themed Accommodation & Tourist Hotels. It was recorded that there were 4,390 tourism establishments with 53,378 room capacity available in Sri Lanka (SLTDA, 2024). The Sri Lanka Tourism Development Authority is involved with the implementation of the sustainable tourism concept in Sri Lanka in different ways. Due to sustainability being a long-term goal for Sri Lanka, SLTDA makes contributions to maintain positive impacts of socio-cultural, environmental, and economic factors on the country from the tourism industry. To make this a reality, the Sri Lanka Tourism Development Authority introduced an international certification for best sustainable practices with a partnership with UNDP. This ensures the safeguarding of destinations and applying sustainable strategies to the different tourism projects in Sri Lanka. Registered tourist establishments can apply for this certification. Green accommodation, responsible travel, carbon offsetting, sustainable transportation, plastic-free travel, wildlife conservation, and community-based tourism are identified as major concerns in sustainable tourism development. Furthermore, this National Sustainable Tourism Certification (NSTC) for hotels and other accommodation providers leads to branding Sri Lanka as a sustainable tourism destination in the world tourism market (SLTDA, n.d.). Modern tourists are following a new trend to travel. Also, tourists are concerned about sustainability when they select tourism destinations, accommodations, and other tourism hospitality-related facilities. Also, booking.com, TripAdvisor, and Agoda can be identified as powerful media sources to share tourists' perceptions with others. This research focused on understanding the motivation and intention behind tourists' sustainability concerns. Tourists' individual behaviour and their attitudes towards sustainability in Sri Lankan tourism and accommodation products. because the Sri Lankan accommodation sector follows sustainable practices in different ways. Various research studies are done by considering international contexts, and this research study focused on the Sri Lankan context. Therefore, the research addresses the following research problem: "How do tourists' attitude towards sustainability influence their choice of hotel?"

Research objectives

- To assess tourists sustainable concerns to select hotel in Sri Lanka
- To develop policy recommendations to enhance hotel experience through sustainability

This research study is significant for accommodation and tourism stakeholders to develop the policy preparation process. Also, there is a lack of research in this researchable area. This study is significant for academic scholars and students. Hotel and accommodation providers can gain valuable insights from the study. This research is bound by a limited time.

2. Literature Review

This research study focused on assessing tourists' sustainability concerns through TripAdvisor reviews. Therefore, various research articles related to the research topic were reviewed by the researchers to generate a frame for the research study. Also, most of the international context research findings can be reviewed as follows.

Brand personality of the hotel is denominated by the sustainability concept and its applications. This enhances the achievement of SDG in different ways for hotel employees. Because of environmental considerations, economic and social aspects are affected with modern tourists selecting the hotel (Paiva Neto et al, 2020). Viability and competitiveness are the most crucial factors for the tourism destination. Trip Advisor reviews focus on tourists' motivations, destination selection, and climatic sensitivity. This makes access to several tourism consumers to make decisions. Analysing reviews is impactful to understanding the competitiveness of the destination or selected tourism service provider (Mokgehle & Fitchett, 2024).

2.1. Theory of Planned Behaviour (TPB)

The Theory of Planned Behaviour (TPB) emphasizes belief salience measures, past behavioural habits, perceived behavioural control (PBC) vs. self-efficacy, moral norms, self-identity, and affective beliefs in various ways. Also, these six

variables broadly apply to attitude-behaviour relationship generation (Conner & Armitage, 1998). Furthermore, this theory leads to understanding consumers' behavioural intention, representing motivation to make his or her conscious plans with proper decisions. Also, it guides self-direction to the expected actions and behaviour. This generates considerable attention in making decisions (Conner, 2020). Globalization facilitates numerous internet facilities in the e-commerce platform around the world. Online consumer behaviour and perception spread beyond international boundaries. This affects cross-cultural effects in the countries and businesses. The Theory of Planned Behaviour can be properly applied to the e-commerce platform, and this proved the primary engagement of the product purchasing process via the Internet. It also generates behavioural intention to online transactions and evaluations. Also, this model emphasized transaction intention with the proper attitudes of the consumer. Also, the credibility of online transaction intentions with attitude generates well-planned behaviour by online consumer in China and the United States (Pavlou, 2002).

2.2. Sustainability Integrate the Theory of Planned Behaviour (TPB)

Based on the traveller's choices, this study proved a positive, significant impact with environmental behavioural intention via different aspects. These are attitudes influenced by social and behavioural control, and they generate a positive impact with environmental behavioural intention. Attitude, social influence, perceived behaviour control, and habit are ideas remain as variables that are directed with travellers' choices (Chuang et al, 2018). This study focused on the environmental sustainability intentions of consumers with the theory of planned behaviour in Fiji. Based on the findings, attitudes directly affected sustainable intention positively. Further, attitudes and subjective norms with environmentally sustainable intentions made practical directions to the business owners (Singh et al, 2021). The theory of planned behaviour predicts consumer's intention to the product and service consumption in various contexts. Attitudes had a significant influence on this. Further, it leads to experience with awareness and consequences (Setiawan et al, 2020).

2.3. Motivations and Intentions Behind Tourists' Sustainability Concerns

Private travellers' awareness and views of the environment, sustainable view, and implications influence the selection of destinations and other tourism facilities. Also, travel motivations are generated based on these considerations with sustainability. Based on the findings, pro-social motivations connect with conservation and are also affected by sustainable tourism (Frost & Frost, 2022). Social and environmental factors are significant issues with tourists' destination choices. Also, it connects with tourists' consumption with tourism services, facilities, and products. This study generated results regarding sustainability with the configuration of culinary tourism products. Tourists' sensitivity to the social and cultural aspects also plays a major role in the successful tourism destination. This affects tourism motivation. This study's findings signify that industry stakeholders to make effective decisions to maintain sustainability for the purpose of tourist arrivals because final consumer satisfaction is a crucial factor (Galati et al, 2023). This research study affects tourists who prefer to visit UNESCO World Heritage sites. It proved that understanding the cognitive and affecting factors on tourists' decisions regarding travel motivation suitable destinations. The findings revealed a strong and significant correlation between travel attitude and perceived authenticity, travel motivations and destination image, as well as authenticity and destination image. Moreover, the study extends these insights by analysing these relationships in an integrated framework across different stages of the visit, providing a deeper understanding of tourist behaviour post-visit (Carreira et al, 2022).

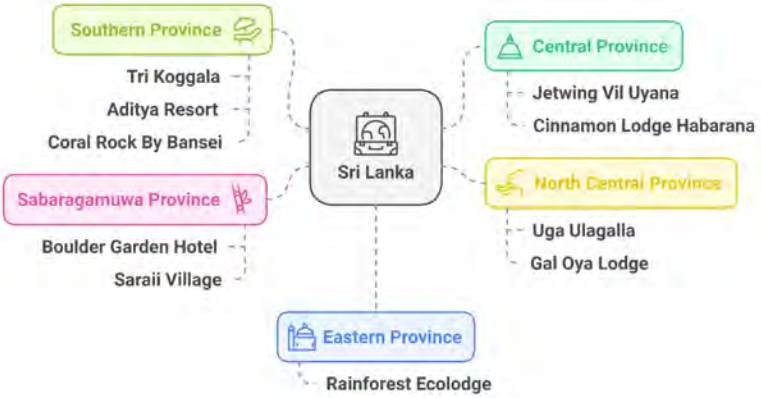
3. Method

3.1. Data Set

To achieve the purpose of the study a big data approach was taken. Accordingly, to assess tourists' sustainable concerns to select hotel in Sri Lanka and to develop policy recommendations to enhance hotel experience through sustainability, the two online review platforms of Booking.com and Tripadvisor were selected. Booking.com is the largest and popular online platform to book hotels with an average of 1.5 million nights daily (https://www.facebook.com/thetravelfreak, 2024). TripAdvisor also emphasizes authentic reviews from travellers

(TripAdvisor GreenLeadersTM Program Highlights Eco-Friendly Hotels to Help Travelers Plan Greener Trips, n.d). The sample for the study is the online user-generated content of ten sustainable hotels (Hotels, 2023). The ten hotels were selected as with review score of more than at least 8 out 10 reviews in Booking.com and 3 out of 5 in Tripadvisor. Accordingly, the data set was made with 934 user generated content of 833 Booking.com reviews and 101 Tripadvisor reviews from the selected ten hotels mentioned below:

Image 1: Hotels selected for the study



Source: Authors

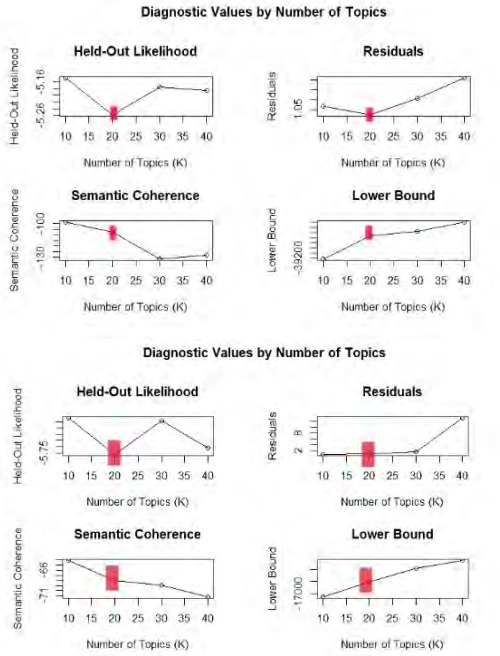
3.2. Methodology

The authors applied a web-based reviews scraper (Booing.com reviews scraper and Tripadvisor reviews scraper) that utilized Application Programming Interface (API) to collect publicly available consumer reviews of the selected ten restaurants in the two platforms. The major approach that was used to achieve the study purpose is Structural Topic Modelling (STM). STM is a powerful library available in R that can identify the hidden structural topics and the correlations between the topics within a corpus using unsupervised models by artificial

intelligence (Roberts et al., 2019). STM is a powerful tool for analysing large amounts of text data, which would be too time-consuming to read and understand manually. It's particularly useful for social science researchers who want to extract meaningful insights from text. Data cleaning was performed to minimize noise in the raw datasets collected from Google Maps business reviews. For that, text pre-processing using the text Processor feature in the STM library, including: (1) building corpus, (2) converting to lower case, (3) removing punctuation, (4) removing stop words, (5) stemming, and (6) creating output (Roberts et al., 2019) were conducted.

4. Results

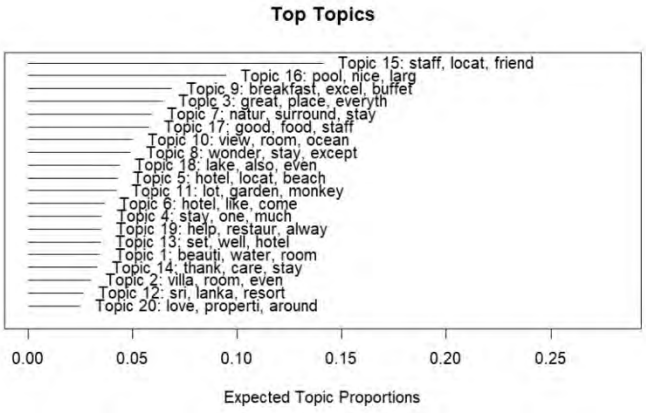
Figure 1: Diagnostic values by Number of Topics



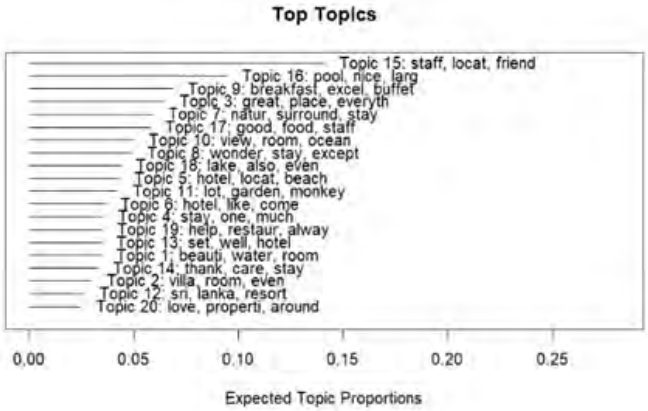
Reviews of Booking.com and Tripadvisor respectively

When using topic modeling, it's important to find the right balance in the number of topics. It is required to capture all important themes, but not so many that it becomes confusing. After careful analysis, the researchers decided on 20 topics for both Booking.com reviews and the Tripadvisor reviews. They then used these numbers to create Structural Topic Models (STM). To make sense of the results, they employed techniques like topic distribution and topic correlation. These methods helped them identify the most significant topics in the restaurant reviews and understand how these topics relate to each other. This approach allowed the researchers to efficiently analyze a large amount of text data and draw meaningful insights into what customers say about the consumer perception through the user generated content of the selected two platforms of Booking.com and Tripadvisor.

Figure 2: Topic Distribution



Booking.com Reviews



Tripadvisor reviews

Table 1: The top five topics and the Representative quotes for the Booking.com Reviews

Label	Representative Quote
T15 Better Location	Super view, beautiful pool, nice design yoga room and library, all made with quality. They care about the maintenance.
T16 Peaceful Atmosphere	Lovely peaceful area, cozy and "homely" fantastic room and lovely big pool.
T9 Good Food	The breakfast was excellent with several juice smoothie options. The breads and pastries were also excellent.
T3 Family Friendly	Everything was simply great. Great place for family. Everything was great, my husband and I couldn't have asked for anything more!
T7 Wildlife Experience	The environment is peaceful, and the presence of animals adds to the natural ambiance. Living in the nature - a lot of birds, beautiful stars in the night sky.

Source: Authors

As shown in the Table 1, the highest topic proportion is of T15 which is labelled as "Better Location". According to the top five topics, T16 (Peaceful Atmosphere) and T7 (Wildlife Experience) show that majority of the topics

highlight that the travellers are more likely to be concerned about the green spaces along with peaceful and serene environments.

Table 2: The top five topics and the Representative quotes for the Tripadvisor Reviews

Label	Representative Quote
T19 Full of Greenery	I recently stayed at Rainforest Ecolodge, and it was a truly unforgettable experience. The view from the lodge is breathtaking, with a misty jungle canopy stretching as far as the eye can see—a perfect escape into nature!
T12 Serene Stay	Most serene stay yet! Staff were great, food was great, views were the best! Meals and drinks were always made fresh with organic, local ingredients. The rooms had all the necessary amenities.
T13 Amazing Experience	Such an amazing destination. The food was incredible. The rooms were incredibly clean and well-kept and sleeping in the treehouse was an amazing experience!
T16 Exceptional Service	All the staff were so lovely, caring, took an interest in our day, provided excellent professional service.
T5 Warm Hospitality	Nicely built chalets maintaining our privacy and keeping the greenish surrounding intact. Top class hospitality of all staff members and they looked after us as of their family members

Source: Authors

According to the analysed reviews of the Tripadvisor, the highest topic proportion is of T19 that is labelled as "full of greenery". As of the top five topics, the other top two topics are the same as of topic one. They also highlight about the concern as well as the appreciation of the greenery and the nature by the travellers. Accordingly, T12 (Serene stay) and T13 (Amazing Experience) showcase that most of the travellers who visit Sri Lanka expect the so called "green" aspect in the island other than the socio-cultural and economical aspect of the three pillars of sustainability.

5. Conclusion

This study provides valuable insights into tourists' sustainability concerns when selecting hotels in Sri Lanka, using a big data approach to analyse reviews from Booking.com and TripAdvisor. The findings align with and expand upon existing literature on sustainable tourism and the Theory of Planned Behaviour

(TPB). The results highlight that travellers are increasingly concerned about environmental aspects, particularly green spaces and peaceful environments. This aligns with previous research indicating that environmental considerations significantly influence tourists' destination and accommodation choices (Frost & Frost, 2022; Galati et al, 2023). The high proportion of topics related to "Better Location," "Peaceful Atmosphere," and "Wildlife Experience" supports the growing importance of sustainability in tourism decision-making.

The study's use of Structural Topic Modelling (STM) with 20 topics for both Booking.com and TripAdvisor reviews allowed for a comprehensive analysis of user-generated content. This approach is consistent with TripAdvisor's own methodology, which analysed around 300,000 reviews for sustainability-related terms and phrases1. The correlation between the findings and TripAdvisor's recent partnership with the Global Destination Sustainability Movement further validates the importance of sustainability in tourism. Limitations of this study include the potential bias of using only online reviews. The reviews in other languages were translated into English language with google translator and sometimes the meaning generated might be not hundred percent the meaning created in the original review. Future research could incorporate multi-lingual analysis and combine review data with other sources, such as social media posts or direct surveys and even structured interviews.

Expected implications for the hospitality industry in Sri Lanka include the need to prioritize and communicate sustainability initiatives, particularly those related to preserving natural environments and creating peaceful atmospheres. This aligns with the growing trend of eco-tourism and sustainable travel choices, as indicated by previous TripAdvisor surveys. Theoretically, this study contributes to the application of TPB in the context of sustainable tourism by demonstrating how online reviews reflect tourists' attitudes, subjective norms, and perceived behavioural control regarding sustainability. This extends the work of researchers like Singh et al. (2021) and Setiawan et al. (2020) who have applied TPB to environmental sustainability intentions in tourism contexts.

In conclusion, this research provides a data-driven approach to understanding tourists' sustainability concerns, offering valuable insights for both academia and the hospitality industry in Sri Lanka. It underscores the importance of integrating

sustainability into hotel operations and marketing strategies to meet the evolving expectations of environmentally conscious travellers.

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10

CHALLENGES AND OPPORTUNITIES FOR MUSEUMS IN UTTAR PRADESH TO ACHIEVE SUSTAINABLE DEVELOPMENT GOALS: A CRITICAL ANALYSIS AT STATE MUSEUM, LUCKNOW

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Abstract

This paper critically examines the challenges and opportunities faced by museums in Uttar Pradesh in achieving the Sustainable Development Goals (SDGs) set up by United Nations. The focus is on the integration of SDGs within the museum sector, specifically in the context of heritage conservation and community engagement. The study highlights the initiatives taken by the government of Uttar Pradesh for preserving and promoting cultural heritage with the significant historical collections preserved at the State Museum, Lucknow. The paper explores the impact of the RE-ORG project by ICCROM (International Centre for the study of Preservation and Restoration for Cultural Property), which provides a self-assessment tool for museums to evaluate their status and identify areas for improvement in terms of collection management, staffing and infrastructure. A case study at State Museum, Lucknow is presented, showcasing its collection, which includesboth Natural and cultural heritage of India and abroad. In the Natural History collection during re-organisation of the collection,Re-identification of a Critically Endangered species, the pink-headed duck, underscores the importance of curatorial accuracy. It emphasizes the importance of re-organisation project for any collection. The paper discusses challenges faced by Govt Museums of Uttar Pradesh and also

the opportunities created by the government to achieve the goals. The State aims to ensure inclusive and equitable quality of education promote lifelong learning opportunities for all and promoting peaceful and inclusive societies, providing access to justice for all and building effective, accountable and inclusive institutions at all level.Establishment of theme based museums, such as the Natural History Museum, Tribal Museum, Freedom Struggle Museum, Archaeology &performing art museumas a part of government's broader strategy for inclusive development. Establishment of new museums in remote areas promotes lifelong learning opportunities to all. Conserving the preserved heritage is an important aspect of and in State Museum Lucknow as well as other Museums of Uttar Pradesh are continuously working in this direction. This paper sheds light on the critical role of museums in sustainable development, particularly in the preservation and display of natural and cultural heritage in Uttar Pradesh.

Keywords: *Re- Organization, ICCROM, Sustainable development, Museum, Preservation, Heritage*
Jel Codes: *C81, C82, D02, E01, E24, I02, I23, I24, L31*

1. Introduction

Museums are custodian of cultural and natural heritage, repository of knowledge and center of community engagement, making them critical contributors for achieving Sustainable Development Goals (SDGs). These Goals emphasize inclusive development, opportunities for all, sustainability and the preservation of heritage for future generations. In Indian context, particularly in Uttar Pradesh, museums hold a unique position due to their diverse collection numismatics, archaeology, ethnography to natural history and several different subjects.

This study aims to analyze the challenges and opportunities faced by museums in Uttar Pradesh in achieving SDGs. Specifically; it focuses on identifying areas where these institutions struggle, such as infrastructure limitations, inadequate staffing and the need for enhanced collection management. The paper also evaluates how international tools like the ICCROM RE-ORG Project can assist museums in self-assessment and strategic planning. These self-assessments help museums to understand their current status and address critical issues like conservation needs, proper storage and resource allocation.

Both the challenges and opportunities inherent in this process is discussed here. It preserves a rich and diverse collection. Regular verification is important for the re identification of any preserved specimen. In one such incidence during

documentation of Avian collection in 2012 the Re-discovery of the specimen of a Critically Endangered species the Pink-Headed Duck in Natural History section of the Museum, exemplifies the importance of re-identification and curative conservation of collections. Previously this specimen was labled as Spot billed duck. These efforts not only preserve biodiversity but also enhance public understanding of endangered species and the need for their protection.

Government efforts towards the conservation and preservation of heritage, is a regular practice. To achieve the target the State Museum has started a collaborative project with Aligarh Muslim University, Aligarh for the Conservation of Natural History collection since 2022.Leading to significant outcomes such as the establishment of a new Natural History Museum by displaying the newly conserved specimens. Apart from this, Tharu Tribal Museum in Balrampur, which underscores the importance of inclusivity and representation of tribal culture within the museum.

The purpose of this research is to critically analyze how museums in Uttar Pradesh can achieve SDGs by overcoming existing barriers and maximizing opportunities. It aims to provide insights into the necessary steps for integrating sustainability into museum practices, such as improved staffing, infrastructure development and technological integration. Through this analysis, the study seeks to contribute to the broader discourse on the role of cultural institutions in sustainable development, offering practical recommendations for policy and practice.

2. Literature Review

Museums are increasingly being recognized as vital institutions for achieving Sustainable Development Goals (SDGs), particularly in areas such as education, cultural preservation, social inclusion and environmental awareness. They play a critical role in contributing to Goals like Quality Education (Goal 4), Sustainable Cities and Communities (Goal 11) and Life on Land (Goal 15). Globally, museums are transitioning from being mere repositories of artifacts to dynamic spaces for learning, conservation and sustainable practices. (MFCA 13 climate action)

In the Indian context, museums hold immense potential to align with SDGs, but they face several challenges, particularly in regions like Uttar Pradesh, which has a rich cultural and natural heritage. Research highlights that many museums in India lack adequate funding, skilled staff and modern infrastructure, which limits their ability to fulfill their role in sustainable development. The museum evaluation reports emphasize the absence of proper storage facilities and conservation methods, leaving many collections vulnerable to damage or mismanagement. There is a significant gap in digitalization efforts, which restricts public access and the broader educational impact of museums.

The ICCROM RE-ORG Project, developed in collaboration with UNESCO, has emerged as a significant initiative for addressing these challenges. The RE-ORG framework enables museums to conduct self-assessments to evaluate their current state, identify critical issues and plan for effective management of collections. This tool is particularly useful in analyzing storage conditions, resource allocation and conservation priorities. (Lambert 2011). In many museums usually they acquire the antiquities regularly with no proper management for storage (Merriman 2006). Self-assessment exercises allow museums to understand challenges such as the lack of trained personnel, insufficient infrastructure, and the need for modern conservation techniques. The partnership with UNESCO ensures that these efforts align with international standards, making it an essential tool for Indian museums striving to achieve SDGs.

A noteworthy achievement of the State Museum, Lucknow was the discovery of a Critically Endangered Pink-Headed Duck during the analysis of its Natural History storage. This finding emphasized the importance of reidentification and proper cataloging of collections, which are crucial for biodiversity conservation and public awareness. (Zarrin, A., 2021). Going through literature we find that a considerable data and information are available both online and offline regarding the management of stores (Johnson and Horgan 1979; NPS 1993-2001).The process revealed that curative conservation is an essential part of preserving delicate and historically significant artifacts. The conservation efforts at the State Museum, Lucknow, further exemplify the potential of collaborative projects. A joint conservation project between the museum and Aligarh Muslim University (AMU) brought together experts to restore and preserve Natural History collections, some of which date back over 150 years. This collaboration

resulted in the establishment of a new Natural History Museum in Lucknow,where conserved specimens, including extinct and endangered species are now displayed. This initiative reflects the critical role of government support and expert partnerships in achieving sustainability goals.

The government of Uttar Pradesh has also proposed the creation of new museums to promote inclusivity and cultural preservation. One such initiative is the Tharu Tribal Museum in Balrampur, which focuses on the heritage of indigenous communities. Efforts like these underscore the importance of representing marginalized voices in the museum narrative, contributing to social cohesion and the preservation of intangible cultural heritage.

The literature reveals that while museums in Uttar Pradesh face significant challenges, they also have immense potential to contribute to SDGs. Through tools like the ICCROM RE-ORG Project, museums can address critical issues such as inadequate storage, lack of resources and the need for expert training. Collaborative conservation projects and government-supported initiatives further demonstrate how museums can align with global sustainability objectives. This study builds upon existing research to provide a comprehensive analysis of the challenges and opportunities for museums in Uttar Pradesh and offers practical recommendations to enhance their contribution to sustainable development.

3. Method

3.1. Data Set

In the present scenario museums are facing many challenges and at the same time they are established institution to combat these challenges to achieve the SDG goals. Museum are continuously leading towards success.The study is basically based on the recognition as well as conservation ofcollection of Govt. Museums of Uttar Pradesh, we have focus on different Museum collections and their display as well as management and up keep.It is an attempt to identify the role played by State government to protect and safeguard the cultural and Natural Heritage and the areas, where government is continuously working to achieve access of Information and established the Government Museum as inclusive Institution.Museum are formal as well as informal institution, imparting

knowledge through learning. In this case the information collected about the Museum and its collection will be elaborated to understand the role played by the Museum to achieve SDGs and its economic impact on the society.

3.2. Methodology

The research methodology for analyzing the challenges and opportunities for museums in Uttar Pradesh to achieve Sustainable Development Goals (SDGs) involves a combination of qualitative data analysis and case-study-based approach. This multi-faceted approach enables an in-depth understanding of the issues faced by museums and the potential strategies to address them.

Research Design-This study employs a Qualitative Research Design (QRD) to explore the underlying challenges, opportunities and strategies for aligning museum practices with SDGs. The focus is on evaluating existing policies, conservation practices and government initiatives, alongside international frameworks like ICCROM RE-ORG.

Data Collection-Primary Data: Interviews with museum staff, conservation experts and policymakers will be conducted to gather first hand insights into the current state of museums, the challenges they face and their efforts to achieve SDGs.

Secondary Data-A review of relevant literature, including government reports, research articles and ICCROM-UNESCO documentation, will provide a comprehensive understanding of the subject. Case studies of specific museums, such as the State Museum, Lucknow, Natural History Museum, Lucknow and the Tharu Tribal Museum, Balrampur (Fatmi, A., &Zarrin. A., 2024.) will be analyzed in detail.

State Museum, Lucknow established in 1863 is a multipurpose museum of International repute. It preserves more than 2,00000 artefacts of Coins, sculptures, natural history specimens, ethnographic material, decorative art and art ware in its collection. It is the largest museum of Uttar Pradesh and displays the rich Cultural and Natural Heritage of the State by using latest technologies. It is the testament in the field of Museology. To its credit it is also a recognized Research Centre from Aligarh Muslim University, Aligarh and Chhatrapati

Shivaji Maharaj University, Kanpur. Students enrolled in these Universities pursues their research in the Museum. So far many scholars have been awarded Ph.D. degree. (Kumar Anand & Fatmi Al Shaz, 2020)

RE-ORG Assessment: This method offers a step by step approach to help professionals working for heritage collection to reorganize their storage rooms with a focus on creative, safe and meaningful change; this assessment involves four Phases: Phase I- Getting Started, Phase II- Storage Condition Report, Phase III- Storage Action Plan and Phase IV- Storage Reorganization Implementation. There are four components of Re- Org, the toolkit and workbooks in soft copy are available online,it consists of self-evaluation tool provided with points.We can match our result in the provided diagnostic table; Management [M] of the Storage area, Building and Space [B], Collection present in the Storage area [C] and the last one aspect is Furniture present in the collection area [F]. (ICCROM method Kit). Assessment tool have been used to check the current status of the museum. One can go to the official website of the ICCROM and can download the workbooks.

Table: 1. RE-ORG self-evaluation sheet for Management [M] and Building space[B] of storage

S.No.	Management [M]	Points	S.No.	Building and Space [B]	Points
M.1	Officially Responsible Person	6	B.1	Building Location	6
M.2	Sufficient Staff for Support	0	B.2	Protection against Natural Hazards	6
M.3	Trained Staff	6	B.3	Security by Door and Windows	6
M.4	Written Procedures of Duties	6	B.4	Location of storage rooms	6
M.5	Access of Collection	3	B.5	Space outside the Storage Room	6
M.6	General Inspection	0	B.6	Obstacle free building	6
M.7	Regular Cleaning	3	B.7	Condition of Building	4
M.8	Terms with Fire Brigade	6	B.8	Plumbing Fixtures	2
M.9	Fire Activities Restrictions	6	B.9	Non-Collection items	2
-	-	-	B.10	Aisles for Storage	3
	Total	36*		Total	45*

**Management [M] =36 points, that shows we need only small improvements*
**Building and Space [B]=45 points, that also shows we need only small improvements*

Table: 2. RE-ORG self-evaluation sheet for Collection [C] and Furniture and Small Equipment [F] of storage

S.No.	Collection [C]	Points	S.No.	Furniture & Small Equipment[F]	Points
C.1	Assessioning	6	F.1	Objects placing	4
C.2	Marking on Objects	6	F.2	Space in storage units	1
C.3	Documentation of measurements	1	F.3	Dimensions of storage units	3
C.4	Labelled shelf, drawer or rack	2	F.4	Pest resistant furniture	3
C.5	Location code	2	F.5	Equipment assigned	3
C.6	Limited handling	2	F.6	Detectors	6
C.7	Time to locate the object	2	F.7	Portable fire extinguishers	6
C.8	Temporary changes location mark	0	F.8	Protection for special objects	1
C.9	Pests and mould free objects	3	-	-	-
C.10	Dust free objects and storage	1	-	-	-
	Total	25*		Total	27*

** Collection [C]= 25 points, that shows we need the RE-ORG project*
**Furniture and Small Equipment [F]=27 points, that shows we need only small improvements*

The Museum has re-arranged and analyzed its storage and has successfully displayed its objects in other Museums of the State. Like during reorganization of the Museum section many duplicate antiquities were sorted and they were sent to Govt. Museum Boudh Museum Kushinagar, Govt Boudh Museum Gorakhpur and State Public service Commission Museum Prayagraj, District Museum Sultanpur, Govt. Museum Jhansi, Govt. Boudh Museum Piprahwan, Sidharth Nagar and Natural History Museum Lucknow. It has also established new galleries displaying more objects from the collection. Displaying of more objects from storage area gives more opportunity for learning and establishes the concept of inclusive development. The museum has installed a fully modern fire system and CCTV security system. During the re-organization, while doing physical verification of the objects in Natural History section of the Museum re-discovery of the Pink Headed duck specimen is an important contribution to biodiversity conservation.

