



TECHNOLOGY ENABLING GOVERNMENTAL POLICIES: IMPACT ON TOURISM AND OTHER ALLIED SECTORS IN KERALA STATE, INDIA.

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Abstract

Given the immense potential of technology adoption, especially the advances in ICT and allied technologies, in promoting tourism and allied sectors, is widely recognized. So also, the positive role of linkages of tourism sector in speeding up the growth in other sectors that are allied to the tourism sector is well acknowledged. Kerala tourism has been ahead in the adoption of ICT and other technological advances, and this was backed by the conducive policies of the Government of Kerala towards technology adoption. In the above context, this paper makes a critical study of the governmental policies on technology adoption in Kerala and its impact on the development of tourism sector and also other allied sectors and hence on the whole economy.

Keywords: *ICT, Economic Growth, Linkages, Tourism Earnings, FEEs, Sustainable Development.*

Introduction

The tremendous potential of technology adoption, especially the rapid advances in ICT and allied technologies; in enabling the fast growth of tourism sector and also other sectors in the economy which are allied to tourism, and hence the development of the economy as a whole; is well acknowledged in the literature. This huge development potential of emanates from the linkage effects of tourism with many other sectors, like, housing and real estate, food preservation, hospitality, handicrafts, cultural preservation, and so on. Use of ICT and other allied technologies could accelerate the pace of tourism development. This promotes faster growth in economic growth in such other sectors that are related (allied) to tourism, and this in turn ultimately leads to development of the whole economy. Because of the above development potential of tourism sector because of linkage effects, world over many nations particularly the developing nations including India have been actively promoting their tourism sector in order to ensure their rapid economic growth. The global pandemic of Covid-19 had an adverse impact on economic growth in general and tourism sector in particular. This fact has given another dimension to the need for accelerating tourism development so as to expedite the overall economic growth of nations, especially the developing world including India. Within India, the State of Kerala deserves special attention as despite its enviable tourism resources this State is yet to regain its own pre-Covid (2019) status in respect of tourism earnings especially in FEEs, even as of 2022. (Shajahan & Kumar, 2024).

Significance of the Study

The vast development potential of tourism is sought to be effectively tapped by the world nations, mostly by the developing countries such as India. A vibrant tourism sector ensures greater earnings from tourism, especially the foreign exchange earnings (FEEs). Attracting more foreign tourists and thus ensuring high level of FTAs (foreign tourist arrivals) is a top priority to these nations, including India. The adverse impact of the global pandemic on economies globally, particularly on the tourism



sector, has added another dimension to the utmost need for promoting tourism sector (in effect, reviving from its slump) in this post-Covid scenario. Indian tourism in general, and that of Kerala State is particular, is relevant, given the fact that Kerala's tourism earnings, including FEEs, as of 2022 is one-third of pre-Covid (2019) levels. (Shajahan & Kumar, 2024).

Given the tremendous capability of technological advances, like advances in ICT and its variants such as artificial intelligence (AI), augmented reality (AR), virtual reality (VR) etc., and also to bring about radical changes in business and economic activities, ICT-integration has become an imperative for rapid development in sectors like tourism which in turn has an extra advantage – its high level of linkages with other sectors. Thus, development in tourism translates into simultaneous development in other sectors allied to tourism. It is in this context that a technology-enabling policies of the Government and its impact on tourism sector in particular and other sectors in general deserve a closer look so as to design policies that ensure rapid and also sustainable development of the whole economy. Here, the sustainability primarily refers to environmental sustainability because Kerala's natural environment has already been under 'Ecological Overkill' over the years because of the short-sighted policies of the successive Governments and this has led to many of the State's precious natural resources being lost rather irreversibly. (Oommen, 2008).

Garnering higher amounts of foreign exchange earnings (FEEs) becomes key concern for many world nations, and India is no exception. Taking the case of Kerala State in India in particular, this State has suffered heavily due to an unprecedented flood that ravaged the State in 2018. Following this, this State had suffered another death blow in the shape of the global level attack of Covid-19 – the global pandemic. Kerala economy as a whole (the State's tourism sector in particular) has not yet fully recovered from Covid-induced slump. In view of the irreparable damage that was caused to Kerala's tourism sector because of the flood havoc in 2018 which was closely followed by Covid-19, the global pandemic in early 2020, Kerala economy needs a radical revival so as to recover its early growth performance. Recovery of Kerala tourism from the Covid-induced slowdown is particularly relevant at present. This in turn demands a close look into the problem, finding its route causes and chalking out remedial strategies in an integrative manner and that too using the ICT advances. As of 2022, even though Kerala tourism could attain a full recovery in a gradual manner in respect of DTAs (Domestic Tourist Arrivals (DTAs)), the case of FTAs is still very poor and so also is the case of FEEs too. In view of the above, it is very relevant to a detailed and critical analysis of Kerala's tourism and allied sectors, so that policies, especially technology-based ones.

The utmost need for FTAs through a dynamic tourism sector is vital for greater flow of FEEs to the economy. Faster development of tourism sector (through various technology-enabling policies) and hence the economy as a whole (because of linkage effects) need to be studied closely in the above context. This in turn would facilitate formulation of strategies to promote the tourism sector as well as other allied sectors in an integrative manner; thus enabling the holistic growth of the economy as whole. This study is an attempt in this direction, and it seeks to formulate strategies to revive Kerala tourism sector specifically and the whole economy in general; all these using the immense potential of the rapid technological advances, like ICT and its variants including AI, VR, AR etc.



Research Questions

1. What have been technology enabling economic policies in India especially in the tourism sector?
2. What have been the trends in FTAs, DTAs and FEEs to Kerala during the post-Covid era?
3. How could technology adoption support tourism and allied sectors, like, housing, transportation, etc.?
4. What technology enabling policies could enhance the growth of Kerala's tourism and allied sectors?

Objectives

1. To study the technology enabling economic policies in India with special reference to tourism sector.
2. To study the performance of India tourism with regard to DTAs, FTAs and FEEs with a focus on Kerala.
3. To study how to use the technology advances effectively for the better performance of Kerala tourism.
4. To suggest technology-based policies to improve the performance of Kerala's tourism and allied sectors.

Methodology

A descriptive-analytical approach with an exploratory outlook was used. Primarily secondary data from authentic sources were used for data analysis and interpretation, together with primary data from field study done in prominent tourism destinations. During field study, data from 300 tourists from 3 main ecotourism destinations were collected. Common statistical tools were used for data analysis and interpretation.

Past studies

Past studies in the tourism parlance as well as in other allied sectors like real estate and housing, hospitality, transportation, food preservation, cultural preservation, handicrafts etc. are discussed here. So also, the impact of technology-adoption (like, advances in ICT and its variants) on tourism and allied sectors are dealt here. Many studies have dealt the aspects like tourism economics, tourism's contribution to the national economy (tourism earnings, for instance) particularly foreign exchange earnings (FEEs) due to tourist arrivals (TAs). Studies dealing with the influence of tourism on the local populace, need for environmental conservation to ensure tourism's long-term sustainability etc. do exist. Huybers and Bennet (2003) delved into the need for suitable environment management in nature-based tourist destinations, through private and public initiatives so as to protect the competitiveness of tourist destination and also better sustainability. Necessity for adoption of ICT in tourism and allied sectors for their greater competitiveness and long-term sustainability is dealt in several studies. Because Kerala's natural environment is facing an 'Ecological Overkill' as pointed out by Oommen (2008) in "Reforms and the Kerala Model". A national level study of Indian tourism with a focus on Kerala by Manoj P K (2008), 'Sustainable Tourism in India: A Study from a Global Perspective with Focus on Tourism Prospects of Kerala' has pointed out the good prospects Indian tourism from a global view, wherein Kerala's exceptional tourism potential, its unique benefits etc. are noted. A book on ecotourism in India by Singh (2009) has pointed out that ecotourism is a fully novel tourism approach that offers avenues to tourists to experience the powerful natural displays, and also warns them of the crucial need to protect the biodiversity, preserve the natural resources, conserve the local cultures, etc.



