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A promising sector for youth, tourism shall contribute 7.1% to India's GDP by 2030

Rajni Hasija
Former Director
IRCTC

Infrastructure is really important to boost tourism in any country

Prof. Luc Beal
Assistant Professor
Excelia Group of Universities
France

Tourism sector set to grow at twice the rate of India's growth rate

Aditya Agarwal
Chief Financial Officer (CFO)
of digital travel platform Cleartrip

Tourism and Hospitality Skill Council wants to help colleges in their vocational training programs

Mr. Rajan Bahadur
Chairman, THSC

Stakeholders in India's tourism sector need to raise salary bar

Prof. Monika Prakash
Nodal Officer
Indian Institute of Travel and Tourism Management (IITTM)
Nellore

INSIDE

IIRF 2023
Hotel Management & Journalism

TOURISM
FOSTERING ECONOMIC GROWTH IN SIKKIM

Bedu Singh Panth
Minister of Tourism, Sikkim

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EDITOR'S NOTE

Incredible India
SET FOR GREATNESS

Earlier this year, India surpassed China to become the world's most populous nation. While that itself is no achievement to write home about, it has come with its fair share of positives. For one, India's tourism sector is growing faster than any other country's in the world, according to experts.

Indians will likely spend about $42 billion each year on outbound travel by 2024. The country, currently the biggest growing outbound destination, is experiencing a tourism boom, says Agoda CEO Omri Morgenshtern.

While that happens, India is continuing to spend billions to strengthen its aviation industry and ensure it becomes one of the world's most sought-after travel hubs.

The Indian government has announced that it intends to spend Rs. 980 billion on constructing and modernizing airports within two years. The Noida International Airport in Uttar Pradesh's Jewar city is one of these. Set to open next year in all likelihood, it will be Asia's largest airport.

More than 70 airports have been made operational since 2017. That apart, Delhi's Indira Gandhi International Airport, for the first time ever in 2022, entered the list of the world's top 10 busiest international airports.

Obviously, it isn't just India's outbound travel trajectory that is pointing upwards.

"The number of foreign tourists who arrived in India this year during January-April is 166 percent higher than the figures for the corresponding period in 2022," Union Tourism Minister G. Kishan Reddy said earlier this year, adding that India's inbound travel was expected to reach the pre-pandemic level this year.

According to the Nangia Andersen report, the number of tourists coming to India and tourism businesses as a whole as expected to grow by a compound annual growth rate (CAGR) of 12 percent between 2022 and 2027. The report cites an increase in disposable income, growth of the middle class, and increased awareness of India as a tourist destination as the major causes for India's growth in inbound tourism.

Due to the COVID-19 pandemic, inbound tourism was severely affected, with a decline of over 80 percent in foreign tourist arrivals in 2020.

The report also pointed out that safety measures, working of bureaucrats, and lack of ample infrastructure could pose prove to be serious challenges for the growth of inbound tourism.

"Our comprehensive report addresses five key priority areas within the tourism industry, namely Green Tourism, Digitization, Skill Development, Nurturing Tourism MSMEs, and Destination Management," says Poonam Kaura of Nangia Anderson LLP, while adding that there is a need for public and private synergy to boost inbound tourism in India.

In this issue of Education Post, our team touches upon all topics that matter most to tourism in India and to students who are studying, or hope to study, Hospitality and Travel Management. The most important one among those is sustainable tourism – the future of travel.

Safe travels!

