A Critical Examination of the Effects of Covid Pandemic on Global Ecotourism

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The coronavirus pandemic has had a major impact on the global ecotourism sector. Examples from Asia, Africa, North America, South America, Europe and Australia were used for the study aimed at impact analysis. The ecotourism sector is crucial for sustainability and local procurement, as it provides employment opportunities without harming the environment. This differs from traditional tourism approaches and is part of a circular economy. Ensuring the success of ecotourism requires the concerted efforts of all stakeholders. This article uses examples from these countries to consider the ecotourism perspective in the context of the pandemic. The approach employed involves conducting a thorough examination of existing literature and performing a correlational analysis. This enables the formulation of an educated viewpoint on significant themes that are frequently disregarded in conventional economic studies. Policy implications encompass various measures that can be undertaken to address the challenges at hand. These measures involve the exploration and development of alternative tourist destinations, the establishment of regulations and penalties to deter illegal construction activities, the promotion of themed tourism experiences, the implementation of restrictions on tourist access to environmentally fragile areas and the enhancement of capabilities of small-scale tourism service providers. A circular economy approach to ecotourism could help reduce the negative impact of the pandemic and strengthen the sector for future times.

Keywords: Circular Economy, COVID-19, Ecotourism, Impact Analysis, Sustainability

1. Introduction

ECOTOURISM is an important sector of the global economy. It accounts for 5 to 7 per cent of the global Gross Domestic Product (GDP). The global

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ecotourism market size is projected to increase from US$185.87 billion in 2021, with a compound annual growth rate (CAGR) of 15.2 per cent expected from 2022 to 2030. This growth can be attributed to several factors, including the growing popularity of eco-friendly travel, the focus on outdoor recreation, the rise in solo traveling, rapid urbanization, and the availability of affordable budget trips. Furthermore, the awareness regarding the negative impact of traditional tourist activities on the environment, such as water pollution, soil erosion and habitat loss, has prompted both sustainable tourists and government authorities to promote ecotourism and contribute to the industry's expansion [16, 26].

Not only does ecotourism help in the recreation of the human body and mind, but it also aids in enabling greater cultural, environmental and social integration among disparate regions. In other words, ecotourism amalgamates the body, mind and spirit. Sustainable tourism is founded on the principles of sourcing locally, embracing regional cultures, and providing economic opportunities to indigenous people without triggering damage to the natural milieu. This mindset is gaining traction within the global tourism industry. Recognizing the detrimental effects of conventional mass tourism, stakeholders have developed policies on ecotourism and launched initiatives to encourage preservation practices among travelers. According to The International Ecotourism Society (TIES), ecotourism refers to "responsible travel to natural areas that conserves the environment, supports the well-being of local people, and involves interpretation and education." Embracing ecotourism may be the way forward in the post-pandemic era. By involving host societies and generating prospects for supplementary livelihood while preserving nature and local cultures, a niche could be established for low-impact, high-value tourism, particularly in environmentally vulnerable regions [26].

The Covid pandemic sought to upend the gains in the tourism sector attained till the year 2019. The world was taken by surprise when the pandemic struck suddenly. The virus spread rapidly, causing a significant increase in cases, which resulted in the implementation of various containment measures worldwide. The most notable measures included strict lockdowns and travel restrictions. The consequences of the pandemic were felt in both the global and national economies, and this impact continues to persist. The tourism industry, in particular, suffered greatly, with the tour and travel industries being severely affected. In 2019-20, the tourism sector contributed to a tenth of the global GDP and employment. However, the Covid pandemic devastated this $10 trillion business, leading to a decline in its output and rendering several unemployed [26].

According to the World Travel and Tourism Council (WTTC), the global travel and tourism industry is anticipated to rebound to its pre-pandemic state

by 2023. Furthermore, it is projected to surpass the global GDP growth rate, with an average yearly growth rate of 5.8 per cent from 2022 to 2032. It would help create 126 million additional employment. Tourism jobs are projected to recover to pre-pandemic levels by the end of 2023, WTTC said. The travel and tourism industry's GDP will reach the pre-pandemic level figure of $9.6 trillion in 2023 [26].

This article aims to develop a discerning viewpoint regarding the influence of the pandemic on the worldwide ecotourism industry. To achieve this objective, the study focuses on various instances from prominent continents across the globe, including Asia (India), Africa (Morocco), North America (USA), South America (Brazil), Europe (Portugal), and Australia. These countries have been chosen for an impact analysis-centric study exclusively based on the prevailing literary substantiation [26].

This article is organized into the following segments. The first section unveils the subject of this work. The next section reviews existing literature on the topic. The third identifies the methods adopted by the researcher to conduct this study. The fourth explains the results of this paper and also discusses its limitations, relevance for researchers and policy-makers and mitigating policies and strategies for any such future crises. The last section concludes the study and elicits the future policy implications of the same [26].