Sudheer, B (2015) in his UGC-sponsored research on Responsible Tourism (RT) in Kumarakom (Kerala) has noted that an alternative and innovative approach like RT is a key need to minimize the adverse environmental impact and also to ensure its long-term sustainability. Sarojkumari, et al. (2023) in their joint study “Health Monitoring Based Cognitive IOT Using Fast Machine Learning Technique” *Journal of Data Acquisition and Processing* have pointed out the crucial necessity for adopting ICT-based tools for scientifically monitoring health in modern times.

Pradeep et. al. (2017), “Community based tourism for the sustained economic development of Kerala: A study with a focus on ecotourism” in *International Journal of Multidisciplinary Research Review* has delved into the need for promoting CBT (Community based Tourism) in the State of Kerala in South India given the huge tourism potential of this State and the need to preserve the environment’s quality also. The development potential of ICT integration was researched by a few scholars, both national and international. Manoj (2007) “ICT industry in India: a SWOT analysis” *Journal of Global Economy* in his national level analysis has looked into India’s ICT industry and its key significance in rapid national economic growth. Globally, Pickens (2009) “Window on the Unbanked: Mobile Money in the Philippines” could demonstrate how ICT-integration through a cheap ICT device (mobile phone) played a key role in empowering rural women and ensuring rural prosperity through financial inclusion. Manoj (2010) “Impact of technology on the efficiency and risk management of old private sector banks in India: Evidence from banks based in Kerala” could prove that ICT-integration by banks significantly raised their operational efficiency. Nasar and Manoj (2013) “Real Estate Development In India And The Behavior of Investors to Invest In The Real Estate Market: An Empirical Investigation” pointed out that proper expert suggestions that real estate investors received from the developers as well as brokers (agents) of real estate business could significantly influence the investors in real estate.

Several research studies have dealt the vital need for facilitating sustained economic growth through diverse kinds of innovations, interventions, and tools (e.g. ICT adoption); from education advances to export promotion, and from promoting SEZs to aiding ecotourism. Manoj (2013) “Prospects and Challenges of Green Buildings and Green Affordable Homes: A Study with Reference to Ernakulam, Kerala” has noted the high growth prospects for green homes and that green homes could create huge employment opportunities and sustainable economic growth. Varghese, K.X, and Manoj, P.K. (2013), “Educational loans and the higher education sector in India” observed that as study loans could improve quality of India’s human resources and enhance youth employability, such loans should be promoted. Manoj, P.K. (2015) “International Container Transshipment Terminal (ICTT) and its impact on coffee exports from India: An analysis” noted the key role that ICTT played in exports and thus economic growth. Manoj, P.K.(2009), *Special economic zones in India: financial inclusion: challenges and opportunities* noted the role of SEZs in rapid economic growth. Manoj, P.K.(2017) “Segmentation Strategy for Promotion of Ecotourism Products: Evidence from Thenmala Ecotourism” observed that careful analysis, planning and segmentation of tourists resulted in rapid economic growth through ecotourism. Rajesh and Manoj (2015) “Women Employees work life and challenges to Industrial Relations: Evidence from North Kerala” found that trade-off between work and life (work life balance) is vital for women for better industrial relations. Manoj (2016) “Employment Generation from Rural Tourism: A Field Study of the Local Community at Kumbalangi, Kerala” pointed out tourism’s vast potential for employment generation and suggested for providing greater ICT resources as well as online services. Manoj (2016) “Real Estate Investment Trusts (REITs) for Faster Housing Development in India: An Analysis in the Context of the New Regulatory Policies of SEBI” pointed out innovative products (e.g. REITs) are vital for fast housing development in the Indian context and



hence the rapid economic development. Manoj (2016) “Bank marketing in India in the current ICT era: Strategies for effective promotion of bank products” pointed out the crucial necessity for ICT-integrated marketing by the banking institutions in this ICT era. Lakshmi and Manoj (2017) “Service quality in rural banking in north Kerala: A comparative study of Kannur district co-operative bank and Kerala Gramin bank” pointed out that greater ICT-adoption by KGB could make its performance better than that of a Co-operative bank like Kannur District Co-operative Bank (KDCB). Lakshmi and Manoj (2017) “Rural Customers and ICT-based Bank Products A Study with a Focus on Kannur District Co-operative Bank and Kerala Gramin Bank” observed that greater customer acceptance for ICT-integrated products of Kerala Gramin Bank (KGB) than the traditional type products of KDCB.

Joju, Vasantha, and Manoj (2017) “Future of brick and mortar banking in Kerala: Relevance of branch banking in the digital era” has pointed out that though ICT-adoption is vital in modern banking ‘human touch’ as in ‘brick and mortar’ (traditional) banking is vital too. Joju, Vasantha, and Manoj (2017) “Financial technology and service quality in banks: Some empirical evidence from the old private sector banks based in Kerala, India” have noted that fin-techs (financial technologies) can really improve service quality and are essential for success in modern banking. Manoj (2017) “Construction costs in affordable housing in Kerala: Relative significance of the various elements of costs of affordable housing projects” seeks to prioritize the cost elements so as to enable selective cost control and ICT acts as a key tool towards this end. Manoj (2017) “Cost management in the construction of affordable housing units in Kerala: A case study of the relevance of earned value analysis (EVA) approach” demonstrates how EVA’s strategic optimizes the construction costs. Joju, Vasantha, and Manoj (2017) “Electronic CRM & ICT-based banking services: An empirical study of the attitude of customers in Kerala, India” has pointed out the vital significance of Electronic-CRM (e-CRM) for efficiency and competitiveness in banking, and also noted positive customers’ feedback towards e-CRM. Another banking study by Manoj (2018) “CRM in old private sector banks and new generation private sector banks in Kerala: A comparison” has noted that NPBs (New Private sector Banks) in Kerala performed better than OPBs (Old Private sector Banks) in CRM-adoption, essentially in high-tech services such as E-CRM and hence NPBs could ensure better command over the bank customers by way of such high-tech services.

Joju and Manoj (2019) “Digital Kerala: A study of the ICT Initiatives in Kerala state” have delved into the ICT initiatives in Kerala – the State with one of the topmost in internet penetration as well as in universal literacy in India, and suggested measures best utilize ICT. Joju and Manoj (2019) “Banking Technology and Service Quality: Evidence from Private Sector Banks in Kerala” observed that ICT in banking improves quality and thus it should be encouraged. Manoj (2019) “Social banking in India in the reforms era and the case of financial inclusion: Relevance of ICT-based policy options” has made suggestions about ICT-driven policies to improve social control in the ongoing digital banking era. Manoj (2019) “Dynamics of human resource management in banks in the ICT era: A study with a focus on Kerala based old private sector banks” has pointed out that ICT-integrated HRM policies results in banking competitiveness. Manoj (2019) “Competitiveness of manufacturing industry in India: need for flexible manufacturing systems” has observed the key need for ICT-integrated production using modern technologies like flexible manufacturing systems (FMS) in India to attain greater manufacturing competitiveness.



Ali and Manoj (2020) “Impact of Falling Price of Rubber-A Case Study of Kothamangalam Taluk in Ernakulam District” have noted that because of frequent price falls the livelihood of rubber farmers are affected and thus governmental actions, like MSP (minimum support price) are essential. Manoj (2015) “Prospects of Responsible Tourism in Kerala: Evidence from Kumarakam in Kottayam District” has noted the vast scope of RT (responsible tourism) to support economic growth. Manoj (2016) “Determinants of sustainability of rural tourism: a study of tourists at Kumbalangi in Kerala, India” has pointed out the major factors that influence the sustainability of rural tourism, including enhanced ICT infrastructure. Manoj (2015) “Impact of Rural Tourism on the Environment and Society: Evidence from Kumbalangi in Kerala, India” has observed the clearly negative environmental effects of rural tourism and hence the vital need to curb them. Manoj (2019) “Tourism Sector in Kerala in the Post-Flood Scenario: Strategies for its Sustainable Growth With a Focus on Responsible Tourism” has observed the key role that RT plays in reviving the flood-hit Kerala economy. Manoj (2023) “Corporate Decisions of RIL: Impact on Share Prices and Policy Implications” *Migration Letters* has delved into the RIL’s corporate decisions and their influence on share prices. ICT’s growing role in tourism, banking, real estate are noted in IBEF (2023) reports on (i) Tourism and Hospitality, (ii) Real Estate, and (iii) Banking; thus ICT usage is vital in tourism, banking, housing, and healthcare.