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CONTENTS

COVER INTERVIEW

Tourism fostering economic growth in Sikkim
Bedu Singh Panth
Minister of Tourism
Sikkim
10

32
Stakeholders in India's tourism sector need to raise salary bar
Prof. Monika Prakash
Nodal Officer of Indian Institute of Travel and Tourism Management (IITTM), Nellore

Infrastructure is really important to boost tourism in any country
Prof. Luc Beal
Assistant Professor
Excelia Group of Universities
France
16

36
Tourism and Hospitality Skill Council wants To help colleges in their vocational training programs THSC Chairman
Mr. Rajan Bahadur
CEO, Tourism and Hospitality Skill Council

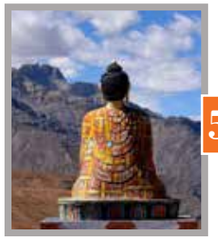
A promising sector for youth, tourism shall contribute 7.1% to India's GDP by 2030
Rajni Hasija
Former Director
IRCTC
20

40
Nanoscience in India Unawareness is Primary Challenge
Dr. Nand Gopal Sahoo
a distinguished professor at Nainital's Kumaun University

Tourism sector set to grow at twice the rate of India's growth rate
Aditya Agarwal
Chief Financial Officer (CFO) of digital travel platform Cleartrip
24

46
Business school teachers should have quality work experience in industry
Dr. Mahapatra
Director General,
JK Business School

Bring back your waste, support locals. Oh… and don't be too hard on yourself, just go with the flow
Radhika Sharma
(IG: @radhika_nomllers)
28



50
Eco-Tourism in India Leaving Behind Nothing but Footprints

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TOURISM
FOSTERING ECONOMIC GROWTH IN SIKKIM

Bedu Singh Panth, Minister of Tourism, Sikkim feels extremely positively about the job potential in the tourism sector for India's youth. In a conversation with Education Post's **Tanay Kumar**, he opens up about an ambitious green hydrogen project in collaboration with a South Korean research institute and its potential contribution to Sikkim's tourism industry.

Q To start on a light note, could you share an incident from your travels that proved to be an eyeopener for you?

There is a famous saying by Lao Tzu: "A journey of a thousand miles begins with a single step." It is always a fun to travel whenever one gets an opportunity. Be it a pilgrimage trip or holidaying in the beaches, getting suntanned or an adventure trip trekking in the icy cold hills, we all must undertake such journeys to experience it in our lifetime.

Pundit Jawaharlal Nehru once said, "We live in a wonderful world that is full of beauty, charm and adventure. There is no end to the adventures. We can have if only we seek them with our eyes open." So, there are countless beautiful places to see and explore, all kinds of people with different cultures, customs and traditions of their own in this beautiful world.

My first travel experience to Singapore and Japan will always be remembered for it being an eye opener for me. I had never seen such planned, neat and clean cities. People in Japan are so disciplined and organized. There, the public transport system is marvellous. I could hardly see police officers or law enforcers. Everyone is so disciplined and stands in a queue without a word and respects each other.

I have come across many Japanese travelers and they always follow their system wherever they travel. They never litter, disturb, or disrespect the places they visit. Looking at them, I realized and strongly feel and appeal to all the travelers to be a responsible traveler like the Japanese. As Chief Seattle said once, "Take only memories and leave only footprints."

Q Chief Minister of Sikkim Shri Prem Singh Tamang has laid the foundation stone of the Maitreya Buddha-cum-cultural complex in Lachen and Guru Rinpochee statue and cultural complex in Lachung, both in North Sikkim. How could these projects help students who are studying travel and tourism management?

Along with the entire people of North Sikkim, I am grateful to the Hon'ble Chief Minister of Sikkim Shri Prem Singh Tamang for conceptualizing and laying the foundation stone of the Maitreya Buddha-cum-cultural complex in Lachen and Guru Rinpochee statue and cultural complex in Lachung. Both projects will undoubtedly boost tourism in both the places and attract more tourist footfalls from across the globe. Further, with the completion of such projects and increased tourist footfalls, it will help the students of tourism management to professionally establish or open various tourism service units such as hotels, homestays, transport services or travel agencies to cater to the needs and demands of the tourists.

Q Please tell us about initiatives that Sikkim's Tourism Ministry has taken for students studying tourism and hospitality courses.

