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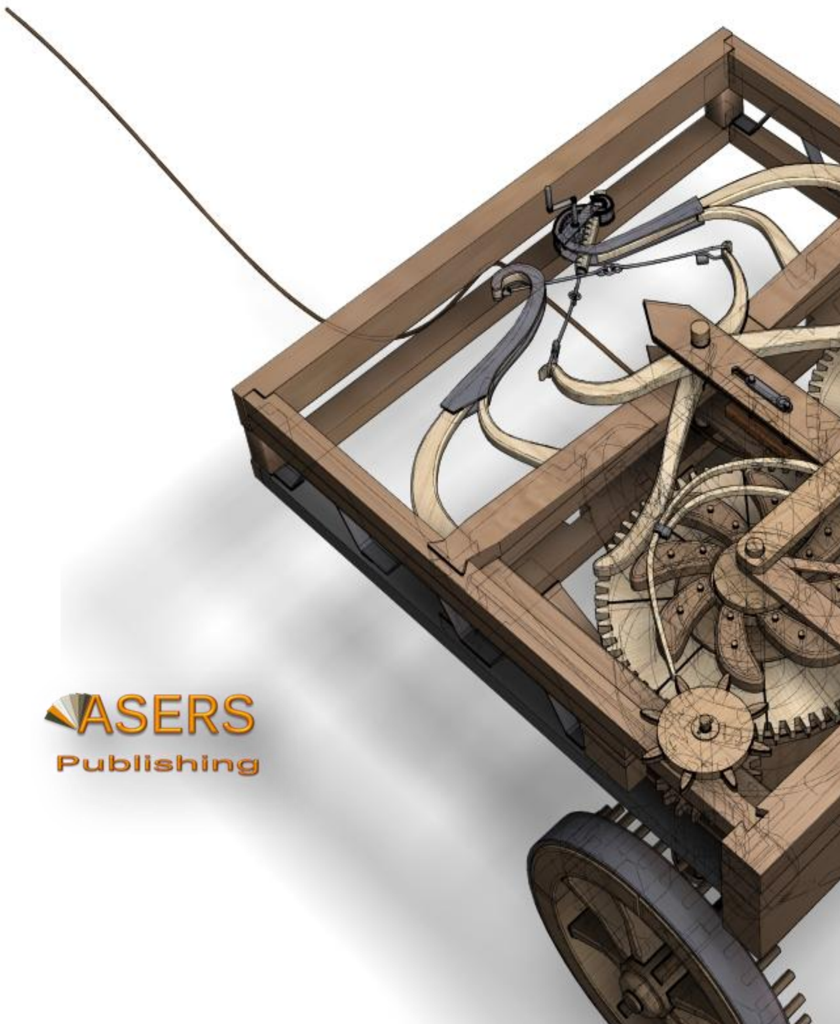

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Journal of Environmental Management and Tourism is an open access, peer-reviewed interdisciplinary research journal, aimed to publish articles and original research papers that contribute to the development of both experimental and theoretical nature in the field of Environmental Management and Tourism Sciences. The Journal publishes original research and seeks to cover a wide range of topics regarding environmental management and engineering, environmental management and health, environmental chemistry, environmental protection technologies (water, air, soil), pollution reduction at source and waste minimization, energy and environment, modelling, simulation and optimization for environmental protection; environmental biotechnology, environmental education and sustainable development, environmental strategies and policies.

Authors are encouraged to submit high quality, original works that discuss the latest developments in environmental management research and application with the certain scope to share experiences and research findings and to stimulate more ideas and useful insights regarding current best-practices and future directions in Environmental Management.

Also, this journal is committed to a broad range of topics regarding Tourism and Travel Management, leisure and recreation studies and the emerging field of event management. It contains both theoretical and applied research papers and encourages obtaining results through collaboration between researchers and those working in the tourism industry.

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An Analysis into India's and China's Revealed Comparative Advantage on Travel and Tourism Economic and Environmental Impact

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Abstract: Travel and Tourism is a major economic sector globally, and countries invest significantly to leverage their natural, cultural, and infrastructural assets. It has come to stay as the largest service industry and widely used as an instrument of growth of national income, poverty alleviation, infrastructure development and employment generation. The Asia Pacific region is slated to be the most preferred tourism regions of world; whereas India, and China, by their size both in terms of geography and population are the rising nations on the global tourism front. As per the different World Travel and Tourism Council reports, these two countries are projected to upsurge in their respective tourism economies both in terms of contribution to GDP and employment in the post pandemic world. However, the growing Economic Impact of tourism also increases the threat of rising Greenhouse Gas (GHG) Emissions impact. The Travel and Tourism Economic and Greenhouse Gas (GHG) Emissions impact cannot be studied in isolation but has to be analyzed for overall advantages for an economy, more so for the massive economies of India and China.

This is comprehensive comparative study on the background of bi-decadal economic impact analysis (1995–2015), covering the period prior to the Covid-19 pandemic in India and China leading to study of economic and Greenhouse Gas (GHG) Emissions impact in the pandemic and post pandemic period through the Revealed Comparative Advantage (RCA) Analysis. It aims to assess the potential of tourism as a key driver of sustained and enhanced economic growth as well as focus on control environmental impact in India and China in the coming decades.

Keywords: India and China; Economic Impact; tourism GDP; tourism employment; environmental impact; Greenhouse Gas (GHG) emissions.

JEL Classification: L83; Z32.

Introduction

India has long historical connection to global trade, particularly through the Spice Route, established its early role in international exchange, creating a long-standing cultural foundation for tourism. India has seen significant growth since 2000s after India's economic liberalization policies of 1990s, with its tourism sector's GDP projected to grow substantially in the coming years. Recent efforts include promoting cultural, religious and medical tourism and a focus on sustainability to attract a broader range of travellers. China's tourism sector on the other hand began to develop significantly after its economic reforms in the late 1970s, leading to a dramatic increase in tourism income. The sector has been propelled by strong economic performance, sophisticated infrastructure development with advance supply chain, and an improving business environment, making it a significant global tourism powerhouse. However, the Travel and Tourism's environmental impact historically taken the backseat in both the countries. Pre-pandemic, China's tourism carbon footprint was the world's largest in absolute terms; India's footprint and contribution to global growth rose quickly from a lower base. Both countries are now scaling sustainability programs, but aviation/transport energy and accommodation utilities remain the biggest levers.

India and China are amongst the top 10 largest global travel economies in 2024–25 in terms of Economic contributions. China is world's second largest Tourism economy contributing 1,300 US$ billion, whereas India is the world's eighth largest Tourism economy contributing 231.6 US$ billion, moving up from the 10th position, India is forecasted by the WTTC to attain the fourth position within the next decade, indicating significant progress in the tourism sector (The Indian Express, 2025).