Vimal Babu and Sandeep Munjal (2015), “Oachira Panthrandu Vilakku A study of a culturally embedded festival aligned with economic benefits” have studied the policy changes regarding this major cultural tourism event in south Kerala and also suggested further policy changes for the faster growth of this niche tourism segment. Manoj, P.K. (2015) “Housing Microfinance: A Study on Quality, Cost and Default Rate with Respect to Bhavanashree in Kerala” has noted that HMF (Housing Micro Finance) has lower asset quality and HMF has higher transactional costs. Deepa Jawahar, and Aslam Muhammed, M. K. (2021). “Product–place image and destination brand equity: special reference to “Kerala is an ayurvedic destination” point out that product-place image, destination image significantly influence the brand image. Parul G Munjal (2021). “Charting the role of digital platforms for cultural heritage tourism in India” has noted the immense capacity of digital platforms to leverage the growth of cultural heritage tourism in India. Paul and Nimmi (2022) Sustainable tourism development: discerning the impact of responsible tourism on community well-being. *Journal of Hospitality and Tourism Insights* have noted that RT leads to the socio-economic, cultural and environmental wellbeing of the community. Saritha and Manoj (2023), “Social inequalities in IT sector: Evidence from Kerala State in India” *Environment and Social Psychology*, have noted the prevalence of inequality in Kerala’s IT sector and the need to eliminate this for the State’s rapid and equitable economic growth. Manoj (2023) “Affordable Healthcare and Affordable Housing: Need for an Integrative Approach for the Holistic Growth of the Digital Economy of Kerala, India” *Community Practitioner*, has observed that a knowledge society like Kerala should duly promote housing and healthcare sectors in an integrative and holistic manner and that too by taking advantage of the immense potential of ICT-integration.

Manoj (2023) “Health Expenditure in Covid-19 Times and the Need for Affordable Houses that Nurture Healthy Citizens: A Roadmap for Digital Economy of Kerala” *Migration Letters* has pointed out that by learning from Kerala’s Covid19 experience, the State should concentrate on homes that really consider the ‘health’ aspect because this aspect could enhance the social value to houses. Manoj, P.K. (2023) “ICT for Sustained Community Development in India in the 5G Era” *Community Practitioner* has pointed out the crucial need for high-tech ICT infrastructure that ensures better internet connectivity for rapid and equitable economic growth. Manoj (2023) “Health Aspect in Housing



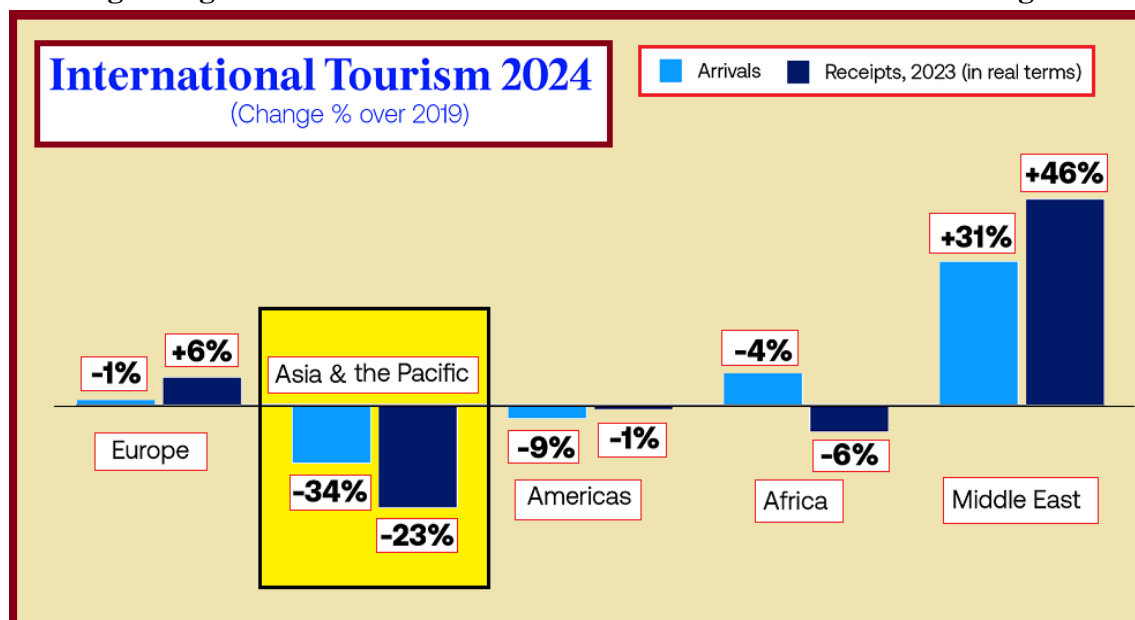
Development for Attaining Greater Social Value: The Case of ‘Affordable Housing For All’ Goal in Digital India” *Community Practitioner* has observed the utmost need for integrating the health aspect in housing development for attaining social value. Singh and Singh (2023) “Financial literacy and its determinants among the schedule tribes: evidences from India” have noted the poor state of financial literacy among the tribal households in Himachal Pradesh in India and that factors like literacy, income level and family status significantly impact financial literacy. UN Report (2016) *Digital Financial Inclusion* has pointed out immense prospects of ICT adoption for digitally empowering the masses globally, learning from successful global experiences. McKinsey (2023) report has observed the key role that ICT plays to bring about sustained and inclusive growth in G20 nations, including India. UNWTO (2023) report has suggested that global tourism has not yet recovered fully from the Covid-19 crisis that emerged in the late 2019 and 2020 across the whole world. Ali et. al. (2024) “Acceptance and use of ICT in tourism: the modified UTAUT model” have pointed out that actual ICT usage by tourists depends on their behavioral intention and their habits; it suggests ICT as a tool to tide over the Covid impact.

Based on the above reviews, it is noted that there are many studies on tourism and allied sectors, and mostly these studies look into the role of such sectors on economic growth; including the ICT’s influence on accelerating the pace of economic growth. But, studies in the post-Covid scenario that consider the impact of Covid on tourism and hence on economic growth are scarce. Thus, an earlier research by the present authors, Shajahan & Kumar (2024), “Leveraging Technology for the Sustainable Development of Tourism and Allied Sectors in Kerala: A Post-Covid Perspective” have studied Kerala’s post-Covid era in respect of tourism and allied sectors and suggested strategies to revive such sectors, duly using ICT advances, like, AI, VR, AR etc.; to ensure faster growth of the economy, given the vast linkages of tourism with other sectors of the economy. This study is a sequence of the last study, Shajahan & Kumar (2024) noted above and it seeks to delve further into the technology-enabling policies, their impact of tourism and allied sectors and thus the whole economy.

Broad Trends in Global Tourism in the Post-Covid Scenario: The Case of Indian Tourism

It is noted that there was an increasing trend in international tourist arrivals as well as in international tourist revenue over the years till the late 2019 (or 2020 beginning) when the global pandemic Covid-19 broke out. The above generally growing trend was steady in nature and it could withstand even major global crises such as the SARS Epidemic (2003), Global Economic Crisis (2009) etc., without significantly affecting the general increasing trend adversely. Rather, the growing trend continued as such reasonably well till Covid-19 (2019). But, the global pandemic of Covid-19 has been so disastrous that it ravaged the global economy, especially the tourism sector, and the global economy is yet to fully recover from its death blow; as is crystal clear from the 2024 scenario in this regard (data available till 2023 only) as shown in Figure I. Tourism sector accounts for nearly one-tenth of the global GDP and its recovery is vital for the global economy. Due to the vast linkage effects, as tourism sector picks up it leads to the growth in various allied sectors and hence the whole economy. From Figure I (based on UNWTO data), it is noted that the Middle East region has been leading in growth rate of tourism since the pandemic year (2019), with 31 percent growth in tourist arrivals (TAs) and 46 percent growth in tourism earnings (TEs). The Middle East region has been followed by the Europe region in the second slot with marginal growth rates of 1 percent in TAs and 6 percent in TEs. (Figure I).