The Department of Tourism and Civil Aviation helps students from various universities in gaining much needed industry exposure by means of offering internship programs wherein the students are exposed to various cells and sections of the Tourism and Civil Aviation Department thereby giving them opportunity to develop both hard and soft skills and obtain valuable practical work experience.

Further, apart from invitations to attend various tourism related trainings/ workshops, the department also recognizes the academic achievements of some of the best performing students in different colleges/universities in the state by felicitating them during the World Tourism Day celebrations every year to encourage them to excel and adopt professionalism form the very beginning.

The Department of Tourism and Civil Aviation also has our own college known as the Institute of Hotel Management (IHM) located at Sajong, Rumtek, which is about 15 kms from the capital city of Gangtok. This IHM College was established in 1990 and offers various pre- and post-graduation courses in tourism and hospitality sectors.

In July, Sikkim Tourism introduced a free refresher cum crash course and certification to trekking guide, tour guide and trekking cook, which is a very welcoming move. Please tell us the motive behind starting these courses and the reason for making it only a week long.

The Department of Tourism and Civil Aviation in collaboration with the Indian Himalayan Institute of Adventure and Eco-Tourism, Chemchey, South Sikkim, organized a free weeklong refresher course for tour guides, trekking guides and trekking cooks to mainly keep them updated with the latest tourism trends. Further, it is meant to promote adventure tourism in the state and to enhance the standard of adventure tourism services. The training, which was conducted in three batches, had participation of over 350 students from across the state. Similar trainings with longer tenure encompassing comprehensive course syllabus along with field training shall also be conducted by the department in the near future.

Q Recently, the Government of Sikkim collaborated with the Korea Research Institute of Human Settlement (KRIHS) to develop the greater Gangtok area as a pilot green hydrogen smart city. Please tell us about the genesis of this plan and why authorities selected KRIHS for it?

Sikkim is a pro-environment state with a number of green initiatives adopted by the state government with a vision to develop Sikkim as a green state with sustainable development model. Sikkim is also the only certified organic state in the country. In continuance to these sustainable efforts of the state government, development of green hydrogen fuel is the next advancement step taken by the state government to develop the state into purely green energy state.

In order to achieve this goal, the

Government of Sikkim has partnered with Korea Research Institute for Human Settlement (KRIHS) in South Korea as a technical partner along with Construction Industry Development Council (CIDC), NITI Aayog. Initiatives are being taken to explore the possibilities of setting up pilot green hydrogen in Sikkim for production, transmission and utilization and also to facilitate capacity building of local entrepreneurs.

It has been observed that KRIHS is committed in enhancing the quality of life and well-being of their citizens through spatial planning and framing policies by way of researches and studies on the efficient use, development and conservation of territorial resources. Under the able guidance and leadership of our Chief Minister, our state is also committed to enhancing the quality of life and well-being of its citizens.

Sikkim being a land locked state surrounded by three international borders with a very fragile economy needs to work towards sustainable development. Hence, we need to focus on balanced territorial development and conservation of our territory. Lately, we have been observing that there has been a major population shift in the urban areas in search of jobs and opportunities which has resulted in over-crowding of cities and towns thus leading to congestion, pollution and traffic problems etc. we are planning to work towards designing housing and urban policies to address the population shift to the suburbs from the villages.

Q Many tourism and hospitality colleges in India offer tourism and travel management programs. What are the necessary academic practices that they should definitely teach students of tourism management?

The tourism industry is one of the biggest contributors to the GDP and is one of the biggest employment generators both in public and private sectors. Tourism is a broad subject and it encompasses diverse sectors. Since, tourism is totally based on the principle of hospitality, I feel apart from the regular academic syllabus offered by the respective universities, special focus should also be given to enhance the interpersonal skills of the students. The course should also include syllabus on personality development, grooming, team building, time management skills, planning and decision making skills which will definitely help the students when they eventually enter the industry as a professional.

Q Please tell us about some other destinations in the state that Sikkim's Tourism Ministry is deciding to develop?