The total and direct contributions of travel and tourism to GDP, along with the sector's role in employment generation, have been extensively studied globally. According to the World Travel and Tourism Council (WTTC, 2024), the total contribution of travel and tourism to global GDP was estimated at USD 10.9 trillion, representing 10 percent of the global economy. The sector was also estimated to support 357 million jobs worldwide, accounting for nearly one in every ten jobs. Total sectoral contributions were estimated at over USD 1.3 trillion for China, positioning it among the world's largest tourism economies, while India's contributions were assessed at more than USD 230 billion. Both nations demonstrated rapid recovery post-COVID-19, with India's growth largely driven by domestic tourism demand, and China benefiting from extensive infrastructure and international visitor receipts (WTTC, 2023).

China with its world ranking of 2 in terms of Travel and Tourism's Direct Contribution to GDP (139.5 US$bn in 2022) and India (68.5 US$bn in 2022) at 10th rank, both exceeding the world average (12.9 US$bn in 2022). With respect to the direct contribution of travel and tourism to employment, China, generating 23,166.4 thousand jobs in 2022, ranked first globally, while India, with 16,897.8 thousand jobs in the same year, held the second rank position – both the countries above than the world average (1,156.0 thousand jobs in 2022). In terms of visitor exports (contribution to exports) India (2.8% Share in 2022) is at World rank 131 and China is (0.8% Share in 2022) at world rank 168 (Travel & Tourism Economic Impact: India, 2023). In terms of Travel and Tourism's Contribution to GDP, China is way ahead than India. However, as per the Travel and Tourism Competitiveness Report (2015), by the World Economic Forum, India is ranked 12th in the Asia Pacific region and 52nd overall on the list of the world's attractive destinations (China ranks 6th regionally and 17th globally; whereas Malaysia follows at ranks 7th regionally and 25th globally). India's natural resources ranked at 17th are vast and diverse and its cultural resources with a global ranking of 10th include world heritage sites, both natural and cultural.

The Bloom Consulting (2024) Country Brand Ranking (Tourism Edition, 2024–25), partnering the World Economic Forum, European and Asian countries are noted as major tourism economies, with India ranked 17th after a five-place rise and China, including Hong Kong SAR, ranked 24th following a sixteen-place decline – both countries being in the top 25.

While China boasts strong infrastructure, India's strength lies in its sustained appeal for its diverse culture, and natural heritage, medical and spiritual tourism. The paper uses data from global tourism reports and comparative indices (mainly from WTTC Data) to build the RCA analytics to show India's ability to enhance its competitive positioning in the future based on the pre pandemic bi-decadal historical analysis coupled with post pandemic study of both the Economic and Environmental Impacts.

1. Research Background

Tourism is a service sector industry which has a vast potential to contribute to visitor export, GDP and employment in the economy as well as its multiplier effects in generating induced income and employment. The Asia Pacific region is slated for high tourism growth, however the region has to usher in the service sector mindset, infrastructure supply chain and right skills for the people connected with the sector. There is growing global awareness around the shift toward ecotourism and sustainable tourism, emphasizing the need to use present resources responsibly to ensure they do not compromise the needs and resources of future generations hence the urgent need for immediate measures of environmental control particularly for the larger economies of China and India who are also one of the largest contributors to Greenhouse Gas (GHG) Emissions. Newer aspects in travel and tourism sector should be identified and motivating bigger industries to target on to this sector as the tourism world over is the only sector, which if developed in a planned way, it can accommodate the need of tourists, environment as well the society (Dangarwala and Rao, 2016) and simultaneously has the capacity to create and sustain employment and entrepreneurship growth.

Bhatia (2016) in his book "International Tourism Management" approaches the subject of tourism from the perspectives of a social science; discussing the subject from historical, economic organizational and international perspectives. He emphasizes that tourism should be recognized as a major source of employment, as it is a highly labor-intensive industry that provides opportunities for both semi-skilled and unskilled workers. It has created employment opportunities for the local population, and it is a major source of income and employment for individuals in many places.

The region, particularly India and China, are blessed with great geographical location which has made it a historical and cultural hub for the tourism. However, tourism in the region continues to suffer from inadequate infrastructure and a shortage of adequately trained manpower as well as the service mindset for tourism. Malaysia can be one example that has improved mindset for tourism. This aspect of need for government initiative has been well realized by the Malaysian Tourism. The Chairman of Tourism Malaysia, Dato' Dr. SiewKa Wei (Malaysia Media, 2017) attribute the growth trend to several service sector factors, particularly the improvements made to visa services following the Prime Minister Datuk Seri NajibTunRazak's announcement to facilitate the matter. He stresses the fact that the Malaysia's easing the travel formalities for Chinese and Indian tourists travelling to Malaysia have helped to improve the tourists' arrivals for these two markets. He said that the constant review of the visa policy is in the interest of Malaysian tourism industry and the efforts and cooperation to improve visa services have now made it easier for Chinese and Indian tourists, the two biggest tourist generating countries, travel to Malaysia. The Malaysian tourism is trying to tap the year-round tourist markets with big populations such as China and India, and the high-income Middle Eastern market and synergising its promotional efforts towards that end. Malaysia is expanding the tourism growth for its second and third tier cities enabling it to expand to new target markets (Bahari, 2016).

The Indian travel and tourism professionals, who are shaping the Indian tourism growth at the ground level, also share the same pragmatism. The current research has been always pivotal of putting forth the views and arguments in an academic discussions environment. Any research that concerns an industry, and which does not include the views and arguments of the practicing professionals of the industry or sector is only half-baked discussion. All the researches and discussions that does not lead to value addition to the sector or industry concerning can be academic but is only contributing to nothing to the development of tourism. Sharat Dhall, the COO (B2C) of an online travel agency, 'Yatra.com', maintains that although the Indian tourism industry is growing at a rapid pace, India still has a long way to go in terms of fulfilling its potential as a tourism destination in contrast with developed tourism destination nations. The Chinese tourism industry & OTAs have benefited from country's economic development and in the same terms, India's tourism sector and online travel market is poised for continued growth and value creation as the economy grows, following the well-established path seen in the US and China (Mandal, 2017). Similarly Ritesh Agarwal, Founder & CEO of 'OYO Rooms' has emphasized upon the need of Infrastructure development which is a pre-requisite to provide the much-needed impetus for the industry's growth. Some additional incentives should be provided to the investors for infrastructure investments in the travel and tourism sector to promote growth. He also calls for supporting small owner-friendly policies including the exemption of taxes in the sub-Rs. 1000 hotel room category (Mandal, 2017). Gautam Kaul, COO of the Inbound Division at Yatra Exotic Routes (a division of Yatra.com), concurs that infrastructure and transportation are indeed major challenges (Arlene, 2013). These professionals admit that the Indian travellers' mindset has evolved significantly over the recent years that now see travel as a mode of self-realisation, exploration and experiencing different forms of lifestyles. Leisure travel is no longer considered a luxury but rather a necessity to rejuvenate oneself.