Available literary evidence is utilized in the following section to locate global ecotourism in the framework of the Covid contagion.

2. Global Ecotourism & COVID-19: Literature Review to Assess the Impact of the Pandemic

As the global community continues to confront the consequences of the COVID-19 pandemic, this segment seeks to locate the global ecotourism sector within the context of the pandemic using instances from all over the world. All the major continents of the world are covered in this section in a bid to build a globalist framework for this study. Asia is represented by India, Europe by Portugal, North America by the USA, South America by Brazil, Africa by Morocco and Australia and Oceania by Australia. These countries have been identified based on reviewed literature and growth in revenue shares generated through tourist activities [34].

2.1 Impact of the Pandemic on the Indian Ecotourism Industry

In the initial six months of 2020, the tourism sector encountered substantial setbacks on a global scale, amounting to a staggering US$460 billion. The Asia-Pacific region, unfortunately, bore the major impact of this decline in tourist

arrivals, accounting for approximately 72 per cent of the overall decrease. India is one of the prominent tourist destinations on the Asian continent. About 3.8 to 4 crore people in the country confronted joblessness due to the disease [27]. By the conclusion of the pandemic, the tourism industry in India could have encountered losses amounting to ₹5 lakh crore (US$65 bn.) throughout its entire value chain. Globally, the tourism sector is bound to get back on track with a gradual lifting of the pandemic restrictions along with a slew of sector-specific recovery measures and stimulus packages. Due to restrictions on international travel for tourism, Indian travelers turned to domestic travel by the Ministry of Tourism's *Dekho Apna Desh* initiative. This initiative aims to promote domestic travel with a focus on ecotourism [27]. With a number of travelers preferring Eco-friendly tourism with its commitment to greener, environmentally and socially friendly practices, sustainable tourism has evolved from being a mere choice to becoming an essential requirement in the global travel landscape. Even though the pandemic had adversely impacted several economic activities, nature thrived without human interference amid lockdowns. Amidst the pandemic, nature underwent its process of rejuvenation, resulting in a significant decrease in air pollution, improved visibility of the Himalayan Range from cities situated in the plains like Jalandhar and Saharanpur, the return of birds and animals to urban areas, and a minimal amount of waste generated in popular tourist destinations [27]. The travel and tourism sector which lost out on considerable business, thanks to COVID-19, is trying to find its mojo back after the pandemic. Although this could prove advantageous for businesses and visitors, the rejuvenating natural environment and indigenous people may not deem it entirely conducive to their survival and prosperity [27]. The same is quite evident across popular tourist sites of the likes of Rishikesh, Varanasi, Manali, Lahaul and Spiti [27].

2.2 Effect of the Contagion on the Portuguese Ecotourism Sector

The imposition of lockdowns and other travel restrictions due to the COVID-19 pandemic brought an end to the Portuguese tourism sector's uninterrupted growth streak, which had been recorded since 2010-11. Portuguese tourism suffered from a tough reduction in tourist influxes and revenues in comparison to the pre-pandemic years and a propensity developed towards keeping small numbers in general. The rural ecotourism sector managed to buck the negative trend, thanks to aggressive campaigning by the Government. However, owing to its small share in the total tourism industry (to the tune of 7% only), the buoyant performance of the rural ecotourism sector could not reverse the losses experienced by the industry as a whole [25]. In Portugal, approximately 65,000 businesses within the tourism industry have implemented workforce reductions, affecting nearly 85 per cent of employees associated with

accommodation establishments [25]. Given the ongoing decline, it is evident that the circumstances surrounding these companies have been and continue to be grave, potentially leading to the permanent closure of some of these businesses. All in all, employment and revenues in the sector received a severe hit due to the pandemic [25].

2.3 Effect of COVID-19 on the US Ecotourism Sector

The pandemic had a considerable impact on the US ecotourism industry, especially on the protected areas. In the context of Utah, it was reported that 15.3 million visitors contributed approximately US$1.2 billion to the local economy in 2019, specifically in the original gateway regions. The travel and tourism sector in Utah contributed to the employment of approximately 19,000 individuals, resulting in an income of nearly US$614 million. Moreover, it significantly enhanced the state's economy by adding approximately US$1 billion in value and US$2 billion in economic output. The economic impact of the Covid lockdowns has been most pronounced. Not only did they lead to fewer visits, but even caused considerable deductions in revenues and profits in the sector [32]. Consequently, the local populations residing near the national parks experienced the most severe impact, facing the highest levels of unemployment within the state of Utah. Simultaneously, directors of national parks advocated for measures to ensure a safer visit, including timed entry, signage promoting social distancing, guidelines for responsible recreation and enhanced cleaning of facilities. Following their reopening, a number of renowned national parks like Yellowstone, Glacier, and Joshua Tree experienced a significant surge in visitor numbers, consequently leading to an increase in revenue [32]. Conclusively, it could be stated that just as in the case of other nations, the US ecotourism industry too witnessed a considerable slowdown during the pandemic [32].