Tourism in Sikkim has emerged as the pivotal economic activity of and for the Sikkimese people. The proactive vision of Sikkim's government through the Tourism and Civil Aviation Department is to tap the enormous tourism potential to ensure larger socio-economic objectives and bring about an all-round development through a well-executed tourism policy with emphasis on inclusive growth through people's participation and convergence.

The development of tourism has not only fostered the economic growth of the urban areas such as Gangtok, but also brought about over all development of the entire state with infusion of high happiness and contentment in the society. Promotion of village tourism, homestay, cultural tourism, adventure tourism, eco-tourism, wellness tourism, bird watching and flora-tourism have given a fillip to the tourism related trade all over the state.

In fact, apart from Gangtok, there are numerous destinations all over the state visited by thousands of tourists every year. With many activities and achievements, the department now has more plans to develop tourism in the state on newer sectors like, MICE tourism, wellness tourism, eco-tourism, luxury accommodation, caravan/campervan tourism, wedding destinations, high-altitude alpine tent city, which will be spread all over the state. The approach, however, shall be in a conscious and controlled manner, keeping in consideration the environmental and social impacts to our small and beloved state. EP

Prof. Luc Beal

INFRASTRUCTURE IS REALLY IMPORTANT TO BOOST TOURISM IN ANY COUNTRY

Observing the potential of tourism, **Prof. Luc Beal,** Assistant Professor, Excelia Group of Universities, France, shared his insights on the essential check-boxes for a flourishing tourism in a country.

Q You completed your PhD in Information System Management from Telecom Ecole de Management. How you thought about entering tourism and travel?

I majored in engineering and my PhD was in information systems, but I also have a master's in economics. And for these two reasons, i.e. economics and IT, I find the field of tourism and travel relevant and interesting. As you well know, information systems and digital technologies are really pervasive in the travel industry.

Q Destination-based Revenue Management has been one of your researches. What is it? Any example you ever found in the same?

It was coined and developed by the airline industry and later on, used extensively by the hotel industry. Basically, revenue management or

yield management is also a focus in the information technologies. Again, the idea is that someone like a hotel operator or an airline operator or any other factor in this sector, can change the price of the same service depending on the expected level of demand.

One example is, for a flight from Delhi to Paris, it is almost certain that the person is sitting next to you didn't pay the same price as you did, although the service is exactly the same. The reasons could be different that you booked your ticket through any other booking channel or at a different time and day, and many other parameters. So this is revenue management.

We coined the concept of destination-based revenue management with an IT entrepreneur. The tourism industry is made up of very small actors, but because they are very small, they have not very high awareness or command of IT. The idea is to aggregate, to put together information or data you wish about customer bookings, customers booked for that destination or intending to visit, compiling a very large amount of data about their booking behavior. Does that person book for themselves only one person, or do they come as a family?

On what date, do they make their reservation or which arrival date? So, it is meant to deliver a better informed decision about what price to set for a room for a given day in the future. The intention of this project is to give to small hotels an alternative to the platform such as booking.com or Airbnb.

Q What are the challenges that students in tourism management are facing?

I think what is really critical for them is to develop an appreciation of the importance of data. This is number one, and, not only the importance of data, but also for them to understand how messy data could be, if not managed in an organized manner. Otherwise, students are used to having data already on an Excel spreadsheet. They just think they

India does have a good infrastructure, but possibly there's more need for such a large population. If we compare it with the level of demand from a European perspective, that's coming up for traveling, if I may, from a French perspective, the infrastructures are, I would say, they surely are here. They're already here. Though, the capacity of Paris airport can be extended, but it is good enough for now.

are supposed to do some calculation with a formula on another column to process the raw data and then produce a ratio, while there is a big scenario in it. I would call it a 'Disneyland version of data.'