The Travel and tourism realize that the growth driver for China, India and others in the Asian region will rely on their investment in people. If China and India want to meet their targeted goals, they must invest in their people, be it by the Chinese Five-year plans, India's National Institute for Transforming India (NITI Aayog) (Sheng, 2015). A common challenge faced by India and China is that rural migrants moving to urban areas often lack the knowledge and skills in innovation and entrepreneurship required by tourism Sector as one of high-end service sectors. The need for trained and skilled human resources is one of the most pressing issues faced by India at present (Aman Mohammed Khan, 2014).

The gaps between tourism planning and implementation - particularly in areas such as infrastructure development, tourism promotion, and actual tourist arrivals - need to be identified and effectively addressed. An analysis should be conducted to assess the effectiveness of marketing strategies in driving the growth of the tourism industry, along with the role of financial management in supporting this growth. It is also important to examine how tourism projections impact key stakeholders - such as government bodies, non-governmental organizations, commercial enterprises, local communities, and lobby groups - and how these stakeholders, in turn, influence tourism outcomes. Moreover, formulating an effective tourism policy is essential to ensure that the benefits of tourism contribute meaningfully and exclusively to the prosperity of local economies. (Sarang, 2014).

Huibin, Marzuki, Rofe and Razak (2012) have studied and analysed the successful experiences in India, Australia and Macau and further suggested a model for the successful growth of tourism industry of China. He has stated that China has a untapped potential to grow as far as Tourism industry is concerned and therefore china has to take some great measures at all level of administrations to improve the present conditions. A proposed model is suggested to increase more value-added features to further intensify international tourism development in China.

Tourism growth in any economy has another alarming effect on the environment. Tourism growth has a dual impact; while contributing to income it also exerts pressure on the environment. Globally, tourism accounts for approximately 8–9% of greenhouse gas emissions, primarily from transport and accommodation (Lenzen *et al.* 2018; Sun *et al.* 2024). Studies identify China and India among the top contributors to tourism-related emissions growth in the post pandemic world, due to their expanding middle class domestic tourism and increasing mobility (Down To Earth, 2024). China has developed more systematic approaches to measuring and mitigating emissions from tourism. Liu and Yang (2024) estimate significant regional variations in tourism-related carbon footprints across provinces, with high emissions concentrated in urbanized regions. Policy innovations such as sustainable aviation fuel trials, eco-labels for hotels, and provincial carbon-neutral tourism zones reflect China's alignment with its national carbon neutrality target for 2060 (Zhang, 2024).

In India, while the literature is relatively nascent, tourism emissions are rising rapidly, largely from road and air travel. Studies suggest that unless integrated with renewable energy and sustainable mobility initiatives, India's tourism growth could undermine its climate commitments (Sun *et al.* 2024). Empirical research also finds that India's domestic-led tourism has a lower carbon intensity per capita than China's internationalized model but faces challenges in balancing affordability, infrastructure, and sustainability.

The studies suggest that while both India and China have leveraged tourism for economic growth and employment, their environmental trajectories diverge. China's greater focus on infrastructural investment and carbon management contrasts with India's domestic-market-driven growth and slower environmental mainstreaming. A comparative approach reveals that the challenge for both nations lies in achieving a balance between tourism-driven economic benefits and environmental sustainability, which will be critical to shaping their future comparative advantage in the sector.

2. Research Methodology

The study relies on the secondary data of Tourism Visitor Exports, contribution to GDP and Employment vis-a-vis the share of each of these three component in the respective countries over the bi-decadal growth in the pre pandemic era and five year pandemic and post pandemic period in the GDP, Employment and Greenhouse Gas (GHG) Emissions with the objective to establish the quantitative analysis towards forecasting the long term growth paths as well as to establish impediments to such the growth in India and China.

The study uses the Revealed Comparative Advantage (RCA) as the research tool to study comparative analysis of the two countries and particularly.

The computation of Revealed Comparative Advantage (RCA) Index is as under:

RCA =(Xih/Xit)/(Xwh/Xwt),

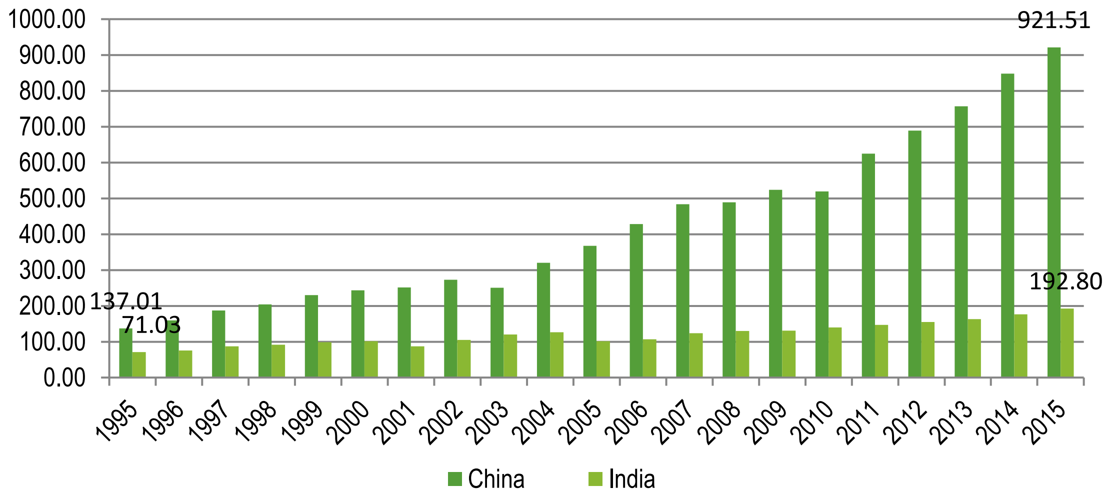
Xih= Country i's Travel and Tourism contribution to GDP/ Employment / GHG Emissions in year h
Xit=total Travel and Tourism contribution to GDP/ Employment / GHG Emissions of country i over study period t
Xwh=World Travel and Tourism contribution to GDP/ Employment / GHG Emissions in year h
Xwt=total World Travel and Tourism contribution to GDP/ Employment / GHG Emissions over study period t.

2.1 An Analysis on Travel and Tourism Income and Employment Generation

India aims to promote tourism as a key driver of economic growth, leveraging its direct and multiplier effects to generate employment and serve as an effective tool for poverty alleviation. The study focussing on the two countries are analysed for contributions to the Income and Employment generation in the respective economies and accordingly, the study employs statistical tool of Revealed Comparative Advantage (RCA) to arrive at the outcomes.