2.4 Impact of the Pandemic on the Brazilian Ecotourism Industry

Tourism holds a significant position in Brazil, a developing country and one of the prominent emerging market economies. The Amazon River Basin, known for its vast rainforests, diverse wildlife, and rich cultural heritage, is a highly sought-after destination for eco-tourists from around the globe [24, 29, 36]. While there was a decline in the number of tourists visiting the Amazon River Basin in 2015-16, it witnessed a resurgence in 2018 and continued to attract visitors until 2019. Interestingly, during this period, tourism companies not only experienced an increase in the number of tourists but also reported higher or stable revenue (74%), customer base (79%), and sales (76%) between 2018 and 2019 [1]. These positive trends provided optimistic prospects for the tourism industry in 2020-21, despite the core pandemic period. However, the state of Amazonas faced challenges due to the pandemic. Many owners and

administrators of ecotourism businesses had to take measures such as employee dismissals, reduced workloads/salaries, and other cost-cutting measures. To mitigate the impact of the pandemic and retain customers, numerous activities were temporarily or permanently suspended. Additionally, a significant number of guides and safari drivers had to seek employment in other sectors to supplement their reduced incomes [1]. The recovery of ecotourism in Amazonas seems challenging in a post-pandemic context. The negative effects on ecotourism and tourism, in general, are expected to persist for several years, although definitive conclusions cannot be drawn at present. Collaborative efforts among different stakeholders, including guides, drivers, accommodation providers, transportation services, and food establishments, could play a crucial role in the financial management of ecotourism professionals and help revitalize the sector [28].

2.5 Impact of the Pandemic on the Moroccan Ecotourism Industry

The Moroccan travel and tourism industry suffered greatly due to the impact of COVID-19. With closed borders, suspended flights, and lockdowns, the entire sector came to a halt. This unprecedented event in the 21st Century caused significant losses, estimated at around 3.2 billion Euros, according to the National Tourism Confederation [10]. In Marrakech, a prominent tourist destination, the situation was dire. Car parks were filled with empty vehicles, hotels were deserted, employees were laid off, and services were deferred. Similarly, in rural areas and other remote tourism centers, hiking trails, cottages, inns, and guest houses were left abandoned. Many tour guides and trek logistics suppliers lost their livings. The development of green ecotourism in Morocco was also severely impacted, as efforts to save nature and raise awareness were overshadowed by social safety concerns [10]. Furthermore, there was a surge in poaching activities across the country, and grassroots conservation organizations faced delays in funding during the pandemic. With wildlife wardens unable to carry out their duties, cases of illegal land grabbing and premeditated wildfires multiplied. Deforestation became rampant in Taza, Middle-Atlas, High Atlas, and Rif Mountains, particularly when the Moroccan government implemented pandemic containment measures in 2020-21. Unfortunately, the pandemic hindered efforts to combat illegal poaching, as there were fewer patrols and rangers in the forests. Instead, unlawful activities disguised as surveillance drops increased in protected areas throughout the country [10, 23].

2.6 Effect of COVID-19 on the Australian Ecotourism Sector

The tour and travel industry, as well as the ecotourism industry, have been significantly affected by the ongoing pandemic in Australia. The implementation of pandemic restrictions, such as internal border closures, stay-at-home orders,

social distancing norms, and travel limitations, played a crucial role in this impact. These measures have led to a pessimistic outlook for outdoor recreation businesses, which will likely persist until full economic confidence is restored. Moreover, the industry is facing challenges such as the loss of a competent workforce and the persistent impact of the pandemic-induced viral transmissibility fears. It is imperative to urgently find a solution that allows the industry to adapt and protect itself against future disruptions, including the potential emergence of new viral contagions due to the numerous mutations of existing viruses [33]. The following segment outlines the approach employed in this paper.

3. Methods

The objective of this paper is to concentrate on the influence of the pandemic on the worldwide ecotourism sector, with its emphasis on economic factors determining the development of global ecotourism during the said period (2020-22). General research methods employed for the purpose are — a review of literature and correlation analysis. This article is based on a review of literature and data obtained variously from Google Scholar, Research Gate and World Development Indicators of the World Bank. For researching and analyzing the indirect impact of the pandemic through factors affecting sustainable tourism, the method of statistical correlation is used. Correlation analysis is utilized to measure the associations between variables e.g. the association between the number of tourist arrivals, revenue generated through ecotourism and select economic factors such as Gross Domestic Product (GDP), wages, foreign direct investments, government expenditure and unemployment rate in the countries being studied. The data pertain to both the pre-pandemic and pandemic phases of 2017-19 and 2020-21, to ascertain the differences in values, if any. The statistical dependence between two quantitative variables can be measured by the correlation coefficient. This coefficient is calculated using the following formula [7].

$$r = \frac{\overline{xy} - \bar{x}\ \bar{y}}{\sigma_x \sigma_y} \quad \text{... (1)}$$

$\overline{xy}$ - Mean of both variables' multiplication,

$\bar{x}$ - Mean of one variable, 'X'

$\bar{y}$ - Mean of another variable, 'Y'

σ_x ... Standard deviation of the variable 'X'

σ_y ... Standard deviation of the variable 'Y'

The correlation coefficient can take on values ranging from -1 to +1.