In reality, if you talk to a hotel manager who's trying to determine their strategy and look at the competitor's behavior at the same time, they have to take into account data that come from different sources. And most of the data they're supposed to use, to make a strategy, are not ready-to-use data on an Excel spreadsheet. Some comes from customer feedbacks on a trip advisor, or booking platform, e.g. customer comments.

This is very critical for one to understand if there's any problem in your service offering. So you need to have a feed on that customer's feedback, so to speak. But you also need to build up some kind of intelligence, but a kind of business intelligence about your competitor's strategic behavior in terms of pricing. So understanding 'business intelligence of demand' is very important, not only the booking dates but also the preferences.

Q What are the necessities that the tourism industry can't do, but they are indispensable for a flourishing travel environment in a country? E.g. building good roads is the responsibility of governments, which is very essential for tourism & hospitality.

That's a very interesting, but also a very difficult question because if I compare an Indian perspective with an European perspective, the answer would be radically different. Although I don't know India that well, I would assume that the rising middle-class is very strongly aspiring for traveling domestically and overseas. So there's a strong demand for a large choice of flights towards whatever destination. As a result, there is an implicit demand for efficient airports and ground transportation to reach the airports, and then hotels and places, and all the security for traffic control, security majors, et cetera.

So in fact, if I would assume that from an Indian perspective, the priority should be infrastructures. India does have a good infrastructure, but possibly there's more need for such a large population. If we compare it with the level of demand from a European perspective, that's coming up for traveling, if I may, from a French perspective, the infrastructures are, I would say, they surely are here. They're already here. Though, the capacity of Paris airport can be extended, but it is good enough for now.

I'm not saying that the airport, the level of service at Charles de Gaulle, Paris airport is perfect. I mean, from my personal experience, the first time I landed in Kuala Lumpur in Malaysia, with that brand new airport of Kuala Lumpur International Airport, and I had taken off, my flight started at Charles de Gaulle terminal one, and we landed in KLIA, Kuala Lumpur International Airport, which is brand new. While Charles de Gaulle terminal one was built in the late seventies.

So, that teaches you a lesson that shows you that the advanced infrastructures are not always in the most, in the countries that developed the earliest. On the contrary, I would say, because in economics, as you may know, there's an expression or a concept, we call it leapfrog. It means you're very likely to choose the best technology, best design, and best architecture for your airport if you're building your airports after an European country has built one, just for example.

As a result, your airport will be much better, design much better than the one from an old continent like Europe. I think from an Indian perspective, priorities are different from France and many countries in Europe. This is more like what the public policy makers need to address.

Q What are the challenges in this industry that students should be aware of?

Bottom line, whatever the country, you would think that if you're in the tourism industry, please do know what's the priority is to create customer satisfaction or customer enchantment. Maybe too Eurocentric what I'm going to say, but students need to appreciate customer satisfaction. Once the priority is customer satisfaction, what are the ways that we can think as tourism professionals so that there is high level of satisfaction without too many negative impacts on the local communities, on the environment of the tourism activity.

That's probably the largest headaches for the young people starting a career in the tourism industry. Maybe it's not that obvious from an Indian perspective, but like I remember that student, that Indian student from Kerala and was doing his bachelor's with us, he took pride in showing his state to visitors Ayurvedic plantations in the state. He was aiming for maximum customer satisfaction, but he was trying to build journeys, build travel services for visitors to really experience the real life.

I think whatever the nationalities, students need to reconcile customer satisfaction and minimize negative effect on the planet as mitigating the negative effects on earth, environment and climate is one of the visible challenges of this sector.

A promising sector for youth,

tourism shall contribute 7.1% to India's GDP by 2030

Rajni Hasija, former director at the Indian Railway Catering and Tourism Corporation (IRCTC), talks to Education Post's **Tanay Kumar** about the potential of the tourism and hospitality sector in India by the end of this decade, and makes it a point to mention that we still have miles to go in terms of safety and hygiene that will inspire women to travel more freely around the country, particularly if they wish to travel solo.