4. Model Result

4.1. Challenges Identified

The findings of this research provide an understanding of the challenges and opportunities for museums in Uttar Pradesh in achieving Sustainable Development Goals (SDGs). The results are drawn from an analysis of museum practices, conservation efforts and government initiatives, with a specific focus on their alignment with SDG objectives.

Inadequate Infrastructure- Many museums in Uttar Pradesh lack modern storage facilities, conservation labs and proper display spaces, which compromises the preservation and accessibility of collections. But Natural History Museum, Lucknow is one of the examples which arise after breaking barriers and gave a long live chance for the survival of Natural History Collection.

Lack of Trained Personnel- There is a significant shortage of trained staff in key areas such as official and non-officials (conservation, curation and storage management, display galleries) which allows limiting the effective functioning of museums. Due to staff shortness there is a lack of outreach programs and limited use of technology in museums restricts their role in education and community engagement.

4.2. Opportunities

International Frameworks-Many museums are getting International professional working such as ICCROM RE-ORG Project, offers a practical framework for self-assessment and improvement in collection management. Its application can help museums address storage and conservation issues systematically.

Collaborative Projects- Partnerships such as the one between the State Museum, Lucknow and Aligarh Muslim University demonstrate how collaboration can lead to successful conservation efforts and the establishment of new institutions like the Natural History Museum, Lucknow.

Biodiversity Conservation- Identification of Critically Endangered species the Pink-Headed duck in the State Museum's collection underscores the potential of museum to contribute to biodiversity preservation and awareness.

Government Support-Initiatives such as the establishment of the Tharu Tribal Museum in Balrampur and approval for new museums at Sonbhadra and Mirzapur highlight the state government's commitment to cultural inclusivity and sustainable development.

5. Conclusion

This research highlights the critical role of museums in Uttar Pradesh in achieving Sustainable Development Goals (SDGs) by addressing challenges and opportunities. Museums are not only repositories of cultural and natural heritage but are increasingly recognized as a place of education, conservation and community engagement. This study reveals that museums in Uttar Pradesh face several challenges, including inadequate infrastructure, lack of trained personnel and insufficient funding, which hinder their ability to align effectively with SDGs.

The application of international frameworks such as the ICCROM RE-ORG Project, in partnership with UNESCO, has proven to be an invaluable tool for museums in self-assessment and strategic planning. These frameworks help institutions identify gaps in storage, resource management and somehow allow to find the collection condition in term of deterioration factors and allow to make conservation efforts, enabling them to prioritize and implement sustainable practices. The case of the State Museum Lucknow underscores the importance of re identification, curative conservation and collaborative projects in preserving and showcasing heritage. The discovery of the critically endangered pink-headed duck and subsequent conservation initiatives, Display of the richest collection in a New Museum demonstrate how systematic efforts can contribute to biodiversity awareness and preservation.

Collaborative conservation projects, such as the joint initiative between the State Museum, Lucknow, and Aligarh Muslim University (AMU), further highlight the significance of interdisciplinary approaches in overcoming conservation challenges. The establishment of the Natural History Museum and the proposal

for new museums like the Tharu Tribal Museum in Balrampur, tribal museum in Sonbhadra, Mirzapur Freedom Struggle Museum and the museum which represents performing art kathak museum, Lucknow reflect the growing commitment of the Uttar Pradesh government to promote inclusivity and sustainable heritage management.

This research concludes that achieving SDGs in the museum sector requires a multifaceted approach, including improved infrastructure, enhanced funding, skilled personnel and community involvement. By adopting international best practices, fostering collaborations, and prioritizing sustainability, museums in Uttar Pradesh can serve as exemplary models of cultural preservation and sustainable development. Future efforts must focus on integrating modern technologies, promoting public awareness and ensuring the long-term sustainability of these institutions to protect and celebrate the rich heritage of the region.

Establishment of new museums provides more employment opportunities and generates revenue. The new museums add a feather to tourism attractions and give more avenues to tourism industry. All these efforts of Govt. are focused on generating revenue and decreasing the dependency on govt. fund for Museum development. If we manage our cultural and Natural resources in a better way it will give more opportunity for revenue generation along with preservation of cultural and natural heritage. At the same time by engaging different sects of the society it will fulfill the concept of inclusive development.

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PART III

CURRENT ISSUES IN ECONOMIC SUSTAINABILITY & ECONOMICS

11

DEVELOPMENT OF CRYPTO CURRENCY

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Abstract

The aim of this study is to conceptually and theoretically examine the structure of the Bitcoin money system, which is a cryptocurrency, after presenting the conceptual framework of cryptocurrency. In this study, after providing a theoretical conceptual framework, Bitcoin money is analyzed by reviewing national and international literature. In this context, it is of great importance to analyze the Bitcoin virtual currency, which is the most widely used of cryptocurrency systems and popular all over the world. Therefore, this study is expected to make a significant theoretical contribution to fill the existing gap in the literature in this field.

Keywords: *Virtual (Crypto) Money, Bitcoin, Financial Markets*
Jel Codes: *E40*

1. Introduction

Emerging in 2008, the concept of virtual money has been an important development for states and individuals. There are different views on the emergence of the virtual currency system. The most accepted of these views is that the virtual money system emerged as a result of the loss of financial confidence in financial markets and states after the 2008 global crisis and its popularity has gradually increased. In this context, it is of great importance to analyze the Bitcoin virtual currency, which is the most widely used of the

cryptocurrency systems and popular all over the world. Therefore, this research is expected to make a significant theoretical contribution to fill the existing gap in the literature in this field. Therefore, it is very important to conduct a study to reveal the outlook of the Bitcoin ecosystem, which is an example of the concept of virtual money. In this study, after presenting the conceptual framework of cryptocurrency, the structure of the Bitcoin monetary system, a cryptocurrency, is examined conceptually and theoretically. In this study, after the theoretical conceptual framework is given, Bitcoin money is analyzed by reviewing national and international literature. This study examines the Bitcoin money ecosystem in general, 'The Theoretical Framework of the Concept of Virtual (Crypto) Money' and 'Cryptocurrency Example: Bitcoin and its place in the financial sector', are analyzed in two sections under the main headings.

2. Crypto Coins in Theory

Cryptocurrency, as it has come to be understood in recent years, is a new alternative medium of exchange for everyone. In contrast to the classical understanding of money as a medium of exchange, the digital economy has started to attract people's interest. So, along with the many risks of this new structure, the high returns recently earned by crypto lenders have driven investors looking for new investment products to target cryptocurrencies and thus earn higher returns. But the biggest problem with this concept is that in many countries there is no effective regulation of these digital currencies. (Atalay Şimşek and Şimşek, 2018:6) Therefore, there is a problem of trust in virtual currencies among both investors and regular users (Kesebir and Günceler, 2019: 606).

Moreover, cryptocurrencies do not originate from precious metals or state reputation, but from the fact that their users accept them as a medium of exchange or see them as commodities. Thus, the value of cryptocurrencies, like other currencies and commodities, is determined by the conditions of supply and demand, which change instantaneously in the markets.

In fact, the emergence of cryptocurrencies has created a new economic structure, since an economy is simply defined as a structure of producers, distributors and consumers at the local, national and international level. With cryptocurrency, the

emerging economy is expressed as a network of companies that provide services in markets where virtual currency producers and users come together. 3. Method

2.1. Cryptocurrency Concept

Due to the global financial crisis of 2007-2008 and the subsequent debt crisis, centralized currencies came under pressure and people around the world began to lose faith in centralized financial institutions. Therefore, there has been a call for decentralization and alternative currencies. The call has been heeded by cryptocurrencies, decentralized digital currencies based on peer-to-peer networks and cryptographic tools. Cryptographic users can transfer virtual money to other users and thus sell or buy goods and services. On the one hand, cryptocurrency is praised for its low transaction fees and promoted as a viable alternative to banks and credit cards. On the other hand, it is also warned that cryptocurrencies are an easy tool to use for money laundering and trading in illicit businesses such as drugs (Morisse, 2015: 2).

Virtual currency refers to 'cryptocurrency', derived from the words 'crypto' and 'currency'. Cryptocurrency is defined as a virtual currency that is used over the internet and is not linked to a central authority or intermediary institution. With cryptocurrency, people or institutions can make payments as with money and it is accepted as money. Although cryptocurrency is a monetary system like the known currencies Turkish Lira, Dollar, Euro, etc., the purpose of creating these currencies is to enable the exchange of digital information in a transaction that is possible thanks to some cryptography principles. The purpose of using cryptography is to control the formation of new funds by securing money transactions (Kenger and Tokmak, 2018: 4701).

Cryptocurrency is defined as a virtual currency that uses cryptography (cryptography). Cryptology is used in the process of creating money and ensuring the reliability of the applications made with it. The theoretical foundation of cryptocurrencies was created by Wei Dai in 1998. In recent years, the technical infrastructure of all cryptocurrencies available in the market was created by a person named Satoshi Nakamoto or his group in 2008 (Gültekin and Bulut, 2016: 84).

One of the main duties of the central government is to determine monetary policy (Taşar et al., 2022). But cryptocurrency systems are decentralized systems and they do not depend on a central authority. The logic of all cryptocurrency systems is that they use cryptography to control transactions, increase supply and prevent fraud. Once transactions are authenticated in the virtual environment, they are stored digitally. As shown in Figure I below, transactions are collected in a 'blockchain', which is treated as an accounting system. The blockchain is a public and accessible structure that covers all transactions. Payments are verified by network nodes (Karaoğlan et al. 2018: 16).

A blockchain is an ever-growing, distributed database where records are linked together with cryptographic elements (hash functions). Although it has no centralized system, data is stored by users who are integrated into the system. Blockchain, a distributed database that provides encrypted transaction tracking, is defined as Distributed Ledger Technology (DLT). With blockchain technology, cryptocurrencies mathematically eliminate the intermediary required by both parties and replace it with a technology with mathematical precision. This also serves as a trust mechanism. The Blockchain technology that makes cryptocurrencies and their infrastructure work is the ultimate in power, as well as being tool-free and transparent. Blockchain allows users to speed up the process, reduce costs, improve security and simplify operational work. Decentralized blockchain technology, which eliminates the need for third parties as a result of the spread of crypto coins, can cause a significant change or disruptive effect in the financial system while making transfers anonymously and at a very low cost (Dilek, 2018: 11).

In other words, a blockchain is a distributed database that enables encrypted transaction tracking, where each piece of information is processed in blocks and with sophisticated encryption algorithms, and linked together without being connected to a center. A blockchain is a data structure that represents a record of account activity and is signed in a secure and virtual way. These account transactions take place over a network and are constantly updated. The system operates securely and quickly with a centralized and complex security network without the need for centralized control. The blockchain is used in many systems, not just in the flow of money, because it allows for conveniences in three main points: fast, secure and easy to monitor.

- First, low-cost and fast processing without the need for any intermediaries;

- Second, the lack of centralized control means that the possibility of corruption is very low.

- Finally, the ease of monitoring and control over the transfer of assets provides the highest level of control.

It is known that blockchain technology is not only associated with cryptocurrencies, but is used as a highly reliable system in many areas that require technology infrastructure, especially in areas such as banking (Çetiner, 2018: 3-4).

- Blockchains are essentially a database where all digital events or transactions are stored and distributed by all system participants. Blockchains are distributed in encrypted form, which enables transaction tracking. All users can connect to the network, send new transactions, verify transactions and create new blocks. Clustering, i.e. blockchain technology, the creation of decentralized currencies, enforceable digital contracts (smart contracts) and smart assets (smart property) that can be controlled over the Internet, is a technological genius that makes this possible. Blockchain technology is similar to the Internet. Blockchains are a spreadsheet that is copied thousands of times over a computer network. The information in a block is stored in a common and continuously agreed database. The database of blockchains is not stored in one centralized location and is publicly available. Everyone on the Internet can access it on millions of computers at the same time. can access the hosted data. Blockchains are digital distributed transaction logs with one-to-one copies on multiple computer systems controlled by different organizations. Everyone participating in blockchains can see their records. There are five main principles underlying blockchain technology. These are (Serçemeli, 2018: 40-41).

- Distributed Database: Each user in blockchains has access to the entire database and its history. No user only checks the data or information.

All users can directly verify the records of their trading partners without intermediaries.

- Peer-to-Peer Transmission: The communication center is between peers rather than directly across a network. Each network stores and transmits information to all other networks.

- Transparency: Every transaction and related values can be seen by anyone with access to the system. Both the node and the user in a blockchain have an alphanumeric address of more than 30 characters that identifies them. Users can choose to remain anonymous or reveal their identity to others. Transactions take place between blockchain addresses.

- Non-Refundable Records: Once a transaction has been entered into the database and accounts have been updated, records cannot be changed. The term "chain" is derived from the fact that this transaction depends on all the transaction records that came before it. Various computational algorithms and approaches are used to organize the records in the database in an established chronological order and make them available to others in the network.

- Computational Logic: The digital nature of master records lies in the ability to program the computational logic of blockchain transactions. Therefore, users can create algorithms and rules that automatically trigger transactions between nodes.

- Finally, these important features of blockchain technology are that it opens a door to remove third parties from multiple types of transactions, reduce transaction costs and increase the potential for innovation across all major industries. Many important features of blockchains are their potential (Schatsky and Muraskin, 2017):

- Trusted and Accessible: Since it is used by a large number of participants, it does not contain any point of failure. It is designed to resist interruptions and attacks.

- Transparent: Blockchain transactions are controlled in a way that all participants can see, which increases control and trust.

- Immutable: It is almost impossible to make changes to blockchains without detecting them. This increases the reliability of the information carried and reduces the possibility of fraud.

- Irreversible: It is possible to make transactions irrevocably, which facilitates administrative procedures and increases the accuracy of records.

- Digital: Almost all assets and documents can be encrypted and restricted or viewed as a book record.

2.2. Classification of Cryptocurrency

According to the European Central Bank classification, virtual currencies are divided into 3 classes (Dulupçu et al. 2017: 2243).

- Closed Virtual Currency Diagram: These types of virtual currencies have almost no connection with the real economy and are generally defined as in-game. Virtual currencies in this category can be earned based on online performance and can only be used to purchase virtual goods and services. These currencies will not be subject to purchases outside the relevant virtual community.

- One-Way Flow Virtual Currency Scheme: This type of virtual currencies can be purchased in real currencies, but will not revert back to real currency. These types of virtual currencies can also be used for trading virtual goods and services, while others can be used for trading real goods and services.

- Two-Way Flow Virtual Currency Scheme: These types of virtual currencies can be exchanged for real currencies through exchange rates. As with all other currencies, they can be used to trade both virtual and real goods and services.

- Cryptocurrencies are also classified as assets because cryptocurrencies have an element of value and people use them as an investment instrument. Therefore, cryptocurrencies can be categorized as electronic money, commodities and securities (Durdu, 2018: 52-55).

- Cryptocurrencies as Electronic Money: In order for a virtual currency such as Bitcoin to be accepted as electronic money, it must be issued by an institution authorized to issue electronic money. However, since cryptocurrencies do not have a centralized system, they fulfill this condition. Whether or not cryptocurrencies are recognized as electronic money is important because the relationship between digital currencies and legal currencies can be through electronic money, and whether or not they are recognized as electronic money has an impact on the acceptance of cryptocurrencies as money. To date, cryptocurrencies have been recognized as Turkish are not recognized as money in the legislation or in the legislation of another country. Therefore, it is not possible to consider cryptocurrencies as currency or foreign currency.

- Cryptocurrencies as Commodities: Another option in terms of cryptocurrencies is to recognize them as meta-commodities. In terms of taxation, many countries recognize cryptocurrencies as commodities. Even China considers these currencies as virtual goods. As is well known, a commodity is a general term for tradable goods, such as gold, silver, copper, wheat, barley, corn, oil, natural gas and minerals that have such a value. Virtual goods are only goods that can be sold in the virtual economy on the internet. The fact that cryptocurrencies interact with legal currencies in exchange centers and exchanges specifically designated for them brings them closer to the concept of commodities, while they have no real value.

- Cryptocurrencies as Securities: For cryptocurrencies to be considered securities, they must be certain to represent certain shares or be borrowed from the markets through instruments such as treasury bills, income trust securities, government bonds, corporate bonds, and invoices used by public or private sector organizations to borrow money. However, cryptocurrencies such as Bitcoin do not represent

private shares and cannot be used as borrowing instruments. Therefore, it is not possible to recognize cryptocurrencies as securities.

2.3. Common Characteristics of Cryptocurrencies

The most important feature of blockchain technology is that it has a decentralized authentication system. In this respect, it has been shown to be one of the most effective areas of digital transformation. Blockchain, which can act as a digital record repository, is a valuable technology that can be applied in a wide range of areas, from evidence and records of instruments and valuables to the collection and realization of birth, marriage and death certificates. Furthermore, blockchain technology gives digital users unprecedented control over individual users. Therefore, blockchain, a globally open ledger, is used not only in the production of cryptocurrencies, but also in many other areas such as storage, management, etc. Its ability to provide digital identity makes it the key to trust in the economy (Dilek, 2018: 12).

Although the characteristics of cryptocurrencies that emerged and implemented in a short period of time cannot be given holistically, it can be said that there are some main features. In this framework, the common features of all cryptocurrencies that are known and considered important are as follows (Durdu, 2018: 20-29).

- Open Source Coding: Almost all cryptocurrency systems are open source software. Bitcoin is an open source software system with no commercial enterprise behind it, but it is built from open source software developed to support a company. Any individual or group who wants to download the source code of this software to their own computers can perform the functions they want to create their own cryptocurrency. In order to adopt an open source structure, it would not be wrong to say that the main purpose of cryptocurrencies is to benefit from being open source software.

- Cryptography: The most obvious feature of cryptocurrency structures is the extensive use of cryptographic techniques. These cryptographic techniques are used in the production of currencies, the movement of user accounts, and the security of the data structures called blockchains

or ledgers where all these transactions are recorded. Encryption techniques, the most widely used in currencies, are broadly categorized into four classes. Hash functions, symmetric key cryptography, public key cryptography and digital signature techniques with applications.

- Hash Function: A hash function is an algorithm that outputs a randomized size of data as input and produces a hash value output with a fixed length bit string. In other words, the same input always gives the same hash value. Regular hash functions can produce the same hash value for different inputs, but the hash values must show a regular distribution. They are subject to stricter requirements than regular hash functions, so that secure or cryptographic hash functions do not produce the same hash value for different inputs.

- Symmetric Key Encryption: Symmetric key encryption is an encryption technique that uses the same encryption key to encrypt or decrypt plaintext. The encryption and decryption keys can be slightly differentiated. Since the symmetric key acts as the common secret key for the parties wishing to communicate, it is shared by a secure channel prior to communication. However, this secure channel may not always be available in electronic commerce over the Internet.

- Public Key Encryption: Public key encryption or asymmetric key encryption is an encryption technique developed in the 1970s to improve the weakness of symmetric key encryption. In public key encryption, instead of a single password, the key that decrypts the message, called the secret-private key, is different. In this technique, only the private key must be stored. Only symmetric keys are generated by public-key encryption and public-key encryption cannot be used for communications. This is because public key encryption is several times slower than symmetric key encryption and the message size is larger.

- Digital Signature: An alternative application of public key cryptography is the digital signature system. A digital signature is obliged to fulfill the following three functions.

- To verify that the message in question belongs to the signer.

- To ensure the integrity of the message, in other words, to ensure that the message cannot be tampered with.

- To reject the claim that the message was not sent by the signatory.

- Lack of a Center: Traditional currencies are managed and legally protected by the country's central banks or financial institutions that perform the same function. Cryptocurrencies, which are designed on the basis of the absence of honest third parties/intermediaries, have no central government and no control unit. For this reason, they are referred to as decentralized systems.

- Anonymity: Anonymity in cryptocurrency means that users can enter the system and make money transactions without having to reveal their real identities. Anonymity also includes not accessing the real identities of the people making the transaction based on the records available in the system. The anonymity provided by cryptocurrencies provides relative privacy. In virtual currency structures such as Bitcoin, the addresses that users use for money transactions allow for greater pseudonymity (username) anonymity.

- Other Features: Other features include ecosystems created by cryptocurrency systems in their environment, blockchain architecture accessible to users, mining, money supply and irreversibility of transactions.

2.4. Legal Framework of Cryptocurrencies

Bitcoin's rules are designed by engineers who are clearly not influenced by lawyers or legal regulators. Instead of storing transactions on any single server or set of servers, Bitcoin is based on a transaction log distributed across a network of participating computers. It includes mechanisms to reward honest participation, initiate the adoption of early adopters, and protect against power concentrations (Böhme et al. 2015: 213). In the absence of a legal framework, the creators of this technology have created different rewards and mechanisms to ensure honesty and to ensure that it is not used for illegal activities.

In fact, there are countries where cryptocurrency is legal. While the US has the largest number of cryptocurrencies and users, the US recognizes cryptocurrency as legal. Many countries are watching the consequences of the US attitude and approach to the legalization and regulation of this system. According to the US position, many countries are planning to implement this system by making regulations on the cryptocurrency market. However, apart from the US; Australia, the UK, Algeria, Estonia, Finland, Finland, South Korea, the Netherlands, Iceland, Iceland, Sweden, Switzerland, Jamaica, Jamaica, Japan, Canada, Mexico, Nicaragua, Norway, Thailand, and the number of countries that accept cryptocurrency legally is increasing day by day. Countries that recognize cryptocurrency systems as illegal are Bangladesh, Bolivia, Ecuador, Kyrgyzstan, Nepal. In addition, the European Union and its member states generally consider cryptocurrency as a non-illegal system (Kenger and Tokmak, 2018: 4701).

Considering the legal status of cryptocurrencies in the European Union countries, only four out of 28 European Union countries recognize cryptocurrencies. Of the remaining 24 countries, 13 (Bulgaria, Ireland, Greece, France, Cyprus, Cyprus, Lithuania, Latvia, Hungary, Hungary, Netherlands, Austria, Portugal, Romania, Romania, Slovakia) do not take any position on Bitcoin. The European Union countries that legally accept crypto are Germany, Estonia, Sweden and the United Kingdom. The German Ministry of Finance considers Bitcoin to be a financial instrument or unit of accounting rather than a legally valid currency. The Estonian Central Bank and Ministry of Finance have adopted cryptocurrencies as an alternative payment method instead of currency. It is not illegal to sell or buy Bitcoin and sees these funds as an alternative means of payment for entrepreneurs. In Sweden, the Tax Agency does not recognize Bitcoin as a currency because it is not linked to any central bank, but argues that it should be classified as another asset. The Bank of England has a very theoretical approach to Bitcoin (Serçemeli, 2018: 55).

Until the 1980s, the Turkish economy operated under interventionist government policies, adopting a self-contained economic model centered on an import-substitution industrialization strategy (Akbulut and Karhan, 2019). Ensuring macroeconomic stability is important for an effectively functioning financial system (Karhan, 2019). There is no official regulation of the digital currency system in Turkey. This situation causes the system not to be considered

illegal. The electronic currency in Turkey, which is covered by the Law No. 6493 enacted by the Banking Regulation and Supervision Agency on 27.06.2013, obliges the issuance of digital currency and keeping the funds equivalent to this money in a fixed account, which is contrary to the functioning of the currencies of cryptocurrency systems. Therefore, the government declared on 25.11.2013 that cryptocurrency systems are not recognized as electronic money due to the risks involved. In this context, the report presented by the IMF in 2016 concluded that the concepts of digital, virtual and cryptocurrencies should be kept separate as types of electronic money. As of today, the licensed companies are listed as Belbim, Birleşik Ödeme, CMT, D Ödeme, Papara, Turkish Electronic Money and Wirecard. Instead of a new currency, these companies offer a PayPal-like, centralized and prepaid service, and these features work differently from cryptocurrency models (Kenger and Tokmak, 2018: 4702).

In other words, in terms of cryptocurrency, it is observed that there is nothing in the Law on the Protection of the Value of the Turkish Currency that prevents the use of virtual currency. Law No. 1567 on the Protection of the Value of the Turkish Currency covers the principles and sanctions envisaged in the protection of the value of the Turkish currency. In this decision of the Council of Ministers, there are regulations on Turkish currency, foreign exchange, precious metals, stones and goods, securities and immovable securities, loans, non-cash loans, collaterals related to guarantees, export and import regimes. The Decision does not contain an appropriate provision for the use of cryptocurrency (Durdu, 2018: 56).

3. Cryptocurrencies

Although it is not clear how many types of cryptocurrencies exist today, it is estimated that there are more than 1000 types of cryptocurrencies, with a small number of cryptocurrencies actively used and reaching a certain number of users.

Table 1: Cryptocurrencies and usage rates

Cryptocurrency	Launch Year	Founder	Description	Usage Rate
Bitcoin (BTC)	2009	Satoshi Nakamoto	The first cryptocurrency, known as digital gold, a decentralized payment system, and a valuable investment asset.	**Most widely used cryptocurrency**, largest market cap, mostly used for investment purposes.
Ethereum (ETH)	2015	Vitalik Buterin	A platform for smart contracts and decentralized applications (dApps), Ethereum's native token.	**Very widely used**, commonly used for smart contracts and decentralized applications, has a large DeFi ecosystem.
Binance Coin (BNB)	2017	Changpeng Zhao	The native token of the Binance exchange, used to reduce trading fees within the Binance ecosystem.	**High usage**, especially for transactions on Binance exchange.
Ripple (XRP)	2012	Chris Larsen and Jed McCaleb	A digital payment solution for international money transfers, commonly used by financial institutions.	**High usage**, especially for international transfers between financial institutions.
Cardano (ADA)	2017	Charles Hoskinson	A research-driven platform for smart contracts and decentralized applications, ADA is the token of this platform.	**Moderate usage**, mostly used for investment purposes, but the Cardano ecosystem is growing.
Solana (SOL)	2020	Anatoly Yakovenko	A platform for high-speed and low-cost transactions, offering a solution for decentralized applications.	**High usage**, popular due to speed and low transaction fees, widely used in DeFi and NFT projects.
Polkadot (DOT)	2020	Gavin Wood	Provides interoperability between different blockchains, enabling communication across them.	**Moderate usage**, Polkadot is an emerging ecosystem, used for cross-chain interactions.
Litecoin (LTC)	2011	Charlie Lee	Similar to Bitcoin but offers faster transaction confirmations and lower fees, known as "Bitcoin's silver."	**Moderate usage**, primarily used as a payment method, but not as popular as Bitcoin.
Chainlink (LINK)	2017	Sergey Nazarov	A decentralized oracle network that provides real-world data to smart contracts.	**High usage**, plays an important role in DeFi projects, widely used in smart contracts.
Dogecoin (DOGE)	2013	Billy Markus and Jackson Palmer	Originally created as a joke, Dogecoin gained a large community and value due to social media influence.	**High usage**, has a large user base due to social media and celebrity influence, also used as a payment method.
Shiba Inu (SHIB)	2020	"Ryoshi" (anonymous group)	Started as a meme coin but has evolved to integrate into decentralized finance (DeFi) projects and build its own ecosystem.	**High usage**, popular due to meme coin culture and social media influence, also used in DeFi projects.
Avalanche (AVAX)	2020	Emin Gün Sirer	A high-performance blockchain platform known for fast transaction times and low fees. AVAX is the token of this platform.	**Moderate usage**, used for fast and low-cost transactions, popular in DeFi projects.

Usage Rate Explanations:

- High usage: This cryptocurrency has a large user base and is widely used for both investment and everyday transactions. It is commonly used for trading, payments, smart contracts, DeFi projects, and other applications.

- Moderate usage: This cryptocurrency has a relatively smaller but growing user base. It is mainly used for investment purposes or in specific use cases.

- Low usage: This cryptocurrency may not have widespread adoption yet, but it may still be followed by investors and has potential for growth in the future.

As can be seen in Table 1, the Bitcoin virtual currency takes the first place among the currencies used in the market. It is very valuable in terms of its current value compared to other currencies and is clearly superior in terms of market capitalization. In other words, Bitcoin has more volume than any other currency in the market. In this context, detailed information about the top three virtual currencies, Bitcoin, Ethereum and Ripple, is provided below. This will give an idea of the general functioning of all virtual currencies.

3.1. Bitcoin (BTC)

Within blockchain technologies, cryptocurrencies such as Bitcoin, Litecoin and Ethereum have attracted significant attention in recent years. To date, Bitcoin is the most important and popular of the blockchain-based cryptocurrencies. Cryptocurrencies such as Bitcoin are a new digital currency system based on computer cryptology and built on a decentralized (peer-to-peer) network architecture. Bitcoin transaction values reached 92 billion dollars in 2016 (Li and Wang, 2017: 49). According to another definition, Bitcoin is a digital currency that provides a secure and low-cost platform for electronic payments. The rapid growth of the Bitcoin network, along with some of the currency's unique features, has caused governments to take notice. Some governments have taken steps to ban their citizens from transacting in Bitcoin (Hendrickson et al. 2016: 927).

Bitcoin, the most popular virtual currency, was created in 2009 by Japanese programmer Satoshi Nakamoto. It is the first open-source virtual currency as it is governed by an open-source software algorithm that uses the global internet network to create Bitcoins. As a cryptocurrency, Bitcoin uses cryptographic principles to control the creation and exchange of Bitcoins. Bitcoins can be stored in local wallets (e.g. personal computer, smartphone) or in an online wallet using open-source software (Ciaian and Rajcaniova, 2016: 888).