In terms of volume China's income from Travel & Tourism far greater exceeds than that of India in the pre pandemic bi decadal era although starting with comparable volume in the mid 1990s (Figure 1).

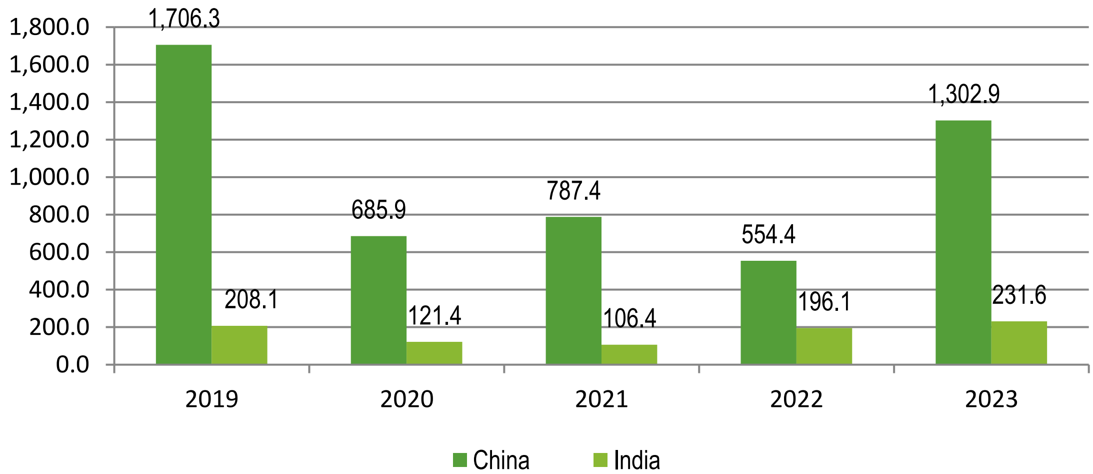
Figure1. Travel & Tourism Total contribution to GDP (US$ in bn: Real prices)



Source: Based on WTTC Data Gateway Economic Research. https://tool.wttc.org/

However, both countries saw in the decline of volume of income in the pandemic era but were able to regain back to 2019 position with India regaining completely and China regaining was slow possible because of extended lockdown of the economy.

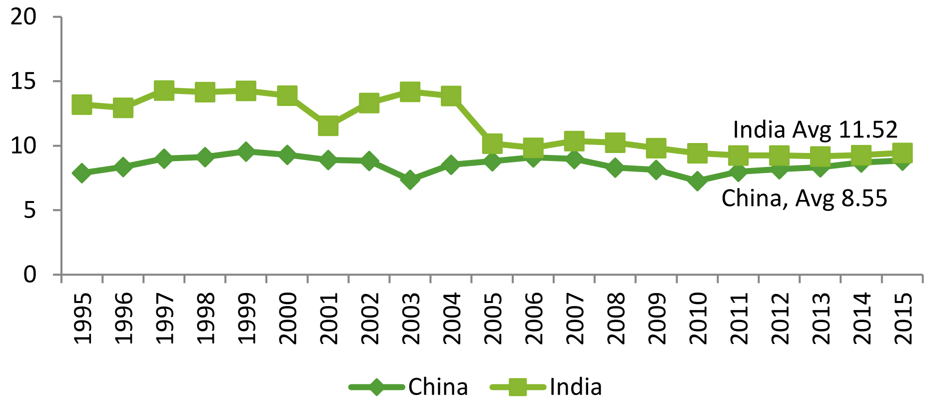
Figure 2. Travel & Tourism Total contribution to GDP (US$ in bn: 2022 prices)



Source: Based on WTTC WTTC, Travel & Tourism's Global Footprint, https://globaltravelfootprint.wttc.org/

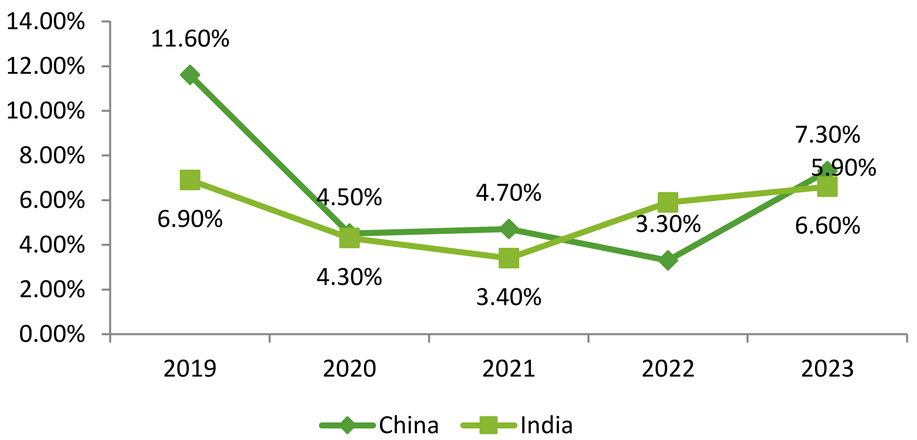
If the comparison is to be made between the Travel and Tourism's Share of Contribution to GDP (% of GDP) in their respective economies along with the Share of Contribution to Employment (% of total employment), the trends show completely opposite picture to that of the pre pandemic and during our post pandemic period. China shows steady progress in improving the Travel and Tourism percentage share in its respective National GDP whereas India shows the steady decline in the bi decadal period despite India having higher average percentage share than China (Figure 3) – the same is reversed in the 2019-2023 period with China improving and India declining drastically (Figure 4).

Figure 3. T&T percentage share of contribution to National GDP



Source: Based on WTTC Data Gateway Economic Research, https://tool.wttc.org/

Figure 4. T&T percentage share of contribution to National GDP



Source: Based on WTTC WTTC, Travel & Tourism's Global Footprint, https://globaltravelfootprint.wttc.org/

Similarly, if we take the volume of Travel and Tourism total contribution to the employment, we come across almost similar trends in the bi decadal pre pandemic period whereby China is gaining steadily and India losing rapidly (Figure 5). This is evident in Travel and Tourism percentage share of employment in the respective economies as shown in Figure 6.