Q In 2019, under your leadership, India saw its first corporate train, which we know as Tejas Express. How is the landscape of corporate travel evolving in India?

Indian Railways decided to handover two Tejas trains to IRCTC to operate them as premium passenger trains in January 2019. It was decided to operate the first Tejas train on the Lucknow–New Delhi route and the second one on the Ahmedabad–Mumbai route. The first corporate train had its maiden journey in October 2019 on the Lucknow–Delhi route. Second corporate train came on track in January 2020 on the Ahmedabad–Mumbai route with value added services like new type of insurance with compensation in case train gets late, good food, special onboard entertainment.

One has to appreciate that the customer nowadays is well informed and there is a change in definition of travel in the corporate world. The travel culture has evolved to an extent that people are not only looking for better facilities in need-based travel but also talking about sustainability while travelling by opting for low emission flights for leisure travel as well. People in the corporate world are ready to pay and look for value for service. So, to match up to the expectation of travelers, trains being introduced with better rolling stock should be operated in different manner as compared to normal trains. Understanding their requirement and consistent feedback from the customer becomes very important here. That is exactly what IRCTC did for these trains and we were able to build a strong relationship with the customers.

Q In the tourism industry as a whole, what are the issues that need to be addressed to help more women travel in India?

Traveling as a woman in India, like in many other countries, comes with its own set of considerations and challenges. While India is a diverse and beautiful country with a rich cultural heritage, it's important for women to be aware of and prepared for certain issues to ensure a safe and enjoyable trip.

Safety while traveling is always the utmost issue for women. Therefore, safe accommodation, destination, safe and hygienic transport and cooperative tour operator services are some of the issues where the entire tourism ecosystem of the country has to excel.

Having said that, it has been observed that in many parts of our country, tours are now being organised specially for women groups with special accommodation throughout the year. Such steps are welcome.

Q We often expect good service from IRCTC, but what are some things we as passengers can do to reduce the burden on IRCTC and the entire railway administration?

While IRCTC and railway administration are committed to providing the best of services to passengers, customers and travelers also have equal responsibility to take care of government property and help the administration maintain it.

The responsibility of customers of the Indian Railways actually starts from the booking phase, which should always be done through authorise channels. At the time of boarding the train one should use facilities at the station in a responsible manner so that facilities are available to others in good condition.

While in the train, one has to appreciate that ensuring the upkeep of on-board housekeeping facilities in a moving train is a big challenge and this cannot happen without the cooperation of passengers. Maintaining hygiene, behaving in a civilised manner while traveling, using the toilets which have to be used by dozens of other people in an appropriate manner will really reduce the burden on the administration.

And trust me, not only will this help the administration, these habits will mostly help the passengers themselves.

Q Last year, the Ministry of Tourism released the Draft National Tourism Policy 2022. What is your opinion of this policy?

The aim of the entire National Tourism Policy 2022 is to generate employment and entrepreneurial opportunities in the tourism sector and provide a skilled labor pool so as to enhance the competitiveness of the tourism industry.

The policy also talks about attracting private sector investment and give clear guidelines to preserve and enhance India's natural and cultural resources. The intention of the government is loud and clear and the work in the tourism industry is happening like a mission mode in order to enhance the contribution of tourism to the Indian economy.

In fact, recently, India has concluded a successful G20 mega event in our capital under its presidency. Before this event, an important historic event took place in Goa in June where a complete roadmap for the G20 economies in tourism was devised. The policy has now therefore gone much beyond the draft stage. The five key areas that have been identified are: Green Tourism, Digital Tourism, Destination Management, Skilling the Hospitality Sector and Supporting Tourism: Related To Micro, Small And Medium Enterprises (MSMES).

Q What are some innovations and reforms brought under your leadership and what are some other plans in the pipeline?

Many of us are in top management of companies handling important positions, but I seriously owe the success of the organization to the whole team of employees in IRCTC.