3.2. Ethereum (ETH)

Developed by the Switzerland-based Ethereum Foundation, Ethereum is a decentralized platform that operates Smart Contracts and uses its own Turing-Complete programming language. Activities on this platform run programmatically, without disruption, tight control, fraud or third-party interference. These activities run on Blockchain, a highly powerful global infrastructure that exchanges a value and represents ownership of an asset. This enables markets to emerge, debt records and commitments to be kept, and funds to be transferred without the risk of intermediaries or counterparties. Officially launched in 2015, Ethereum is popular among many developers and business players (Aslan, 2018: 10).

Although Ethereum looks like an altcoin, it is a digital currency because of its many different characteristics. It was founded by Vitalik Buterin, Charles Hoskinson, Anthony Diorio and Gawin Wood. This virtual currency, planned based on the idea of Bitcoin, has many features different from Bitcoin. It uses a more advanced system than Bitcoin. They also create the verification process with a different algorithm. The Ethereum algorithm is called “Ethash”. The block time is intended to be faster than Bitcoin. In terms of development, Ethereum supports developers, while change in Bitcoin is more limited (Kesebir and Günceler, 2019: 616). The structure of this virtual currency uses trustless smart contracts and provides a suitable environment for applications that facilitate coordinated group actions in a network. For example, peer-to-peer market coordination or the automation of complex financial contracts are examples of applications that can be used on the Ethereum platform. Also, the currency used in the Ethereum system is called ether. Ethereum, which ranks second among cryptocurrencies in terms of market share after Bitcoin, currently has a market value of approximately 70 billion US dollars (Durdu, 2018: 85).

3.3. Ripple (XRP)

Ripple (XRP) was launched in 2012. Unlike other cryptocurrencies based on Bitcoin, Ripple does not use blockchain technology. In this respect, Ripple is almost completely independent of Bitcoin. Although based on a distributed settlement protocol, Ripple's current distribution is managed by Ripple Labs. Supplying 100 billion units, Ripple has 20% of Ripple's founders and 25% of Ripple Labs. The remaining 55% is allocated for the distribution of the network. All ledgers in Ripple are seamlessly closed from the beginning. With Ripple, up to 1500 transactions can be made per second and payments can be made at a very high speed (4 seconds). Ripple is favored by large banks and other institutional actors providing financial services. Ripple acts as a bridge between currencies that are rarely traded and prevents virtual attacks (Aslan, 2018: 10).

Ripple is the third largest cryptocurrency on the market. Although Ripple is lower than the others, it has seen a rapid increase in 2017. Thanks to this surge, its founder, Chris Larsen, became the 14th richest person in the world. With the rapid progress of the company, Larsen earned $14 billion from this increase. Ripple's main goal is to facilitate payments between banks and customers. In other words, banks transfer money at a very low cost. Ripple has cheaper transaction costs than Bitcoin, charging US$0.0011 per transaction. The transferred funds can be on the other side within 5 to 10 seconds. In addition, banks and senders can check transfers instantly. Bitcoin has a market share of $41.6 billion, Ethereum 22.8 and Ripple 11.5 billion (Kesebir and Günceler, 2019: 616).

In addition, the modern Ripple network is able to manage not only digital assets or cryptocurrencies, but also all kinds of assets, including precious metals or parcels, through the network. The database that Ripple uses is described as a ledger. In this data system, all account holders have balances and credit limits. . In addition, all transactions, such as Bitcoin, are also protected. Account balances on the Ripple network can be held in XRP, currency or other digital assets. The Ripple protocol offers a distributed exchange. The Ripple protocol also allows for the creation of different digital assets, such as a new currency supply (Durdu, 2018: 85-86).

3.4. Other Currencies

After the announcement of the virtual currency Bitcoin, especially in 2013, the number of cryptocurrencies increased rapidly. Today, there are approximately 1591 of them. The main reason for the introduction of so many cryptocurrencies is undoubtedly the success story of Bitcoin. Moreover, the Bitcoin system is open source software, giving developers the opportunity to pursue new projects in the currency, adapting the code to their own projects. Currencies that are forks of the Bitcoin currency structure are called alternative cryptocurrency altcoins. In addition, cryptocurrencies with a completely new software architecture are referred to as metacoins (Durdu, 2018: 82-85).

3.5. Altcoins

Litecoin (LTC): Litecoin, a peer-to-peer internet currency, was invented in 2011 by a former Google employee. Compared to Bitcoin, it is characterized by fast storage efficiency and confirmation of money movement in as little as 2.5 minutes. The system applies a decoding algorithm that requires less memory space for proof-of-work. As of today, it has a cryptocurrency market share size of USD 9 million.

Peercoin (PPC): Announced in 2012, Peercoin uses proof-of-work and proof-of-risk algorithms as the method of adding blocks. In this structure, blocks added with proof of work are different from blocks added with proof of stake. There is no upper limit for the money supply in its structure and as of today, 68 million USD Peercoin is in the market.

Namecoin (NMC): Namecoin, known as the first fork of Bitcoin, is a decentralized, trusted, censorship and privacy-sensitive data structure for internet infrastructure components such as DNS. However, as a cryptocurrency, Namecoin uses a method called merge mining, which, unlike Bitcoin, allows you to add blocks to multiple blockchains simultaneously. Other features of Namecoin are the same as Bitcoin.

3.6. Metacoins

Counterparty (XCP): Counterparty, a metacoin based on the Bitcoin blockchain, enables digital asset creation and data stream publishing. With these capabilities, it creates a distributed cleansing infrastructure and enables the trading of digital objects and betting and contracts for difference based on the published data stream. This virtual currency, which has a market capitalization of approximately USD 55 million as of today, entered the market on January 2, 2014.

Other Blockchain Applications: The blockchain technology that Bitcoin and other virtual currencies have creates a variety of potential uses. These are listed as follows.

- Smart Protocols
- Digital Assets
- Crowdfunding
- Smart Ownership
- Micropayments
- Digital Notary

4. Overview of Cryptocurrency in Turkey

In Turkey, the number and diversity of businesses accepting Bitcoin is increasing. In Turkey, the virtual currency has started to be accepted especially in sectors such as real estate, restaurants and education. Crypto-intermediary users in Turkey are exchanging money, especially to protect against currency exchange rate risk, BTCTürk money exchange shows that businesses are making efforts to pay with Bitcoin in e-commerce and shopping areas. The impact on cryptocurrencies and Bitcoin technology stocks in the international arena should rise along with Turkey's attempt to move beyond the individual interests of these initiatives. As an example, Akbank has started using Bitcoin technology to make international money transfers easier (Dilek, 2018: 16).

5. Advantages and Disadvantages of Cryptocurrency

Cryptocurrencies have their advantages and disadvantages. Therefore, while some countries legally use virtual currencies, some countries prohibit the use of virtual currencies. The positive and negative aspects of cryptocurrencies in general are described in detail below.

5.1. Advantages

There are many advantages of using cryptocurrencies. For example, transactions are fast, they are cheap in terms of transaction costs, they cannot be confiscated by governments because there is no dependence on centralized governments. There is no possibility to stop or reverse the transaction and your payment information cannot be taken or shared by anyone. Cryptocurrencies are easier to store thanks to the blockchain and do not cause security issues, there is no need for a bank to store it, it is a currency where the absolute owner is the user. With cryptocurrencies, it is possible to make transactions without intermediaries and without trust. These transactions are transparent and can be seen instantly. In addition, the risk of inflation in cryptocurrencies is low, the increase in the supply of real money in circulation causes inflation, while this is not the case with cryptocurrencies. Comparing cryptocurrency with traditional money, the risk of cryptocurrency collapse is low. While the collapse of real currencies was caused by hyperinflation from governments, cryptocurrencies are not tied to a central authority. While traditional money relies on physical money for security purposes, the verification of transactions in electronic money and the protection of confidentiality and data integrity are provided by cryptography (encryption). Electronic money is not physically changed manually and remote payments can be made easily (Kenger and Tokmak, 2018: 4700).

In short, cryptocurrencies offer users advantages over traditional currencies. The advantages of cryptocurrencies are generally summarized as follows (Hendrickson et al. 2016: 928).

- Cryptocurrencies largely operate outside traditional financial institutions and without regard to national borders. Therefore, many users circumvent the existing regulatory framework.

- There is no disclosure, reporting and investigation of large transactions when transacting with cryptocurrencies. Regardless of the origin, there is no distinction between sending funds to Arkansas or Afghanistan.

- Furthermore, users in the system can only be identified by their virtual address. Cryptocurrency intermediaries require users to link their cryptocurrency address to a traditional bank account. However, it is not possible to use cryptocurrencies without creating an account with these intermediaries.

- Users can receive and transfer cryptocurrencies without even identifying themselves in the physical world. Therefore, cryptocurrencies can be said to enable non-fraudulent exchange.

- Cryptocurrencies are processed through a distributed network, so there is no centralized entity in the system. The relative importance of a user is determined by the amount of computing power they provide to the system, and a single user is not required for the transaction.

In summary, Bitcoin is used in an environment with a fully centralized architecture with no single central point of trust, and double spending is not possible. The Bitcoin ecosystem is ingeniously designed so that users can contribute to it. The Bitcoin money supply is designed to grow predictably and steadily. Bitcoins can be divided and exchanged. It is designed to be completely transparent and clear. The Bitcoin structure allows for the development of different financial contracts and mechanisms in the future. Bitcoin processes are irreversible, providing different security benefits. Transaction fees are very low and provide a great advantage especially in international money transfers (Serçemeli, 2018: 49).

5.2. Disadvantages

One of the biggest disadvantages is the acceptance of the system, while many private businesses recognize cryptocurrency and make transactions with it, there are also a large number of institutions and organizations that do not trust cryptocurrency and therefore do not use it. Since the use of cryptocurrency has a much lower usage rate than real money, it can cause a very small fluctuation in

the number of cryptocurrencies and small events. This makes it difficult to identify the trends of cryptocurrency users. It is not possible to find a legal interlocutor for the problems that arise, as there is no government that fully recognizes cryptocurrencies. In addition, due to the constant updates to the electronic platforms where cryptocurrencies are traded, it is a problem that users do not follow the system and platforms closely. The biggest danger of password encryption is the possibility that the money in this system could be banned by governments, because they are open to money transactions. If this happens, the money could be lost or even devalued. In addition, financial institutions such as banks become a tax front for governments. The government is increasing pressure on such financial institutions to provide information on account holders that exclude taxes on financial accounts and tax authorities around the world.

Earnings in cryptocurrency systems are not taxable and the anonymity of taxpayers does not allow them to obtain information about taxpayers. This is a disadvantage for governments. On the other hand, the fact that cryptocurrencies are not linked to financial institutions makes governments unable to obtain information on overseas tax evasion. In this context, by increasing the popularity of cryptocurrencies, it is possible for tax evaders to choose cryptocurrencies more effectively than traditional tax evasion by using offshore bank accounts that are considered tax havens. States cannot impose any sanctions due to the secrecy and untraceability of cryptocurrency (Kenger and Tokmak, 2018: 4700-4701).

However, the fact that some states want to take measures to prevent or prevent the use of cryptocurrencies are the disadvantages of cryptocurrencies. The negative features of cryptocurrencies in general can be listed as follows (Hendrickson et al. 2016: 930-932).

- Cryptocurrencies prevent a government from fulfilling its assigned tasks, such as setting monetary policy or raising revenue.

- Traditional financial accounts can be frozen if parties to a transaction engage in illegal activities. Payments made on traditional networks can be reversed. Traditional account holders are easy to identify in the physical world. In contrast, in cryptocurrency systems, accounts cannot be frozen, transactions cannot be reversed and account holders are not

easy to identify. Therefore, cryptocurrencies can be used to conduct illegal transactions.

- Similarly, there are around 50 known gambling sites that accept payments and pay with cryptocurrencies. The most popular of these sites allows users to send a bet to a unique address corresponding to a number between 1-64,000.

- In addition to drugs and gambling, some believe that cryptocurrencies can provide an effective tool for terrorist financing.

6. Conclusion

The Bitcoin currency emerged in 2009 and has survived to the present day, becoming one of the most popular cryptocurrencies in the virtual environment. Over time, as a result of being a preferred currency on the international platform, the Bitcoin economy or ecosystem has emerged. Accordingly, the purpose of this study is to examine the cryptocurrency Bitcoin conceptually for a better understanding of the currency and to investigate its place and future, especially in the financial sector.

After the conceptual framework of the cryptocurrency is given in the study, the functioning structure of virtual currencies specific to the Bitcoin currency and its impact on the sectors are examined in the study. Although the use of Bitcoin is very new, it does not have any legal status and there is a risk of being used in illegal transactions, it is preferred by the whole world and its use is increasing. This is because the speed, low cost and less risk that Bitcoin virtual currency carries as an alternative means of payment make the use of virtual currency attractive. In this respect, it is predicted that virtual currencies will become more widespread in the future and have the potential to become not only a means of transfer, but also an investment instrument and currency.

When the use of virtual currency and Bitcoin in Turkey is evaluated, it is seen that it is far behind the world in general. It is expected that the virtual currency, which is slowly being used, will gradually become widespread in Turkey. Turkish investors and users are distant from virtual currencies because they are afraid of being victimized due to the lack of a legal framework for the use of Bitcoin.

Some of the recommendations made within the scope of the study are summarized below.

- In order to prevent virtual currency users from being victimized, governments should take legal steps regarding blockchain technology and create a legal framework that will positively affect users.

- It is essential for Turkey to evaluate the opportunities and risks by encouraging research and development (R&D) activities related to virtual currency technology.

- Considering that the use of virtual currencies will increase gradually, the infrastructure and policies regarding the use of cryptocurrencies in Turkey should be developed by governments.

- There is a market for cryptocurrencies in the world and virtual currencies are considered as a commodity by some states and virtual currency transactions are subject to taxation. Therefore, Turkey should prepare its taxation policies on the use of virtual currencies in advance and put them into practice when appropriate.

- Supervision and control of the use of virtual currencies is on the agenda in the world. Turkey should take steps in this direction and it may be possible in the future for virtual currencies to be issued through the Central Bank.

In summary, Bitcoin is a reliable store of value and a means of payment without intermediary information with minimal access to the international market. Alongside these advantages, it is a new technological product that is still new and unproven, not widely accepted, has legal loopholes and is vulnerable to volatility. Among the opportunities inherent in this product, perhaps the most important is as a way of ensuring trade stability for countries all over the world. The most serious threat, however, is the unpredictable unknowns in this new system.

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INEQUALITY OF INCOME DISTRIBUTION: A COMPARATIVE ANALYSIS FOR DEVELOPED AND DEVELOPING ECONOMIES

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Abstract

This study examines the changes in income distribution across selected countries from 2015 to 2022, with a focus on the significant impact of the Covid-19 pandemic (2020-2021) on global income distribution. The data used in this analysis was sourced from the World Inequality Database, specifically looking at household income adjusted for after-tax earnings. Each household's income was allocated among adults aged 20 and older. The data were organized into ten income groups, creating ten distinct income levels for comparison. The study includes ten countries comprising five developed countries, namely; France, Germany, Netherlands, Italy, and the United Kingdom and five developing countries, namely; Czechia, Hungary, Romania, Greece and Turkiye. The analysis spans the eight-year period from 2015 to 2022. All countries implemented various social programs to support those people most affected by the Covid-19 pandemic. Developed countries generally succeeded in protecting and restoring their pre-pandemic income distribution. In contrast, developing countries faced challenges with their social programs. Although the developing countries were successful in increasing their overall national income, they struggled to restore their pre-pandemic income distribution. An income

transfer occurred from the bottom 20% and the middle 60% to the top 20% in these developing nations. By 2022, the average income per capita for the bottom 10% in developing countries was $9,500 while the top 10% was $141,000 resulting in a 14.8-fold difference. In developed countries, these figures were $25,700 for the bottom 10% and $160,400 for the top 10%, yielding a 6.2-fold difference.

Keywords: *Income Distribution, Income Deciles, Income Inequality, Developed Countries, Developing Countries*
JEL Codes: *D3, O15, E64*

1. Introduction

Income inequality has long been a critical issue in both developed and developing countries, and that significantly impacts social stability and economic growth. The Covid-19 pandemic, which began in late 2019 and escalated globally in 2020, has worsened the problem by disrupting economies and deepening existing inequalities. In response, governments around the world have implemented various social policies and programs aimed at mitigating the pandemic's economic impact, protecting vulnerable populations, and maintaining equitable income distribution. This study seeks to analyze changes in income distribution in selected countries between 2015 and 2022, with a specific focus on the effects of the Covid-19 pandemic. The study hypothesizes that the pandemic has disrupted income distribution with varying degrees of recovery success observed across different countries. By obtaining income data from the World Inequality Database, the study compares changes in income distribution between five developed countries, namely; France, Germany, Netherlands, Italy, and the United Kingdom and five developing countries, namely; Czechia, Hungary, Romania, Greece and Turkiye. The analysis covers an eight-year period capturing the pre-pandemic, pandemic, and post-pandemic eras. Through this comparative approach, the study aims to light on the effectiveness of social policies in mitigating income inequality and the resilience of different economies in restoring equitable income distribution. The following section reviews the related literature. Then, the dataset and related analysis and findings are presented. The final section covers the concluding remarks.

2. Literature Review

In their research Qian & Fan (2020) examine the economic impact of Covid-19 in mainland China using data from March-April 2020. They find that income losses are mitigated by factors like level of education, family economic status, and state-sector employment. Those in harder-hit regions or families face greater income declines. The study concludes that Covid-19 exacerbates existing inequalities and creates new disparities recommending public policies to support vulnerable and marginalized populations for recovery.

Han et al. (2020) examine the economic impact of Covid-19 on U.S. income and poverty using high-frequency data from the Basic Monthly Current Population Survey (CPS). They validate these timely income measures against historical data and find that government policies at the pandemic's onset effectively countered income loss, reducing poverty and increasing incomes at lower percentiles across various demographics. Simulations show that the poverty reduction can be fully attributed to increased government assistance such as unemployment benefits and economic impact payments. However, the distribution of unemployment insurance varied by state, with some states initially failing to reach many unemployed residents.

Qian and Fan (2020) examined the economic impact in Mainland China, discovering that education, family economic status, and state employment helped mitigate income losses. They concluded that Covid-19 exacerbated existing inequalities and recommended public policies to support vulnerable populations during recovery.

Wildman (2021) investigates the link between income inequality and Covid-19 outcomes in OECD countries using cross-sectional regression and the Gini coefficient. The study finds that a 1% increase in income inequality corresponds to a 4% rise in Covid-19 cases and a 5% rise in deaths per million. The research indicates that higher income inequality worsens Covid-19 outcomes due to socioeconomic disadvantages, highlighting the need to address these disparities.

Alon et al. (2023) analyzed why emerging markets faced more severe macroeconomic impacts than advanced countries using a model that considered factors like lockdown measures and healthcare capacity. They found that a high share of employment in socially interactive jobs and limited public transfers

forced vulnerable households to work during the pandemic. Conversely, low-income countries fared better due to younger populations and larger agricultural sectors.

Bayar et al. (2023) analyze the economic and social costs of Turkiye's modest growth during the pandemic, despite a global output contraction of 3.5% in 2020. They use TurkStat's 2017 data to estimate 2020 income and living conditions based on changes in sectoral output and employment. Their findings emphasize the need for substantial fiscal support such as short-term working allowances and direct cash assistance to mitigate pandemic-related losses and improve income distribution.

Petrakos et al. (2023) analyze the impact of the 2007–2009 Great Recession and the Covid-19 pandemic on income inequality and poverty in Greece. They find that both crises worsened inequality and poverty with growth disproportionately benefiting the wealthy. Inequality rises with unemployment and decreases with a higher share of wages in total income, stressing the importance of labor market regulations. Pre-election periods temporarily reduce inequality, mainly benefiting the middle-income bracket due to political budget cycles. Using EU - SILC data they conclude that the country's response to the shock was harmful for disadvantaged groups.

Acevedo et al. (2024) studied inequality in Latin America during Covid-19 and found a 2% rise in inequality from 2019 to 2020 influenced by gender, location, and sector. Government transfers helped reduce disparities in some areas, although employment declines increased overall inequality.

The current literature reviwing the effects of Covid-19 pandemic on the income distribution of various countries generally states that the income distribution is distorted by the Covid-19 and low-income and unemployed groups are negatively affected most. However, the literature has yet to cover the distorted income distribution among the groups of developing and developed countries. Hence, this study intends to fulfill this deficiency of the literature. Table 1 below summarizes the current literature about the income distribution.

Table 1: Summary of most recent literature

Study	Countries	Dataset	Period Covered	Methodology	Results
Arndt et al. (2020)	South Africa	Input Output tables	2019	Social Accounting Matrix	Covid-19 had negative implications for the factor distribution of income in South Africa.
Baena-Diez et al. (2020)	Spain - Barcelona	Family Available Income per capita	2020	Spearman rho	Covid-19 incidence in Barcelona's districts inversely correlated with mean income highlighting the need for targeted health strategies in the most deprived areas.
Carta, F & De Philippis, M (2021)	Italy	Labor Force Survey	2020	Simulations	Italy introduced social insurance benefits to compensate for income losses.
Clark et al. (2021)	France, Germany, Italy, Spain	COME-HERE data	2020-2021	Generalized Lorenz Curves	Covid-19 income-support policies have prioritized assistance for lower-income groups over equal compensation across all income levels.
Shen et al. (2021)	China	City-level income data from CEIC	2019-2020	Distribution dynamics	Regional income inequality increased in cities with long-lasting stringent social distancing policies during COVID-19, but disappeared in cities with shorter policies.
Wildman (2021)	OECD Countries	ECDC, World Bank	2020	Cross-sectional regressions	Countries with high level of income inequality have performed significantly worlse when dealing with Covid 19.
Li et al. (2022)	Australia	Longitudinal Labor Force Survey, Survey of Income and Housing, Administrative Payroll Data	2020	Decomposition	The results support that the ffectiveness of temporary policy measures both in maintaining living standards and avoiding increases in income inequality.
Astariata, C.&vAlcidi, C. (2022)	Denmark, Estonia, Greece, Ireland, Italy and Portugal	EU Labor Force Survey	2020	Transition Matrices	Employee income mobility increased during the Covid-19 compared to the 2019 pre-pandemic period and the financial crises with a notable worsening for women, young workers, and those without higher education.
Su et al. (2022)	74 Countries	World Bank, Global Burden of Disease	2020	Cox Proportional Hazards regressions	Countries with more unequal income distribution carried a higher burden.
Alon et al. (2023)	World	Penn World Tables, ILO Statistical Database	2019-2020	Calibration model	Emerging economies suffered more from Covid-19.
Oyenubi (2023)	South Africa	National Income Dynamic Study	2020	Decomposition	They found that polarisation was stronger in vulnerable groups.
Bayar et al. (2023)	Turkiye	Income and living conditions survey	2020	Gini coefficient	The short run working allowance policy played an important role to improvethe income distribution.
Acevedo et al. (2024)	26 Latin American Countries	Household and Employment Surveys	1992-2020	Panel regression	Covid-19 caused a rise in unemployment and an increase in inequality.

3. Data and Analysis

3.1. Dataset

In this study, the data obtained from the World Inequality Database examines the income distribution of various countries from 2015 to 2022. The post-tax household income data for the age of 20 or more is used. This dataset offers a clearer picture of the actual income available to households after taxation. The analysis focuses on income distribution in ten different countries; five developed countries, namely; France, Germany, Netherlands, Italy and the United Kingdom and five developing countries, namely; Czechia, Greece, Hungary, Romania and Turkiye. An accurate and complete representation of disposable income, the household income is distributed among the adult population, defined as individuals aged 20 and older. This approach enables us to categorize household income into deciles, that is ten equal income groups used in this study. Then, the shares of total income are computed that each decile receives. That provides an easily observable view of income distribution across different segments of the population. Determining the impact of the pandemic on income distribution by solely examining the Gini coefficient is challenging. To gain an easy understanding, this paper analyzed income distribution among 10% deciles. Later, the three main income groups are defined as the bottom 20%, the middle 60%, and the top 20%. This categorization allowed us to observe shifts in income among these groups and determine the effects of the pandemic.

Table 2 below shows the data statistics. There are 80 observations for each country. Min, max, mean, median, standard deviation, skewness and kurtosis values of each data set can be viewed on Table 2.

Table 2: Data statistics

	Country	# Obs	Min	Max	Mean	Median	SD	Skewness	Kurtosis
Developing Countries	Czechia	80	14.513	115.047	44.250	40.015	23.939	1,50	2,02
	Hungary	80	8.695	111.691	33.217	27.496	23.865	1,96	3,47
	Romania	80	4.214	140.274	37.608	27.787	33.549	1,84	2,85
	Greece	80	6.726	117.688	36.782	30.256	26.213	1,71	2,58
	Turkiye	80	5.983	220.064	41.775	23.477	55.239	2,49	4,84
Developed Countries	United Kingdom	80	23.981	149.191	52.953	42.243	31.538	2,01	3,23
	Netherlands	80	35.489	205.946	72.746	59.953	41.450	1,93	3,07
	Germany	80	23.381	196.801	62.647	49.029	43.305	2,06	3,46
	France	80	24.047	141.331	57.835	49.961	30.582	1,54	1,89
	Italy	80	4.114	157.140	47.065	36.462	34.769	1,81	2,78

The dataset is first tested for normality. The normality test results are presented below on Table 3. Shapiro-Wilk test, Anderson-Darling test and Jarque-Bera normality test are run for each country. The p values of all datasets are less than the critical values of 0.05. Therefore, it is concluded that the distribution of income deciles for all countries are not consistent with normal distribution as expected. Figure 1 and Figure 2 visiolize the income distribution of all countries. As the income deciles get higher from bottom 10% to top 10%, the observations divert from the normality line.

Table 3: Results of normality tests

Normality Tests	Czechia	Hungary	Romania	Greece	Turkiye	U. Kingdom	Netherlands	Germany	France	Italy
Shapiro-Wilk Test										
W	0,83797047	0,75686698	0,76978347	0,7959806	0,55247175	0,71162462	0,74031415	0,70618177	0,81627389	0,77514679
p-value	6,5256E-08	3,4725E-10	7,3451E-10	3,6683E-09	3,0864E-14	3,0502E-11	1,3804E-10	2,3172E-11	1,4002E-08	1,0107E-09
alpha	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05
Anderson-Darling Test										
A2	3,96289817	6,406839	5,9592207	5,27158345	14,6163534	8,03900332	6,94894027	8,10474285	4,37316994	5,93192515
p-value	5,8892E-10	7,2504E-16	8,6177E-15	3,92E-13	5,3609E-35	9,2986E-20	3,6546E-17	6,495E-20	5,9035E-11	1,0024E-14
alpha	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05
Jarque-Bera Test										
JB-critical	5,99146455	5,99146455	5,99146455	5,99146455	5,99146455	5,99146455	5,99146455	5,99146455	5,99146455	5,99146455
DF	2	2	2	2	2	2	2	2	2	2
p-value	2,0215E-09	0	5,107E-15	6,7024E-13	0	0	1,1102E-16	0	2,1586E-09	1,5654E-14
alpha	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,05

Figure 1: Normality Tests of Developing Countries

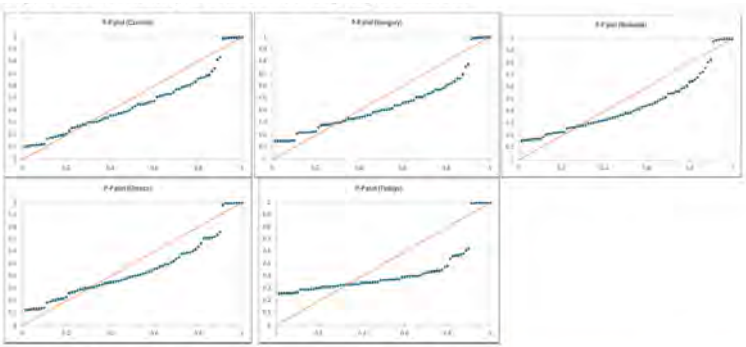
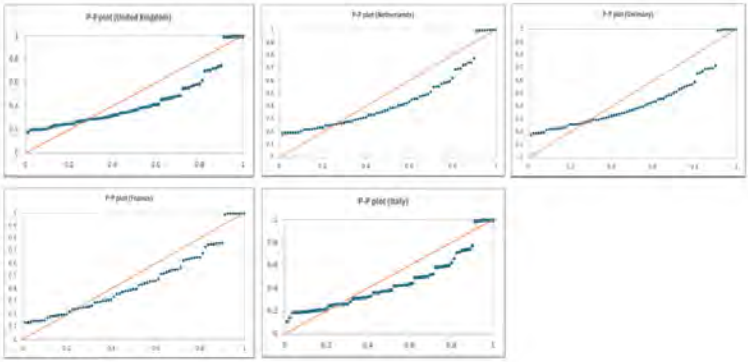


Figure 2: Normality Tests of Developed Countries



3.2. Analysis

Table 4 below presents the income groups by 10% deciles for five developing countries under investigation in this study. In the period of 2015-2022, Czechia increased its average income from $39,913 in 2015 to $46,768 in 2022 representing a total of 17.18% and an annual average of 2.15% increase. Hungary increased its average income from $28,765 in 2015 to $37,070 in 2022 representing a total of 37.07% and an annual average of 4.63% increase. Romania increased its average income from $31,324 in 2015 to $42,684 in 2022 representing a total of 36.27% and an annual average of 4.53% increase. Greece increased its average income from $35,834 in 2015 to $40,119 in 2022 representing a total of 11.96% and an annual average of 1.49% increase. Turkiye increased its average income from $38,408 in 2015 to $46,407 in 2022 representing a total of 20.83% and an annual average of 2.60% increase.