The correlation coefficient 'r' can be interpreted in the following ways [8].

From 0.9 till 1.0 (from -0.9 till -1.0) – very strong positive (negative) linear correlation;

From 0.7 till 0.9 (from -0.7 till -0.9) – strong positive (negative) linear correlation;

From 0.5 till 0.7 (from -0.5 till -0.7) – average positive (negative) linear correlation;

From 0.3 till 0.5 (from -0.3 till -0.5) – weak positive (negative) linear correlation;

From 0.3 till 0 (from -0.3 till 0) – very weak positive (negative) linear correlation.

The following variables are used for this study as '*x*' (independent variables) and '*y*' (dependent variable) respectively. The '*x*' variables are CO_2 emissions, Employment to population ratio, Net inflows of Foreign Direct Investment, GDP per capita, Public or General Government Expenditure, Interest rate spread, International Tourist Arrivals, International Tourist Receipts, Labour Force Participation Rate, Unemployment Rate and Proportion of Wage and Salaried Workers in Total Employment. The '*y*' variables are International Tourist Arrivals (including pre and post-pandemic as well as the total period from 2017-19, 2020-21 and 2017-21 respectively) and International Tourist Receipts (including pre and post-pandemic as well as the total period from 2017-19, 2020-21 and 2017-21 respectively).

The next section lays out the results of this paper and also conducts an objective discussion on the same.

4. Results and Discussion

Ecotourism or tourism in general, is influenced by numerous factors. The same would be analyzed further after using evidence from existing literature.

Several studies have categorized the major environmental factors that impact tourism, including ecotourism. One group of factors consists of economic, ecological, political, social, and technological factors [13, 14]. Another group identifies economic, social, natural/ecological, cultural, and legal factors [2, 6, 17]. The development of ecotourism is primarily influenced by factors such as GDP, wages, inflation, unemployment levels, interest rates, government expenditure, and foreign investments. Additionally, research indicates that GDP, inflation, and unemployment rates indirectly affect the growth of tourism [9, 15, 21, 22, 31, 39]. Tables 1 to 6 present the correlation coefficients between various economic factors (such as CO2 emissions, employment to population ratio, Net

TABLE 1

FACTORS IMPACTING BRAZIL'S TOURISM INDUSTRY

Factor	Correlation with ITA (2017-19)	Correlation with (current US$) ITR (2017-19)	Correlation with ITA (2020-21)	Correlation with ITR (2020-21)	Total Correlation with ITA (2017-21)	Total Correlation with ITR (2017-21)
Carbon Dioxide releases (kilogram / purchasing power parity terms in USD of Gross Domestic Product)	0.82	0.25	-	-	0.82	0.25
Ratio of employment to population, 15+, overall (%) (ILO estimate, predicted)	0.44	-0.24	-	-	0.44	1.00
Net inflows of foreign direct investment (% of GDP)	-0.11	-0.73	-	-	-0.11	0.34
Net inflows of foreign direct investment (BoP, current US$)	-0.19	-0.78	-	-	-0.19	0.36
Per capita gross domestic product, purchasing power parity (in constant 2017 international dollars)	-0.75	-0.14	-	-	-0.75	0.51
General government final consumption expenditure (% of GDP)	-1	-0.75	-	-	-1.00	-1.00
Interest rate spread in %	-1	-0.79	-	-	-1.00	-0.79
International tourism, number of arrivals	-0.74	-0.14	-	-	-0.74	-0.14

Factor	Correlation with ITA (2017-19)	Correlation with (current US$) ITR (2017-19)	Correlation with ITA (2020-21)	Correlation with ITR (2020-21)	Total Correlation with ITA (2017-21)	Total Correlation with ITR (2017-21)
International tourism, receipts (current US$)	-0.55	0.12	-	-	-0.55	0.12
Labour force participation rate as a percentage of the total population aged 15+ (ILO estimates)	0.51	-0.17	-	-	0.51	0.99
Unemployed as a percentage of the total labour force (ILO estimates)	0.54	-0.13	-	-	0.54	-0.99
All workers earning wages and salaries as a percentage of the total employment (ILO estimates)	-0.79	-0.21	-	-	-0.79	-0.21

Source: Author's computations using data extracted from the World Development Indicators