An organization does not have just a leader but also teams of staff and officers at various levels who give the leader an identity. I am lucky to head IRCTC, which has delivered many successful innovating projects like Operation of Private Trains, Operation of Bharat Gaurav Trains, launch of the Ask Disha portal and the help box that turns at the IRCTC's website, Operating Ramayana Circuit, running affiliate marketing first time on Indian railways portal, and the ticketing project for CWG 2010.

Further, existing services of all business verticals were taken to greater heights. These team efforts led to several coveted awards like National E-governance award for three times with the National Tourism Award in 2022 and many more.

Q How did it happen that as a Zoology scholar, you entered the Indian Railway Services?

Well, after graduation, I took up zoology as a subject because I wanted to be a research scholar and pursue my doctorate degree from Delhi University. But my destiny had written something else for me. I had taken up the UPSC civil services exam, conducted and qualified with zoology as the main subject and opted Indian Railway Traffic services as per my priority choice. In fact, by that time I wanted to learn more about our country through Indian Railways. It is now my love for travel which has further driven me to the tourism sector and what you learn, it always stays with you.

Q No doubt, tourism has tremendous potential in India, but the workforce in this industry is majorly under-skilled. Do you agree with this situation or do you have a different opinion?

The tourism sector surely has immense potential, as it touches not only segments like business, employment but also encompasses culture, revenue in the country and the world at large.

As per an analysis done by the World Travel and Tourism Council for the upcoming decade, it has been projected that globally, travel and tourism contribution to the GDP shall be around 11.6% with a positive compound annual growth rate (CAGR) of 5.1%. When it concerns India, it has been predicted that tourism industry shall be contributing 7.1% in the GDP with positive CAGR of over 8% in the same period.

However, there is need to have skill development for youth specially so as to enhance job resilience and making the tourism industry a great career path.

Special thrust for economic development in rural areas and nurturing tourism skills among the local people will have a long-term impact on their economic growth. And for this purpose, upskilling and reskilling etc. are badly needed. Tourism has to be positioned as a promising carrier, especially for young men and women. EP

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TOURISM SECTOR SET TO GROW AT TWICE THE RATE OF INDIA'S GROWTH RATE

Aditya Agarwal, Chief Financial Officer (CFO) of digital travel platform Cleartrip assures Education Post's **Tanay Kumar** that travel and tourism management students in India are looking at a great time ahead, as the sector is projected to have a super growth rate, even more than India's cumulative figure.

cleartrip
A *Flipkart* Company

Q Recently, Recently, Cleartrip introduced a new feature – "Cancel for No Reason," where people can cancel the hotel till the last hour and can get a complete refund. What is the feedback from hotels and hotel chains?

The idea behind CFNR (Cancel for no reason) is that we want to make it much easier for customers to make their bookings. And one of the roadblocks has been that people's plans change. So, there's always uncertainty around whether some plans will change and they will not be able to travel, or even if they travel, they may or may not like what they see. So, that has been a friction point which may have held back some people from making bookings that they would otherwise do.

Thus, the idea was to make it easier for people. We take out this uncertainty, we give them that assurance, that don't be afraid, go ahead and make the booking. And for whatever reason or even for no reason, if you have to cancel it later, we will cover for you. And our partner hotels are also very excited to see that the objective is to benefit the customer and if the customer benefits the entire industry benefits. And, the purpose is to spur the demand. And that's the reason we brought it in.

Q Cleartrip is now on an ambition to focus on the hotel business. What exactly is your plan in this regard?

I think the hotel sector is very large in India, as big as flights. And it is very under penetrated when it comes to online bookings. Almost 60% of all flight tickets are booked online, but that number for hotels is probably 15-20%. So, we see there's a lot of scope to drive the industry there. Move more people and consumers into the online channels. And this sector itself is very fragmented.