Table 4: Income Groups (10% Decile) – Developing Countries (Czechia, Hungary, Romania, Greece, Turkiye)

Income Groups	Czechia															
	2015		2016		2017		2018		2019		2020		2021		2022	
	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%
1 (Bottom 10%)	14.513	3,64	14.906	3,73	15.477	3,88	16.150	4,05	16.810	4,21	16.794	4,21	15.572	3,90	16.042	4,02
2	21.338	5,35	22.550	5,65	23.645	5,92	24.482	6,13	24.789	6,21	24.172	6,06	22.410	5,61	23.091	5,79
3	26.963	6,76	29.020	7,27	30.725	7,70	31.973	8,01	32.065	8,03	30.872	7,73	28.711	7,19	29.587	7,41
4	29.811	7,47	32.181	8,06	34.594	8,67	36.114	9,05	36.678	9,19	34.395	8,62	31.994	8,02	32.959	8,26
5	33.423	8,37	35.589	8,92	38.432	9,63	40.418	10,13	41.261	10,34	37.627	9,43	35.767	8,96	36.845	9,23
6	37.570	9,41	39.613	9,92	42.808	10,73	44.964	11,27	46.058	11,54	41.740	10,46	41.367	10,36	42.601	10,67
7	41.228	10,33	42.228	10,58	46.346	11,61	48.726	12,21	50.126	12,56	45.440	11,38	47.146	11,81	48.539	12,16
8	45.507	11,40	46.390	11,62	50.485	12,65	52.687	13,20	54.382	13,62	49.448	12,39	54.039	13,54	55.639	13,94
9	50.745	12,71	51.543	12,91	56.051	14,04	58.273	14,60	59.800	14,98	54.909	13,76	65.423	16,39	67.331	16,87
10 (Top 10%)	98.037	24,56	97.222	24,36	104.483	26,18	105.227	26,36	107.641	26,97	100.284	25,13	112.132	28,09	115.047	28,82
Average	39.913		41.124		44.305		45.901		46.961		43.568		45.456		46.768	

Income Groups	Hungary															
	2015		2016		2017		2018		2019		2020		2021		2022	
	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%
1 (Bottom 10%)	8.695	3,02	8.896	2,92	8.867	2,82	8.781	2,63	9.050	2,57	8.870	2,66	8.872	2,46	9.110	2,46
2	14.184	4,93	15.156	4,98	15.093	4,81	14.955	4,48	15.685	4,45	14.962	4,49	14.966	4,14	15.367	4,15
3	18.145	6,31	19.402	6,37	19.584	6,24	19.686	5,90	20.574	5,84	19.622	5,88	20.274	5,61	20.821	5,62
4	20.738	7,21	21.618	7,10	22.083	7,03	22.942	6,87	24.009	6,82	22.865	6,86	23.560	6,52	24.197	6,53
5	22.936	7,97	23.689	7,78	24.954	7,95	26.393	7,91	27.613	7,84	26.271	7,88	27.380	7,58	28.120	7,59
6	24.850	8,64	26.787	8,80	27.905	8,89	29.903	8,96	31.360	8,90	29.793	8,94	31.433	8,70	32.284	8,71
7	27.642	9,61	29.841	9,80	30.781	9,81	33.876	10,15	35.590	10,10	33.793	10,13	35.423	9,81	36.381	9,81
8	31.820	11,06	33.760	11,09	34.533	11,00	37.550	11,25	39.370	11,18	37.388	11,21	40.696	11,27	41.794	11,27
9	37.261	12,95	38.243	12,56	40.060	12,76	43.105	12,92	45.388	12,88	43.048	12,91	49.609	13,73	50.939	13,74
10 (Top 10%)	81.377	28,29	87.023	28,59	90.047	28,69	96.516	28,92	103.656	29,42	96.830	29,04	109.036	30,18	111.691	30,13
Average	28.765		30.441		31.391		33.371		35.230		33.344		36.125		37.070	

Income Groups	Romania															
	2015		2016		2017		2018		2019		2020		2021		2022	
	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%
1 (Bottom 10%)	4.214	1,35	4.586	1,42	4.894	1,38	5.177	1,38	5.857	1,43	5.684	1,45	5.661	1,37	5.836	1,37
2	8.397	2,68	10.640	3,30	11.189	3,16	11.255	2,99	12.799	3,12	12.203	3,11	12.156	2,94	12.531	2,94
3	13.057	4,17	16.050	4,97	16.933	4,78	16.685	4,44	18.794	4,58	17.870	4,56	17.905	4,32	18.457	4,32
4	16.887	5,39	20.213	6,26	21.227	5,99	20.639	5,49	23.141	5,64	21.998	5,61	22.233	5,37	22.918	5,37
5	20.356	6,50	24.080	7,46	25.292	7,14	24.839	6,61	27.827	6,79	26.406	6,74	26.916	6,50	27.746	6,50
6	24.571	7,84	28.220	8,75	30.877	8,72	30.684	8,16	33.885	8,27	32.067	8,18	33.253	8,03	34.278	8,03
7	29.368	9,38	32.702	10,14	35.942	10,15	37.356	9,94	41.449	10,11	39.193	10,00	41.730	10,08	43.015	10,08
8	35.259	11,26	38.053	11,79	41.706	11,78	45.702	12,16	49.908	12,17	47.108	12,02	51.677	12,48	53.269	12,48
9	43.209	13,79	45.061	13,97	50.460	14,25	56.431	15,01	60.921	14,86	57.699	14,72	66.469	16,05	68.516	16,05
10 (Top 10%)	117.923	37,65	103.049	31,94	115.576	32,64	127.130	33,82	135.397	33,03	131.635	33,59	136.103	32,87	140.274	32,86
Average	31.324		32.265		35.410		37.590		40.998		39.186		41.410		42.684	

Income Groups	Greece															
	2015		2016		2017		2018		2019		2020		2021		2022	
	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%
1 (Bottom 10%)	6.726	1,88	7.088	1,98	7.539	2,07	7.823	2,11	7.797	2,07	7.740	2,28	8.295	2,21	8.894	2,22
2	13.281	3,71	14.066	3,94	15.119	4,14	16.155	4,35	16.351	4,35	14.987	4,42	16.264	4,34	17.449	4,35
3	20.171	5,63	20.891	5,85	21.798	5,97	22.748	6,13	23.252	6,18	21.038	6,21	22.693	6,06	24.351	6,07
4	23.447	6,54	23.952	6,71	25.024	6,86	26.076	7,02	26.435	7,03	23.910	7,05	25.531	6,82	27.397	6,83
5	26.808	7,48	27.162	7,61	27.941	7,66	28.986	7,81	29.574	7,86	26.722	7,88	28.461	7,60	30.542	7,61
6	30.420	8,49	31.062	8,70	31.695	8,68	32.774	8,83	33.316	8,86	30.093	8,88	32.053	8,56	34.394	8,57
7	35.474	9,90	35.749	10,01	36.496	10,00	37.522	10,10	38.151	10,14	34.426	10,16	36.677	9,79	39.355	9,81
8	42.209	11,78	42.319	11,85	42.872	11,75	43.809	11,80	44.560	11,85	40.205	11,86	43.029	11,49	46.164	11,51
9	51.427	14,35	51.266	14,36	51.578	14,13	51.958	13,99	53.257	14,16	48.030	14,17	51.219	13,68	54.952	13,70
10 (Top 10%)	108.377	30,24	103.516	28,99	104.933	28,75	103.482	27,87	103.424	27,50	91.843	27,09	110.307	29,45	117.688	29,34
Average	35.834		35.707		36.499		37.133		37.612		33.899		37.453		40.119	

Income Groups	Turkiye															
	2015		2016		2017		2018		2019		2020		2021		2022	
	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%
1 (Bottom 10%)	5.983	1,56	6.379	1,56	6.530	1,53	6.387	1,56	6.811	1,70	6.670	1,66	7.670	1,72	7.989	1,72
2	12.121	3,16	11.568	2,83	11.879	2,78	11.505	2,81	12.066	3,01	11.599	2,89	13.340	2,99	13.894	2,99
3	15.188	3,95	15.347	3,76	16.044	3,75	15.322	3,74	15.770	3,93	15.077	3,76	17.311	3,88	18.029	3,88
4	15.811	4,12	17.853	4,37	18.561	4,34	17.858	4,36	18.372	4,58	17.540	4,37	20.090	4,51	20.923	4,51
5	18.405	4,79	20.498	5,02	21.122	4,94	20.355	4,97	20.908	5,21	20.143	5,02	22.911	5,14	23.862	5,14
6	23.482	6,11	23.935	5,86	24.588	5,75	23.796	5,81	24.236	6,04	23.472	5,85	26.638	5,98	27.744	5,98
7	27.195	7,08	28.003	6,85	28.768	6,73	27.818	6,79	28.169	7,02	27.467	6,84	31.097	6,98	32.387	6,98
8	31.759	8,27	34.142	8,36	35.121	8,22	33.826	8,25	34.227	8,54	33.352	8,31	37.937	8,51	39.511	8,51
9	47.613	12,40	52.070	12,75	53.316	12,47	51.437	12,55	51.228	12,77	50.342	12,54	57.294	12,86	59.671	12,86
10 (Top 10%)	186.524	48,56	198.726	48,65	211.458	49,48	201.567	49,18	189.224	47,19	195.817	48,77	211.298	47,42	220.064	47,42
Average	38.408		40.852		42.739		40.987		40.101		40.148		44.559		46.407	

Table 5 shows the average income per decile for the same developing countries. In the period of 2015-2022, the average income in these developing countries increased from $34,849 in 2015 to $42,610 in 2022 depicting a total of 22.27% and an annual average of 2.78% increase.

Pre-Covid years in between 2025 and 2019, the average income for each decile consistently increased. The strongest effect of Covid badly hit the level of incomes for all deciles except the top 10% in 2020. The recovery for the bottom deciles was moderate but did not look successful while the top 10% decile increased average income and income share strongly after the Covid era for the years 2021 and 2022.

When the percentage deciles are examined for the developing countries, the top 10% decile takes around 33% of the total income while the bottom 10% takes only 2.25% on the average. On the other hand, the most income transfer happened from middle income deciles to higher income deciles and this effect looks stronger after the Covid-19. The bottom 2., 3., 4., 5., and 6th deciles lost their shares of income for the advantage of 7., 8, and 9th decile. The bottom 10% decile could barely protect its share of income.

Table 5: Average Income (10% Decile) – Developing Countries (Czechia, Hungary, Romania, Greece, Turkiye)

Income Groups	AVERAGE INCOME OF DEVELOPING COUNTRIES | Czechia - Hungary - Romania - Greece - Turkiye															
	2015		2016		2017		2018		2019		2020		2021		2022	
1 (Bottom 10%)	8.026	2,30	8.371	2,32	8.661	2,28	8.864	2,27	9.265	2,31	9.151	2,41	9.214	2,25	9.574	2,25
2	13.864	3,98	14.796	4,10	15.385	4,04	15.670	4,02	16.338	4,07	15.584	4,10	15.827	3,86	16.466	3,86
3	18.705	5,37	20.142	5,58	21.017	5,52	21.283	5,46	22.091	5,50	20.896	5,49	21.379	5,21	22.249	5,22
4	21.339	6,12	23.163	6,42	24.298	6,38	24.726	6,34	25.727	6,40	24.142	6,35	24.682	6,02	25.679	6,03
5	24.386	7,00	26.203	7,26	27.548	7,24	28.198	7,23	29.437	7,33	27.434	7,21	28.287	6,90	29.423	6,91
6	28.179	8,09	29.923	8,29	31.575	8,29	32.424	8,31	33.771	8,40	31.433	8,27	32.949	8,04	34.260	8,04
7	32.181	9,23	33.704	9,34	35.667	9,37	37.059	9,50	38.697	9,63	36.064	9,48	38.415	9,37	39.935	9,37
8	37.311	10,71	38.933	10,79	40.943	10,76	42.715	10,95	44.489	11,07	41.500	10,91	45.475	11,09	47.275	11,09
9	46.051	13,21	47.637	13,20	50.293	13,21	52.241	13,40	54.119	13,47	50.806	13,36	58.003	14,15	60.282	14,15
10 (Top 10%)	118.447	33,99	117.907	32,68	125.299	32,91	126.784	32,51	127.868	31,82	123.282	32,42	135.775	33,12	140.953	33,08
Average	34.849		36.078		38.069		38.996		40.180		38.029		41.001		42.610	

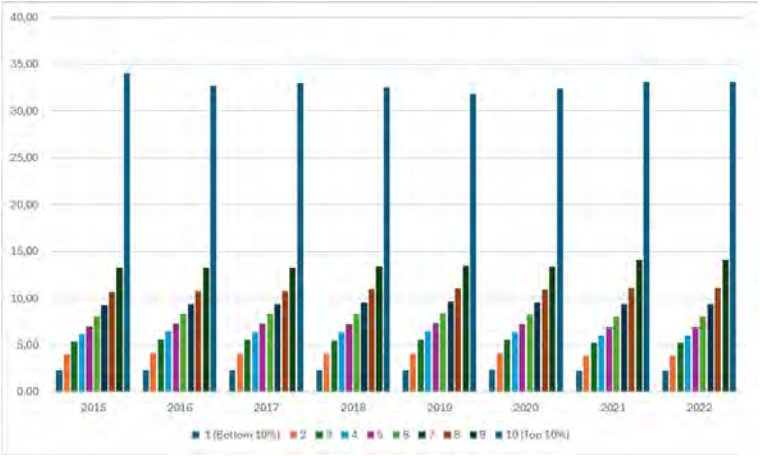


Table 6 below presents the income groups by 10% deciles for five developed countries under investigation in this study. In the period of 2015-2022, United Kingdom increased its average income from $52,717 in 2015 to $54,148 in 2022 representing a total of 2.71% and an annual average of 0.34% increase. Netherland increased its average income from $70,127 in 2015 to $77,632 in 2022 representing a total of 10.70% and an annual average of 1.34% increase. Germany increased its average income from $60,630 in 2015 to $64,298 in 2022 representing a total of 6.05% and an annual average of 0.76% increase. France increased its average income from $57,156 in 2015 to $59,479 in 2022 representing a total of 4.06% and an annual average of 0.51% increase. Italy increased its average income from $45,557 in 2015 to $49,320 in 2022 representing a total of 8.31% and an annual average of 1.04% increase.

Table 7 shows the average income per deciles for the same developing countries. In the period of 2015-2022, the average income in these developed countries increased from $57,237 in 2015 to $60,975 in 2022 depicting a total of 6.53% and an annual average of 0.82% increase.

When the percentage deciles are examined for the developed countries, the top 10% decile takes around 26% of the total income while the bottom 10% takes only 4% on the average. The income distribution over the whole research period

showed almost no changes. Therefore, the social programs put in use during the Covid-19 era maintained the existing income shares in the developed countries.

Table 6: Income Groups (10% Decile) – Developed Countries (United Kingdom, Netherlands, Germany, France, Italy)

Income Groups	United Kingdom															
	2015		2016		2017		2018		2019		2020		2021		2022	
	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%
1 (Bottom 10%)	26.528	5,03	26.651	5,01	27.091	4,98	26.961	4,89	26.836	4,93	23.981	5,02	27.498	5,30	28.744	5,31
2	30.367	5,76	31.075	5,84	31.498	5,79	31.578	5,73	30.618	5,62	26.929	5,64	30.887	5,96	32.288	5,96
3	34.329	6,51	34.181	6,42	35.544	6,53	35.590	6,46	33.887	6,22	29.495	6,18	33.646	6,49	35.173	6,50
4	36.588	6,94	37.348	7,02	38.829	7,14	38.393	6,97	36.813	6,76	31.870	6,68	36.032	6,95	37.664	6,96
5	39.997	7,59	40.528	7,62	41.480	7,62	42.295	7,68	41.066	7,54	35.643	7,47	40.368	7,78	42.191	7,79
6	43.840	8,32	44.473	8,36	46.012	8,46	46.053	8,36	45.130	8,29	39.175	8,21	44.364	8,55	46.367	8,56
7	49.557	9,40	50.122	9,42	52.091	9,57	51.603	9,37	50.800	9,33	44.147	9,25	49.756	9,59	51.998	9,60
8	56.778	10,77	57.168	10,74	59.812	10,99	59.133	10,73	58.523	10,75	50.976	10,68	57.550	11,10	60.138	11,11
9	69.513	13,19	69.719	13,10	73.696	13,54	71.549	12,99	71.699	13,17	62.692	13,14	69.887	13,48	73.013	13,48
10 (Top 10%)	139.677	26,50	140.792	26,46	138.086	25,38	147.778	26,82	149.191	27,40	132.363	27,73	128.653	24,81	133.906	24,73
Average	52.717		53.206		54.414		55.093		54.456		47.727		51.864		54.148	

Income Groups	Netherlands															
	2015		2016		2017		2018		2019		2020		2021		2022	
	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%
1 (Bottom 10%)	35.489	5,06	36.438	5,23	36.708	5,03	37.065	4,97	37.128	5,09	37.116	5,32	37.155	4,99	38.765	4,99
2	40.629	5,79	40.845	5,87	41.782	5,73	42.489	5,70	42.449	5,82	40.819	5,86	40.853	5,48	42.629	5,49
3	44.589	6,36	44.859	6,44	46.215	6,33	47.252	6,34	47.005	6,45	45.178	6,48	45.808	6,15	47.784	6,16
4	48.651	6,94	48.813	7,01	50.907	6,98	52.306	7,02	51.616	7,08	49.589	7,11	50.541	6,78	52.717	6,79
5	55.142	7,86	54.724	7,86	56.958	7,81	58.351	7,83	57.635	7,90	55.302	7,93	56.730	7,62	59.162	7,62
6	61.089	8,71	60.745	8,72	63.257	8,67	64.654	8,68	63.939	8,77	61.429	8,81	63.196	8,48	65.910	8,49
7	68.581	9,78	67.970	9,76	70.684	9,69	72.392	9,72	71.418	9,79	68.451	9,82	71.115	9,55	74.161	9,55
8	78.187	11,15	77.905	11,19	80.771	11,07	82.897	11,13	81.491	11,18	78.105	11,21	81.933	11,00	85.420	11,00
9	93.496	13,33	93.803	13,47	97.683	13,39	99.601	13,37	97.381	13,35	92.973	13,34	99.608	13,37	103.824	13,37
10 (Top 10%)	175.419	25,01	170.222	24,45	184.596	25,30	188.030	25,24	179.155	24,57	168.083	24,11	197.974	26,58	205.946	26,53
Average	70.127		69.632		72.956		74.504		72.922		69.705		74.491		77.632	

Income Groups	Germany															
	2015		2016		2017		2018		2019		2020		2021		2022	
	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%
1 (Bottom 10%)	23.381	3,86	24.849	4,01	25.156	3,97	25.438	3,98	25.722	4,05	26.089	4,30	29.871	4,76	30.694	4,77
2	29.215	4,82	30.212	4,88	31.153	4,92	31.688	4,96	30.512	4,80	30.513	5,02	34.948	5,57	35.910	5,58
3	33.913	5,59	35.188	5,68	36.454	5,76	37.219	5,83	35.195	5,54	34.894	5,74	39.433	6,28	40.533	6,30
4	38.490	6,35	39.476	6,37	40.813	6,44	41.630	6,52	39.478	6,21	38.425	6,33	42.632	6,79	43.854	6,82
5	44.343	7,31	45.798	7,39	46.338	7,32	47.294	7,41	45.103	7,09	43.254	7,12	47.903	7,63	49.311	7,67
6	49.998	8,25	51.351	8,29	52.727	8,32	53.738	8,42	51.226	8,06	48.747	8,03	54.426	8,67	55.925	8,70
7	57.587	9,50	58.422	9,43	60.245	9,51	61.292	9,60	58.673	9,23	55.427	9,13	61.540	9,80	63.352	9,85
8	66.086	10,90	67.174	10,84	69.018	10,90	69.863	10,94	68.069	10,71	64.040	10,54	70.359	11,21	72.426	11,26
9	80.400	13,26	81.897	13,22	84.138	13,28	84.384	13,22	84.948	13,36	80.035	13,18	84.946	13,53	87.336	13,58
10 (Top 10%)	182.884	30,16	185.209	29,89	187.386	29,58	185.986	29,13	196.801	30,96	185.975	30,62	161.802	25,77	163.638	25,45
Average	60.630		61.958		63.343		63.853		63.573		60.740		62.786		64.298	

Income Groups	France															
	2015		2016		2017		2018		2019		2020		2021		2022	
	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%
1 (Bottom 10%)	24.207	4,24	24.949	4,34	25.622	4,37	25.936	4,38	26.107	4,42	24.047	4,48	25.658	4,43	26.344	4,43
2	30.204	5,28	30.771	5,36	31.506	5,38	31.859	5,38	31.986	5,41	29.047	5,41	30.994	5,35	31.822	5,35
3	36.114	6,32	36.362	6,33	37.479	6,40	37.890	6,40	37.997	6,43	34.509	6,42	36.780	6,35	37.762	6,35
4	41.276	7,22	41.677	7,26	42.426	7,24	42.864	7,24	42.970	7,27	39.027	7,26	41.559	7,17	42.669	7,17
5	46.640	8,16	47.158	8,21	48.161	8,22	48.879	8,25	49.194	8,32	45.029	8,38	48.724	8,41	50.026	8,41
6	52.666	9,21	52.743	9,18	53.975	9,21	54.752	9,24	54.764	9,26	49.896	9,29	53.651	9,26	55.084	9,26
7	59.294	10,37	59.533	10,37	60.963	10,40	61.756	10,43	61.672	10,43	56.166	10,45	60.244	10,40	61.853	10,40
8	68.171	11,93	68.081	11,85	68.984	11,77	69.581	11,75	69.568	11,77	63.285	11,78	67.469	11,65	69.271	11,65
9	78.207	13,68	78.422	13,65	79.222	13,52	79.351	13,40	79.230	13,40	72.086	13,42	76.583	13,22	78.628	13,22
10 (Top 10%)	134.778	23,58	134.657	23,45	137.643	23,49	139.492	23,55	137.688	23,29	124.191	23,11	137.655	23,76	141.331	23,76
Average	57.156		57.435		58.598		59.236		59.118		53.728		57.932		59.479	

Income Groups	Italy															
	2015		2016		2017		2018		2019		2020		2021		2022	
	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%	Inc.$	%
1 (Bottom 10%)	16.243	3,57	16.719	3,58	16.686	3,50	16.578	3,42	16.867	3,50	18.162	4,19	10.079	2,14	4.114	0,83
2	18.182	3,99	18.802	4,02	19.145	4,01	19.059	3,93	19.279	4,00	20.519	4,73	17.147	3,64	16.890	3,42
3	23.986	5,27	24.564	5,25	24.615	5,16	24.743	5,11	24.792	5,14	23.172	5,35	24.053	5,10	25.116	5,09
4	30.148	6,62	30.126	6,44	30.361	6,36	30.758	6,35	30.734	6,37	27.262	6,29	29.960	6,36	31.363	6,36
5	34.727	7,62	34.696	7,42	35.347	7,41	35.827	7,39	35.763	7,41	31.704	7,31	34.904	7,41	36.634	7,43
6	40.377	8,86	40.259	8,61	40.550	8,50	41.099	8,48	40.987	8,50	36.291	8,37	40.185	8,53	42.190	8,55
7	46.861	10,29	46.416	9,93	46.744	9,80	47.368	9,77	47.189	9,78	41.761	9,63	46.501	9,87	48.900	9,91
8	54.443	11,95	54.387	11,63	54.813	11,49	55.894	11,53	55.668	11,54	49.240	11,36	55.191	11,71	58.089	11,78
9	66.589	14,62	67.136	14,36	68.118	14,28	69.547	14,35	69.164	14,34	61.084	14,09	68.918	14,62	72.768	14,75
10 (Top 10%)	124.017	27,22	134.465	28,76	140.732	29,50	143.727	29,66	141.907	29,42	124.262	28,67	144.394	30,64	157.140	31,86
Average	45.557		46.757		47.711		48.460		48.235		43.346		47.133		49.320	

Table 7: Average Income (10% Decile) – Developed Countries (United Kingdom, Netherlands, Germany, France, Italy)

Income Groups	AVERAGE INCOME OF DEVELOPED COUNTRIES | United Kingdom - Netherlands - Germany - France - Italy															
	2015		2016		2017		2018		2019		2020		2021		2022	
1 (Bottom 10%)	25.169	4,40	25.921	4,48	26.253	4,42	26.396	4,38	26.532	4,45	25.879	4,70	26.052	4,43	25.732	4,22
2	29.719	5,19	30.341	5,25	31.017	5,22	31.335	5,20	30.969	5,19	29.566	5,37	30.966	5,26	31.908	5,23
3	34.586	6,04	35.031	6,06	36.061	6,07	36.539	6,07	35.775	6,00	33.449	6,08	35.944	6,11	37.274	6,11
4	39.031	6,82	39.488	6,83	40.667	6,85	41.190	6,84	40.322	6,76	37.235	6,76	40.145	6,82	41.653	6,83
5	44.170	7,72	44.581	7,71	45.657	7,69	46.529	7,73	45.752	7,67	42.186	7,66	45.726	7,77	47.465	7,78
6	49.594	8,66	49.914	8,64	51.304	8,64	52.059	8,64	51.209	8,58	47.108	8,56	51.164	8,70	53.095	8,71
7	56.376	9,85	56.493	9,77	58.145	9,79	58.882	9,78	57.950	9,71	53.190	9,66	57.831	9,83	60.053	9,85
8	64.733	11,31	64.943	11,24	66.680	11,22	67.474	11,20	66.664	11,17	61.129	11,10	66.500	11,30	69.069	11,33
9	77.641	13,56	78.195	13,53	80.571	13,56	80.886	13,43	80.484	13,49	73.774	13,40	79.989	13,59	83.114	13,63
10 (Top 10%)	151.355	26,44	153.069	26,48	157.689	26,54	161.003	26,73	160.948	26,98	146.975	26,70	154.096	26,19	160.392	26,30
Average	57.237		57.798		59.404		60.229		59.661		55.049		58.841		60.975	

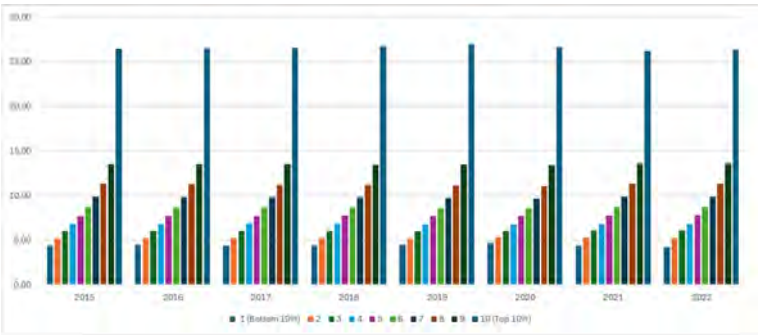


Table 8 shows the income distributions by grouped deciles for the developing countries. The bottom 2 groups form "Bottom 20%", from bottom 3 to 8 groups form "Middle 60%", and top 2 groups form "Top 20%" groups. By grouping deciles this way, the income transfers between main social groups can be better visualized. The top 20% in Czechia had 58% share of income in 2015 and then its income share increased to 60%. The increased share of the top 20% is transferred from middle 60% and bottom 20%. Moreover, the income transfer from the bottom 20% was higher than that of middle 60%. Top20/Bottom20

ratio was 4,15 in 2015 and this ratio increased to 4,66 in 2022. Top20/Middle60 ratio was 2,08 in 2025 and this ratio increased to 2,22 in 2022.

The top 20% in Hungary had 62% share of income in 2015 and then its income share increased to 66%. The increased share of the top 20% is transferred from middle 60% and bottom 20%. Moreover, the income transfer from the bottom 20% was higher than that of middle 60%. Top20/Bottom20 ratio was 5,19 in 2015 and this ratio increased to 6,64 in 2022. Top20/Middle60 ratio was 2,44 in 2025 and this ratio increased to 2,66 in 2022.

The top 20% in Romania had 73% share of income in 2015 and then its income share decreased to 51%. The decreased share of top 20% is transferred to middle 60% and bottom 20%. Moreover, the income transfer from the top 20% to bottom 20% was higher than that of middle 60%. Top20/Bottom20 ratio was 12,78 in 2015 and this ratio decreased to 11,37 in 2022. Top20/Middle60 ratio was 3,47 in 2025 and this ratio decreased to 3,14 in 2022.

The top 20% in Greece had 80% share of income in 2015 and then its income share decreased to 71%. The decreased share of top 20% is transferred to middle 60% and bottom 20%. Moreover, the income transfer from the top 20% to bottom 20% was higher than that of middle 60%. Top20/Bottom20 ratio was 7,99 in 2015 and this ratio decreased to 6,55 in 2022. Top20/Middle60 ratio was 2,69 in 2025 and this ratio decreased to 2,56 in 2022.

The top 20% in Turkiye had 79,05% share of income in 2015 and then its income shares slightly decreased to 78,65%. The income transferred from top 20% to middle 60% and bottom 20% look to be distributed evenly. Top20/Bottom20 ratio was 12,93 in 2015 and this ratio decreased to 12,78 in 2022. Top20/Middle60 ratio was 5,33 in 2025 and this ratio decreased to 5,17 in 2022.

Table 9 shows the average income distributions by grouped deciles for the developing countries. It is viewed that top 20% is slightly better off over the research period in the expense of mostly bottom 20% and middle 60%.