Figure 5. T&T Total contribution to Employment (Thousands of Jobs)

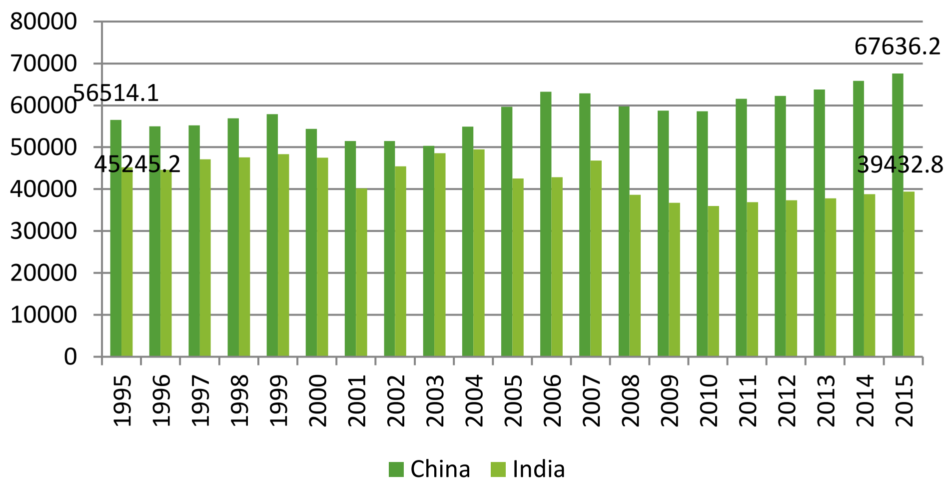
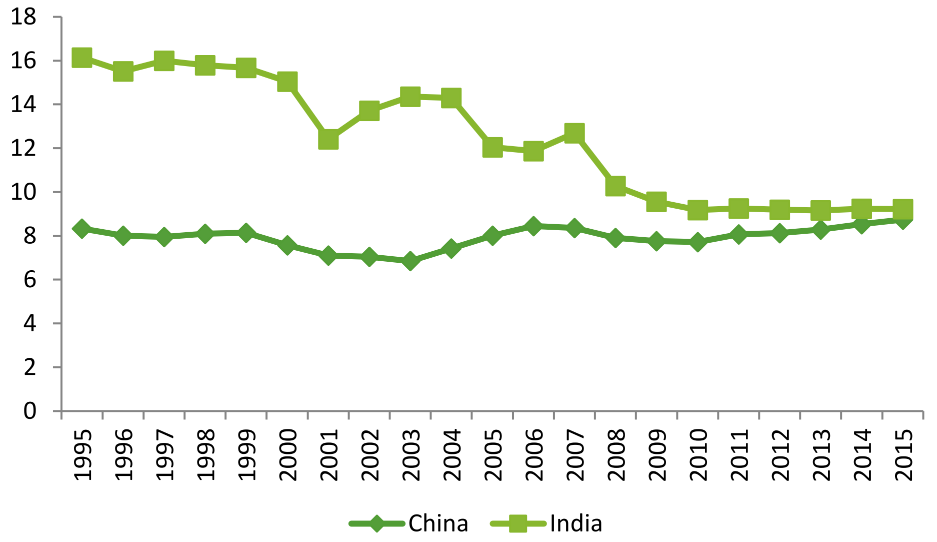


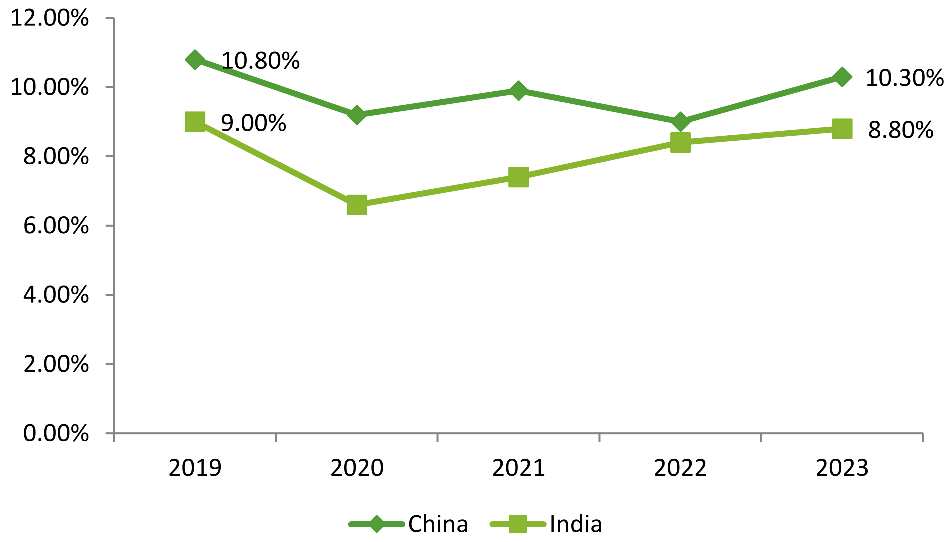
Figure 6. T&T percentage share of total employment



Source: Based on WTTC Data Gateway Economic Research, https://tool.wttc.org/

However, post 2019 the Travel and Tourism total employment as well as the percentage share of employment in both India and China has shown remarkable recovery in almost rebounding back to 2019 level in the post pandemic period in their respective economies.

Figure 7. T&T percentage share of total employment



Source: Based on WTTC, Travel & Tourism's Global Footprint, https://globaltravelfootprint.wttc.org/

2.2 An Analysis on Travel and Tourism Greehouse Gas (GHG) Emission

The economic impact of Travel Tourism remains incomplete the environmental impact is not studied for the sector to make progress towards sustainable growth. China and India are accounting for the largest Greenhouse Gas Emissions and only United States of America is leading ahead of them (Down To Earth, 2024). The WTTC (2024) Travel & Tourism's Global Footprint on the Environmental footprint shows that the Global Absolute Travel & Tourism greenhouse gas (GHG) emissions have been 3410 million tonnes of CO_2 equivalent in 2023 and that the Sector's share of total greenhouse gas emissions in 2023 stood at 6.55%. Talking individually about China and India, Absolute Travel & Tourism greenhouse gas (GHG) emissions has been respectively 583 and 247 million tonnes of CO_2 equivalent in the same year and their sector's share of National GHG Emissions stood at 3.49% and 4.83% respectively for China and India.

China and India share of Absolute Travel & Tourism greenhouse gas (GHG) emissions and their respective share of National GHG Emissions are respectively shown in figures 8 & 9 below. Both countries are able to bring down the Travel and Tourism share of GHG emissions out of total nation GHG emissions considerably down from 2019 level to 2023 level. However, if we compare the Travel and Tourism share of GHG emissions out of the respective national emissions from 2010 level to 2019 level, we find that the same has increased in case of China and India has been able to decrease the emissions considerably. If we follow the 2010 level to 2019 level, then China needs to take all the more effective steps and India must follow the suit as the current trend shows that both the countries since 2022 onwards are moving upwards in their respective Travel and Tourism share of National GHG Emissions.