Figure I: Regional growth rates in International Tourism – The Middle East region is leading.



Source: Based on UNWTO statistics. (www.unwto.org/tourism-data).

From Figure I, it may be noted that Asia-Pacific region (AP) has been showing the poorest growth rate in respect of both TAs (negative 34 percent) and TEs (negative 23 percent), and India as a country fall in this region only. Now, coming to the specific case of India within this AP region, it is noted that Indian tourism could perform reasonably well in respect of TAs during the post-pandemic period (2019 to 2023) and there has been an overall growth rate of 5.6 percent in TAs (in millions) during the period whereas at the global level, the world tourism could register only an overall negative growth of 11.3 percent. Only one region viz. the Middle East (ME) could attain a better growth (as a region) than India (as a country) within the AP region since the ME region could register a commendable positive growth rate, as high as 22 percent as against just 5.6 percent for India. It is further noted that all major regions (except ME region) could register only negative growth rates during the said period (2019 to 2023) viz. Africa with negative growth of 3.9 percent, Americas with a negative growth of 8.7 percent, AP region (which includes India as a country) with a negative growth rate of 34.6 percent and the Europe region with a negative growth of 4.4 percent. Thus, despite a huge growth rate of negative 34.6 percent of AP region, India as a country within this AP region could still attain a reasonably good positive growth of 5.6 percent. This positive growth rate of 5.6 percent second only to the overall growth rate of the ME region with a very appreciable (highest of all) positive growth, as high as 22 percent. In short, the performance of India in respect of TAs is observed to be very good from a regional (AP region) perspective and is relatively good from a global (whole world) perspective. (Table I). Table I further suggests that in respect of TAs ME region alone could register a positive growth rate which is very high also (22 percent) whereas all the other regions could register only negative growth rates. Of the different regions other than ME region all of which could register only negative growth rates in TAs, it is the AP region with a negative growth rate of 34.6 percent is the one with the lowest (worst) performance and within this AP region that India with a positive growth rate of 5.6 percent falls. Moreover, it may be that India's share in world's TAs has been consistent at about 1.5 percent and there is no growth. Rather, its share is stagnant only. So, India's overall performance in respect of TAs may be said to be only reasonable, not very good. (Table I).



Table I: Regional growth in Tourist Arrivals (TAs) (Millions).

Region	2019	2021	2022	2023*	Growth Rate 2023/19*
World					
Arrivals	1465.0	458.0	975.0	1300.0	-11.3%
% Annual change	3.7	12.5	112.9	33.3	
Africa					
Arrivals	69.0	19.7	47.0	66.3	-3.9%
% Annual change	0.4	5.3	138.6	41.1	
% Share in world	4.7	4.3	4.8	5.1	
Americas					
Arrivals	219.3	81.8	157.2	200.2	-8.7%
% Annual change	1.5	17.5	92.2	27.4	
% Share in world	15.0	17.9	16.1	15.4	
Asia and the Pacific					
Arrivals	362.7	24.6	93.3	237.2	-34.6%
% Annual change	5.0	-58.4	279.3	154.2	
% Share in world	24.8	5.4	9.6	18.2	
Europe					
Arrivals	742.4	301.3	609.5	709.4	-4.4%
% Annual change	3.7	25.7	102.3	16.4	
% Share in world	50.7	65.8	62.5	54.6	
Middle East					
Arrivals	71.3	30.2	67.8	87.0	22.0%
% Annual change	8.9	55.7	124.5	28.3	
% Share in world	4.9	6.6	7.0	6.7	
India					
Arrivals	17.9	7.0	14.3	18.9	5.6%
% Annual change	2.8	10.6	104.3	31.9	
% Share in world	1.2	1.5	1.5	1.5	

Source: Govt. of India, *India Tourism 2024*, pp.9-10.

Given the only reasonably good (and not appreciable) relative performance of India in respect of TAs, from a global perspective and the stagnancy that the country faces in its relative share of TAs in the world, it may be noted that technological interventions for tourism promotion can help the Indian tourism to perform better and to improve its present share of just 1.5 percent, that is stagnant at this level over the last few years. Thus, environment-friendly tourism models (like ecotourism), if promoted in a sustainable manner can help the country to improve its share, if the immense potential of technological advances are also utilized properly. Added thrust on the adoption of ICT and such other technological advances like AI (artificial intelligence), VR (virtual reality), AR (augmented reality) etc. is relevant in Indian tourism in the above context. Because, latest technologies as noted above can effectively lure the new generation tourists, including foreign tourists. Such technologies can greatly improve the competitiveness and reputation of tourism locations and thus attract more TEs (especially FEEs) through higher TAs; hence technology adoption is an imperative today, globally.



Table II: India's Global Ranking in Tourist Arrivals (TAs) (Millions).

Year	World		India		Percentage Share of India	Rank of India
	Number (in million)	% Change	Number (in million)	% Change		
2001	683.4	0	2.5	-4.2	0.4	51st
2002	703.2	2.9	2.4	-6.3	0.3	54th
2003	691.0	-1.7	2.7	14.7	0.4	51st
2004	762.0	10.3	3.5	26.7	0.5	44th
2005	803.4	5.4	3.9	13.3	0.5	43rd
2006	846.0	5.4	4.5	13.5	0.5	44th
2007	894.0	5.6	5.1	14.2	0.6	41st
2008	917.0	2.6	5.3	3.9	0.6	41st
2009	883.0	-3.7	5.2	-2.1	1.0	41st
2010	948.0	7.4	5.8	11.8	0.6	42nd
2011	994.0	4.9	6.3	9.2	0.6	38th
2012	1,039.0	4.5	6.6	4.3	0.6	41st
2013	1,087.0	4.6	7.0	5.9	0.6	41st
2014	1,137.0	4.6	13.1	\$	1.2	24th
2015	1,195.0	5.1	13.8	5.0	1.2	24th
2016	1,241.0	3.8	15.0	9.1	1.2	26th
2017	1,332.0	7.3	16.8	11.8	1.3	26th
2018	1,413.0	6.1	17.4	3.7	1.2	23rd
2019	1,465.0	3.7	17.9	2.8	1.2	24th
2020	407.0	-72.2	6.3	-64.7	1.6	19th
2021	458.0	12.5	7.0	11.1	1.5	18th
2022	975.0	112.9	14.3	104.3	1.5	17th
2023 (P)	1,300.0	33.3	18.9	32.2	1.5	-

Source: Govt. of India, *India Tourism 2024*, pp.9-10.