Table 8: Income for Grouped Deciles – Developing Countries

Grouped Deciles	Czechia															
	2015		2016		2017		2018		2019		2020		2021		2022	
Bottom %20	17.925	14,00	18.728	14,34	19.561	13,93	20.316	14,05	20.800	14,06	20.483	14,84	18.991	12,87	19.566	12,89
Middle %60	35.750	27,92	37.503	28,71	40.565	28,89	42.480	29,39	43.429	29,35	39.920	28,93	39.837	26,99	41.028	27,03
Top %20	74.391	58,09	74.383	56,95	80.267	57,17	81.750	56,56	83.720	56,59	77.597	56,23	88.778	60,15	91.189	60,08
Top20/Bottom20	4,15		3,97		4,10		4,02		4,03		3,79		4,67		4,66	
Top20/Middle60	2,08		1,98		1,98		1,92		1,93		1,94		2,23		2,22	
Middle60/Bottom20	1,99		2,00		2,07		2,09		2,09		1,95		2,10		2,10	

Grouped Deciles	Hungary															
	2015		2016		2017		2018		2019		2020		2021		2022	
Bottom %20	11.439	12,03	12.026	11,97	11.980	11,56	11.868	10,78	12.368	10,60	11.916	10,82	11.919	9,85	12.239	9,86
Middle %60	24.355	25,61	25.849	25,72	26.640	25,70	28.391	25,79	29.753	25,51	28.289	25,68	29.794	24,62	30.600	24,65
Top %20	59.319	62,37	62.633	62,32	65.054	62,75	69.810	63,42	74.522	63,89	69.939	63,50	79.323	65,54	81.315	65,50
Top20/Bottom20	5,19		5,21		5,43		5,88		6,03		5,87		6,66		6,64	
Top20/Middle60	2,44		2,42		2,44		2,46		2,50		2,47		2,66		2,66	
Middle60/Bottom20	2,13		2,15		2,22		2,39		2,41		2,37		2,50		2,50	

Grouped Deciles	Romania															
	2015		2016		2017		2018		2019		2020		2021		2022	
Bottom %20	6.306	5,73	7.613	7,03	8.042	6,72	8.216	6,35	9.328	6,66	8.943	6,66	8.909	6,25	9.183	6,25
Middle %60	23.250	21,11	26.553	24,54	28.663	23,94	29.317	22,67	32.501	23,22	30.774	22,90	32.286	22,66	33.280	22,66
Top %20	80.566	73,16	74.055	68,43	83.018	69,34	91.780	70,97	98.159	70,12	94.667	70,45	101.286	71,09	104.395	71,09
Top20/Bottom20	12,78		9,73		10,32		11,17		10,52		10,59		11,37		11,37	
Top20/Middle60	3,47		2,79		2,90		3,13		3,02		3,08		3,14		3,14	
Middle60/Bottom20	3,69		3,49		3,56		3,57		3,48		3,44		3,62		3,62	

Grouped Deciles	Greece															
	2015		2016		2017		2018		2019		2020		2021		2022	
Bottom %20	10.003	8,36	10.577	8,95	11.329	9,40	11.989	9,85	12.074	9,82	11.363	10,26	12.280	9,87	13.171	9,89
Middle %60	29.755	24,87	30.189	25,55	30.971	25,69	31.986	26,28	32.548	26,47	29.399	26,56	31.407	25,24	33.701	25,30
Top %20	79.902	66,77	77.391	65,50	78.255	64,91	77.720	63,86	78.341	63,71	69.937	63,18	80.763	64,90	86.320	64,81
Top20/Bottom20	7,99		7,32		6,91		6,48		6,49		6,15		6,58		6,55	
Top20/Middle60	2,69		2,56		2,53		2,43		2,41		2,38		2,57		2,56	
Middle60/Bottom20	2,97		2,85		2,73		2,67		2,70		2,59		2,56		2,56	

Grouped Deciles	Turkiye															
	2015		2016		2017		2018		2019		2020		2021		2022	
Bottom %20	9.052	6,11	8.973	5,69	9.205	5,56	8.946	5,64	9.439	6,16	9.134	5,89	10.505	6,15	10.941	6,15
Middle %60	21.973	14,84	23.296	14,78	24.034	14,51	23.162	14,60	23.614	15,41	22.842	14,73	25.997	15,22	27.076	15,22
Top %20	117.069	79,05	125.398	79,53	132.387	79,93	126.502	79,76	120.226	78,44	123.079	79,38	134.296	78,63	139.868	78,63
Top20/Bottom20	12,93		13,97		14,38		14,14		12,74		13,47		12,78		12,78	
Top20/Middle60	5,33		5,38		5,51		5,46		5,09		5,39		5,17		5,17	
Middle60/Bottom20	2,43		2,60		2,61		2,59		2,50		2,50		2,47		2,47	

Table 9: Average Income for Grouped Deciles – Developing Countries

Grouped Deciles	AVERAGE INCOME OF DEVELOPING COUNTRIES | Czechia - Hungary - Romania - Greece - Turkiye															
	2015		2016		2017		2018		2019		2020		2021		2022	
Bottom %20	10.945	9,10	11.583	9,41	12.023	9,25	12.267	9,23	12.802	9,40	12.368	9,54	12.521	8,86	13.020	8,87
Middle %60	27.017	22,47	28.678	23,31	30.175	23,21	31.068	23,39	32.369	23,77	30.245	23,33	31.864	22,56	33.137	22,58
Top %20	82.249	68,42	82.772	67,28	87.796	67,54	89.513	67,38	90.994	66,83	87.044	67,13	96.889	68,58	100.617	68,55
Top20/Bottom20	7,51		7,15		7,30		7,30		7,11		7,04		7,74		7,73	
Top20/Middle60	3,04		2,89		2,91		2,88		2,81		2,88		3,04		3,04	
Middle60/Bottom20	2,47		2,48		2,51		2,53		2,53		2,45		2,54		2,55	

Table 10 shows the income distributions by grouped deciles for the developed countries. The bottom 2 groups form “Bottom 20%”, from bottom 3 to 8 groups form “Middle 60%”, and top 2 groups form “Top 20%” groups.

The top 20% in United Kingdom had 59% share of income in 2015 and then its income share decreased to 58%. The bottom 20% increased its share from 16,11% in 2015 to 16,99% in 2022 while the middle 60% gained a slight income share from the top 20%. Top20/Bottom20 ratio was 3,68 in 2015 and this ratio decreased to 3,39 in 2022. Top20/Middle60 ratio was 2,40 in 2025 and this ratio decreased to 2,27 in 2022.

The top 20% in Netherland had 58% share of income in 2015 and then its income share increased to 60%. The bottom 20% lost its share from 16,41% in 2015 to 15,67% in 2022 while the middle 60% lost its share from 25,60% in 2015 to 24,71% in 2022. Top20/Bottom20 ratio was 3,53 in 2015 and this ratio decreased to 3,81 in 2022. Top20/Middle60 ratio was 2,26 in 2025 and this ratio decreased to 2,41 in 2022.

The top 20% in Germany had 64% share of income in 2015 and then its income share decreased to 59%. The bottom 20% increased its share from 12,74% in 2015 to 15,63% in 2022 while the middle 60% gained an income share of 23,46% in 2025 and it increased to 25,46% in 2022. Top20/Bottom20 ratio was 5,01 in 2015 and this ratio decreased to 3,77 in 2022. Top20/Middle60 ratio was 2,72 in 2025 and this ratio decreaed to 2,31 in 2022.

The top 20% in France had 57,75% share of income in 2015 and then its income shares slightly decreased to 57,33%. The bottom 20% increased its share from 14,75% in 2015 to 15,16% in 2022. Top20/Bottom20 ratio was 3,91 in 2015 and this ratio decreased to 3,78 in 2022. Top20/Middle60 ratio was 2,10 in 2025 and this ratio decreased to 2,08 in 2022.

The top 20% in Italy had 63% share of income in 2015 and then its income share increased to 69%. The bottom 20% lost its share from 11,40% in 2015 to 6,33% in 2022 while the middle 60% could maintain its share around 25%. Top20/Bottom20 ratio was 5,54 in 2015 and this ratio increased to 10,95in 2022. Top20/Middle60 ratio was 2,48 in 2025 and this ratio increased to 2,85 in 2022.

Table 11 shows the average income distributions by grouped deciles for the developed countries. It is viewed that the top 20% and middle 60% are slightly better off over the research period in the expense of bottom 20%.

Table 10: Income for Grouped Deciles – Developed Countries

Grouped Deciles	United Kingdom															
	2015		2016		2017		2018		2019		2020		2021		2022	
Bottom %20	28.447	16,11	28.863	16,21	29.295	16,20	29.270	15,87	28.727	15,65	25.455	15,76	29.192	16,96	30.516	16,99
Middle %60	43.515	24,65	43.970	24,69	45.628	25,23	45.511	24,67	44.370	24,17	38.551	23,87	43.619	25,35	45.588	25,39
Top %20	104.595	59,24	105.255	59,10	105.891	58,56	109.664	59,46	110.445	60,17	97.527	60,38	99.270	57,69	103.460	57,62
Top20/Bottom20	3,68		3,65		3,61		3,75		3,84		3,83		3,40		3,39	
Top20/Middle60	2,40		2,39		2,32		2,41		2,49		2,53		2,28		2,27	
Middle60/Bottom20	1,53		1,52		1,56		1,55		1,54		1,51		1,49		1,49	

Grouped Deciles	Netherlands															
	2015		2016		2017		2018		2019		2020		2021		2022	
Bottom %20	38.059	16,41	38.642	16,81	39.245	16,23	39.777	16,13	39.789	16,56	38.968	17,00	39.004	15,64	40.697	15,67
Middle %60	59.373	25,60	59.169	25,75	61.465	25,41	62.975	25,54	62.184	25,88	59.676	26,04	61.554	24,69	64.192	24,71
Top %20	134.458	57,98	132.012	57,44	141.140	58,36	143.816	58,33	138.268	57,55	130.528	56,96	148.791	59,67	154.885	59,62
Top20/Bottom20	3,53		3,42		3,60		3,62		3,48		3,35		3,81		3,81	
Top20/Middle60	2,26		2,23		2,30		2,28		2,22		2,19		2,42		2,41	
Middle60/Bottom20	1,56		1,53		1,57		1,58		1,56		1,53		1,58		1,58	

Grouped Deciles	Germany															
	2015		2016		2017		2018		2019		2020		2021		2022	
Bottom %20	26.298	12,74	27.531	13,07	28.155	13,10	28.563	13,25	28.117	12,86	28.301	13,56	32.410	15,54	33.302	15,63
Middle %60	48.403	23,46	49.568	23,53	50.932	23,71	51.839	24,05	49.624	22,70	47.465	22,74	52.715	25,28	54.234	25,46
Top %20	131.642	63,80	133.553	63,40	135.762	63,19	135.185	62,71	140.874	64,44	133.005	63,71	123.374	59,17	125.487	58,91
Top20/Bottom20	5,01		4,85		4,82		4,73		5,01		4,70		3,81		3,77	
Top20/Middle60	2,72		2,69		2,67		2,61		2,84		2,80		2,34		2,31	
Middle 60/Bottom20	1,84		1,80		1,81		1,81		1,76		1,68		1,63		1,63	

Grouped Deciles	France															
	2015		2016		2017		2018		2019		2020		2021		2022	
Bottom %20	27.205	14,75	27.860	15,03	28.564	15,11	28.897	15,13	29.047	15,27	26.547	15,37	28.326	15,16	29.083	15,16
Middle %60	50.693	27,49	50.926	27,48	51.998	27,51	52.620	27,56	52.694	27,70	47.985	27,79	51.405	27,51	52.777	27,51
Top %20	106.492	57,75	106.540	57,49	108.432	57,37	109.421	57,31	108.459	57,02	98.139	56,84	107.119	57,33	109.980	57,33
Top20/Bottom20	3,91		3,82		3,80		3,79		3,73		3,70		3,78		3,78	
Top20/Middle60	2,10		2,09		2,09		2,08		2,06		2,05		2,08		2,08	
Middle60/Bottom20	1,86		1,83		1,82		1,82		1,81		1,81		1,81		1,81	

Grouped Deciles	Italy															
	2015		2016		2017		2018		2019		2020		2021		2022	
Bottom %20	17.212	11,40	17.761	11,31	17.915	11,12	17.819	10,88	18.073	11,10	19.341	13,16	13.613	8,58	10.502	6,33
Middle %60	38.424	25,46	38.408	24,47	38.738	24,05	39.281	23,99	39.189	24,07	34.905	23,76	38.466	24,23	40.382	24,35
Top %20	95.303	63,14	100.800	64,22	104.425	64,83	106.637	65,13	105.535	64,83	92.673	63,08	106.656	67,19	114.954	69,32
Top20/Bottom20	5,54		5,68		5,83		5,98		5,84		4,79		7,83		10,95	
Top20/Middle60	2,48		2,62		2,70		2,71		2,69		2,66		2,77		2,85	
Middle60/Bottom20	2,23		2,16		2,16		2,20		2,17		1,80		2,83		3,85	

Table 11: Average Income for Grouped Deciles – Developed Countries

Grouped Deciles	AVERAGE INCOME OF DEVELOPED COUNTRIES] United Kingdom - Netherlands - Germany - France - Italy															
	2015		2016		2017		2018		2019		2020		2021		2022	
Bottom %20	27.444	14,44	28.131	14,64	28.635	14,50	28.865	14,41	28.751	14,44	27.722	15,08	28.509	14,61	28.820	14,27
Middle %60	48.082	25,30	48.408	25,19	49.752	25,19	50.445	25,19	49.612	24,92	45.716	24,87	49.552	25,40	51.435	25,46
Top %20	114.498	60,25	115.632	60,17	119.130	60,31	120.944	60,40	120.716	60,64	110.374	60,05	117.042	59,99	121.753	60,27
Top20/Bottom20	4,17		4,11		4,16		4,19		4,20		3,98		4,11		4,22	
Top20/Middle60	2,38		2,39		2,39		2,40		2,43		2,41		2,36		2,37	
Middle60/Bottom20	1,75		1,72		1,74		1,75		1,73		1,65		1,74		1,78	

4. Conclusion

This study aimed to analyze the changes in income distribution in the period of 2015-2022. Hence, this period covered the pre- and post Covid-19 era. World

Inequality Database is used to observe income distribution among the population with an age of 20 or older. Then, the population is divided into ten equal income deciles. The study employed five developing countries, namely; Czekhia, Hungary, Romania, Greece and Turkiye, and five developed countries, namely; United Kingdom, Netherlands, Germany, France, and Italy. Therefore, a total of 800 observation points downloaded from the database.

Covid-19 resulted in a substantial reduction in national incomes and, more critically, disrupted income distribution across all countries. The effect of Covid-19 is reflected on income distribution of deciles in the year 2020. There was a significant income loss for all deciles. In response, all countries implemented various social programs to support those (the people in bottom deciles) most affected by the pandemic. Developed countries largely succeeded in protecting and restoring their income distribution to pre-pandemic levels. However, developing countries faced challenges with their social programs. While the developing countries were able to increase their overall national income post-Covid era, they struggled to restore income distribution to pre-pandemic levels. This situation led to a notable income transfer from the bottom 20% and the middle 60% to the top 20%.

By the year 2022, the disparity in income distribution was stark. In developing countries, the average income for the bottom 10% was $9,500 while the top 10% received $141,000, a 14.8-fold difference. In developed countries, the average income for the bottom 10% was $25,700 compared to $160,400 for the top 10%, a 6.2-fold difference. These findings highlight the varying degrees of success in social policies between developed and developing countries and underscore the ongoing challenges in addressing income inequality exacerbated by the pandemic.

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13

DEVELOPMENT OF E-COMMERCE IN TÜRKİYE: POST COVID-19 ERA

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Abstract:

The COVID-19 pandemic catalyzed a significant transformation in consumer behavior, accelerating the adoption of e-commerce worldwide. This study focuses on the development and growth of e-commerce in Türkiye during the post-COVID-19 era, examining the sector's expansion from 2020 onwards. Key factors contributing to this growth include increased internet and smartphone penetration, advancements in digital payment systems, and heightened consumer reliance on online shopping during lockdowns. The analysis highlights how these shifts have not only enhanced domestic retail e-commerce but also positioned Türkiye as a rapidly growing e-commerce market globally, with a projected compound annual growth rate of 11.6% between 2024 and 2029. Additionally, the article explores opportunities for Turkish businesses to leverage cross-border e-commerce for international market expansion, emphasizing the strategic role of digitalization, logistics improvements, and government incentives. By presenting key data and trends, the study underscores Türkiye's potential to strengthen its presence in global trade through e-commerce, driving economic growth and fostering innovation in its digital economy.

Keywords: *E-commerce; online retail; marketplace; basket size; digital payment*
JEL Codes: *L81, F43, O19, O40*

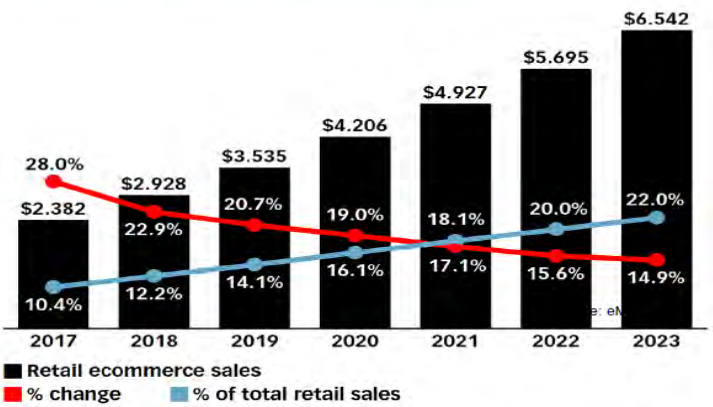
Introduction

The COVID-19 pandemic has profoundly reshaped global consumer behavior, accelerating the digital transformation of commerce. Türkiye, as an emerging economy with a dynamic and digitally savvy population, has experienced significant growth in e-commerce since 2020. During the lockdowns, the necessity for contactless shopping drove millions of Turkish consumers and businesses to adopt online platforms (Atalay Şimşek, 2021). This shift was accompanied by a surge in e-commerce infrastructure investments, an expansion of digital payment systems, and the rise of new marketplaces. Post-pandemic, the momentum has continued, with average spending per online shopper steadily increasing as digital commerce becomes an integral part of everyday life. The article examines Türkiye's rapid e-commerce adoption during the pandemic and its sustained growth in the post-COVID-19 era, highlighting key data points and trends that illustrate its transformative impact on the nation's economy and consumer habits.

The Role of E-Commerce in Global Economy

E-commerce has played a critical role in the transformation of the global economy during the pandemic. Between 2019-2021, total e-commerce sales increased from $3.5 Trillion to $4.9 trillion, representing a total growth of 46.85%. In the same period, the share of e-commerce sales in total retail sales increased from 14% to 18%. This growth is expected to continue at the same rate in the following years pointing out the demand in the e-commerce sector, which made a leap with the pandemic, will be permanent. Figure 1 and figure 2 highlights e-commerce volume in between 2017 to 2023. The graph indicates the increase in the percentage of retail e-commerce sales to total retail sales.

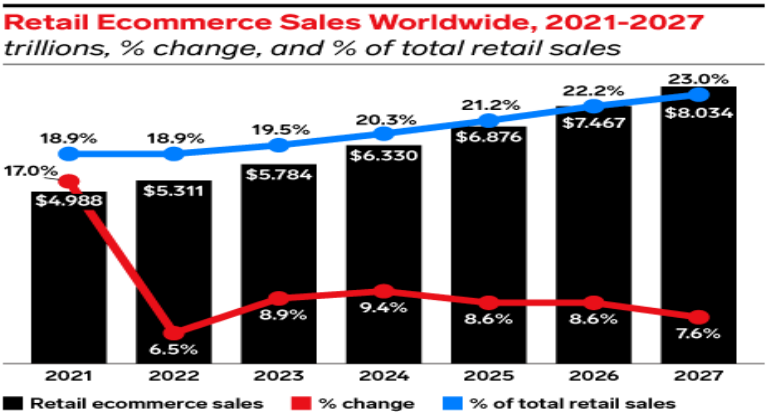
Figure 1: Retail E-commerce Sales Worldwide (2017-2023) (trillion USD)



Source: Insider Intelligence - eMarketer (Worldwide Ecommerce Forecast 2023)

The global e-commerce market has demonstrated remarkable resilience and growth, with forecasts projecting continued expansion between 2021 and 2027. In 2021, worldwide e-commerce sales reached approximately $4.9 trillion, a figure expected to nearly double to $8 trillion by 2027. This steady growth is driven by rising internet penetration, increasing smartphone adoption, and a shift in consumer preferences toward digital shopping. Emerging markets in Asia-Pacific, Latin America, and the Middle East are anticipated to lead this expansion, fuelled by improved digital infrastructure and a burgeoning middle class. Meanwhile, established markets in North America and Europe continue to innovate through personalization, AI-driven recommendations, and faster delivery options, further enhancing consumer experiences. This forecast underscores the growing importance of e-commerce as a critical driver of global retail and economic development.

Figure 2: Worldwide E-Commerce Forecast (2021-2027)

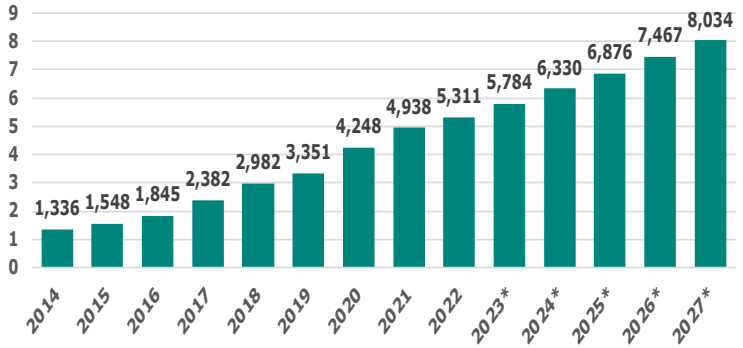


Source: Insider Intelligence - eMarketer (Worldwide Ecommerce Forecast 2023)

According to a study done by Oberlo (2023), the top 10 reasons why people shop online are classified as follows; Free Delivery (45%), Coupons and Discounts (33,5%), Customer Reviews (26,5%), Next-Day Delivery (25,9%), Simple Online Check-Out (24%), Loyalty Points (22,8%), Social Likes & Comments (17,5%), Cash on Delivery (14,5%), Eco-Friendly Credentials (14,2%) and Click & Collect (13,1%).

These reasons simply sum up what e-commerce offers to users; convenience, speed, affordability, time management and peer reviews. By the end of 2024, e-commerce is expected to take 20.8% of the entire retail market. E-commerce sales are expected to exceed $8.1 trillion in 2026 while e-commerce websites may account for 22.3% of total retail sales. China remains the largest market for e-commerce followed by the USA. Mobile shopping accounts for 63% of all e-commerce sales. Artificial intelligence is used in areas such as personalized product recommendations, pricing and customer service. In addition, personalized products are the focus of online platform suppliers such as Etsy and secondhand sales are the focus of platforms like Ebay. Figure 3 provides the growth of worldwide retail e-commerce sales.

Figure 3: Growth of Worldwide Retail E-commerce Sales (2014-2027) (billion USD)



Source: Statista (E-commerce in the World - statistics & facts)

According to recent industry calculations done by Statista, Turkiye will rank the first among 20 countries worldwide in retail e-commerce development between 2024 and 2029, with a compound annual growth rate of 11.6%. The Turkish e-commerce market is currently valued at $10 billion. India and Brazil are also among the fastest-growing e-commerce markets globally, with a compounded average growth rate of over 11% while the global retail e-commerce growth is estimated at 9.5% during the same period.

By 2026, the U.S. online retail market is expected to exceed $1.5 trillion. Despite this impressive growth, it won't be the world's largest. In fact, China's e-commerce market already reached over $1 trillion in 2020 and is projected to surpass $2 trillion by 2027. The Chinese and American online shopping markets are closely matched, though outcomes vary by KPI. For example, average revenue per user (ARPU) serves as a strong indicator of e-commerce penetration. In 2024, the ARPU in the U.S. is around $4,500, significantly higher than in China, where it exceeds $1,500.

E-Commerce Growth Factors

The growth of e-commerce may be appropriated by several key factors.

1. Internet and smartphone penetration: Widespread access to the internet and smartphones allows consumers to shop online conveniently.

2. Digital payment systems: Secure and diverse payment options make online shopping accessible and trusted.

3. Logistics and delivery improvements: Fast, reliable delivery options boost customer satisfaction and repeat purchases.

4. Consumer behavior shift: Increasing consumer preference for convenience, variety, and competitive pricing.

5. Covid-19 pandemic impact: Lockdowns and safety concerns accelerated the adoption of online shopping.

6. Social media and digital marketing: Targeted advertising and influencer marketing engage potential buyers directly.

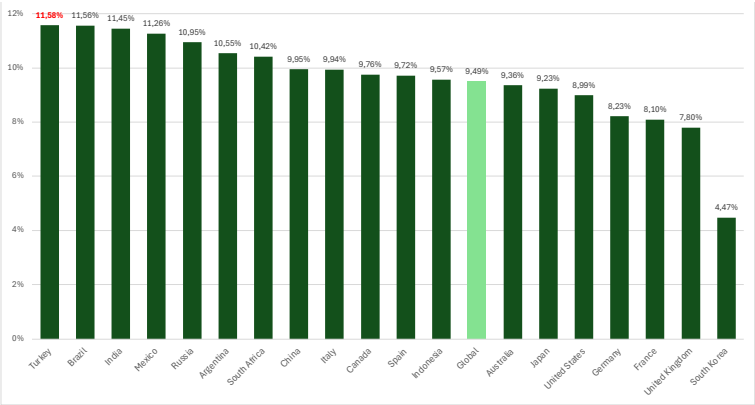
These factors collectively make e-commerce a compelling option for both businesses and consumers globally. Globally, around 5.3 billion people (66% of the world's population) had internet access in 2023, which underpins e-commerce expansion. Mobile e-commerce (m-commerce) is expected to grow by 8.5% annually, reaching nearly $620 billion globally by 2025. Digital payment volume grew by 15% globally in 2022, with options like mobile wallets driving online purchases. Digital payments and mobile commerce contribute greatly to convenience, which triggers consumer buying habits. Same-day delivery in urban areas increased customer satisfaction by 67%, with companies investing heavily in logistics infrastructure. Speed in delivery and ease in returns also increases convenience, therefore further contributes to e-commerce adoption and growth. The pandemic accelerated e-commerce growth by 20-30% across many markets in 2020, with lasting effects on online shopping behavior.

An Overview of Turkish E-Commerce Sector

From 2020 to 2024, Turkiye's e-commerce market has grown significantly, spurred by rising internet penetration, digital payment adoption, and the expansion of online retail options. The Covid-19 pandemic accelerated digital

buying habits, leading more consumers to embrace online shopping, which broadened the market's base. Government incentives for digitalization and increasing investments in logistics infrastructure have supported this expansion, enabling faster delivery and improved services. By the end of 2024, Turkiye's e-commerce revenue is expected to reach new heights, driven by local businesses entering online marketplaces and heightened consumer engagement in the digital economy.

Figure 4: Retail e-commerce Sales Compounded Annual Growth Rate (2024-2029)

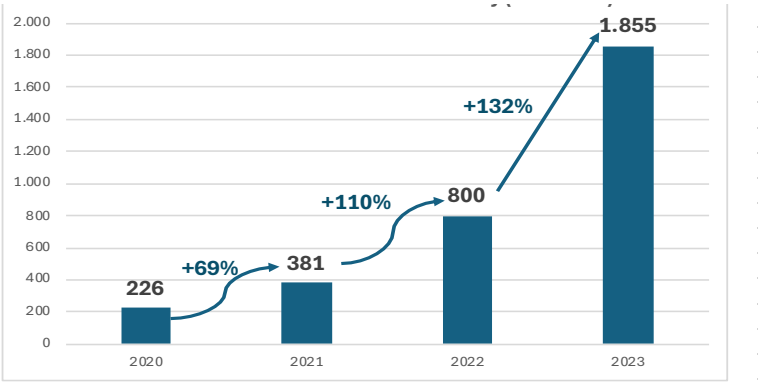


Source: Statista (E-commerce in Turkey - statistics & facts)

The Turkish e-commerce market is projected to generate approximately $28.61 billion in revenue in 2024, with a strong annual growth rate (CAGR) of 11.58% anticipated between 2024 and 2029. This growth trajectory suggests that the market could reach a volume of $49.49 billion by 2029. The number of users is expected to reach 31.9 million by 2029, with user penetration increasing from 29.3% in 2024 to 36.8% by 2029. Additionally, the average revenue per user (ARPU) is forecasted to be around $1,277, indicating a robust potential for consumer spending within Turkey's digital retail landscape. Globally, China is expected to lead e-commerce revenues, with a projected volume of $1.469 trillion in 2024.

This analysis highlights Turkiye's significant growth within the global e-commerce sector and reflects the potential for further digital expansion and market penetration among Turkish consumers.

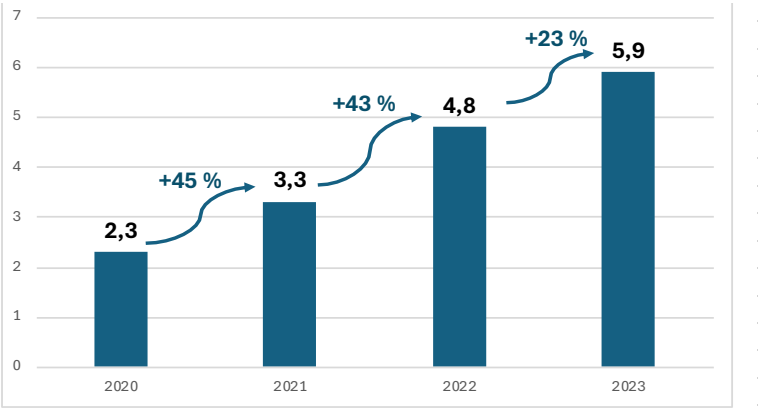
Figure 5: E-commerce Sales Volume in Turkiye (billion TRL)



Source: Ministry of Trade (Turkish Government Data)

According to Turkish Ministry of Trade, e-commerce sales volume and number of transactions grew very rapidly between 2020 and 2023, during and after the Covid-19 pandemic as indicated in Figure 5 & 6. Consumer adoption was very fast in accordance with technology adoption and the sales volume grew as well. The Turkish e-commerce market not only grew in market volume but also the number of transactions completed increased. There were almost 6 billion e-commerce transactions completed in Turkiye in 2023.

Figure 6: Number of E-commerce Transactions in Türkiye (billion)



Source: Ministry of Trade (Turkish Government Data)

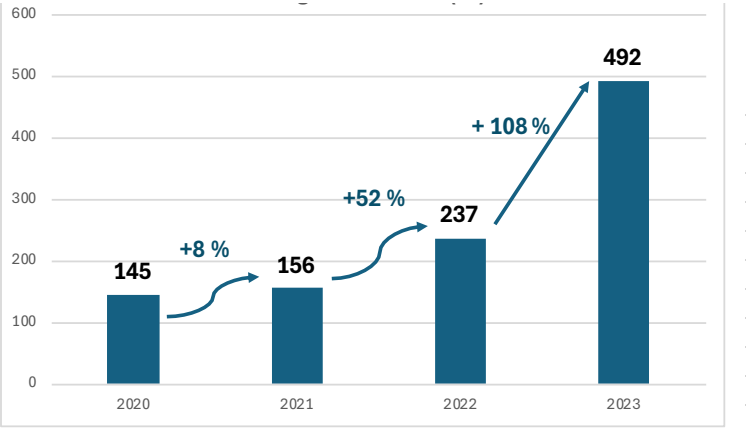
This growth in e-commerce is also reflected as a proportion of Gross Domestic Product (GDP). The share of e-commerce in Türkiye's GDP increased from 2.7% in 2019 (the beginning of pandemic) to 6.8% in 2023. China and USA have the highest e-commerce share in GDP ratio, with China dominating the global e-commerce landscape with contributing more than 33% to global e-commerce retail sales.