Figure 8. Absolute Travel & Tourism Greenhouse Gas (GHG) Emissions (Million tonnes of CO_2 equivalent)

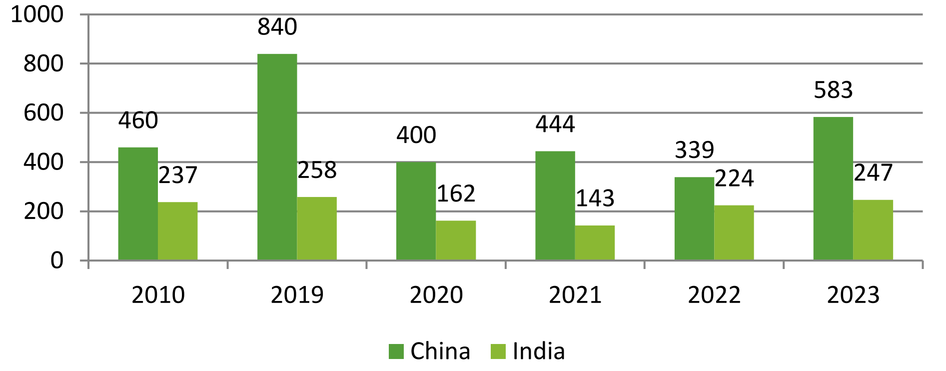
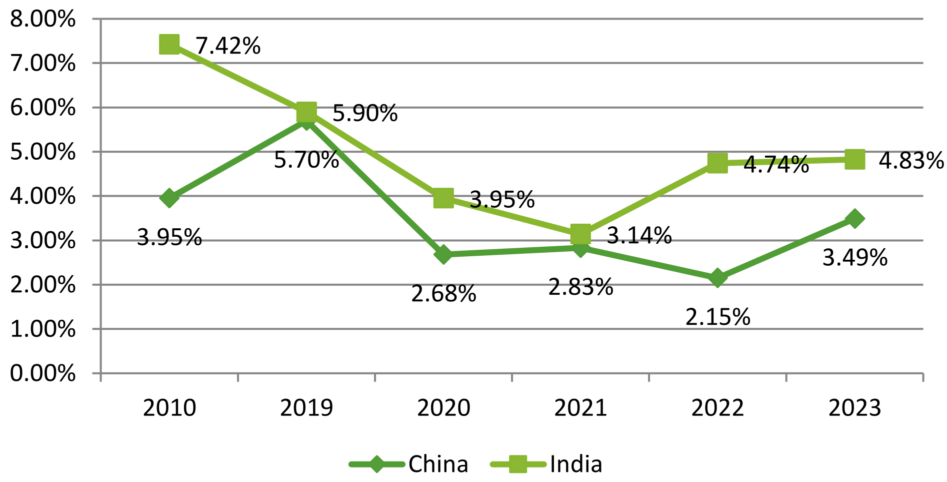


Figure 9. Travel & Tourism Share of National GHG Emissions



Source: Based on WTTC, Travel & Tourism's Global Footprint, https://globaltravelfootprint.wttc.org/

2.3 Revealed Comparative Advantage Analysis

India and China being the larger economies in the Asia Pacific region, the region slated for immense tourism growth possibilities, as the instrument for growth and employment. The economic impact of tourism is still to be further realized for both the countries, particularly for sector's capacity to generate employment for the World's most populous countries. However, the increases in tourism's economic impact give rise to environmental negative impact which must be part of the new studies as this one. The economic impact in terms of revealed comparative advantage must be studied together with the revealed comparative advantages for environmental impact related to Greenhouse Gas (GHG) emissions.

India's tourism growth in income and employment capacity along with environmental impact needs to be deeply probed with China to understand and plan for the Indian tourism capacity in the more sustainable sense. The study uses the Revealed Comparative Advantage (RCA) as the research tool to study comparative analysis of the two countries and particularly with reference to India.

A. RCA of Travel & Tourism's Total contribution to GDP (Bi Decadal Pre Pandemic)

Considering the WTTC Economic Impact data on Travel & Tourism's Total contribution to GDP (US$ in bn; Real prices) as presented in the previous section for the two countries respectively needs to be analysed in relation to the World's Travel & Tourism's Total contribution to GDP (US$ in bn; Real prices) and the revealed comparative advantage follows as below Table

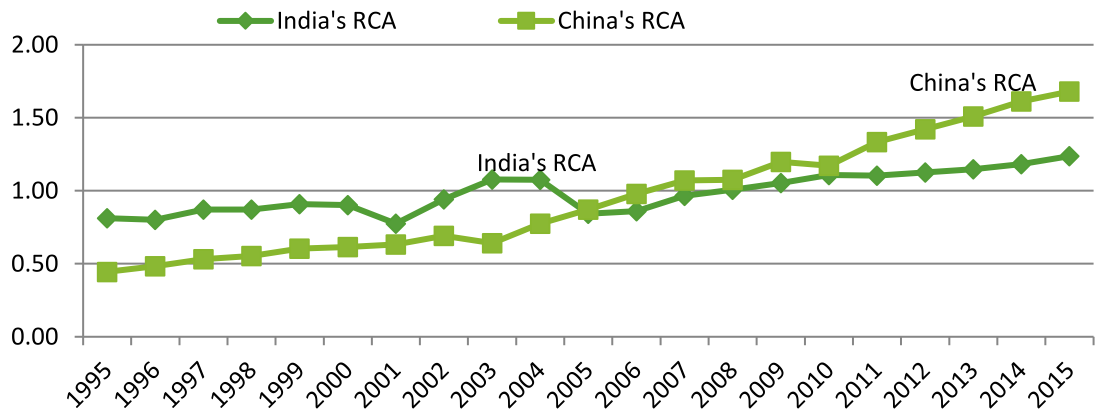
Table 1. Countries RCA of Travel & Tourism's Total contribution to GDP (Bi Decadal Pre Pandemic)

Year	India's RCA	China's RCA
1995	0.81	0.44
1996	0.80	0.48
1997	0.87	0.53
1998	0.87	0.55
1999	0.91	0.60
2000	0.90	0.62
2001	0.78	0.63
2002	0.94	0.69
2003	1.08	0.64
2004	1.08	0.77
2005	0.84	0.87
2006	0.86	0.98
2007	0.97	1.07
2008	1.01	1.07
2009	1.05	1.20
2010	1.11	1.17
2011	1.10	1.33
2012	1.13	1.42
2013	1.15	1.51
2014	1.18	1.61
2015	1.24	1.68

Source: Authors' calculation based on WTTC Data Gateway Economic Research, https://tool.wttc.org/

The revealed comparative advantage year on year basis for the two countries respectively analysed in relation to the World's Travel & Tourism's Total contribution to GDP (US$ in bn; Real prices) shows the below trends

Figure 10. Countries RCA of Travel & Tourism's Total contribution to GDP



Source: Authors' calculation based on WTTC Data Gateway Economic Research, https://tool.wttc.org/

China comparatively had lesser advantage in terms of Travel and Tourism's contribution to GDP since 1995 and prior to 2005. The year 2005 has the tip point when both the countries enjoyed almost the same comparative advantages in terms of Travel and Tourism's contribution to GDP; however, China has gained enormously hence after and has shown larger revealed comparative advantage over India which has remained almost static in their comparative growth in relations to the World growth.