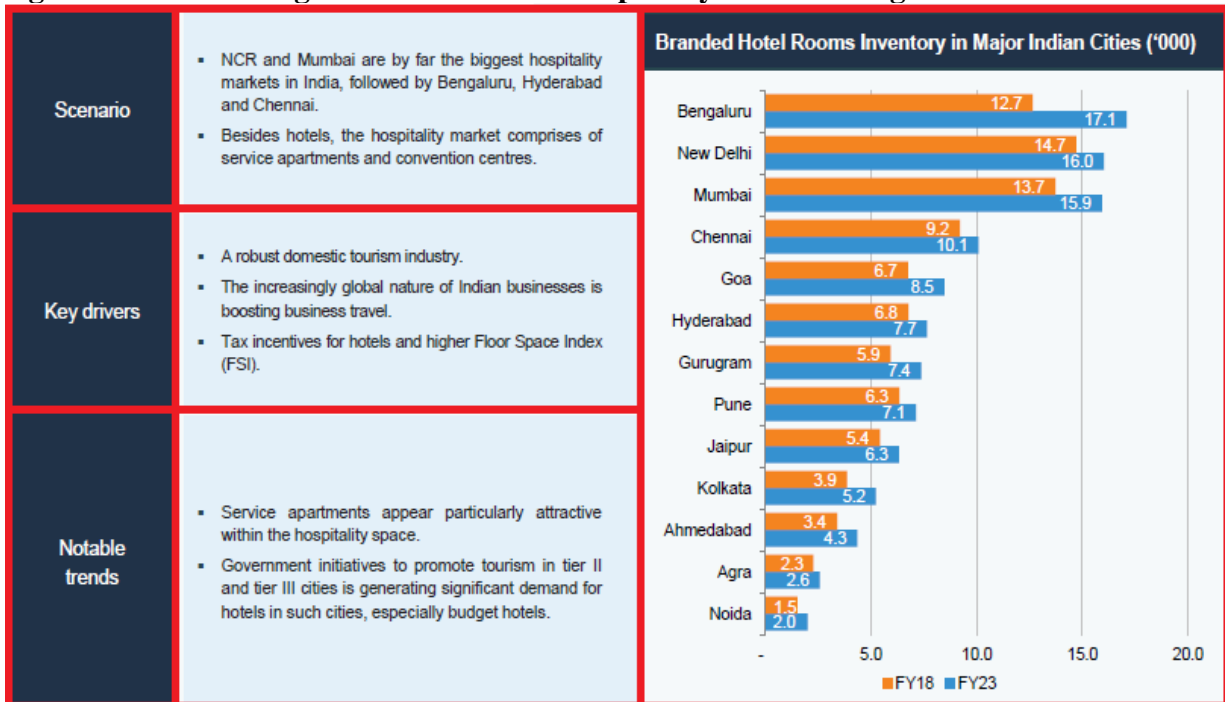
From Table II, regarding the relative ranking of India in the global tourism landscape, in the initial years of this century i.e. till 2003 India rank was in the 'Early 50s' range (i.e. 51-54). However, over the next one decade i.e. 2004 to 2013 period, India's rank improved to the 'Early 40s' range (i.e. 41-44, in general). Over the next six years till the Covid-19 year (i.e. 2014 to 2019) India's relative ranking was in a still better level of 'Early 20s' (i.e. 23-24, in general). Over the post-Covid period i.e. since 2020 onwards, India has been in the 'Less than 20' range (i.e. 17-19, in general). Thus, despite the stagnancy in the share of India's TAs at the level of 1.5 percent in the post-Covid scenario, India's relative rank in the post-Covid scenario has been relatively better as it has improved from 'Above 20' or 'Early 20s' range to that of 'Below 20'. The latter one (i.e. the Post-Covid scenario since 2020) is obviously better than the former one (i.e. Pre-Covid era till 2019); and hence it may be pointed out that from a global perspective India's ranking in respect of TAs has been definitely better than the country's ranking throughout the Pre-Covid era, right from the early years of the current century. Still, the stagnancy in its global share of TAs at about 1.5 percent throughout in the ongoing Post-Covid regime (Table I) reduces the sheen in the improvement in India's global ranking (Table II).



Tourism and Hospitality Sector: Vast Linkages with Housing and Real Estate Sector

The linkages of the tourism and hospitality sector with top priority sectors like housing and real estate brings in strategic benefits to the whole national economy. This is because of the fact that housing and real estate is a sector that has strategic significance being a primary human need on the one hand and a sector with huge linkages, both forward and backward, with over 350 other sectors. Thus, as we encourage tourism we are promoting the housing and real estate sector also and this in turn accelerates the growth of the whole national economy of India because of the vast linkages of this vital sector with large number of other industries such as cement, steel, metal, sand, etc. (backward) on the one hand, as well as with consumer durables, furniture, air-conditioners, fans etc. (forward) on the other hand. In effect, investments in tourism translates into similar investments in a large number of other sectors in an indirect manner because of the linkage (multiplier) effects. Because of the above reason, deliberate efforts to invest in sectors like housing and real estate, tourism etc. are made by the Government so that such investments in other sectors automatically due to linkages. More importantly, such sectors are heavily labor-intensive in nature and hence they create very large number of employment opportunities. Thus, huge employment-generation capability, vast linkage (multiplier) effects etc. together with sizeable share in the total GDP of the country make investments in tourism and hospitality sector (and so also in sectors like housing and real estate) make investments strategically significant at the national level, especially for developing nations, including India. It may be observed that in the aftermath of Covid-10 pandemic, as part of the ABA (Atmanirbhar Bharat Abhiyan) housing and real estate sector was one of the topmost priority area for which special financial (investment) packages were announced by the Govt. of India. From the above discussions, the utmost significance of the tourism-allied sectors, such as the housing and real estate may be observed. Similar are the cases of transportation, food services, handicrafts, cultural preservation etc. because these are all sectors which are closely allied (linked) to tourism sector.

Figure II: Vast Linkages of Tourism and Hospitality with Housing and Real Estate Sector.



Source: IBEF (2024), *Real Estate*, p. 13



Kerala Tourism in the Post-Covid Era: A Closer Look on the Technology-based Drives

In respect of Kerala tourism even though the DTAs (or, DTVs) to Kerala have already picked up momentum. DTAs to Kerala could surpass the pre-Covid (2019) level in 2022 and DTAs have further improved in 2023. On the other hand, FTAs (or, FTVs) to Kerala has not improved significantly as in the case of DTAs (DTV) and even as of 2023 FTAs remain to be about half that of the pre-Covid (2019) level. The poor performance of Kerala in attracting the foreign tourists as reflected in the poor FTAs (FTVs) is really a matter of great concern. In fact, the performance of Indian tourism as a whole has been more appreciable, in general, than the performance of Kerala tourism, especially in respect of FTAs to Kerala. FTAs to Kerala need to be scaled up and technology enabling policies, like, ICT-enabled tourism marketing is very much essential in order to scale up the FTAs to Kerala which is still at the level of about 50 percent of the pre-Covid (2019) level (Table III).

Table III: TAs to Kerala – FTAs still lags behind the Pre-Covid Level.

CAL YEAR	DOMESTIC TOURIST VISITS (DTV)	% variation over the previous year	FOREIGN TOURIST VISITS (FTV)	% variation over the previous year
2017	14673520	11.39	1091870	5.15
2018	15604661	6.35	1096407	0.42
2019	18384233	17.81	1189771	8.52
2020	4988972	-72.86	340755	-71.36
2021	7537617	51.09	60487	-82.25
2022	18867414	150.31	345549	471.28
2023	21871641	15.92	649057	87.83

Source: Govt. of Kerala (2024), *Kerala Tourism Statistics 2023*. p.2.

It may be pointed out that given the discerning nature of the young generation tourists, especially foreign tourists, technology adoption becomes an imperative especially by way of ICT-enabled marketing practices, pervasive use of ICT for travel reservations, ICT-enabled booking facility for various tourism services, provision of AI-enabled services for guiding the tourists as against the traditional tourist guides, provision of ICT-enabled and user-friendly kiosks etc. are some of the major ICT-enabled tourism services that modern tourists expect today. Manoj (2016) “Impact of Rural Tourism on the Environment and Society: Evidence from Kumbalangi in Kerala, India” has specifically noted the need for ICT infrastructure to retain and attract more tourists, especially foreign tourists, based on his empirical study on rural tourism in Kerala.