In 2024, the share of e-commerce sales in total retail sales increased to 20.4% in Turkiye compared to 5% pre-pandemic levels. The average basket size in 2023 increased to 492 TRL. In November, due to promotional campaigns, the average basket value peaked at 795 TRL, making it the highest month in 2023

November typically sees the highest average basket size in Turkiye's e-commerce market due to major shopping events like Singles' Day, Black Friday, and Cyber Monday. These global retail events lead to widespread promotional campaigns which drive consumers to make larger purchases, often taking advantage of discounts and deals for high-ticket items. This trend boosts the average basket value as shoppers aim to maximize savings during these limited time offers.

Additionally, the start of holiday shopping contributes to increased spending in November.

Figure 7: Average Basket Size in Türkiye (TRL)



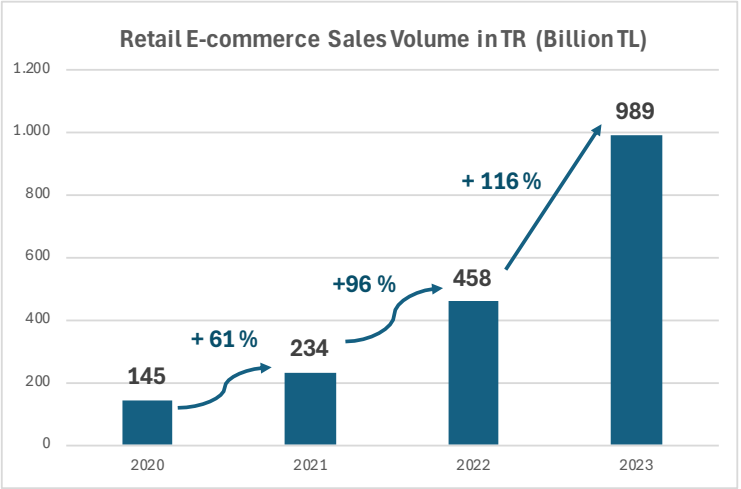
Source: Ministry of Trade (Turkish Government Data)

Even though e-commerce showed strong growth during and post pandemic, some other industries such as housing and automobiles have slowed starting from 2023. A number of economic programs and monetary policies applied by the governments resulted in economic slowdown, even recessions in some countries. Retail in Türkiye kept its strong growth amid all fluctuations and continues to grow. In line with the growth in retail, retail e-commerce sales have an continuous upward trend.

Retail e-commerce specifically refers to online sales of goods and services directly to consumers (B2C) where most of the transactions are completed through online marketplaces such as Hepsiburada, Amazon, Trendyol, eBay or online stores of individual brands (Atalay Şimşek 2021:360). Trendyol, Hepsiburada and Amazon combined capture more than 300 million monthly visits in Turkiye which underscores the growing importance of online retail in Turkish market.

According to the Ministry of Trade, the volume of retail e-commerce sales continued to grow since 2020, reaching 989 billion TRL in total revenue in 2023 with 116% growth compared to previous year. The growth of retail e-commerce has surpassed overall retail sector's growth in Turkiye resulting an increase in the share of overall retail sector. Covid-19 pandemic caused a disruption in online retail where spending almost doubled in a year.

Figure 8: Retail E-commerce Sales Volume in Turkiye (billion TRL)

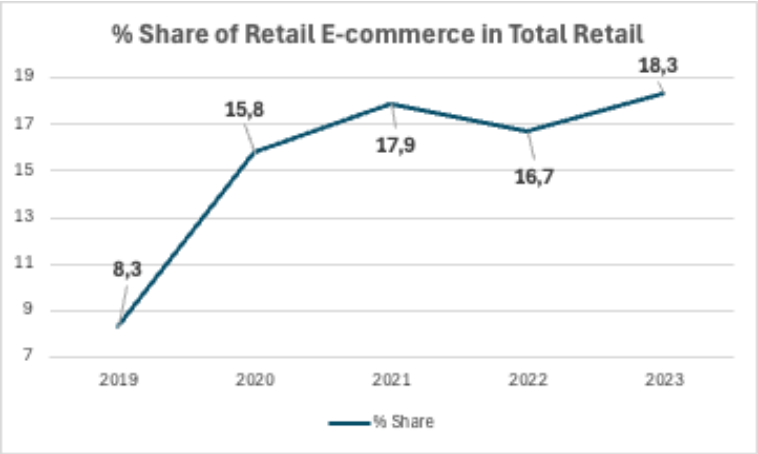


Source: Ministry of Trade (Turkish Government Data)

In 2022, consumers preferred traditional retail as a relief response to previous lock downs during pandemic, but the online adaption had a speedy recovery and recorded 18,3% share in total retail spend in 2023.

According to Euromonitor data, China has the highest share of retail e-commerce in total retail with 36,3% followed by UK and USA, 27,9% and 27,5 %, respectively. Turkiye has shown a strong growth in online retail but still has great potential for both retail e-commerce growth and cross-border e-commerce contributing to exports.

Figure 9: Share of Retail E-commerce in Total Retail in Turkiye (%)



Source: Ministry of Trade (Turkish Government Data)

Even though fashion industry has the highest market share in e-commerce, it has less number of transactions following services. E-commerce services are tools and solutions that help businesses sell products online which includes platforms for building online stores, processing payments, managing inventory, shipping products, marketing, and providing customer support as well as delivering food.

Electronics, with the highest average basket size and higher price-per-product has the second highest market share but accounts only 4% of e-commerce transactions.

Average basket size of e-commerce transactions increased to 564 TRL in 2023 from 290 TRL in 2022. Credit cards are the most preffered payment method, followed by debit cards due to some payment restrictions applied by Turkish government. Debit cards, pre-paid cards and meal cards were mostly used for food transactions, which have the highest frequency among e-commerce.

Table 1. Average Basket Size of E-Commerce Sectors

Average Basket Size by Sector	TL
Vehicles, Spare Parts, Accessories	8.273
Furniture, Kitchenware	2.539
Garden and Hardware	2.242
Electronics and Technology	2.098
Health	1.958
Real Estate Services	1.910
Education	1.374
Pet Products	1.092
Fashion and Accessories	1.023
Sports and Outdoor	666
Average	564
Tourism and Travel	534
Culture, Arts and Hobbies	439
Books and Printed Publications	388
Cosmetics and Personal Care	373
Equipment	265
Services	205
Food and Beverage	48
Others	1.058

Source: Statista (E-commerce in Turkey - statistics & facts)

Table 2. Year-end E-Commerce Campaigns & Sales Multiples

		Difference from the average		
Special Day	Dates	Sales Volume (TL)	Transaction Count	Basket Size
Back to School	1-11 September	1.12 x	1.03 x	1.08 x
Singles' Day	11 November (11.11)	1.47 x	0.98 x	1.51 x
Black Friday	20-24 Novemner	2.41 x	1.41 x	1.71 x
Cyber Monday	27-29 November	1.46 x	1.08 x	1.35 x
End of Year (After Holidays)	19-31 December	1.31 x	1.01 x	1.30 x

Source: Statista (E-commerce in Turkey - statistics & facts)

Starting from September, e-commerce sales gain momentum due to special days and year-end campaigns. This is a global trend where Turkish e-commerce sellers and final consumers are also accustomed to. Back to School, Black Friday and Christmas Holiday season are the most important shopping "special days" where e-commerce sales peak. According to Iyzico e-commerce transactions analysis, in

2023, sales volume increased by 2.41 times and basket size grew by 1.71 times during Black Friday.

Conclusion

The rapid development of e-commerce in Turkiye during and after the COVID-19 era has established a solid foundation for further growth, both domestically and internationally. The country's impressive e-commerce trajectory, driven by advancements in digital payment systems, increasing internet penetration, and robust consumer demand, reflects its potential to become a key player in the global digital economy. As cross-border e-commerce emerges as a transformative opportunity, Turkish businesses are uniquely positioned to expand their reach beyond national borders.

Leveraging Türkiye's competitive advantages—such as its strategic geographical location and growing logistical infrastructure—businesses can tap into international markets and cater to a global audience. Government initiatives promoting digitalization, coupled with enhanced logistics and marketplace integrations, can support small and medium-sized enterprises (SMEs) in embracing cross-border trade. By capitalizing on these opportunities, Türkiye can strengthen its role in global commerce, drive economic growth, and further integrate into the global e-commerce ecosystem.

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14

ECONOMIC EFFECTS OF ENVIRONMENTAL DEGRADATION: THE CASE OF TURKEY

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Abstract

Turkey has faced environmental degradation in the process of rapid economic growth and industrialisation. This study analyses the relationship between economic growth and environmental degradation in Turkey between 1990 and 2022. The main variables used in the study using Turkey's economic and environmental data between 1990-2022 are GDP (2015 base year) representing economic growth, CO2 emissions (2015 base year) indicating environmental degradation and population growth rate. In the time series analysis used in the study, firstly, the stationarity test (ADF test) of the variables was performed and then the ARDL model was applied. According to the ARDL model results, a significant relationship was found between CO2 emissions and economic growth. Then, FMOLS coefficient test was applied to determine the level of this relationship. The coefficient of CO2 emissions on GDP was found to be negative and significant, which supports the EKC hypothesis. The population growth rate (NFS) variable did not show a significant relationship.

Keywords: *Environmental Degradation, Economic Growth, Environmental Kuznets Curve*

1. Introduction

The relationship between humans and the environment has been in a mutual interaction since the beginning of human history. From past to present, this relationship between humans and the environment has undergone a great change and evolution. This evolution has significantly changed the way of using the resources of the environment and human impact on the environment throughout human history.

The first human communities used the resources of the environment by hunting and gathering and lived as a part of the natural balance. In this period, people used natural resources in a sustainable way. However, with the agricultural revolution, people started to use natural resources more intensively. The emergence of agriculture allowed people to settle down and cultivate the land more intensively. Agricultural societies started to cut down forests in order to cultivate agricultural lands and created irrigation systems by controlling water resources. During the period, human demand for natural resources increased significantly. This process was the first significant increase in human impact on the environment

The industrial revolution has magnified the impact of human beings on the environment. With industrialization, especially uncontrolled economic growth, environmental destruction played a role in its increase. Due to the increase in industrialization, countries grow, production and they continued to increase their consumption (Şimşek, 2023, p.20). The industrialisation process started to meet the energy need with the widespread use of fossil fuels and led to the emergence of large-scale production facilities. This has led to the emergence of environmental problems such as air, water and soil pollution. Those pollution specially after using fossil fuels in the industrialization process, negatively affect human health (Atalay Şimşek and Avcı, 2024, p.1221). At the same time, industrial activities have destroyed natural habitats and reduced biodiversity, while natural resource consumption has increased rapidly.

Towards the end of the 20th century, environmental awareness began to increase and environmental protection movements strengthened. Increasing environmental awareness has increased people's efforts to reduce their impact on the environment. Environmental protection movements, environmental regulations and sustainability efforts have encouraged people to use natural resources more sustainably. Various non-governmental organisations and environmental activists have emerged to draw attention to environmental problems and propose solutions. In addition, governments and international organisations have taken steps to strengthen environmental protection regulations and environmental agreements. Today, the relationship between environment and human beings is becoming more and more complex . While technological advances are increasing the use of natural resources,

environmentally friendly technologies and sustainable practices are also being developed.

Globalisation has revealed the cross-border dimension of environmental problems and made international cooperation even more important. In order to make sense of and test these problems economically, the Environmental Kuznets Curve (EKC) hypothesis, which was created by Gene M. Grossman and Alan B. Krueger by adapting Simon Kuznets' Kuznets curve to explain economic growth and income inequality, was used. According to the hypothesis, the rate of environmental pollution is higher in low-income countries. Over time, environmental pollution increases with increasing income level. After a certain point, people with higher income levels start to demand a better environment. This demand can reverse environmental pollution after a peak point. Environmental problems begin to decrease. According to Karhan (2019), Turkey is one of the countries with low contribution of factor productivity to total output. Therefore, it reflects the characteristics of developing countries. Climate and environmental pollution in the world were questioned after the global warming that started to be observed in the 1960s and global actions and policies started to be formed. In the same years, environmental pollution was considered as a health problem in Turkey. In 1983, although environmental pollution was accepted as a separate problem with the regulations made, still energy production centres and the damages caused by them have not been completely eliminated. Although many problems have become solvable with the development of technology in recent years, the high profit motivation of energy producing actors can make it difficult to implement these measures (Şahin and Karhan, 2019).

The aim of this study is to test the validity of the Environmental Kuznets Curve (EKC) hypothesis for the period between 1990-2022 in Turkey. In the study, firstly, the studies on the EKC hypothesis are analysed. Then, information about the variables to be used in the empirical analysis is given and the methodology of the study is explained. Then, the results of the analyses are presented. Finally, in the conclusion section, the results of the study are evaluated and the conclusions made are shared.

2. Literature Review

Many studies have been conducted in the literature on testing the Environmental Kuznets Curve and different results have been reached. Some of these studies are summarised below.

Friedl and Getzner (2003), in their study covering the period 1960-1999 for Austria, concluded that the findings do not support the ECA hypothesis. Although the data for the relevant period indicate that there is a cubic (N-shaped) relationship between GDP and CO_2 emissions, a structural break was detected due to the oil price increase shocks in the mid-seventies.

Iwata et al. (2010), covering the period 1960-2003 for France, concluded that the findings consistently support the ESD hypothesis throughout the sample period. Granger causality analysis and ARDL bounds test methods were used in the study. Although the independent variable is taken as nuclear energy, the model is further extended by including international trade, energy consumption and urbanisation variables in the model. The results provide important evidence on the role of nuclear energy in electricity generation in reducing CO_2 emissions.

Shahbaz et al. (2013) for South Africa covering the period 1965-2008 concluded that the findings support the ECA hypothesis. The effects of economic growth, financial development and trade openness on environmental degradation were investigated. In the analyses, the ARDL method was used for cointegration in the long-run relationship test and the ECM method was used for short-run dynamics. The findings confirm the existence of the relationship between the variables in the long run. The results show that economic growth has a positive effect on energy emissions, while financial development has a negative effect on energy emissions. In addition, it is concluded that trade openness affects environmental degradation negatively, while coal consumption affects environmental degradation positively

Karhan (2016) investigated the long-run relationship between per capita income and environmental degradation variables for selected Turkic republics for the years 1992-2011 with cointegration tests. According to the results obtained, it is concluded that the EKC hypothesis is not valid in this country group.

Javid and Sharif (2016), in their study covering the period 1972-2013 for Pakistan, concluded that the findings support the ESD hypothesis. While CO_2 emissions were taken as the dependent variable in the study, financial development, F.GDP, energy consumption and external openness data were used as independent variables. The findings indicate that GDP, energy consumption and financial development increase CO_2 emissions. In addition, external openness has no significant effect on CO_2 emissions regardless of short or long term.

Yurtkuran and Terzi (2018) tested the validity of the EKC hypothesis in a time series analysis covering the period 1971-2015 for Mexico. In the study, coal consumption per capita, F.GDP and financial development were used as independent variables. The findings indicate that the statistical relationship between F.GDP and CO_2 emissions confirms the EKC hypothesis. In addition, it is concluded that financial development reduces carbon emissions, while anti-coal consumption policies negatively affect economic growth.

Sarkodie and Öztürk (2020) tested the validity of the EKC hypothesis in a time series analysis for Kenya covering the period 1971-2013. Least squares method (LSM), ARDL method and SIMPLS regression analysis were used in the study. The findings indicate that the EKC hypothesis is valid.

Lise (2006) concluded that the EKC hypothesis is not valid in his time series analysis for Turkey covering the period 1980-2003. They used Dickey Fuller unit root test and Durbin Watson statistics in their study. The findings suggest that there is no divergence in the relationship between CO_2 emissions and economic growth in Turkey when the 1980-2003 period data are considered. CO_2 emissions per capita and F.GDP levels increase linearly and it is concluded that the main factor in this increase is the scale effect in GDP growth.

Halıcıoğlu (2009) tested the validity of the ECA hypothesis in his time series analysis for Turkey covering the period 1960-2005. Energy consumption, GDP, CO_2 emissions and foreign trade data were used as variables in the study. In the study, cointegration relationship and the relationship between variables in the long run were determined by ARDL bounds test method. Granger causality analysis was also used to test the long-run linkages between variables in terms of parameter stability. In his study, Halıcıoğlu states that the results support the

ECA hypothesis at first glance and the level of environmental pollution increases with the increase in income in the early stages, increases until it reaches the equilibrium level and then starts to decrease at the peak level.

Saatçi and Dumrul (2011) concluded that the EKC hypothesis is valid in their time series analysis for Turkey covering the period 1950-2010. In the study, unit root tests that include structural breaks and co-integration tests were applied. The findings suggest that the relationship between environmental degradation and economic growth is long-run, although the quantitative relationship varies.

Koçak (2014), in his time series analysis covering the period 1960-2010 for Turkey, did not find any result supporting the ECA hypothesis. Energy consumption and F.GDP are included as independent variables in the study. ARDL bounds test method was applied to test the relationships between variables. As a result of the findings, it is concluded that energy consumption increases CO_2 emissions in the long run.

Ekinci (2024) tested the validity of the EKC hypothesis in a time series analysis covering the period 1970-2022 for Turkey. In the study, 15 critical periods affecting the dependent (GDP) and independent variable (CO_2) were analysed by the least squares method with structural breaks. The findings indicate that the EKC hypothesis takes different forms in different periods. The hypothesis, which takes the shape of U, inverted-U, N, takes the shape of M in addition to these, is among the results obtained.

3. Method

3.1. Data Set

In this study, the effect of economic growth and population growth rate on CO2 emissions is analysed in the context of the Environmental Kuznets Curve hypothesis. The data used in the study covers the period between 1990-2022. The reason why the data started in 1990 is that the financial liberalisation process of the sample country Turkey was completed in these years. According to Öztürk and Kuşçu, financial liberalisation can offer benefits such as strengthening competition in markets, increasing flexibility and more efficient use of resources.

The growth of international financial markets has the potential to provide flexibility while encouraging competition in the sector (Öztürk and Kuşçu, 2011, p.15). Considering the possibility of these potentials to create radical changes in production and consumption patterns, the starting year of the study was determined. The last year of the study is 2022 because the latest available and closest current data covers this year. The data were obtained from the World Bank database and included in the study.

Table 1. Explanations of Variables

Variable	Source	Abbreviation
Per Capita Carbon Dioxide Emission Amount	WB	CO2
Per Capita Gross Domestic Product	WB	GDP
Square of Per Capita Gross Domestic Product	Calculated by the author	GDP2
Population Growth Rate	WB	NFS

3.2 Methodology

In our study where the long-run relationship is analysed, the variables are first tested for unit root test. The fact that the series has a unit root indicates that the series is not stationary (Şimşek, 2024, p.429). According to Wolters and Hassler, the purpose of the unit root test for data in a given period is not to investigate the nature of the economic process, but to determine the degree of persistence in the sample. This persistence is known as stationarity and means that the mean and variance of the series remain constant over time. According to Karhan and Akbulut (2019), non-stationarity of series may cause spurious regression problem. In this study, Augmented-Dickey Fuller (ADF) unit root test was used to test the stationarity of the series.

Following the unit root test, ARDL cointegration test was applied. According to Shahbaz et al. the ARDL model is used to determine how different variables are related to each other in the long run. This method is useful for analysing the long-term links and interactions between variables (Shahbaz et al., 2015, p. 580). What makes this test stand out is that it can be applied to variables at different levels of stationarity (Dirican & Canoz, 2017, p. 382). It was included in the study due to these features. Finally, the coefficients of the long-run relationship between variables were estimated with the FMOLS coefficient test

The model created for our study in the Environmental Kuznets Curve hypothesis is given below. In the model, $\beta 0$, $\beta 1$, $\beta 2$ and $\beta 3$ represent the coefficients of the variables. For the EKC hypothesis to be valid, the variables must be significant and the coefficients of $\beta 1$ and $\beta 3$ must be positive and the coefficient of $\beta 2$ must be negative.

$$CO_2 = \beta_0 + \beta_1 GDPt + \beta_2 GDP2t + \beta_3 NFSt + et \quad (1)$$

4. Model Results

In order to determine the stationarity of the variables examined within the scope of the study, the ADF unit root test was first applied. According to the test results, GDP, GDP2 and CO2 variables are not stationary at level but become stationary when first differences are taken. Since the NFS variable was stationary at level, it was not necessary to take its difference.

Table 2. ADF Unit Root Test Results

Variables	t-Statistic	Prob. (p-test)	Test Critical Values (1%)	Test Critical Values (5%)	Test Critical Values (10%)	Results
GDP	0.634146	0.9885	-3.653730	-2.957110	-2.617434	Non-stationary
ΔGDP	-3.955538	0.0003	-2.641672***	-1.952066**	-1.610400*	Stationary
GDP2	0.765040	0.9918	-3.653730	-2.957110	-2.617434	Non-stationary
ΔGDP2	-3.873292	0.0003	-2.641672***	-1.952066**	-1.610400*	Stationary
CO2	-0.831183	0.7965	-3.653730	-2.957110	-2.617434	Non-stationary
ΔCO2	-5.602778	0.0000	-2.641672***	-1.952066**	-1.610400*	Stationary
NFS	-5.297161	0.0001	-3.653730***	-2.957110**	-2.617434*	Stationary

*Note: *** denotes significance at 1% level, ** denotes significance at 5% level, * denotes significance at 10% level.*

As a result of the unit root test, all variables became stationary. This the ARDL cointegration test applicable. According to the results of the ARDL cointegration test, which can be applied at different levels of stationarity, it is seen that there is cointegration between the variables at 5% level.

Table 3. ARDL Cointegration Test Results

Test Statistic	Value	Significance	I(0)	I(1)
F-statistic	4.258750**			
k	3	%5	2.79	3.67

The long-run relationship between the variables was found by ARDL cointegration. Finally, FMOLS coefficient test was applied to determine the coefficients of this relationship. According to the FMOLS coefficient test whose results are presented in Table 4, GDP and GDP2 are statistically significant at the 5% level, while the NFS variable is not significant at the 5% level. According to the FMOLS coefficient test, when GDP increases by 1%, CO2 emissions increase by approximately 3.68%, while when GDP2 increases by 1%, CO2 emissions decrease by approximately 0.51%. This supports the EKC hypothesis for Turkey.

Table 4. FMOLS Coefficient Test Results

Variables	Coefficient	Standart Error	t-stat	Prob. (p-test)
GDP	3.684302	1.697797	2.170048	0.0386
GDP2	-0.508672	0.216236	-2.352396	0.0259
NFS	-0.126209	0.082795	-1.524363	0.1386

5. Conclusion

In this study, the effect of economic growth and population growth rate on CO2 emissions, which is selected as an indicator of environmental degradation in the period 1990-2022, is analysed by time series analysis for Turkey sample. In the analysis, firstly, independent variables and data acquisition sources are mentioned. Then, the stationarity of the variables was tested by applying the ADF unit root test. The non-stationary variables were solved by taking their differences and the unit root problem was solved and they were included in the analysis. Afterwards, ARDL bounds test was applied to test whether there is a balanced relationship between the variables in the long run. As a result of the test, it was concluded that there is cointegration between the variables at 5% level. This result indicates that there is a strong long-run relationship (95%) between the dependent and independent variables. Finally, FMOLS coefficient test was used to determine the extent to which the independent variables affect the dependent variable. While a 1% increase in GDP increases CO2 emissions by 3.68%, a 1% increase in GDP2 decreases CO2 emissions by 0.508%. No significant result was found for the NFS variable. The test results show that the relationship between environmental degradation and economic growth between 1990-2022 confirms the environmental Kuznets curve hypothesis.

The study is important for us to see the negativities that only growth will bring with it. Because the fact that 1% growth increases CO2 emissions by 3.68% is realised with a disproportionate difference. In order to reduce and reverse this difference, turning towards policies that cause less environmental degradation will contribute to reaching the turning point more easily.

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PART IV

CASE STUDIES IN SUSTAINABILITY: EDUCATION, HERITAGE, ACCOUNTING, AND POLITICS

15

SHAPING TOMORROW'S EDUCATION: TRANSFORMATION AND SUSTAINABILITY IN EDUCATION

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Abstract

This study examines the systemic integration of artificial intelligence (AI) in education, emphasizing the necessity of AI-driven change while addressing sustainability in educational practices. Educational organizations, as complex networks with unique cultures, require an open system approach that accounts for how external environments influence internal operations. These organizations, like open systems, transform inputs into outputs, continually adapting to external changes. This adaptability is essential as digital technologies redefine societal expectations and the goals of education. Integrating sustainability, these transformations must also prioritize long-term viability, environmental consciousness, and equitable access. Programs like the Open Exploration Area (OEA) and the AKA transformation support system exemplify initiatives modernizing education. They provide access to e-learning platforms, digital resources, and teacher support, fostering flexibility, innovation, and student-centered approaches. Despite AI's potential to customize learning paths and enhance adaptability, challenges remain. The balance between AI applications and human mentorship must be addressed to maintain ethical and sustainable practices in education. Effective integration requires a shift from a product-centric to a process-centric paradigm, ensuring that advancements align with sustainability principles. Exploring AI-driven transformation in educational organizations, viewed as open social systems, from various perspectives—including sustainability—is vital to achieving resilient, inclusive, and forward-thinking educational ecosystems.

Keywords: *Educational Organizations, Education Management, Transformation, Sustainability, System Theory*
Jel Codes: *I20, I21, Q01, Q56, O33.*

1. Introduction

Change is a continuous phenomenon that causes various differentiations. This phenomenon has both beneficial and detrimental impacts on society, as well as at the organizational and individual levels. Effective change management enables transformation and has positive, enduring impacts on society. In this context, it is possible to describe education as one of the crucial fields that requires effective change management due to its wide-ranging impact, functions, and societal expectations.

The necessity of change in educational systems stems from the phenomenon of globalization. Globalisation not only intensifies complexity but also speeds up environmental transformation, compelling organisations facing swifter change in a complex environment to collaborate with others, especially those sharing the same resource pool. Such cooperation brings issues such as the location of the organisation, the compatibility of the transformation with the general goals, and the organisation's harmony with its environment to the forefront and creates new dynamics and challenges for the organisation. This process of cooperation is most clear in educational organizations because of their unique settings and ongoing social relationships that start in open social systems. Indeed, transformation in education not only redesigns learning processes but also aims to provide individuals and societies with the skills that will enable them to move toward a sustainable future. This process, a combination of transformation and sustainability, enables the education system to fulfill its environmental and social responsibilities. Thus, effective change management in education not only drives progress but also ensures that its benefits extend beyond organizational goals and contribute to a more immediate, resilient, and responsible global society.

2. Literature Review

The literature review encompasses the system and system theories, educational organizations as social systems, and the concept of transformation and transformation management in education.

2.1. Introduction to System Concept and Theories

A system is a structured organization existing within a certain context (Marchal, 1975; Zhang, 2014), consisting of "interconnected and complicated elements" (Bursalıoğlu, 2014). A system consists of components that collaborate to accomplish a specific goal; nonetheless, its continued existence is dependent upon the interaction among these components (Balcı, 2010). Hence, techniques that just focus on the internal functioning of an organization, disregarding the impact of the environment, are inadequate (Hoy & Miskel, 2012).

Two approaches that focus entirely on the internal functioning of an organization are the rational system theory, which is based on scientific management theory, and the natural system theory, which is based on the human relations approach. The rational systems theory asserts that goals determine organizational structure, while the natural systems theory emphasizes the importance of considering the informal structure for an organization's existence. According to rational systems theory, there should be a high degree of specialization and formalization. Therefore, in situations where goals are ambiguous, it is possible to maintain operational efficiency by implementing specific criteria and regulations. In contrast, natural systems theory emphasizes the importance of informal structure and human needs. It argues that organizational survival depends on more than just accomplishing specific objectives (Dooren, Lehtinen, & Verschaffel, 2015; Mills & Scott, 1983; Hoy & Miskel, 2012).

Other models ignore the organization-environment interaction, but open systems theory, a synthesis of rational and natural systems theories, addresses it. Open systems theory asserts that an organization's external environment influences its internal functioning. This theory ties an organization's existence to the level of interaction it has with its environment. Open systems theory suggests that organizations respond to environmental pressures for change by strategically positioning themselves between balanced-flexible processes and tight-loose structures. Therefore, the organization turns into a dynamic and intricate system that swings between rationality and resemblance to a natural system. The components of the system are depicted in Figure 1 (Balcı, 2010; Bertalanffy; 1950; Bursalıoğlu, 2014; Cârlan, 2017; Hoy & Miskel, 2012):

Figure I Internal compoments of the system (Hoy ve Miskel, 2012)

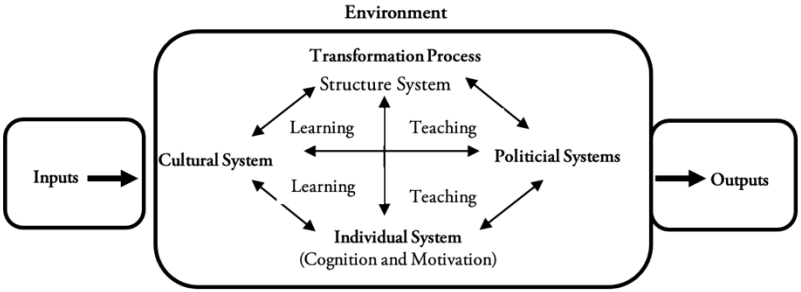


Figure 1 illustrates that the organization consists of structural, cultural, individual, and political subsystems. As an open system, the organization gains a value or output (product or service) through transforming the inputs it receives from the environment (such as human resources, raw materials, information, and money), and the organization continuously improves this cycle based on the feedback received from the environment. Therefore, boundaries that exist within each system and differentiate it from its surroundings are comparatively less obvious in open systems. In fact, the organization's performance relies on its ability to acquire resources from the environment and compete with other entities (Balcı, 2010; Hoy & Miskel, 2012; Jung & Vakharia, 2019; Yokote & Nagayama, 2013).