TABLE 2

FACTORS IMPACTING AUSTRALIA'S TOURISM INDUSTRY

Factor	Correlation with ITA (2017-19)	Correlation with (current US$) ITR (2017-19)	Correlation with ITA (2020-21)	Correlation with ITR (2020-21)	Total Correlation with ITA (2017-21)	Total Correlation with ITR (2017-21)
Carbon Dioxide releases (kilogram/ purchasing power parity terms in US$ of Gross Domestic Product)	-0.98	-0.92	-	-	-0.98	-0.92
Ratio of employment to population, 15+, overall (%) (ILO estimate predicted)	-0.96	-0.99	-	-	1.00	0.98
Net inflows of foreign direct investment (% of GDP)	-0.65	-0.78	-	-	0.33	0.25
Net inflows of foreign direct investment (BoP, current US$)	-0.58	-0.73	-	-	0.36	0.28
Per capita gross domestic product, purchasing power parity (in constant 2017 international dollars)	1.00	0.96	-	-	0.58	0.65
General government final consumption expenditure (% of GDP)	0.70	0.55	-	-	-0.99	-0.97
Interest rate spread in %	0.66	0.50	-	-	0.66	0.50
International tourism, number of arrivals	1.00	0.96	-	-	1.00	0.96

Factor	Correlation with ITA (2017-19)	Correlation with (current US$) ITR (2017-19)	Correlation with ITA (2020-21)	Correlation with ITR (2020-21)	Total Correlation with ITA (2017-21)	Total Correlation with ITR (2017-21)
International tourism, receipts (current US$)	0.99	1.00	-	-	0.99	1.00
Labour force participation rate as a percentage of the total population aged 15+ (ILO estimates)	-0.98	-1.00	-	-	0.99	0.97
Unemployed as a percentage of the total labour force (ILO estimates)	-0.98	-1.00	-	-	-1.00	-1.00
All workers earning wages and salaries as a percentage of the total employment (ILO estimates)	0.99	0.94	-	-	0.99	0.94

Source: Author's computations using data extracted from the World Development Indicators

TABLE 3

FACTORS IMPACTING INDIA'S TOURISM INDUSTRY

Factor	Correlation with ITA (2017-19)	Correlation with (current US$) ITR (2017-19)	Correlation with ITA (2020-21)	Correlation with ITR (2020-21)	Total Correlation with ITA (2017-21)	Total Correlation with ITR (2017-21)
Carbon Dioxide releases (kilogram/ purchasing power parity terms in US$ of Gross Domestic Product)	-0.94	-0.99	-	-	-0.94	-0.99
Ratio of employment to population, 15+, overall (%) (ILO estimate predicted)	-0.99	-0.79	-	-	-0.99	0.98
Net inflows of foreign direct investment (% of GDP)	-0.75	-0.33	-	-	-0.75	0.32
Net inflows of foreign direct investment (BoP, current US$)	-0.69	-0.25	-	-	-0.69	0.34
Per capita gross domestic product, purchasing power parity (in constant 2017 international dollars)	0.97	0.96	-	-	0.97	0.67
General government final consumption expenditure (% of GDP)	0.59	0.91	-	-	0.59	-0.96
Interest rate spread in %	0.54	0.89	-	-	0.54	0.89
International tourism, number of arrivals	0.97	0.96	-	-	0.97	0.96

Factor	Correlation with ITA (2017-19)	Correlation with (current US$) ITR (2017-19)	Correlation with ITA (2020-21)	Correlation with ITR (2020-21)	Total Correlation with ITA (2017-21)	Total Correlation with ITR (2017-21)
International tourism, receipts (current US$)	1.00	0.86	-	-	1.00	0.86
Labour force participation rate as a percentage of the total population aged 15+ (ILO estimates)	-1.00	-0.83	-	-	-1.00	0.96
Unemployed as a percentage of the total labour force (ILO estimates)	-1.00	-0.85	-	-	-1.00	-0.99
All workers earning wages and salaries as a percentage of the total employment (ILO estimates)	0.95	0.98	-	-	0.95	0.98

Source: Author's computations using data extracted from the World Development Indicators

TABLE 4

FACTORS IMPACTING PORTUGAL'S TOURISM INDUSTRY

Factor	Correlation with ITA (2017-19)	Correlation with (current US$) ITR (2017-19)	Correlation with ITA (2020-21)	Correlation with ITR (2020-21)	Total Correlation with ITA (2017-21)	Total Correlation with ITR (2017-21)
Carbon Dioxide releases (kilogram/ purchasing power parity terms in US$ of Gross Domestic Product)	-1.00	-0.89	-	-	-1.00	-0.89
Ratio of employment to population, 15+, overall (%) (ILO estimate predicted)	-0.83	-1.00	-	-	0.99	0.97
Net inflows of foreign direct investment (% of GDP)	-0.40	-0.83	-	-	0.33	0.21
Net inflows of foreign direct investment (BoP, current US$)	-0.33	-0.78	-	-	0.35	0.24
Per capita gross domestic product, purchasing power parity (in constant 2017 international dollars)	0.98	0.94	-	-	0.62	0.67
General government final consumption expenditure (% of GDP)	0.88	0.48	-	-	-0.98	-0.96
Interest rate spread in %	0.85	0.43	-	-	0.85	0.43
International tourism, number of arrivals	0.98	0.94	-	-	0.98	0.94