Whatever the foreign tourists spend during their visits becomes earnings for the host nation or State. So, spending by the foreign tourists visiting Kerala turns into revenue (earnings) for the host State viz. Kerala. Regarding the foreign exchange earnings (FEEs) from tourists visiting Kerala, it may be noted that till 2019 (i.e. before the year when the global pandemic Covid-19 broke out) there had been steadily growing trend in FEEs to Kerala till 2019 when it was as high as Rs.10,271.06 Cr. However, since the next year 2020 onwards there was drastic fall in the FEEs because of the fatal blow of the Covid-19. The drastic fall of FEEs to Rs.2799.85 Cr. was witnessed in 2020; and there was still drastic fall to as low as Rs. 461.5 Cr. in the next year, 2021. From the next year 2022 onwards there have been indications of revival and these are reflected in the more than 5 times growth in 2022 followed by a near doubling growth in the subsequent year 2023. In spite of the growth as above the FEEs to Kerala as of 2023 is roughly about a half of that of the Pre-Covid level (2019). The above situation in respect of FEEs to Kerala (or, spending by Foreign Tourists in Kerala) suggests the utmost need for a strong push so as to double its reach so as to attain normalcy i.e. the 2019 status (Pre-Covid level) first and also to push it up further to a new growth trajectory that is ahead of 2019 level. This in turn is possible only through leveraging the tremendous potential of technological advances, like, ICT advances and its variants such as AI, VR, AR etc. – all these being extensively used in the tourism sector, given its wide popularity among the new generation tourists, especially the foreign tourists. Considering the total spending by tourists (i.e. both domestic and foreign tourists), the situation is ‘not-very-encouraging’ as the pre-Covid level (2019) could not be attained even as of 2023. However, the situation in respect of total earnings (TEs), i.e. the total spending by all the tourists (i.e. both domestic and foreign tourists), is far better than in the case of case of FEEs alone. This may be because of the good growth in DTAs which in turn can even out the abrupt fall in FTAs and FTEs by compensating it with commendable growth in DTAs and the earnings arising out the DTAs. (Table III and Table IV).

Table IV: Spending by Foreign Tourists and Total Spending by All Tourists

Cal Year	~Spending by Foreign Tourists Visits (In Crore)	% variation over the previous year	~Total Spending by Foreign & Domestic Tourists Visits (Direct & Indirect) (In Crore)	% variation over the previous year
2017	8392.11	8.29	33383.68	12.56
2018	8764.46	4.44	36258.01	8.61
2019	10271.06	17.19	45010.69	24.14
2020	2799.85	-72.74	11335.96	-74.82
2021	461.5	-83.52	12285.91	8.38
2022	2792.42	505.07	35168.42	186.25
2023	5245.09	87.83	43621.22	24.03

Source: Govt. of Kerala (2024), *Kerala Tourism Statistics 2023*. p. 4-5.



Figure III: Technology Infrastructure in Kerala.

Telecom Infrastructure (as of March 2023)		Performance status of Bharat Net Project	
Wireless subscribers (in million)	42.34	Service-ready GPs (September 2023)	1,130
Wireline subscribers (in million)	1.38		
Teledensity (in%)	122.16%		
Internet subscribers (million)	31.86		

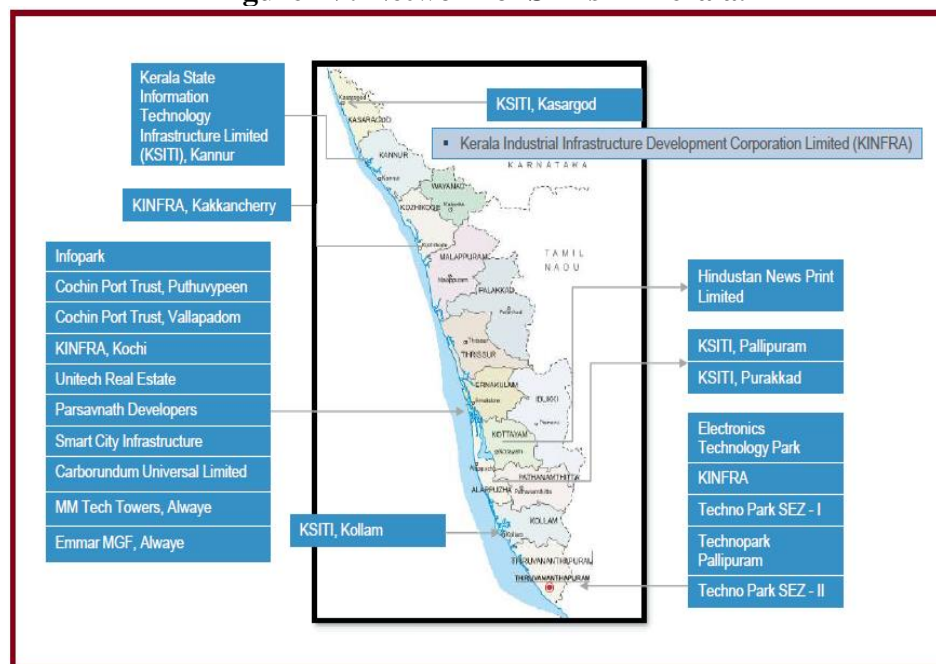
- As of March 2023, Kerala had a tele-density of 122.16%.
- According to the Telecom Regulatory Authority of India (TRAI), Kerala had 42.34 million wireless and 1.38 million wireline subscribers, as of March 2023.
- As of March 2023, Kerala had 31.86 million internet subscribers.
- By March 2023, 20.84 million subscribers had submitted requests for mobile number portability in Kerala.
- In June 2023, Mr. Pinarayi Vijayan, the Chief Minister of Kerala, unveiled the Kerala Fiber Optic Network (K-FON), a government-owned broadband service provider, with the aim of ensuring universal internet access at an affordable cost. During its initial phase, K-FON will extend internet services to approximately 14,000 financially disadvantaged households and 30,000 government offices.

Source: IBEF (2023), *Kerala*, p. 28.

Fully in line with the *Digital India* initiative of the Govt. of India (GOI) and also the concomitant policies like *JAM* (that is Jandhan, Aadhaar, Mobile) the Govt. of Kerala (GOK) too has been promoting adoption of ICT and other technological advances in a big way. Thus, as GOI encourages the use of widespread financial inclusion by way of ensuring own bank accounts for all (through PM Jan Dhan Yojana) (PMJDY) everyone especially women, ensures that Aadhaar accounts for better transparency in all transaction (like, benefits reach the deserving beneficiaries alone) and Mobile phones that ICT-led empowerment, GOK encourages similar initiatives at the State level in Kerala. The superior technology infrastructure in Kerala, like, a tele-density of 122.16 percent, 42.34 million wireless subscribers and 1.38 million wire-line subscribers, and 31.86 million internet subscribers, makes this State an ideal location for technology-enabled economic transformation. Tourism and hospitality sector in Kerala has been one of the most important beneficiaries in this drive, because the superior technology-infrastructure supports the growth of this vital sector in Kerala significantly because modern tourists, especially the foreign tourists, prefer such high-tech services only. Figure III depicts the salient features of the technology infrastructure in Kerala. Given the better ICT and allied infrastructure in Kerala, efforts for properly segmenting the tourists and also targeting the right customer segments with their ‘as you like it’ and tailor-made tourism products would make sense in the Kerala context, as empirical studies on ecotourism support its practical relevance. For instance for attracting more FTAs to India, especially to Kerala, based on his empirical investigation at a typical ecotourism destination viz. Thenmala in Kollam district (Kerala) Manoj, P. K. (2017) “Segmentation Strategy for Promotion of Ecotourism Products: Evidence from Thenmala Ecotourism” has suggested going for a systematic segmentation those who visit the destination as per their demographic profile, and thereafter specifically targeting the respective tourist groups (segments) with their tailor-made ‘as you like it’ tourism products.