Further, the two economies when measured in terms of their Revealed Comparative Advantage (RCA) in relations to the World Travel and Tourism contribution to GDP, it was found that India could achieve parity with World contribution to GDP only since 2008 continuously. China could achieve the continuous parity with the world in terms of contribution to GDP from 2006 onwards. India has been slightly above the world parity (1.24 times) in 2015, and China is way ahead with 1.68 times the World parity. India has to call for more elaborate planning and execution of Travel and Tourism as economic building sector particularly in terms of increasing its income multipliers through tourism.

B. RCA of Travel & Tourism's Total contribution to Employment (Bi Decadal Pre Pandemic)

Similarly, when the WTTC Economic Impact data on Travel & Tourism's Direct contribution to Employment (thousands of jobs) for the two countries respectively was analysed in relation to the World's Travel & Tourism's Direct contribution to employment (thousands of jobs), the revealed comparative advantages are as per Table 2.

Table 2. Countries RCA of Travel & Tourism's Direct contribution to Employment (Bi Decadal Pre Pandemic)

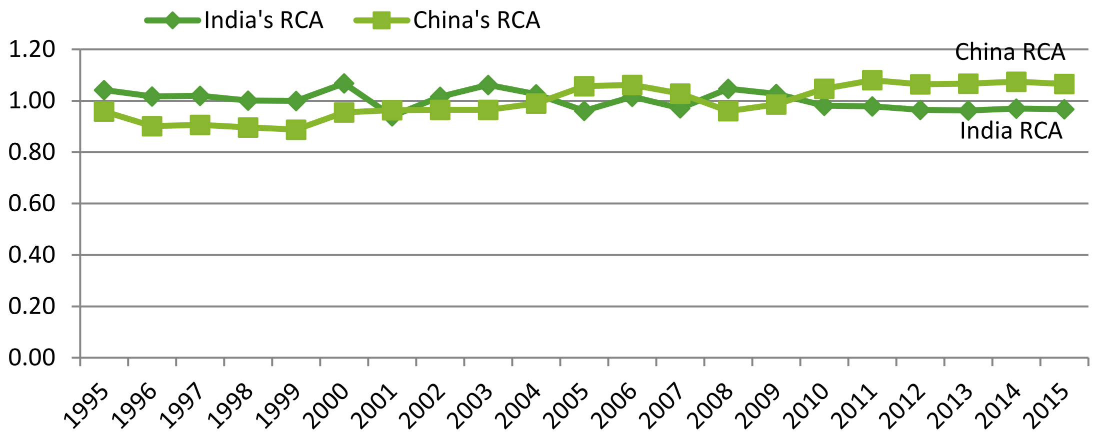
Year	India's RCA	China's RCA
1995	1.04	0.96
1996	1.02	0.90
1997	1.02	0.91
1998	1.00	0.90
1999	1.00	0.89
2000	1.07	0.95
2001	0.94	0.96
2002	1.02	0.96
2003	1.06	0.96
2004	1.03	0.99
2005	0.96	1.06
2006	1.02	1.06
2007	0.97	1.03
2008	1.05	0.96
2009	1.03	0.99
2010	0.98	1.05
2011	0.98	1.08
2012	0.96	1.06
2013	0.96	1.07
2014	0.97	1.07
2015	0.97	1.06

Source: Authors' calculation based on WTTC Data Gateway Economic Research https://tool.wttc.org/

The revealed comparative advantage year on year basis for India and China respectively analysed in relation to the World's Travel & Tourism's Direct contribution to employment (thousands of jobs) shows the trends as represented in Figure 11.

Both countries in study are barely able to match the revealed comparative advantage parity with the World parity in terms of Travel & Tourism's contribution to employment (thousands of jobs). China has able to stay just ahead of World parity, but India has been just below the world parity since 2010. Both countries, however, are devoid of growth of employment generation capacity in the last five years as the trends point to static progress.

Figure 11. Countries RCA of Travel & Tourism's Total contribution to Employment



Source: Graph on Authors' calculation based on WTTC Data Gateway Economic Research https://tool.wttc.org/

India and China are on the upscale growth in terms of revealed comparative advantage on Travel & Tourism's Total contribution to GDP in relation to the World's Travel & Tourism's Total contribution to GDP, but are unable match the RCA for Direct contribution to employment on the same scale. A quick glance over the average Revealed Comparative Advantages in relation to the World by both the countries under study over the period of study (1995-2015) on both contribution to GDP and contribution to direct employment reflects the same. The countries together are unable to pull up the direct employment capacity creation in relation to their respective income growth.

C. RCA of Travel & Tourism's Economic & Environmental Impact (Last 5 years)

The pandemic and post pandemic Economic Impact do not suggest changes but the addition of Environmental Impact does make the study useful in terms of whether the Travel and Tourism future economic growth is leading towards sustainability.

Table 3. Countries RCA of Travel & Tourism's contribution to Economic Impact (2019-2023)

RCA on Contribution to GDP			RCA on Contribution to Employment		
Year	India's RCA	China's RCA	Year	India's RCA	China's RCA
2019	0.94	2.23	2019	0.97	1.43
2020	1.06	1.74	2020	0.91	1.57
2021	0.76	1.63	2021	0.98	1.55
2022	1.14	0.93	2022	1.06	1.29
2023	1.08	1.77	2023	1.06	1.37

Source: Authors' calculation based on on WTTC, Travel & Tourism's Global Footprint, https://globaltravelfootprint.wttc.org/

However, the study shall remain incomplete without the revealed comparative advantages for environmental impact related to Greenhouse Gas (GHG) emissions in relation to the World emissions.

Table 4. Countries RCA of Travel & Tourism's contribution to Environmental Impact (2019-2023)

RCA on Share of T&T GHG emissions		
Year	India's RCA	China's RCA
2019	0.91	1.18
2020	1.16	1.14
2021	0.88	1.08
2022	1.10	0.66
2023	1.01	0.95

Source: Authors' calculation based on on WTTC, Travel & Tourism's Global Footprint, https://globaltravelfootprint.wttc.org/

The Revealed Comparative Advantages of Economic Impact in relation to the World by both the countries (Table 3) shows that both the countries have picked up more than the world parity in terms of both Travel and Tourism Contribution to Income and Employment with China picking up higher than India in 2023. An increasing RCA shows an upward growth. India on the both the accounts either remained static or has shown marginal de growth.