When a system encounters circumstances that disrupt its state of balance, it has to adapt to a change in order to find a new equilibrium that ensures its survival. The presence of a feedback loop hinders the equilibrium from being static, the solution from remaining fixed, and change from consistently producing the intended effects (Balcı, 2010; Balcı, 2014; Chau & Tam, 2000; Hoy & Miskel, 2012). Indeed, educational organizations are shaped by social and cultural values, as well as the power dynamics created by these values. Therefore, it is necessary to assess the system based on specific criteria, identify causes of errors, adapt to the environment, and to enhance efficiency, the level of independence from the environment has to be changed continuously (Bursalıoğlu, 2014). In this context, it is important to keep in mind that educational organizations are social systems formed from multiple subsystems that continuously communicate with each other.

2.2. Educational Organizations as Social Systems

The systematic approach, with its well-established roots in the fundamental and social sciences, is a comparatively new phenomenon in the field of education. An educational organization is a complicated network of social connections with its own culture, comprising a specific group of individuals and interconnected components. The operations and functionalities of social networks rely on consistent and habitual activities, necessitating an organized approach with an open system perspective. Similarly to other systems, an educational organization consists of many different essential components and subsystems that impact organizational behavior (Balcı, 2010; Bursalıoğlu, 2014; Hoy & Miskel, 2012). Figure 2 illustrates the components of educational organizations, also known as open systems, along with their corresponding subsystems.

Figure 2. Educational organization as a social system (Yalçınkaya, 2002)

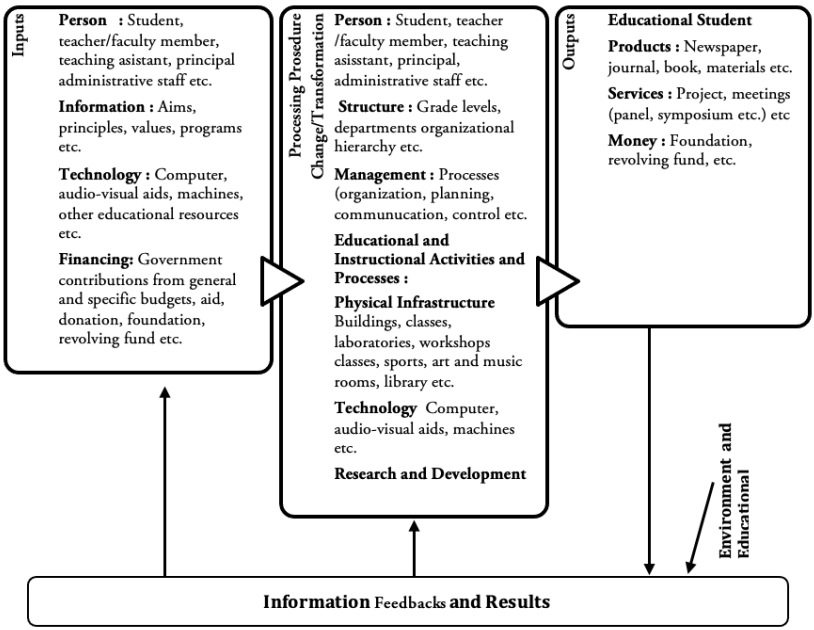


Figure 2 illustrates how an educational organization transforms inputs from the environment, such as classes, books, computers, teaching materials, teachers, and students, into outputs such as educated individuals, products, and services. It then makes adjustments to the system based on feedback it receives from society. Stakeholder satisfaction level, graduate employment rate, comments, suggestions, and complaints regarding the education and training process as feedback are some of the feedbacks that should be taken into consideration by educational organizations (Hoy & Miskel, 2012; Yalçınkaya, 2002).

Several circumstances influence the education and training process, which is the primary focus of the educational organization and lead to different outcomes. This makes it impossible to completely isolate the educational organization from its distinct surroundings, nor can we discuss a universally acceptable and obvious path the goal. The adaptability of the organization and the availability of environmental resources influence the interaction between the educational organization and the environment (Hoy & Miskel, 2012).

However, attaining and sustaining harmony among the objective, assignment, and methodology is a significant challenge. For this reason, open systems have mechanisms that prevent deviation from the goal. At this point, educational managers must currently acknowledge the necessity for change, assess it, and formulate suitable strategies (Bursalıoğlu, 2019). However, despite thorough system analysis, change continues, resulting in an unpredictable dynamic outcome (Hoy & Miskel, 2012).

In educational organization practices, the values and norms of informal groups are more effective than the rules of the formal structure. When the organizational culture is strong, common beliefs and values foster individual identification and increased group influence. Within this specific framework, the balance between official positions and personal expectations shapes the structure of the educational organization. When an educational organization tends towards bureaucratic duties, it becomes inflexible (as seen in schools associated with clichés), and when it tends towards individual expectations, it becomes flexible (as seen in Montessori schools) (Balcı, 2014; Hoy & Miskel, 2012). Also, some schools have such deep engagement with the environment that it immediately impacts social development. In these schools, the society has a direct influence on their management (Yalçınkaya, 2002). This dynamic structure is a result of

educational organizations, which are social systems in a constant state of transformation, adapting to changing social requirements and expectations.

2.3. The Concept of Transformation and Transformation Management in Education

The Turkish Language Association (2020) defines transformation as the process of transitioning from one state to another and undergoing a change in shape. Change is a phenomenon that can happen either spontaneously or as a result of purposeful planning, without a predetermined direction or evaluation standard, and can lead to either positive or adverse outcomes (Helvacı, 2005). According to Balcı (2010), transformation is the process of transforming input, form, shape, conditions, or attitudes by using technology. It distinguishes itself from change, which is defined as the use of technology for transformation. So, it is clear that the evaluation of change as transformation necessitates its alignment with technological advancements.

Transformation is a continuous process that compels organizations to adapt to changes in their surroundings. Society's perspective on education influences the transformation of educational organizations, which must remain resilient and vigilant in times of change. The prerequisite for transformation in education is that society recognizes the significance of education and adopts suitable strategies to effectively fulfill its duties. Education, which plays a central role in social justice, democracy, equality, welfare, and development, emerges as the catalyst of transformation. Neverthless, despite its considerable potential for transformation, education is known as an organization that resists change (Başaran, 2008; Bursalıoğlu, 2014; Drucker çev. 2015; Organisation for Economic Co-operation and Development (OECD), 2016).

The relative and limitless functions of education make educational organizations a multifaceted endeavor, while the process of transformation in education proves to be challenging and intricate. However, not basing transformation practices in education on theoretical and technical infrastructure and focusing on structure rather than process leads to failure. However, not basing transformation practices in education on theoretical and technical infrastructure and focusing on structure rather than process leads to failure. Therefore, establishing a functional education system is becoming as challenging as completely reinventing it. Indeed, despite

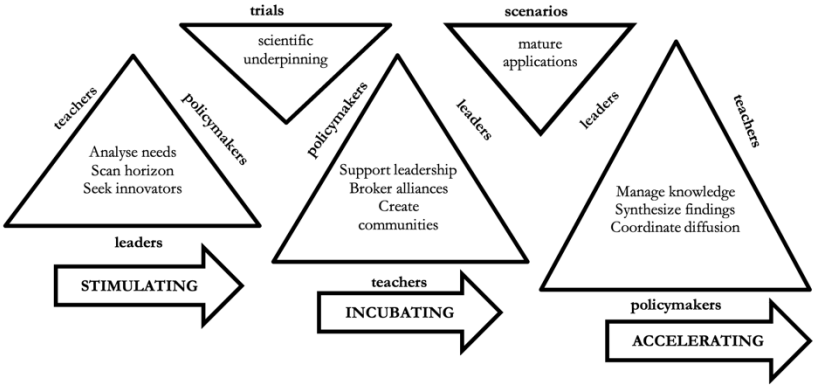
the fact that more and more resources are allocated to education, the desired level of effectiveness and efficiency cannot be achieved (Bursalıoğlu, 2013; OECD, 2016; Sotirio, Riviou, Cherouvis, & Chelioti, 2016).

The transformation of education necessitates certain prerequisites at the organizational level, including an innovative organizational culture and action research. At the system level, it requires a holistic comprehension of change and effective leadership. Efficient leadership is essential to ensure that policy changes implemented at the core result in an outstanding transformation within the educational organization. The educational administrator has the capacity to bring together the unique experiences and knowledge of teachers with the valuable contributions of stakeholders. Indeed, even if the interaction between the educational organization and the environment isn't based on a deep-rooted past and focuses on temporary and instant solutions, it leads to successful and effective transformation (Brown, MacGregor &Flood, 2020; Hopkins, Stringfield, Harris, Stool, & Mackay, 2014; Ravshanovna &Abdurashidovich, 2019). In this context, an effective transformation support system is unique as it integrates both organizational-level innovative approaches and system-level strategies.

The transformation support system will only work if politicians let educational organizations and their stakeholders operate freely, don't put in place rules that aren't needed and stop innovation, and use comprehensive strategies (Abad-Segura, González-Zamar, Infante-Moro, & García, 2020; Brown, MacGregor, & Flood, 2020; Jackson, 2019; Honig, 2013; Oord, 2013; Rad & Shahi, 2021). The "Open Exploration Area (OEA)" program, operated by a pan-European open access platform (Sotirio, Riviou, Cherouvis, & Chelioti, 2016), can be characterized as a system that provides support for transformation.

The AKA transformation support system aims to identify the challenges that develop as a result of the nature of change and to find ways to modernize educational organizations. Within this framework, all educational organizations and teachers in Europe are granted entry to the e-learning portal and digital resources. The goal is to facilitate the integration of technology-enhanced learning into educational settings and enhance teachers' proficiency in technology (Sotirio, Riviou, Cherouvis, & Chelioti, 2016). Figure 3 depicts the AKA Transformation Support System.

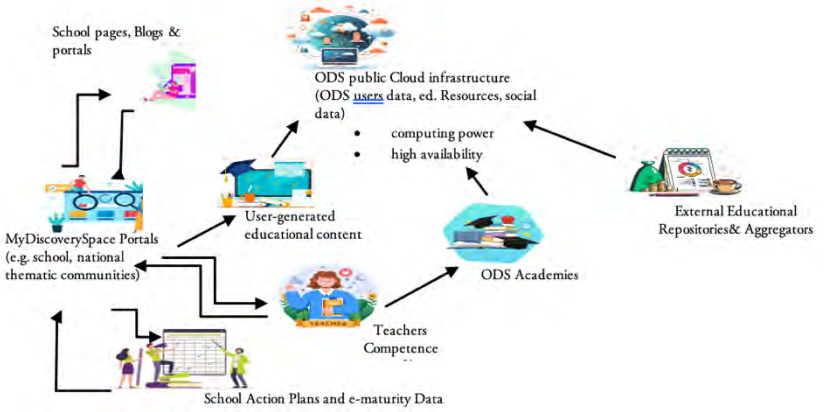
Figure 3 ODS model of school innovation and reform (Sotiriou & Bogner, 2011)



As seen in Figure 3, the AKA process consists of analysis, incubation, and acceleration stages. In the analysis stage, needs are identified, the environment is scanned, and innovation leaders are determined. In the incubation stage, the leader needs to be supported, obstacles to innovation need to be overcome, and cooperation networks need to be established. During the acceleration stage, information needs to be managed to foster innovation, evaluate progress, and coordinate dissemination. Figure 4 shows the infrastructure of the AKA transformation support system.

Figure 4 illustrates that the AKA transformation support system is equipped with a cloud computing architecture and provides unlimited access. The AKA transformation support system is comprised of the open access education program, the teacher academy, and the stakeholders, and the interaction between these components is constant. The open access education program includes a customized education portal developed according to the teachers' qualifications, the strategic plan of the educational organization, and its official website. The teacher academy provides educators with the necessary skills and abilities to effectively and efficiently operate within the education system. The stakeholders support the functioning of the system by contributing finances, educational materials, IT infrastructure, and other necessary resources.

Figure 4. AKA Dönüşüm Destek Sistemi Altyapısı
(Sotirio, Riviou, Cherouvis, & Chelioti, 2016)



The significance of transformation support systems like AKA becomes apparent when we recognize that educational managers, teachers, and even students are unable to dedicate time and effort towards educational changes due to their multiple duties (Bursalıoğlu, 2014; Ravshanovna & Abdurashidovich, 2019). The network of interactions is the most important part of the AKA transformation support system. It includes interactions between coworkers and with organizations and institutions around the world (Sotirio, Riviou, Cherouvis, & Chelioti, 2016). It supports the professional growth of educational managers and teachers in different areas such as leadership and collaboration with colleagues and serves as an illustration of unique support strategies.

2.4. Sustainable Education: The Transformation of Educational Organizations Through Social and Cultural Dimensions

Sustainability in education either refers to those education programs that are capable of protecting the environment and ensuring the cautious usage of natural resources, or to the settings of educational institutes and their research arrangements with the alignment of the protection of the environment and natural resources (Dale, 2005). However, the transformation process for educational organizations produces permanent, effective results when

approached with a sustainability-focused vision, not just structural changes. In fact, educational organizations have started addressing sustainability with its social and cultural dimensions in recent years.

By embedding principles of equality, justice, and inclusivity within the educational system and being sensitive to the cultural needs of society, we can achieve social sustainability in education. To achieve this vision, it is crucial to encourage the active participation of individuals from diverse socioeconomic and cultural backgrounds in the learning process. This ensures that everyone has an equal opportunity to contribute and succeed. Moreover, a strong culture of social solidarity among all stakeholders is essential for creating an environment.

Education plays a fundamental role in driving sustainability by facilitating the understanding of a sustainability mindset and building a thriving society. Such an approach emphasizes the interconnectedness of ecological, social, and cultural systems and highlights education as a key tool for fostering resilience and long-term societal well-being (Žalėnienė & Pereira, 2021). However, socioeconomic, cultural, and geographical factors often skew access to quality education, revealing deep inequalities in the reality of education systems around the world.

For instance, the commoditization and high costs of international education in nations like China, Malaysia, Korea, Hong Kong, and the UAE raise concerns about sustainability. Poor students may attend public schools lacking governance, leading to resource misuse and unnecessary expenses. Private schools may adopt a luxury theory, promoting commodification and corruption, and underprivileged students may seek revenge for their education (Alam, 2023). These disparities create significant barriers to achieving sustainability goals, particularly in underfunded or poorly governed schools. In this context, the transformation toward sustainability within education is an important tool to reshape worldviews and values and has the potential to address these challenges (Kioupi & Voulvoulis, 2019).

Educational organizations are under pressure to set an example and mold the next generation of leaders capable of tackling complex sustainability challenges, as the global demand for sustainable education continues to rise. In this context, the leadership of educational administrators is thus pivotal in transforming education systems and making them more inclusive and sustainable. The concept of

organizational routines plays a crucial role in sustainable leadership—ensuring sustainability in educational environments. These routines involve repetitive actions that affect each other and require the cooperation of multiple actors within the institution. Sustainable leadership promotes the execution of these routines, guaranteeing the smooth integration of innovations into current systems without any disturbance. This ensures continuous innovation and change, thereby assisting the institution in achieving long-term success (Fullan, 2007).

3. Method

3.1. Data Set

This study generated the dataset by reviewing the relevant literature. Data were sourced from scientific reports, articles, and books found through academic sources like Google Scholar, Taylor and Francis Online, etc. Moreover, commonly cited books in the national literature were also employed. The study searched the literature using the terms "educational organizations," "sustainability," and "transformation" and offered access to publications published over various years.

3.2. Methodology

The descriptive scanning model was used in this study. The descriptive scanning model is a research design used to describe the characteristics of a particular event, situation, or phenomenon under present circumstances (Karasar, 2005). This method enables the researcher to present the existing circumstances authentically, without interference (Büyüköztürk et al., 2018). The study thoroughly analyzed the present circumstances concerning the sustainability and transformation processes of educational organizations.

4. Conclusion

Educational organizations are considered fundamental elements of sustainability, as they constitute one of the most important building blocks of social development. Educational organizations serve as institutions that foster

environmental awareness, transfer values, skills, and social responsibility from generation to generation and contribute to the creation of a more sustainable society for the future.

The sustainability of educational organizations depends on their flexibility and adaptability. When you change the way educational organizations work to fit your idea of sustainability, you can create a system that will have long-lasting effects on the environment, society, and economy. It also lets educational systems adapt changes in society and the environment, be open to new Ideas, and come up with solutions for future. In this context, educational policies have a critical place in ensuring the sustainability of transformation processes.

The integration of technological innovations into educational processes constitutes one of the most important elements of transformation. Because technological innovations make teaching processes more accessible and flexible, they play an important role in ensuring equality in education. In other words, the effective use of technology in education increases the applicability of sustainability principles and reinforces social responsibility awareness by giving students a global perspective. To meet the needs of educational organizations and systematically integrate technology and innovation, education reform necessitates a variety of special support techniques and pilot applications (Sotirio, Riviou, Cherouvis, & Chelioti, 2016). Furthermore, the papers "Trends Shaping Education" (OECD, 2019) and "Schools of the Future" (World Economic Forum, 2020) demonstrate that digital skills have an essential function in enhancing flexibility, innovation, adaptability, and student-centeredness in education systems. In this context, artificial intelligence technologies such as learning platforms and digital tools are critical for diversifying teaching techniques and improving learning outcomes (OECD, 2021).

Recommendations have been formulated for politicians, education administrators, and researchers based on the study's findings. The guidelines provided for politicians are as follows:

- In order to ensure social sustainability in education, the right of all individuals to equal access to education should be guaranteed.

- A system for performance assessment should be implemented to guarantee that the educational organization fulfills societal expectations.

- The outcomes of educational policies should be analyzed, and measures should be implemented to enhance their strengths and rectify their weaknesses.

- National education systems and policies should be compared with those of nations that succeed in international evaluations, and their strengths should be modified into policies suitable for specific contexts.

- In formulating the education system and policies, an environmental study should be undertaken at the international, national, regional, local, and organizational levels to uncover the present circumstances, potential dangers, possibilities, and resources.

- All stakeholders should be engaged in the environmental analysis, and the analysis findings should be distributed to the relevant parties along with a definition of their responsibilities and authority. Establishing a unit responsible for managing this problem is necessary.

- We should identify the factors that cause conflicts among education stakeholders (education administrator, teacher, student, parents, etc.) and the ways to resolve them.

The guidelines provided for educational administrators are as follows:

- Periodic assessments that demonstrate the educational organization's impact on national education policies, strategies, and objectives should be conducted and documented.

- Solutions to the existing and prospective issues of the educational organization should be formulated based on the experiences of different educational organizations with similar structures, methods, cultures, and operations.

- The extent of teacher contributions to conducted activities should be assessed; a system of rewards, incentives, and support should be established.

The guide provided for researchers is as follows:

- Action research should be undertaken, and practical training programs should be established to discern the challenges encountered by educational administrators during the transformation process, as well as the effective and ineffective actions within this framework, with the objective of offering guidance to educational administrators.

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16

SUSTAINABILITY ACCOUNTING: CONCEPT, DEVELOPMENT, RELATIONSHIPS, CONSTRAINTS AND APPLICATION IN TURKEY

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Abstract

Sustainability accounting extends traditional financial valuation methods to assess the economic, environmental and social dimensions of corporate performance. Based on the "Triple Bottom Line" framework, this approach emphasizes transparency and accountability, aligning financial operations with sustainability goals. Many institutions and initiatives continue their efforts in this direction, although certain challenges remain, such as data collection and standardization. Recent regulatory developments in Turkey, including the BIST Sustainability Index, TSRS 1 and TSRS 2 standards, are serious efforts to align with the world. This paper examines the concept of sustainability accounting, its development, limitations and applications in Turkey and emphasizes the importance of sustainability accounting in enhancing long-term corporate value and resilience.

Keywords: *Sustainability, Sustainability Accounting, Corporate Social Responsibility, TSRS 1, TSRS 2*
JEL Codes: *M41, M14, Q56*

1. Introduction

The growth of the human population and the development of civilization have brought with them a number of unprecedented challenges. These challenges, which manifest themselves as climate change, depletion of natural resources, pollution of the environment, decline in biodiversity,

increasing social inequalities, poverty and human rights violations, can be categorized as economic, social and environmental problems. These problems, which require urgent solutions, have increased the importance of sustainability. Sustainability, as defined in the Brundtland Report of the United Nations in 1987, is "meeting the needs of present generations without compromising the ability of future generations to meet their own needs." As can be understood from the definition, sustainability is a concept that refers to strategies to solve today's needs and problems without mortgaging the possibilities of future generations.

The integration of sustainability into the accounting discipline, which is becoming increasingly important today and which has formed a common opinion that it should guide all human activities, is called sustainability accounting. Surpassing the limits of traditional accounting approaches, sustainability accounting offers a holistic approach by evaluating the social and environmental responsibilities of businesses beyond their economic performance (Bebbington and Larrinaga, 2014). Sustainability accounting is an approach that aims to evaluate the environmental and social performance of businesses in addition to measuring their financial performance. In this guiding research, the conceptual foundations of sustainability accounting, its historical development, related concepts, limitations, standardization efforts and applications in Turkey are discussed.

2. Concept and Dimensions of Sustainability Accounting

Sustainability accounting is a discipline that aims to address the economic, environmental and social performances of businesses in an integrated manner by going beyond the boundaries of traditional financial accounting (Gray, 2006; Lamberton, 2005). Sustainability accounting is an accounting approach that measures, evaluates and reports the social and environmental performance of businesses in addition to their financial performance (Schaltegger and Burritt, 2010). This approach requires focusing not only on the financial returns of businesses, but also on how effectively they use natural resources, what contributions they make to society and how much they adhere to ethical values. Sustainability accounting aims to increase the accountability of businesses and strengthen their transparency and stakeholder trust (Adams, 2008).

John Elkington's (1997) "Triple Bottom Line" concept forms the theoretical basis of the sustainability accounting approach. The three dimensions that underpin sustainability accounting are:

Economic Dimension: This dimension includes traditional financial performance indicators such as profit generation, growth, productivity, competitiveness and innovation. However, sustainability accounting emphasizes evaluating these indicators from a long-term perspective and considering the environmental and social impacts of economic activities (Schaltegger and Burritt, 2010; Mirzade & Şiriner, 2023). For example, instead of focusing on short-term profit maximization, a sustainable business emphasizes long-term value creation and efficient use of resources. This dimension also includes strategic advantages such as risk management, cost savings and access to new markets (Fülöp and Hernádi, 2013).

Environmental Dimension: This dimension, also known as environmental accounting, aims to measure, evaluate and report the impacts of business activities on natural resources (Schaltegger and Burritt, 2000). In this context, issues such as energy consumption, water use, waste generation, greenhouse gas emissions, biodiversity loss and pollution are addressed. Businesses focus on practices such as sustainable production processes, use of renewable energy sources, waste management and recycling to reduce their environmental impact. Environmental accounting helps businesses transparently report their environmental performance and use natural resources more efficiently.

Social Dimension: This dimension addresses the impact of businesses on their workforce, society and other stakeholders (Hopwood, 2009). In this context, issues such as employee rights, occupational health and safety, training and development, diversity and inclusion, human rights, community development, ethical behavior and product responsibility are evaluated. In order to improve their social performance, businesses pay attention to providing fair working conditions, supporting social projects, cooperating with local communities and adhering to ethical values. Social accounting helps businesses transparently report their social impacts and fulfill their social responsibilities. In this way, businesses not only achieve their economic goals but also contribute to the building of a sustainable society (Demirdizen-Çevik, 2024).

3. Development of Sustainability Accounting

Sustainability accounting has evolved into its current holistic approach through a series of stages. These stages have been shaped by growing awareness and responses to environmental and social issues:

The Birth of Environmental Accounting (1970s): Environmental disasters and increasing pollution problems, especially in the 1970s, led to the realization of the environmental impacts of business activities. In this period, issues such as the calculation of environmental costs, waste management and the protection of natural resources were emphasized. Environmental accounting emerged in this period as an effort to measure and report environmental impacts in addition to traditional financial accounting (Mathews, 1997). Sustainability accounting can facilitate entrepreneurs in developing innovative business models. For instance, an entrepreneur may adopt a business model that produces new products from waste materials and measure the environmental impacts of this model using sustainability accounting methods (Büyük, 2014).

Development of Social Accounting (1980s): The understanding that not only environmental but also social impacts of businesses are important triggered the development of social accounting in the 1980s. During this period, the focus was on issues such as employee rights, community relations, ethical behavior and human rights. Social accounting emerged as an effort by businesses to fulfill their social responsibilities and meet stakeholder expectations.

Triple Bottom Line Approach (1990s): With John Elkington's development of the Triple Bottom Line concept (Elkington, 1997), the understanding that economic, environmental and social dimensions should be considered together has become widespread. This approach emphasizes addressing all dimensions of sustainability in an integrated manner and evaluating the performance of businesses in these three dimensions. Sustainability accounting has evolved into a more holistic approach in this period.

Sustainability Reporting and Integrated Reporting (2000s and beyond): In the 2000s, the development of corporate social responsibility reporting standards and the activities of organizations such as the International Integrated Reporting Council (IIRC) contributed to the spread of sustainability accounting. Sustainability reporting standards and guidelines developed during this period

encouraged businesses to transparently report their sustainability performance (Adams, 2015; Esteves and Pina, 2011). In addition, approaches such as Integrated Reporting have enabled financial and non-financial information to be presented together and a more holistic understanding of the value creation processes of businesses (Barker and Eccles, 2013).

4. Related Concepts

Sustainability accounting is closely related to many concepts. Some of these concepts are:

Corporate Social Responsibility (CSR): Corporate Social Responsibility (CSR) means that a business operates not only for the purpose of making profit, but also by taking into account its impact on society and the environment. CSR refers to the responsibility of businesses not only to comply with legal regulations but also to create a positive impact on society and the environment by considering ethical values. This concept encourages businesses to work for a sustainable future in economic, social and environmental dimensions. Sustainability accounting is an important tool for measuring and reporting CSR practices (Banerjee, 2000).

Stakeholder Theory: Stakeholder Theory: Stakeholder Theory refers to the expansion of companies' profit maximization and shareholder value creation objectives to create and maximize value for stakeholders other than shareholders (Çetin, Varan and Fışkın, 2015). It emphasizes that businesses are responsible not only to their shareholders but also to all stakeholders such as employees, customers, suppliers, society and the environment (Donaldson and Preston, 1995). Sustainability accounting helps to produce and share information that will meet the expectations of stakeholders.

Legitimacy Theory: It is a theory that argues that businesses should operate in accordance with the values and expectations of society (Deegan, 2002). According to this theory, for an organization to be accepted and supported by society, it must act in accordance with the values, norms and expectations of that society. Sustainability accounting provides the reporting of information that will help businesses maintain their legitimacy.

Integrated Reporting: It is a holistic reporting approach in which financial and non-financial information is presented together (King and Eccles, 2014). Integrated reporting is a strategic communication tool that covers all aspects of an organization's value creation process, brings together financial and non-financial information and provides a forward-looking perspective. Sustainability accounting is a key component of integrated reporting.

Carbon Accounting: It refers to the processes of measuring, reporting and managing greenhouse gas emissions of businesses (Hahn, 2011). Carbon accounting is an approach that covers both the processes of measuring, monitoring and reporting greenhouse gas emissions of enterprises and the accounting of financial impacts arising from carbon regulations (Öktem, 2020). It is an important sub-branch of environmental accounting.

Materiality: It is the process of identifying the important issues that should be included in a report (McManus and Adams, 2010). Materiality is an evaluation process to determine which issues are of critical importance within the framework of an organization's economic, environmental and social impacts and to what extent these issues affect stakeholders' decision-making processes (Adams, 2015). What information is important in sustainability reporting should be determined in line with stakeholder expectations.

Circular Economy: The circular economy, in its most basic sense, is a sustainability-oriented economic model based on minimizing waste in production processes and recovering and reusing materials that are seen as waste (Yalçın, 2023). It aims to use natural resources efficiently, reduce waste and recover resources. Sustainability accounting is an important tool for measuring and reporting the performance of circular economy practices. Businesses can track data such as waste management and resource utilization in this context.

These concepts provide a deeper understanding of the scope and importance of sustainability accounting, and their strong interactions support businesses to take a more holistic approach to sustainability efforts (Kaur and Lodhia, 2019).

5. Constraints and Challenges of Sustainability Accounting

While sustainability accounting is still evolving, it also has some limitations and challenges. Below, we discuss the limitations related to the validity and reliability of the information produced by sustainability accounting in its current form and the challenges that hinder its development.

Lack of Standards and Lack of Harmonization: The lack of internationally accepted standards for sustainability reporting and the application of different standards make it difficult for reports to be comparable (Cooper and Owen, 2007). This situation causes businesses to follow different reporting frameworks and complicates stakeholders' access to information. Therefore, the work of organizations such as the International Accounting Standards Board (IASB) and the Global Reporting Initiative (GRI) is of great importance (Ekergil and Göde, 2017). Collecting and analyzing sustainability accounting data can be both costly and time-consuming. In this context, reverse innovation, with its low-cost and simple solutions emerging from developing countries, can facilitate more efficient and economical data collection

Measurement Challenges: Environmental and social impacts can be difficult to quantify and assess in monetary terms (Gray, 2015). This can lead to subjectivity and uncertainty in reports. In particular, some abstract concepts are extremely difficult to measure.

Data Collection and Reliability Issues: Collecting and analyzing sustainability performance data can be time consuming and costly. In addition, in some cases, the accuracy and reliability of the data may be questioned. In particular, the collection and reliability of sustainability data covering many sectors can sometimes be problematic. Collecting and analyzing sustainability accounting data can be both costly and time-consuming. In this context, reverse innovation, with its low-cost and simple solutions emerging from developing countries, can facilitate more efficient and economical data collection (Büyük and Gümüştekin, 2017)

Implementation Challenges: Effective implementation of sustainability accounting may require businesses to allocate resources and change processes. This can be costly and challenging for some businesses. It can sometimes be difficult for businesses to integrate sustainability into all their operations.

Credibility Issues: The fact that businesses carry out social and environmental activities only for showcasing purposes (greenwashing) and do not reflect the real performance in their reports can reduce the trust in these reports (Gray, 2015). Independent audits are needed to prevent this situation.