It is noted that international experiences, like, the one noted by Pickens (2009) in the Philippines context wherein a simple ICT-based device (Mobile phone) could prove to be change-agent for financial inclusion, women empowerment and rural transformation and prosperity. In India the *Digital India* initiative of the GOI and its JAM policy and large number of schemes like PMJDY have created an environment that conducive for technology adoption, especially the adoption of ICT advances and the variants thereof. Similar to the global success story noted by Pickens (2009), there are studies in the Indian as well as context also, like, the one by Manoj, P.K. et. al. (2023) “Women empowerment in digital India and the Kerala knowledge economy” wherein an ICT-based approach is noted to be highly desirable in the Kerala context as it strives hard to turn itself into a knowledge economy in the global village, since such a policy could bring about Kerala’s faster economic development as well as women empowerment, in view of its unique social, economic, cultural, demographic and such other special characteristics. It has also been noted that CBET (community-based ecotourism) model is especially relevant in the Kerala’s scenario. It is noted that Kerala could start many ICT-centric infrastructure development projects throughout Kerala, a number of SEZs (Special Economic Zones) started throughout Kerala is just an example. So also are such other initiatives for export promotion like ICTT (International Container Transshipment Terminal) at Kochi in central Kerala. Earlier research studies by Manoj, P. K. (Ed.) (2009) “Special economic zones in India: financial inclusion: challenges and opportunities” has noted the economic benefits of encouraging SEZs in India, duly learning from Manoj, P. K. (2015) “International Container Transshipment Terminal (ICTT) and its impact on coffee exports from India: An analysis” has noted the strategic importance of ICTT in boosting the exports performance of India, especially the coffee exports. A recent by Ali et. al. (2024) “Acceptance and use of ICT in tourism: the modified UTAUT model” have noted that actual ICT usage by tourists depends on their behavioral intention and their habits. The details of the SEZs network in Kerala are depicted in Figure IV. It shows that SEZs are there almost uniformly across the length and breadth of this south Indian State. (Figure IV).

Figure IV: Network of SEZs in Kerala.



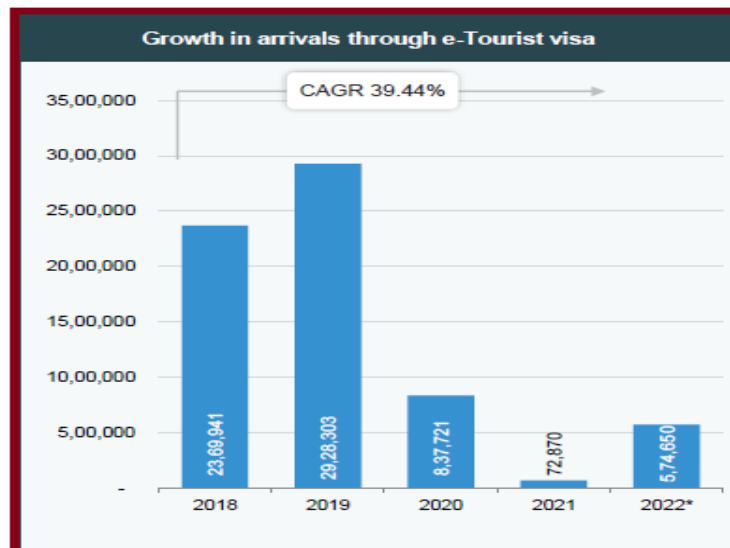
Source: IBEF (2023), *Kerala*, p. 30.



Technology Enabling Policies in Tourism Sector in India: An Overview with a Focus on Kerala

ICT advances like AI and its variants like AR, VR etc. are fast transforming the tourism sector in India by way of improving the tourist experiences as well as in optimizing their destination management. For instance the national digital platform under the GOI called IIDP (Incredible India Digital Platform) is one that leverage the immense potential of AI. Accordingly, IIDP can provide its users (like, tourists) with highly personalized ('tailor-made') suggestions on tours. Besides, IIDP enables seamless booking and also other services including virtual tours. Tourism being a vital sector and also a key driver of economic growth in a country like India and also a great contributor to employment generation, FEEs to India's national revenue and also enabler of cultural exchange, technology adoption (particularly ICT advances including AI and its variants) can significantly enhance the reach of tourism sector and its effectiveness and efficiency. Given India's excellent heritage, exceptional natural resources, beautiful landscapes, and also its very vibrant traditions, India has tremendous capacity to lure global tourists. Integrating AI and also other digital platforms can revolutionize India's tourism sector by way enhancing the visitor experiences, optimizing tourism services and also improvising the destination management. Despite many commendable ICT-based drives, including AI-powered ones, it is noted that e-Visas being used by foreign tourists coming to India are not picking up in this post-Covid scenario. (Figure V).

Figure V: Foreign Visitors to India on e-Visas are Less after Covid-19.



IBEF (2024), *Tourism & Hospitality*, Nov., p.33.

Foreign visitors to India in the post-Covid scenario are less. Those coming to India on e-Tourist visas are not at all picking up as already noted (Figure V). The case of Kerala in this regard is much more glaring. Accordingly, the DTAs to Kerala has overtaken the pre-Covid (2019) figure in 2022 itself and in 2023 the DTAs have been still higher and are significantly higher than the 2022 figures. On the other hand, even in 2023 the FTAs to Kerala has not caught up with the pre-Covid (2019) level; rather the FTAs as of 2023 to Kerala is about a half of the FTAs to Kerala as of the pre-Covid (2019) level. The Kerala's scenario in respect of FTAs (and hence FEEs) continues to be very poor till date, and the situation is much poorer than the general scenario of India as a whole. In this scenario, aggressive tourism marketing is imminent in the Kerala context, and that too after duly leveraging the immense potential of ICT as well as AI, AR, VR and such other schemes.



It may be pointed out here that even before the Covid breakout in 2019, Kerala started deliberating on the scientific use of AI in tourism. In an important International Summit held in Kerala in 2019, Kerala had seriously discussed using AI and other technological advances in the tourism front. In fact, the GOK has already launched its own peculiar campaign through social media platforms and accordingly prospective visitors can participate in such campaigns and could even win various holiday packages at the lowest permissible prices. In the more recent past, during the post-Covid scenario also, during February 2021, Kerala could launch an array of novel tourism projects to the tune of Rs. 60 crore (USD 8 Million) to promote tourism and also to lend visibility to Kerala's 25 major tourist destinations, mostly in the rural and semi-urban areas. Besides, Kerala has been actively promoting other ICT-based tourism promotion measures like E-Books on various tourist destinations, which are being widely utilized by the foreign and domestic tourists alike. In view of the foregoing it may be stated that Kerala needs to more vigorously pursue its ICT and AI initiatives as well as other technological advances including AR, VR etc.

Technology Enabling Policies in Tourism Sector in Kerala: Feedback from Tourists in Kerala

Based on the field survey conducted at three major ecotourism spots using a pro-rata number of tourists viz. (i) Thenmala [THEN], in Kollam (60 tourists), (ii) Kumbalangi [KUMB], in Ernakulam (120 tourists), and (iii) Nelliampathy [NELL] in Palakkad (120 tourists). Accordingly, 300 tourists from Kerala as a whole and representing i.e. Southern (Kollam), Central (Ernakulam) and Northern (Palakkad) parts were interviewed. In respect of the satisfaction with the Digital Booking System among the 300 tourists studied, feedback received from as high as four-fifth of the tourists (80 percent) on an average were positive i.e. Satisfied with Digital Booking while the remaining one-fifth (20 percent) were not satisfied. Since a p-value of 0.038 is significant here, at an LOS (level of significance) of 5 percent, it may be inferred that there is significantly high level of satisfaction (positive attitude) among the tourists regarding digital booking facilities. Further, it was at KUMB that there was the maximum satisfaction (90 percent) and it was followed by THEN (80 percent) and thereafter by NELL (70 percent). Therefore, the thrust for investment in ICT infrastructure and for marketing using ICT tools in these three tourist locations should be in the reverse order [i.e. NELL, THEN, KUMB], so that the satisfaction of the tourists in the three locations would become more uniform in the future. (Table V).

Table V: Satisfaction of Tourists regarding Digital Booking

Destinations	Thenmala [THEN]		Kumbalangi [KUMB]		Nelliampathy [NELL]		Total (of the Three Sites)	
	No	Percentage	No	Percentage	No	Percentage	No	Percentage
Satisfied	48	80 percent	108	90 percent	84	70 percent	240	80 percent
Not Satisfied	12	20 percent	12	10 percent	36	30 percent	60	25 percent
Total	60	100 percent	120	100 percent	120	100 percent	300	100 percent
Stat. Results	Test. p-value = 0.038 is significant; satisfied tourists are significantly higher than others.							