Factor	Correlation with ITA (2017-19)	Correlation with (current US$) ITR (2017-19)	Correlation with ITA (2020-21)	Correlation with ITR (2020-21)	Total Correlation with ITA (2017-21)	Total Correlation with ITR (2017-21)
International tourism, receipts (current US$)	0.90	0.99	-	-	0.90	0.99
Labour force participation rate as a percentage of the total population aged 15+ (ILO estimates)	-0.87	-1.00	-	-	0.98	0.96
Unemployed as a percentage of the total labour force (ILO estimates)	-0.89	-1.00	-	-	-1.00	-1.00
All workers earning wages and salaries as a percentage of the total employment (ILO estimates)	0.99	0.91	-	-	0.99	0.91

Source: Author's computations using data extracted from the World Development Indicators

TABLE 5
FACTORS IMPACTING USA'S TOURISM INDUSTRY

Factor	Correlation with ITA (2017-19)	Correlation with (current US$) ITR (2017-19)	Correlation with ITA (2020-21)	Correlation with ITR (2020-21)	Total Correlation with ITA (2017-21)	Total Correlation with ITR (2017-21)
Carbon Dioxide releases (kilogram/ purchasing power parity terms in US$ of Gross Domestic Product)	1.00	-0.66	-	-	1.00	-0.66
Ratio of employment to population, 15+, overall (%) (ILO estimate predicted)	0.92	-0.94	-	-	1.00	1.00
Net inflows of foreign direct investment (% of GDP)	0.56	-0.98	-	-	0.41	0.34
Net inflows of foreign direct investment (BoP, current US$)	0.49	-0.95	-	-	0.42	0.36
Per capita gross domestic product, purchasing power parity (in constant 2017 international dollars)	-1.00	0.74	-	-	0.47	0.55
General government final consumption expenditure (% of GDP)	-0.77	0.13	-	-	-1.00	-0.99
Interest rate spread in %	-0.74	0.07	-	-	-0.74	0.07
International tourism, number of arrivals	-1.00	0.75	-	-	-1.00	0.75

Factor	Correlation with ITA (2017-19)	Correlation with (current US$) ITR (2017-19)	Correlation with ITA (2020-21)	Correlation with ITR (2020-21)	Total Correlation with ITA (2017-21)	Total Correlation with ITR (2017-21)
International tourism, receipts (current US$)	-0.96	0.89	-	-	-0.96	0.89
Labour force participation rate as a percentage of the total population aged 15+ (ILO estimates)	0.95	-0.91	-	-	1.00	0.99
Unemployed as a percentage of the total labour force (ILO estimates)	0.96	-0.89	-	-	-0.98	-0.99
All workers earning wages and salaries as a percentage of the total employment (ILO estimates)	-1.00	0.69	-	-	-1.00	0.69

Source: Author's computations using data extracted from the World Development Indicators

TABLE 6

FACTORS IMPACTING MOROCCO'S TOURISM INDUSTRY

Factor	Correlation with ITA (2017-19)	Correlation with (current US$) ITR (2017-19)	Correlation with ITA (2020-21)	Correlation with ITR (2020-21)	Total Correlation with ITA (2017-21)	Total Correlation with ITR (2017-21)
Carbon Dioxide releases (kilogram/ purchasing power parity terms in US$ of Gross Domestic Product)	-0.99	-1.00	-	-	-0.99	-1.00
Ratio of employment to population, 15+, overall (%) (ILO estimate predicted)	-0.94	-0.89	-	-	0.99	0.99
Net inflows of foreign direct investment (% of GDP)	-0.60	-0.50	-	-	0.30	0.31
Net inflows of foreign direct investment (BoP, current US$)	-0.53	-0.43	-	-	0.33	0.34
Per capita gross domestic product, purchasing power parity (in constant 2017 international dollars)	1.00	1.00	-	-	0.63	0.63
General government final consumption expenditure (% of GDP)	0.74	0.82	-	-	-0.98	-0.97
Interest rate spread in %	0.70	0.78	-	-	0.70	0.78
International tourism, number of arrivals	1.00	1.00	-	-	1.00	1.00

Factor	Correlation with ITA (2017-19)	Correlation with (current US$) ITR (2017-19)	Correlation with ITA (2020-21)	Correlation with ITR (2020-21)	Total Correlation with ITA (2017-21)	Total Correlation with ITR (2017-21)
International tourism, receipts (current US$)	0.97	0.94	-	-	0.97	0.94
Labour force participation rate as a percentage of the total population aged 15+ (ILO estimates)	-0.96	-0.92	-	-	0.98	0.98
Unemployed as a percentage of the total labour force (ILO estimates)	-0.97	-0.94	-	-	-1.00	-1.00
All workers earning wages and salaries as a percentage of the total employment (ILO estimates)	1.00	1.00	-	-	1.00	1.00