Unlike Economic Impact where the increasing RCA shows the growth, the increasing RCA in Travel and Tourism contribution to Greenhouse Gas (GHG) emissions shows the worsening of environmental impact whereby both India and China are almost at parity with the World's GHG emissions. India is better off than China (it had extended Covid lockdown) as it shows the declining RCA in 2023 in relation 2022. However, both the countries need to extensively control their Environmental Impact.

Conclusion and Suggestions

China's tourism is driven by its historical landmarks, modern cities, and strong infrastructure. With strategic investments in high-speed rail and smart tourism, China attracts both cultural and business travelers. India on the other hand holds a strong comparative advantage in cultural and spiritual tourism. With 42 UNESCO World Heritage Sites (as of 2024), it outperforms both China (43 sites, but fewer spiritual routes). India has a advantage over the China with respect to Cultural and Natural Heritage as it offers unique spiritual destinations, varying landscapes and diverse languages and cuisines. Similarly, China offers historic grandeur (Great Wall, Forbidden City) but emphasizes modernization more than the cultural immersion. India needs to step up its campaigns as Incredible India 2.0, Dekho Apna Desh and better global reach. There is much to be done in India with regards to Infrastructure and Accessibility. China leads in transportation and tourism infrastructure, with world-class airports, high-speed rail, and smart tourism initiatives. India needs to tackle the challenges faced by Indian tourism such as inadequate infrastructure in Tier-2 and Tier-3 destinations, Safety concerns for female travelers, Visa and bureaucratic hurdles, Inconsistent cleanliness and hygiene standards, as well as marketing inconsistency. Policy focus needs to shift from promotion to quality improvement.

The Travel and Tourism Revealed Comparative Advantage (RCA) results conclude that the India and China Average RCA on Contribution to GDP in relation to world was respectively 1.08 and 1.31 in the pre pandemic bi decadal period and respectively 0.99 and 1.66 in the last five years that shows the China's better progress in terms of sector's income generation for the country than India. Further, in terms of India and China Average RCA on Contribution to Employment was respectively 0.99 and 1.04 in the pre pandemic bi decadal period and respectively 1.00 and 1.44 that again shows the China's better progress in terms of sector's employment generation. China's Travel and Tourism Economic Impact is certainly skewed towards positive growth than India.

However, the Travel and Tourism Revealed Comparative Advantage (RCA) results show that the India and China Average RCA on Contribution to Greenhouse Gas (GHG) Emission in relation to world for the last five years is respectively 1.01 and 1.00 and is in parity with the World's Greenhouse Gas (GHG) Emissions. India is slightly better off than China (it had extended Covid lockdown) as it shows the declining RCA in 2023 in relation 2022. It may be fairly concluded that India and China need to address the sector's environmental impact rigorously that is sure to bring down the World's Greenhouse Gas (GHG) Emission.

The study may have the limitation of having only few years of data related to economic and environmental impact in the pandemic and post pandemic period and some results may be quite premature. But the pre-pandemic results, particularly for Economic Impact, will certainly give the results a solid background.

Credit Authorship Contribution Statement

Authors contributed equally to this work.

Declaration of Competing Interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

Declaration of Use of Generative AI and AI-Assisted Technologies

The authors declare that they have not used generative AI and AI-assisted technologies during the preparation of this work.

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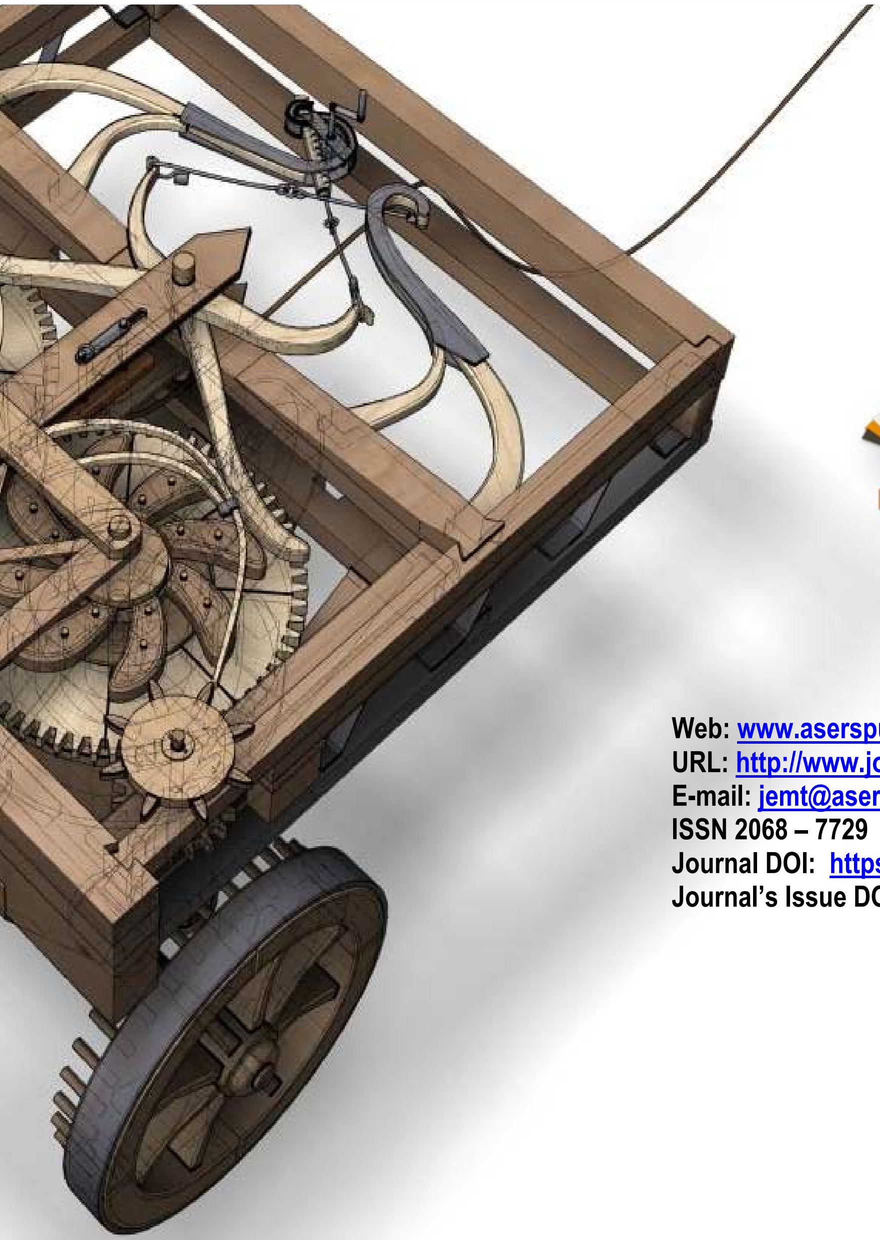

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