Source: Field Survey



Regarding the AI-enabled personalisation on their spending during tours, the feedback from the 300 tourists under study was generally positive. As high as 72 percent replied an increase in their spending while the rest 28 percent alone replied that such AI-based facility didn't influence their spending decision. Since the p-value of 0.035 is statistically significant at an LOS of 5 percent, the results clearly show the AI-enabled personalisation experiences do influence the spending decision of tourists significantly. (Table VI).

As in the case of their satisfaction with digital booking as already noted above (Table V), regarding the AI-enabled personalisation facility (Table VI) too, KUMB tourist spot was the one that scored the highest with as high as 85 percent of the tourists who visited KUMB admitting that AI-enabled personalisation could influence (increase) their spending; and KUMB was followed by THEN location wherein three-fourth of the tourists (75 percent) responded that AI-powered personalisation increased their spending; and lastly came the NELL destination wherein only 57.5 percent of the tourists had positive influence on their spending due to the influence of AI-based personalisation and the rest 42.5 percent didn't have such a positive influence on their spending. Thus, as high as 72 percent of the tourists in the three destinations under study were influenced by the AI-enabled personalisation. This is a statistically significant share of tourists ($p=0.035$). (Table VI). Now, the frequency or the intensity of the above influence was in the order of KUMB, THEN and NELL also i.e. exactly as in the case of satisfaction with digital booking; as a strategy to utilize AI-enabled services more uniformly across the destinations in the future, the thrust on AI-based personalisation drives should be in the reverse order, viz. NELL, THEN, KUMB, so that the reach and acceptance of such AI-based services could be ensured to be more uniform across the all three destinations under study. (Table VI).

Table VI: Influence of AI-enabled Personalisation on Tourists' Spending

Destinations AI-Personalisation	Thenmala [THEN]		Kumbalangi [KUMB]		Nelliyampathy [NELL]		Total (of the Three Sites)	
	No	Percentage	No	Percentage	No	Percentage	No	Percentage
Increased Spending	45	75 percent	102	85 percent	69	57.5 percent	216	72 percent
Not Influenced	15	25 percent	18	15 percent	51	42.5 percent	84	28 percent
Total	60	100 percent	120	100 percent	120	100 percent	300	100 percent
Stat. Test. Results	p-value = 0.035 is significant; AI-enabled Personalisation increase the spending							

Source: Field Survey

Strategies for Better Effectiveness of the Technology Enabling Policies

Based on the foregoing analysis, it may be noted that greater thrust on technology-based services is an imperative in Indian tourism in the days to come, especially in Kerala tourism. Then only the TAs, especially the FTAs can be raised to the pre-Covid levels and hence the FEEs emanating from tourism. ICT-enabled and more aggressive tourism marketing is inevitable. As noted in a study by Ashley, C. and Lafrnchi, C. (1997) In Scheyvens, R. (2002), *Tourism for Development: Empowering Communities*, tourism is vital player in community empowerment. This observation in the above international study is supported in Kerala-based study also. As Kerala suffered a lot from an unprecedented flood in 2018 and thereafter the Covid pandemic also, Manoj, P. K. (2018) "Tourism



Sector In Kerala In The Post-Flood Scenario: Strategies For Its Sustainable Growth With A Focus on Responsible Tourism” has noted that scientifically designed and clearly monitored strategies using technological tools are required to help Kerala to tide over the crises faced by it. The sustainability imperative as noted by Aguilar, B. (1997) In Yoder,A. (1998), *Sustainable Development, Ecotourism and Globalization: Are they compatible?* is really relevant when we consider tourism promotion particularly using nature based tourism types like ecotourism and RT. Here also, a very focused approach that seeks to segment (classify) the tourists based on their social and economic features and further targeting on the specific segments (groups) is vital as pointed out by Manoj, P.K (2017) “Segmentation Strategy for Promotion of Ecotourism Products: Evidence from Thenmala Ecotourism” based on an empirical study at Thenmala ecotourism spot in Kerala – the first planned ecotourism project in the whole of India.

Together with scientific marketing, equally relevant is learning duly from global success stories as the one noted by Pickens, M (2009) “Window on the unbanked: Mobile money in the Philippines” which relates to the use of an ICT device (Mobile phone) for financial inclusion and women empowerment in Philippines. Such success stories need to be replicated in India, especially in Kerala State. Sectors like housing and real estate are being closely related to tourism need to be promoted along with the tourism sector for accelerating the pace of economic growth in India. Regarding the housing sector in particular, housing investments that benefit the low income people through pro-poor models like housing micro finance (HMF) need to be focused. Manoj, P. K. (2015) “Housing Microfinance: A Study on Quality, Cost and Default Rate with Respect to Bhavanashree in Kerala” has pointed out the relevance of HMF and similar models (e.g. “Bhavanashree” HMF model run by “Kudumbashree” in Kerala) for rapid housing development and hence faster economic development of the whole economy. Equally important is the vital need to promote novel and innovative financing instruments such as REITs; as Manoj P. K. (2016) “Real Estate Investment Trusts (REITs) for Faster Housing Development in India: An Analysis in the Context of the New Regulatory Policies of SEBI” has observed that REITs could enable the flow of cheaper funds into the housing and real estate market in India. In fact, nature-friendly models like ecotourism, RT etc. deserve better encouragement in the Kerala context; and so also various sectors allied to tourism. A integrative perspective by Manoj, P. K. (2023) “Affordable Healthcare and Affordable Housing: Need for an Integrative Approach for the Holistic Growth of the Digital Economy of Kerala, India” has sought to focus on the housing needs and health needs of the poor people so that sustained and equitable growth can be ensured; also noting the utmost need for ICT-integrated policies. Some specific suggestions relating technology enabling policies in the case of Kerala tourism are as follows:

- Specifically designed and tailor-made marketing strategies be in place for all major ecotourism spots. Learning from empirical studies, like, Manoj, P.K.(2017)“Segmentation Strategy for Promotion of Ecotourism Products: Evidence from Thenmala Ecotourism” who suggests specific strategies for each individual segments (groups) of tourists. ICT-enabled strategies for each such group would be desirable for profitability management also, as premium segments (e.g. foreign tourists) offer better earnings.
- Developing less reputed yet very promising ecotourism locations through scientific marketing, especially using ICT and AI tools can help to reduce the overcrowding in well-reputed destinations. Also, it helps such promising tourist locations to become established very fast so that frequency of the visits by the tourists become well-balanced across the destinations, with less over-crowding issues. All such efforts should be backed by effective ICT usage, as ICT can help to make the marketing efforts more effective, yet cheaper. So also, ICT-based marketing is



more environment-friendly as it ensures the least use of paper and non-degradable materials like plastics, flex, etc. Technological advances (like, AI, AR, VR, etc.) can lure more young generation tourists as well as foreign tourists to Kerala.

- The support and co-operation from the Government is needed at all levels and must be duly secured. Using the governmental support and its infrastructure facilities like ICT-based facilities (like, wi-fi), internet connectivity etc. be arranged at all major tourist destinations. ICT-based marketing policies be scientifically designed duly considering the governmental policies and priorities; to ensure cost savings, competitiveness and can easily fetch approvals. Proper training and development of the staff (human resources) be done to make them abreast of the changes, in view of fast technology advances.
- As supported by the empirical study in Kerala, ICT-based (online) booking, AI-enabled personalisation services, and also the use of AR, VR etc. be widely promoted along with the current practices like the use of E-Books on various tourist destinations seem to be very relevant in the Kerala context. Use of AI in creating smart tourism infrastructure needs to be ensured in all future tourism initiatives for better competitiveness of the tourist destinations. Promotion of ecotourism, RT etc. be done on an ongoing basis using the social media data and tourists' feedback; and that too using ICT and other advances.

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