Source: Author's computations using data extracted from the World Development Indicators

inflows of foreign direct investment, GDP per capita, general government final consumption expenditure, interest rate spread, international tourist arrivals, international tourism receipts, total labour force participation rate, total unemployment, and total wage and salaried workers) and the international tourist arrivals and tourism receipts of specific countries (Brazil, Australia, India, Portugal, USA, and Morocco). The empirical analysis is divided into three periods: pre-pandemic (2017-19), during the pandemic (2020-21), and the total period (2017-21). The data used for this analysis are obtained from the World Development Indicators (WDI) of the World Bank.

As tables 1 to 6 depict, Brazilian, Australian, Indian, Portuguese, US, and Moroccan respectively tourism/ecotourism sectors are affected by CO2 emissions, Employment to population ratio, Net inflows of foreign direct investment, GDP per capita, General government final consumption expenditure, Interest rate spread, International tourist arrivals, International tourism receipts, Total Labor force participation rate, Total unemployment and Total wage and salaried workers to different degrees.

As evident from tables 1 to 6, World's CO2 emissions, Employment to population ratio, GDP per capita, General government final consumption expenditure, Interest rate spread, International tourist arrivals, International tourism receipts, Total Labour force participation rate, Total unemployment and Total wage and salaried workers exert significant influence (wherein, 'r' or the correlation coefficient is greater than 0.50 for all these indicators) upon international tourist arrivals as well as revenues for the period under study (2017-21) [8]. In the absence of reliable sectoral data for the pandemic times (evident from dashed lines in lieu of values for the correlation coefficients for the period 2020-21, peak of the pandemic), it is safe to assume that the lockdown-induced disruptions caused a fall in major economic activities such as CO2 emissions, Employment, GDP per capita, General government final consumption expenditure, International tourist arrivals, International tourism receipts, Total Labour force participation rate and Total wage and salaried workers. There was an atmosphere of general gloom and doom on account of widespread joblessness and socio-economic misery [5,19]. Thus, the pandemic wrought a negative influence the tourism sector in general and the ecotourism sector in particular [3, 5]. This study is one of the earliest attempts at studying the pandemic's effect on the global ecotourism industry across major regions of the world. With a gradual availability of sectoral data, it would be easier for future researchers to educe exact linkages between COVID and its impact on tourism/ecotourism sectors. Despite its limitations, the study shall serve as a beacon for researchers and policy-makers alike in the fields of environmental and tourism economics. In order to curtail the negative fallout of the pandemic on their ecotourism sectors, the nations under study for the purpose of this article such as India, Portugal,

the USA, Brazil, Morocco and Australia could adopt/have adopted certain policies and strategies. These could serve as pointers for any such future crises, whether manmade or natural. *First*, to begin with, governments have the opportunity to issue guidelines that address various issues related to tourism. These guidelines can cover topics such as the development of alternative tourist destinations, the regulation and punishment of illegal construction activities, and the promotion of theme-based tourism (such as adventure, nature, cultural, heritage, religious, and wellness tourism). Additionally, governments can impose restrictions on tourist entry into ecologically sensitive areas and focus on capacity building for tourism service providers [27]. In order to reduce additional carbon emissions, it is advisable to promote locally-owned guest houses and homestays instead of large hotels [27]. *Second*, serious attention should be paid to waste management measures by the relevant authorities. Proper waste management is crucial not only for protecting the environment and wildlife but also for maintaining the aesthetic value of tourist spots [27]. In essence, promoting the concept of 'circularity' in dealing with plastic and human waste within the tourism industry can have a positive impact on both human health and the ecological well-being of tourist destinations. Implementing a 'Circular Economy' approach can be the most effective solution to combat the increasing pollution caused by tourist activities [3, 20, 27]. In fact, this approach is a vital component of ecotourism or sustainable tourism [3]. *Third*, it is essential to prioritize well-being, sanitation, and safety critera in the tourism industry. This can be achieved by emphasizing and enforcing measures such as clean living spaces and kitchens, the use of organic produce in cooking, the provision of open kitchens, and the development of touchless washrooms [4, 27]. By focusing on these aspects, the tourism industry can ensure the well-being of both tourists and the local community. *Fourth*, at the same time, it is incumbent on the Governments to upgrade and enhance health infrastructure at ecotourism hotspots, without compromising with the natural environs. Moreover, it is crucial for tourists to make wise decisions that align with the preservation of the natural environment and the consideration of local sensitivities, all while augmenting their travel experience. An excellent example of this is when selecting accommodations, where travelers can choose homestays and local tourist lodges over large hotels. Although these options may not provide an abundance of luxuries, they undoubtedly contribute to the sustainable generation of livelihood opportunities for the community. Likewise, tourists should be encouraged to support local value chains by purchasing locally made handicrafts, which in turn contribute to the socio-economic well-being of the local population [4, 27].