Short-Term Thinking: Businesses often focus on short-term financial goals, which can hinder long-term sustainability investments and efforts. Sustainability accounting aims to encourage a long-term perspective.

The Challenge of Stakeholder Engagement: Engaging all stakeholders in the sustainability reporting process and obtaining their feedback can be challenging. Stakeholder engagement is important to improve the quality and credibility of reports (Cooper and Owen, 2007). Different strategies should be developed to ensure stakeholder engagement.

6. Efforts to Standardize Sustainability Accounting

Different enterprises report using different methods and criteria, making it difficult to understand and compare reports (Cooper and Owen, 2007). Therefore, the need for standardization in sustainability accounting and reporting is increasing. Standardization of sustainability accounting practices is important in the following respects:

Comparability: Standards facilitate comparison by assessing the sustainability performance of different businesses against the same criteria (Lamberton, 2005). This helps investors and other stakeholders make more informed decisions.

Transparency and Reliability: Standards make reporting more transparent and reliable (Gray, 2010). When reporting processes comply with certain principles and rules, it increases trust in reports.

Ease of Implementation: Standards provide clear guidance to businesses on how to conduct sustainability reporting (McManus and Adams, 2010). This facilitates the reporting processes of businesses and reduces costs.

Systematic Approach: Standards provide a systematic approach to the production and presentation of sustainability information, thereby increasing the

consistency of this information and preventing different reports from being presented in different ways (Unerman and Chapman, 2014).

International Recognition: International adoption of standards facilitates global comparison and understanding of reports from businesses in different countries.

Many international organizations and initiatives are working to standardize sustainability accounting. Some of the organizations and studies that carry out these studies are as follows:

Global Reporting Initiative (GRI): GRI is an independent organization that develops the most widely used standards for sustainability reporting (Ekergil and Göde, 2017). GRI standards provide a broad framework covering economic, environmental and social dimensions and provide detailed guidance on what information businesses should present and how they should present it in their reporting processes. GRI standards provide businesses with both general reporting principles and sectoral indicators (GRI, 2024). The GRI standards are one of the most widely accepted standards in sustainability accounting reporting.

Sustainability Accounting Standards Board (SASB): SASB is an organization that develops sector-based sustainability standards (Akarçay, 2014). SASB standards focus specifically on the information needs of investors and provide guidance on which economic, social and environmental issues businesses should prioritize (SASB, 2024). Unlike GRI standards, SASB standards are more sectoral and financial-oriented (Şenol & Kaya, 2021). SASB has issued sustainability accounting standards for 77 sectors.

Integrated Reporting Council (IIRC): IIRC has developed an integrated reporting framework that combines financial and non-financial information (King and Eccles, 2014). The IIRC's integrated reporting framework helps businesses to communicate their value creation processes in a more holistic manner and provides a basis for reporting sustainability information.

International Accounting Standards Board (IASB): In addition to financial reporting standards, the IASB has developed some conceptual frameworks for sustainability reporting (Adams, 2015). The IASB's work aims to provide

guidance on how sustainability information can be integrated into financial reports.

Task Force on Climate-related Financial Disclosures (TCFD): Established by the Financial Stability Board (FSB), the TCFD publishes recommendations on how to report financial risks related to climate change (TCFD, 2024). The TCFD recommendations help businesses identify and report their climate-related risks and opportunities.

Global Sustainability Standards Board (GSSB): The Global Sustainability Standards Board (GSSB) is the organization that develops GRI's standards and works towards wider international acceptance of sustainability reporting. The GSSB operates under a Terms of Reference to oversee the development of GRI Standards in accordance with a formally defined procedure.

United Nations Sustainable Development Goals (SDGs): The SDGs, set by the UN in 2015, constitute the goals of sustainability reporting. The SDGs, which consist of 17 interconnected ambitious goals, basically set some targets to eliminate the main problems facing people all over the world (United Nations Turkey , 2024). In addition, the SDGs provide a framework for businesses to measure and report their sustainability performance and encourage them to contribute to achieving these goals.

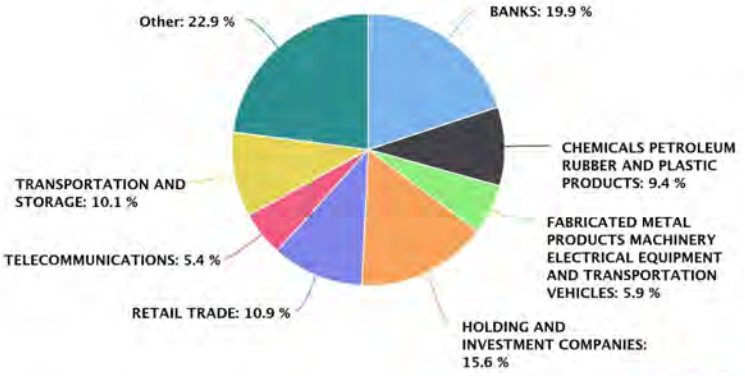
These organizations and initiatives carry out various efforts to develop and standardize sustainability accounting and reporting. However, different stakeholder expectations, measurement challenges, sectoral differences, different legal frameworks, political and economic pressures can be cited as barriers to these efforts.

7. Applications of Sustainability Accounting in Turkey

Sustainability accounting practices in Turkey are newer than in other developed countries. However, important steps have been taken in this area in recent years. In particular, Borsa Istanbul (BIST) plays an important role by creating sustainability indices and encouraging companies to report on sustainability (Süklüm and Hiçyorulmaz, 2019). The BIST Sustainability Index was established in 2014 to assess the environmental, social and governance (ESG)

performance of companies in Turkey. The index introduces investors to companies that comply with sustainability principles and enables the stocks of these companies to be traded. The aim of the Sustainability Index is to promote sustainable business practices and reward companies that meet ESG criteria. Companies included in the index must comply with certain standards in terms of sustainability reporting and performance. As of 2024, 84 stocks are listed in the BIST sustainability index. (BIST, 2024).

Figure 1. Sectoral Distribution



Source: Borsa Istanbul, 2024.

Figure 1 shows the sectoral distribution of stocks listed in the BIST Sustainability Index. Accordingly, banking, holding and retail trade companies have a relatively higher weight in the BIST Sustainability Index.

When sustainability reporting practices in Turkey were not mandatory, many large companies published such reports on a voluntary basis (Gençoğlu and Aytaç, 2016). When these reports were analyzed, it was seen that they were generally based on GRI standards, but there were also some deficiencies and incompatibilities. In particular, there were difficulties in measuring and monetizing social and environmental impacts. In addition, many companies used sustainability reporting only as a showcase tool, which undermined trust in the reports.

Legal regulations on sustainability in Turkey have evolved over time (Demircioğlu and Ever, 2019). The 2012 "Regulation on Monitoring of Greenhouse Gas Emissions" and its 2014 revision determined the obligations of businesses to monitor and report greenhouse gas emissions. Finally, the legal framework of sustainability reporting standards in Turkey was established with the amendment made to Article 88 of the Turkish Commercial Code on June 4, 2022 and the authority to establish standards was given to the Public Oversight Authority (POA). The Authority adopted the international standards issued by the International Sustainability Standards Board (ISSB) and established two main standard sets, namely TSRS 1 (General Provisions on Disclosure of Sustainability-Related Financial Information) and TSRS 2 (Climate-related Disclosures). These standards, set in line with the European Union's Corporate Sustainability Reporting Directive (CSRD), have become mandatory for large enterprises exceeding certain thresholds as of January 1, 2024. In order to provide a healthy transition period for businesses, an exemption was granted for the calculation of 'Scope 3' carbon emission data for the first two reporting periods. These regulations entered into force after being published in the Official Gazette dated December 29, 2023 (POA, 2024).

The TSRS 1, outlines the framework for sustainability reporting by businesses, focusing on the integration of sustainability risks and opportunities in financial reporting. It aims to provide transparent, reliable, and comparable disclosures, facilitating informed decision-making by stakeholders. The standard emphasizes the importance of including sustainability factors in financial statements and ensuring their accuracy. It applies to both private and public entities, guiding them on how to report sustainability-related financial data comprehensively to reflect their long-term financial health and resilience.

TSRS 2 addresses the impact of climate-related risks and opportunities on business activities in the context of financial reporting. The standard explains how businesses should manage climate risks under four main headings: governance, strategy, risk management and metrics. The aim is to ensure that businesses report on climate factors that may affect their cash flows and cost of capital. In addition, the standard provides a detailed reporting framework to increase transparency and support investors in making informed decisions.

8. Conclusion

Sustainability accounting is an important tool that supports long-term value creation by assessing the economic, environmental and social impacts of businesses in a holistic manner. This approach does not only focus on financial performance, but also requires businesses to consider their impact on society and the environment. The complex and dynamic nature of today's business world has made sustainability accounting a necessity rather than a choice. In particular, the increase in environmental crises, social inequalities and ethical issues increases the importance of practices in this field.

In the Turkish context, the development of sustainability accounting has gained momentum with the adoption of international standards and legal regulations. Standards such as TSRS 1 and TSRS 2 provide businesses with a comprehensive framework for sustainability reporting and contribute to the spread of transparency and accountability principles. However, problems such as data collection difficulties, lack of standardization, the dominance of a short-term perspective in business management and high costs are still awaiting solutions.

With a future perspective, various steps need to be taken both at the enterprise level and at the national and international level to increase the effectiveness of sustainable accounting. Training programs to increase the sustainability awareness of businesses, integration of innovative technologies into processes and stakeholder engagement will play a critical role in this process. At the same time, global harmonization of standards will make sustainability accounting practices more consistent and comparable.

As a result, sustainability accounting will be an important tool in achieving sustainable development goals while making businesses more resilient to future risks. The adoption of sustainability as a paradigm shift in the business world will create long-term positive effects in terms of both economic growth and social benefit.

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17

COMPARING THE ENERGY POLICIES OF POLITICAL PARTIES IN TURKEY

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Abstract

Energy is a critical component for the survival of modern societies, yet its production and consumption contribute significantly to global challenges such as climate change and global warming. This study examines the approaches of Turkish political parties toward energy policies in the context of climate change, emphasizing the importance of sustainable energy transitions. Utilizing a qualitative content analysis method, the study analyzes the party programs of 15 political parties that entered the Turkish Grand National Assembly after the 2023 general elections. The analysis focuses on key themes, including renewable energy, fossil fuels, nuclear energy, and climate change policies. Findings reveal that while most parties prioritize renewable energy sources such as solar and wind, many also continue to support the use of domestic fossil fuels and nuclear energy. A notable divide exists between parties advocating ecological sustainability, such as the Workers' Party of Turkey (TİP) and the Labor Party (EMEP), and those emphasizing energy supply security and reducing foreign dependency, such as the Justice and Development Party (AKP), Nationalist Movement Party (MHP), and Yeniden Refah Partisi (YRP). The study highlights the varying levels of commitment to addressing climate change, with some parties incorporating detailed climate policies while others overlook the issue. The research underscores the critical role of political parties in shaping Turkey's energy and climate policies, as well as the need for increased public awareness and engagement on energy policy issues. These findings provide insights into the potential trajectories of Turkey's energy transition and its alignment with international climate commitments.

Keywords: *Energy, climate change, political parties, policy*

1. Introduction

The Energy is a vital element for modern societies to survive. Energy, which directly determines the quality of life (Kaymakçıoğlu, 2011), is used in a wide range of activities from industrial activities to individual consumption habits. However, the side effects of energy use cause worldwide crises such as global warming and climate change. In particular, the widespread use of fossil fuels in energy production increases the amount of carbon in the atmosphere and disrupts the balance of the atmosphere by creating a greenhouse effect, which leads to global warming.

The rapidly increasing demand for energy with the Industrial Revolution has reinforced the dependence on fossil fuels and caused serious environmental problems around the world. Therefore, a shift towards more sustainable approaches to energy production and consumption has become a necessity. Transitions such as the use of renewable energy sources are critical to reduce carbon emissions and meet energy needs with less environmental damage.

Changes in the energy sector are considered a strategic necessity to keep global warming at a certain level. However, in order to achieve this transformation, the political will must develop decisive policies. Otherwise, extreme weather events, which are only seen in certain regions today, may become more frequent and intense all over the world in the future. Especially small island states are one of the regions most affected by climate change. However, if necessary measures are not taken, such impacts will become inevitable all over the world.

Turkey is among the countries with high climate vulnerability due to its location in the Mediterranean Basin. The destructive effects of climate change such as drought, reduction in biodiversity, extreme weather events and forest fires cause countries to face vital problems such as decreased agricultural production and food security (Karatabanoğlu, 2023). In this context, energy policies aim to contribute to development and increase social welfare as well as adapt to the climate crisis. Social welfare is one of the most important measures of a society's development (Demirdizen, 2013).

Within the framework of sustainable development, the transformation of energy policies is important both nationally and internationally. The United Nations' (UN) Sustainable Development Goals (SDGs) include the “Affordable and Clean

Energy" target. This goal promotes the use of renewable energy and thus aims to reduce carbon emissions and increase energy efficiency (UN, 2015). Moreover, sustainable energy policies allow countries not only to achieve energy independence but also to fulfil their international commitments in the fight against climate change. Especially for energy import-dependent countries such as Turkey, the transition to sustainable energy policies is a strategic imperative from both economic and environmental perspectives.

Political parties have a critical role in the process of determining and implementing energy policies. Political parties share their views on energy in the context of climate change through their party programs. In this context, the approaches of political parties are important in terms of Turkey's compliance with international commitments on climate change and energy transition. At the international level, framework agreements such as the Paris Climate Agreement have adopted the energy transition as a strategic goal in combating climate change. For Turkey to comply with these goals, the commitment and vision of political parties in energy policies are important.

This study examines how political parties deal with energy in the context of climate change and their views on how to formulate energy policy. The aim of the study is to compare the approaches of political parties on energy and evaluate their responsiveness to the climate crisis. For this purpose, the programs of the political parties that entered the 2023 general elections and are in the Turkish Grand National Assembly as of December 2024 were examined. Content analysis was conducted using qualitative method.

2. Turkey's Energy Profile and Climate Policy

Turkey's approach to climate change, and accordingly its energy policy, has undergone significant changes over the course of history. Climate change, which is seen as a global problem, has been an effective pressure factor for Turkey to harmonize its energy and climate policies with international targets. Energy policies in particular stand out as a key area in the fight against climate change.

Climate change policies in Turkey were initially largely associated with foreign policy and handled as part of international negotiation processes. The adoption of the Kyoto Protocol increased Turkey's visibility in international climate

negotiations, and various capacity building activities were carried out in this context. Turkey signed the United Nations Framework Convention on Climate Change in 2004, but was included in the Kyoto Protocol without undertaking a binding greenhouse gas reduction target, despite being on the list of developed countries. Following the Kyoto Protocol, the Paris Climate Agreement was signed in 2015 and entered into force in 2016 (Climate Change Presidency, 2024a).

Turkey signed the Paris Agreement in 2015, but ratified it in 2021 and set concrete climate targets. Among the main goals of the Paris Agreement is to keep global warming below 2°C compared to the pre-industrial period and to limit it to 1.5°C if possible. In addition, countries were expected to submit Nationally Determined Contributions (NDCs) that include their greenhouse gas emission reduction targets (Climate Change Presidency, 2024b).

Turkey submitted its Intended Nationally Determined Contribution (NDC) to the UN upon ratification of the Paris Agreement. Turkey made a commitment to reduce greenhouse gas emissions with the emphasis that it should be considered as a developing country. In its Updated I. National Contribution, Turkey has committed to keep its total emissions at 695 million tons of CO2 equivalent with an emission reduction of 41% compared to the Reference Scenario (the amount that Turkey's emissions will reach in 2030 if no climate policy is implemented, which is 1,175 million tons of CO2 equivalent). It also plans to achieve net zero carbon emissions by 2053. In line with these targets, Turkey has envisioned various transformations in its energy policies:

1. Increase the share of renewable energy sources in electricity generation: 35 GW of hydroelectric capacity, 3.33 GW of solar power, 18 GW of wind power and 4.8 GW of nuclear power by 2030.

2. Reduce energy consumption by improving energy efficiency.

3. Promote new energy technologies (e.g. battery systems, carbon capture and storage).

4. Establishing an emissions trading system and carbon pricing in emission-intensive sectors.

In addition, again in relation to energy, the sectoral reduction targets are as follows:

1. Industry: expanding the use of alternative fuels, increasing energy efficiency, transforming high carbon emission sectors (cement, iron and steel, etc.) based on green growth technologies.

2. Transport: reduce road transport and focus on rail and maritime transport, increase the use of electric vehicles, improve charging infrastructure.

3. Buildings: Increasing energy efficiency standards with energy identity certificates and making renewable energy systems compulsory in buildings (I.GUKB, 2023).

Turkey has a high potential in terms of renewable energy resources. As of 2022, 54% of the installed electricity capacity was provided by renewable energy sources. Among these sources, hydroelectricity, wind and solar energy stand out (Turkey National Energy Plan, 2022). However, it is noted that there is a mismatch between Turkey's renewable energy targets and the 1.5°C targets of the Paris Agreement. The Climate Change Performance Index (CCPI) report emphasizes that Turkey should triple its share of renewable energy and stop subsidies for fossil fuels (Burck et al., 2022).

An important focus of Turkey's energy policies is to ensure security of energy supply and reduce dependence on imports (Midelashvili et.al, 2023). However, as of 2022, 70% of its energy needs are met through imports. Natural gas plays an important role in electricity generation, accounting for 33% of the total, with most of its imports coming from Russia, Azerbaijan and Iran (Turkey National Energy Plan, 2022).

Energy efficiency has been identified as an important strategy in Turkey's energy policies. In the period 2017-2023, USD 8.5 billion was invested in energy efficiency projects, resulting in primary energy savings of 24.6 MTEP (II. National Energy Efficiency Action Plan, 2024-2030). However, it is stated that efforts in this area are insufficient and that broader transformations are needed, especially in the industrial and transportation sectors.

According to the CCPI-2024 Report (Burck et al., 2023), Turkey's energy policies paint a complex and multifaceted picture in the context of climate policies. Looking at Turkey's overall situation, it is seen that Turkey has a "moderate" ranking in renewable energy use, a "low" ranking in greenhouse gas emissions and energy use, and a "very low" ranking in climate policies. This indicates that there are significant challenges in achieving climate goals. Turkey's energy policies fall short of reducing the weight of fossil fuels. Setting absolute GHG reduction targets, stopping fossil fuel subsidies and closing old thermal power plants are necessary to comply with the Paris Agreement's targets (Burck et al., 2022). However, experts emphasize the importance of shaping energy policies within the framework of a transparent and participatory climate law.

While Turkey has made progress in energy and climate policies, it needs to take more ambitious and concrete steps to fully align with international targets in these areas. Renewable energy investments should be increased, dependence on fossil fuels should be reduced and long-term strategies should be developed in the framework of international cooperation.

3. Political Parties' Approach

In Turkey, political parties' approaches to energy policies have become more important with the increasing impacts of the climate crisis and the challenges of energy supply. Climate change has become one of the focal points of political decision-makers with its not only environmental but also economic and social dimensions. In this context, the views and practices of political parties on energy policies are critical for sustainable development and combating climate change (Karatabanoğlu, 2023). Recognizing this importance, there are many studies on the approaches of political parties in the context of energy policies and climate change.

In the 2011 general elections, Kaymakçıoğlu (2011) analyzes the energy policies of AKP (Justice and Development Party), CHP (Republican People's Party) and MHP (Nationalist Movement Party) in their election manifestos and reveals the different approaches of these parties towards energy. According to the analysis, AKP advocates the free market, privatization of energy facilities and the construction of new ones through the build-operate model. It also advocates projects to prevent energy losses, and the establishment of thermal power plants

based on domestic coal. CHP, on the other hand, considers energy as a public service and aims to ensure energy supply security through public investments and prioritize domestic resources. The CHP has also stated that renewable energy sources should be promoted and energy saving projects should be prioritized. MHP emphasized that bio-fuel production would be prioritized to reduce energy dependency, and that nuclear energy technology should be acquired (Kaymakçıoğlu, 2011).

Tamzok (2018) evaluates the positions of political parties on energy policies in the 2018 general elections. He states that AKP, CHP, İYİP (Humanity, Innovation and Goodness Party) and MHP made statements on energy, SP (Felicity Party) did not mention it at all and HDP addressed the issue with general statements. According to Tamzok (2018), while there are no major differences in approaches to energy production, parties' visions on energy supply are limited. The fact that Turkey is not a country rich in fossil fuel resources necessitates cooperation with neighbouring countries, storage, and transportation policies for energy supply. It also states that developing renewable energy resources and increasing energy efficiency should be among the important strategic goals. It argues that structural transformations are needed in energy consumption and that Turkey's growth model should focus on low energy consumption and high value-added economic activities instead of energy-intensive secondary economic activities. Among the opposition parties, CHP states that it will support low energy consumption with high added value in its industrial and technology policies, while İYİP adopts a similar approach. The MHP, on the other hand, emphasized a transition to high-technology based production models. However, AKP's election manifestos did not take any steps to change the growth model based on energy-intensive secondary economic activities.

Özpek et al. (2023), who asked political parties about their energy policies before the 2023 general elections, reported the answers given. According to Özpek et al. (2023), while some of the political parties emphasize the renewable energy potential, they underline that they insist on the inclusion of national fossil resources in the system and the continuation of exploration and exploration activities. Especially AKP and İYİP argue that fossil energy resources can be managed in an environmentally compatible manner. This has been considered as

a factor overshadowing Turkey's commitment to transition to renewable energy in its energy policies.

The views of the society on energy preferences are as important as the approaches of political parties towards energy policies. Ediger et al. (2022) conducted a study on the Energy Preferences of the Turkish Society with 1237 respondents and obtained data revealing the priorities and preferences of the participants regarding energy. According to the study, the fact that the energy used in consumption is clean and harmless to the environment was seen as the most important criterion by 32% of the participants. This was followed by being obtained from domestic resources (15.4%), uninterrupted supply (13.6%), being cheap (13.6%), being efficient (12.1%) and being of good quality (10.6%). When the participants' views on power plants to be established in the regions where they live are analyzed, wind energy (58.7%) and solar energy (55.4%) projects received the most support. Coal power plants (34.5%) and nuclear power plants (28.8%) were the least supported energy generation methods. In the study, 42% of the participants stated that they were not informed about the energy policies of political parties, indicating a lack of awareness on this issue. Regarding the tendency to take into account the energy policies of the party they voted for in the elections, only 36.2% of the participants stated that they take energy policies into account. Ediger et al. (2022) state that the public's interest in energy policies in Turkey is at a low level, which may also indicate a lack of demand from society to make energy policies a priority issue for political parties.

Political parties' approaches to energy policies are critical for Turkey's fight against climate change and energy supply security. However, it is possible to say that the lack of awareness and prioritization of energy policies both at the level of political parties and society is among the main obstacles Turkey faces on the way to establishing a sustainable energy policy.

4. The Evaluation of The Party Programs of The Political Parties

4.1. Method

While in this study, the party programs of the political parties that entered the Grand National Assembly of Turkey in the 2023 General Elections were

examined using the content analysis method. Content analysis is a qualitative method that enables systematic and objective analysis of implicit and explicit meanings in texts (Krippendorff, 2018). In this context, party programs were scanned in detail in order to evaluate the approaches of political parties to energy policies in the context of climate change and global warming.

Data Collection Process

In the first phase, party programs were accessed through the official websites of the 15 parties that entered the Grand National Assembly of Turkey in the 2023 general elections. Where party programs were available, the texts were downloaded in digital format for a systematic scan. Among the 15 political parties, the party program of the Peoples' Equality and Democracy Party (DEM) and the Democratic Regions Party could not be accessed on the web.

Content Analysis

Party programs were analysed for certain key terms that can be used in the context of energy policies and climate change. In content analysis, it is taken into account whether the identified terms are mentioned and if so, in which context. These key terms were identified by utilizing the Climate Change Performance Index (CCPI)reports used at the beginning of the study. The terms analysed in this context are:

- Climate change
- Global warming
- Energy
- Renewable energy
- Coal
- Oil
- Nuclear energy

Each party program was evaluated in terms of the use of these terms, their context and proposed policies. In particular, the contexts in which the terms were used

and the relationship between energy policies and climate change were emphasized.

Coding and Analysis of Data

During the content analysis process, terms and policies mentioned in the programs were systematically coded. The coding enabled the categorization of energy policies into three main themes:

1. **Renewable energy sources**: Promoting resources such as solar, wind and hydroelectricity and increasing their utilization rates.

2. **Fossil fuels and nuclear energy**: The use of resources such as coal, oil and the attitude towards nuclear energy.

3. **Climate change policies**: Targets and adaptation policies to combat climate change and global warming.

These themes formed the basis for assessing the energy and climate policies of each political party in a comparative framework.

4.2. Analysis and Comparison of Parties

When the programs of political parties are examined, it is seen that they display different approaches in the context of climate change and energy policies and similar approaches in some issues. In this section, parties' approaches to energy policies are compiled and compared with each other through content analysis. In addition, common themes and differences in the parties' programs were evaluated).

Justice and Development Party (AKP):

AKP's energy policy is mainly based on security of supply. It is stated that renewable energy sources (solar, wind) will be used, but it is also emphasized that hydroelectric power plants and thermal power plants based on domestic coal will be supported. The establishment of nuclear power plants and focus on oil

exploration are prominent elements. However, the program did not mention climate change and global warming(www.akparti.org.tr).

Republican People's Party (CHP):

CHP defined climate change as a "universal threat" and developed its energy policies in this context. It was stated that climate-friendly technologies would be used, renewable energy sources (solar, wind) would be developed and national resources would be prioritized. It was stated that nuclear energy was not completely opposed, but the use of fossil resources such as domestic coal was also included(https://content.chp.org.tr).

Nationalist Movement Party (MHP):

The MHP listed climate change policies among its prioritized goals and stated that adaptation policies would be implemented in areas such as agriculture and forests. It aims to increase renewable energy diversity, ensure energy supply security and reduce foreign dependency. It is also planned to establish nuclear power plants and to continue oil exploration and extraction activities(www.mhp.org.tr).

The Party of Humanity Innovation Goodness (IYIP):

IYIP has based its energy policies on protecting the ecological balance and reducing foreign dependency. Domestic and renewable energy sources were prioritized, but it was also stated that thermal power plants would continue to be built and coal would continue to be used in electricity generation(https://iyiparti.org.tr).

Felicity Party (SP):

SP stated that renewable energy resources will be utilized as much as possible and energy resource diversity will be ensured. It is planned to focus on nuclear energy and oil production activities(https://saadet.org.tr).

Democracy and Progress Party (DEVAP):

DEVAP stated that energy policies should be reconsidered in the context of climate change. Increasing renewable energy resources, utilizing domestic coal resources with environmentally friendly technologies and encouraging R&D studies on nuclear energy are the prominent elements(https://cdn.devapartisi.org).

Free Cause Party (HUDA-PAR):

HÜDA-PAR stated that wind and solar energy would be utilized, hydroelectric and nuclear power plants would be established and oil exploration activities would be increased(https://hudapar.org).

New Welfare Party (YRP)

The YRP based its energy policy on reducing external dependence and ensuring security of supply. The party has promoted the use of domestic fossil resources such as coal and oil, the use of lignite in thermal power plants and R&D to reduce carbon emissions. The establishment of nuclear power plants is also encouraged. However, there is no emphasis on climate change and global warming in the program (https://yenidenrefahpartisi.org.tr).

Democratic Left Party (DSP)

The DSP prioritized the use of domestic resources in energy production and low-cost energy production. However, the program does not specify concrete targets for renewable energy and makes no mention of climate change. There is no positive or negative statement on nuclear energy (www.dsp.org.tr).

Democrat Party (DP):

The DP prioritized security of supply and the use of domestic energy resources in its energy policies. It plans to utilize hydrogen energy and increase renewable energy investments. Nuclear energy and the use of coal were also included (www.dp.org.tr).

Workers' Party of Turkey (TİP):

The TİP addressed energy policies from the perspective of preventing ecological destruction and advocated the use of clean, renewable energy sources. It took a stance against nuclear energy and energy policies that harm the environment(https://tip.org.tr).

Labor Party (EMEP):

EMEP argued that energy policies should prioritize human and living life and opposed nuclear power plants (www.emep.org)

4.3. Evaluation and Comparison of Views

1. Approach to Renewable Energy:

All parties emphasized the importance of renewable energy sources and aimed to increase investments in solar and wind energy. However, parties such as AKP, SP, MHP, İYİP also support the use of fossil fuels (coal, oil) despite their emphasis on renewable energy. They especially emphasize technology in their support. On the other hand, TİP and EMEP completely oppose the use of fossil fuels and build their energy policies on ecological sustainability.

2. View on Nuclear Energy:

While parties such as AKP, MHP, SP, HÜDA-PAR and DP support nuclear energy, EMEP and TİP have taken a stance against this type of energy. CHP, on the other hand, stated that it was not completely against nuclear energy, but suggested the use of methods that do not harm the environment. Similarly, DEVA stated that R&D studies on nuclear energy should be conducted.

3. Use of Fossil Fuels and Coal:

Parties such as AKP, MHP, İYİP and YRP supported the use of domestic coal, while TİP and EMEP explicitly rejected the use of fossil fuels. CHP, while prioritizing domestic resources, stated that the environmental impacts of these resources should be taken into consideration.

4. Climate Change Policies:

CHP, MHP, İYİP, DEVA and DP mentioned policies that directly address climate change in their programs and indicated what can be done. However, parties such as AKP and YRP either did not mention climate change at all or made limited statements on the issue.

5. Security of Supply and External Dependency:

All parties share the goal of ensuring energy supply security and reducing foreign dependency. However, the balance between the use of domestic fossil fuels such as coal and oil and renewable energy investments differs between the parties.

5. Conclusion

The parties' approaches to energy policies differ markedly on environmental and sustainability issues. While parties such as AKP, MHP, SP and YRP focus more on energy supply security and the utilization of domestic resources, parties such as TİP and EMEP approach energy policies entirely within the framework of ecological sustainability. Parties such as CHP and DEVA, on the other hand, have increased their emphasis on renewable energy sources, but have also adopted a more balanced approach by proposing the controlled use of fossil fuels. These differences provide clues as to how Turkey's energy policies will be shaped in the future. However, it is also noteworthy that the energy policies of the parties are not sufficiently understood at the social level and that public awareness on this issue should be increased.

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