Fifth, there is a need to develop unexplored tourist destinations in a sustainable manner as these places are yet to be subjected to mass tourism. This

would also aid in easing the pressure on existing ecotourist sites and help in establishing a healthy balance between nature and human activities due to tourism. In short, keeping in view people's behavioural changes due to COVID-19, the global ecotourism sector must focus on investing in safety and hygiene protocols. Examples in this regard could be *Dekho Apna Desh* and the *Rural Tourism Schemes* of the Government of India and *Turismo de Portugal's* '*Can't Skip Hope*' campaign [25, 27]. *Sixth*, the utilization of cutting-edge tools and technologies to transform tourist areas into digital, paperless, and contactless environments for various functions like food deliveries, providing information on local attractions, and managing waste, among others, could pave the way for the future [20, 27]. Additionally, involving communities, including women's self-help groups (SHGs) and local youth groups, in promoting authentic local experiences to tourists, preserving the natural landscape, and maintaining vigilance, could effectively conserve fragile ecosystems while also creating livelihood opportunities for the local population. Whether it's the majestic Himalayas or the picturesque Western Ghats in India, the stunning sea beaches of Porto in Portugal, the iconic Yellowstone National Park in the USA, the vast Amazon Basin in Brazil, the vibrant city of Marrakech in Morocco, or the breathtaking Great Barrier Reef in Australia, ecotourism needs a fresh revival, not only from governments but also from the ecotourists themselves, in light of the evolving post-pandemic global tourism landscape [27]. Lastly, government interventions such as establishing a reliable social safety net, such as unemployment allowances or Universal Basic Income (UBI), should be prioritized as a policy/strategy to address the challenges faced by the ecotourism sector due to pandemic-induced disruptions in livelihoods and income [18]. Given this context, it is not only desirable but also necessary for the respective countries' governments to take more targeted actions in ecotourism hubs, including promoting attractions at national and international levels, as well as recognizing and appreciating the traditional people and their cultural activities [18, 30]. The subsequent section completes this study and outlines its prospect policy inferences.

5. Conclusion and Future Policy Implications

The Covid pandemic has emerged as a significant disruptor on a global scale, serving as a pivotal moment in the lives of individuals worldwide. Thanks to this pandemic, the ecotourism industry was given the opportunity to reevaluate if its pre-pandemic strategies needed to be adjusted. The process of review outspreads the every day and working spheres. At the core of this post-pandemic realignment and readjustment lie the concepts of efficiency, vivacity and proficiency of local communities. [12] postulated that post-pandemic programmes should focus on the health infrastructure development of ecotourism communities and incorporate elements of stress reduction and coping

mechanisms for dealing with uncertainty, anxiety, and a sense of helplessness or bleakness in addition to life-force training. This article has been drafted in a manner such that it serves as a future reference for researchers and policy-makers in the field and also helps in formulating appropriate crisis strategies. Examples of the pandemic-stricken Indian, Portuguese, American, Brazilian, Moroccan and Australian ecotourism sectors appropriately described the challenges and opportunities in the industry owing to pandemic-induced alterations. The same pertains to both social and economic changes. The article also described the numerous ways in which these post-pandemic alterations could be utilized in favour of the industry for its long-term sustenance and resilience against any such future shocks. All in all, this study is one of the earliest attempts at evolving a comparative framework of analysis with reference to the influence of COVID on the ecotourism industry worldwide. Any future research on the theme could build on this work and conduct a more empirically rigorous study after undertaking comprehensive primary survey analyses on the same, involving all the industry stakeholders— government representatives, managers, workers and ecotourists. This study has significant implications for all the stakeholders of the ecotourism industry. *First*, as other zoonotic viruses may emerge in the near future, therefore COVID-19's disruptive impact on the sector is not an anomaly. The "new normal" is here to stay [33, 35, 37]. *Second*, Ecotourism service providers will need to adjust to the new reality of the Covid pandemic's "on-and-off" occurrence, some of which may turn into long-term pandemics [12]. *Third*, it is imperative for the sector to create endeavours that can be executed in a secure manner while adhering to superior well-being, cleanliness, and social distancing criteria [11, 30, 33, 35, 37]. *Last*, the pandemic has highlighted the potential dangers of losing skilled personnel and customer trust. Therefore, ecotourism service providers must formulate comprehensive strategies to mitigate such setbacks during future outbreaks. At the core of these is the promotion of circular and contactless digital economies, as well as the provision of comprehensive social safety nets to communities involved in the ecotourism industry. The same would aid the stakeholders in the sector to weather any kind of storm in the upcoming future [3, 11, 33, 35, 37].

Conflict of Interest

The author declare that they have no conflict of interest.

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