Once again, if you compare it with flights, there are maybe four or five airlines, which command the bulk of the domestic market share. In hotels, you have probably 40 to 50,000 hotels, which don't even cover the entire market, making it around covering 80-90% of the market. So the industry is very fragmented on the supply side, and it is very under penetrated on the demand side. And we have done very well in building digital businesses. We feel that this is a segment of the travel sector which is ripe for disruption. And we would want to be the leading player to do that.

Q Flights, hotels and buses are integral parts of the tourism industry in India. What future projections do you see for these three domains in terms of employment, as there are students who are studying courses like hotel management, tourism management, hospitality?

I think there is massive potential. See, overall, if you look at India, our country is one of the fastest growing large economies in the world. And typically,

tourism in a country like India is fast developing. The thumb rule is that the travel sector will typically grow at one and a half to two times the rate of GDP growth. So, if we are expecting GDP growth of say 7 or 8%, travel is expected to grow at 12 to 15%. That is the kind of growth that we are foreseeing.

Hence, governments are massively promoting travel and tourism. They are investing a lot in infrastructure. Lots of roads are getting built and investment is getting infused into trains and airports. If you look at all our airline carriers, Air India and Indigo have probably ordered one of the largest orders globally of any carrier. And that is surely going to drive huge growth of the industry and therefore, obviously employment will also be there.

Q What would be your advice to students and professors of those academic institutions that are teaching tourism and travel management?

First, for professors, I would not presume that I'm qualified enough to give them any suggestions. All I would say is that the industry has great potential. And the industry is going through a massive change. So, while the growth is there, which offers a lot of opportunity for people coming into the industry and to see that there is a lot of change, which means that people who are coming into the industry, who are doing these courses right now, need to be prepared to be very agile. Because whatever they are learning today, tomorrow, who knows what is going to change after some years.

Now we are talking about artificial intelligence so much. Students need to be flexible and to be able to move fast with changing times, because all of these developments are going to affect the travel sector in a big and positive manner.

It's a changing sector, online penetration is rising, digital penetration is rising, incomes are rising, which means that what has worked in the past for the sector may not necessarily work, because the customer demands have changed. After COVID, people are looking for a lot more flexibility. I think until three years ago, the industry never really had to worry about things like changing plans and cancellations and amendments. In the beginning of this interview, you asked me about CFNR. That is a response to the fact that customers are now demanding more flexible options. Now we have seen that even in flights, we have launched the same product, we call it FlexMax, and we have seen almost one in every three or four customers is willing to pay to get a protection from cancellation charges and amendment charges, which is a huge new insight.

Typically, we have always seen that travel is a very price sensitive sector where customers want to go for the cheapest option. But this has shown that now there is a consumer change. Consumer is willing to pay 5% 10% extra at the time of booking a flight if they are getting the flexibility to make changes. So, what I'm trying to say is that this is a time of a lot of change, which will bring a lot of benefit to all the participants in the industry, but the participants will need to be prepared so that they don't get left behind. We have worked with partners like insurance companies to be able to provide this product at an affordable cost.

Q In India, has the infrastructure and other material advancement for tourism progressed at a similar ratio to the digital adaption of this industry?

I would say that it's not really a right comparison because I think both are moving ahead in parallel. The digital adoption is led far more by private players and that's why you cannot compare that the speed of digital adoption with what's happening on the infrastructure side, which is where there's a mix of public investment as well as private one.

I think in general, I would say that India, as a country, can absorb a lot more investment into the tourism related infrastructure. A lot of the market today, has a supply constraint. For example, as a country, we have about 400 to 500 aircraft, which is even smaller than some individual airlines in the world. China has three or four airlines and each of them is larger than the entire India market. So, even today, even out of these aircraft, a lot of them are grounded and there are issues with certain airlines, which have run into some engine troubles and so on.

Capacity constraint is sort of limiting the size of the market today, the market can absorb far more demand if the supply was there, which tells me that yes, a lot more investment is required. We have definitely come a long way in the last few years in terms of the investment that has gone in, but yeah, it's very far to go.

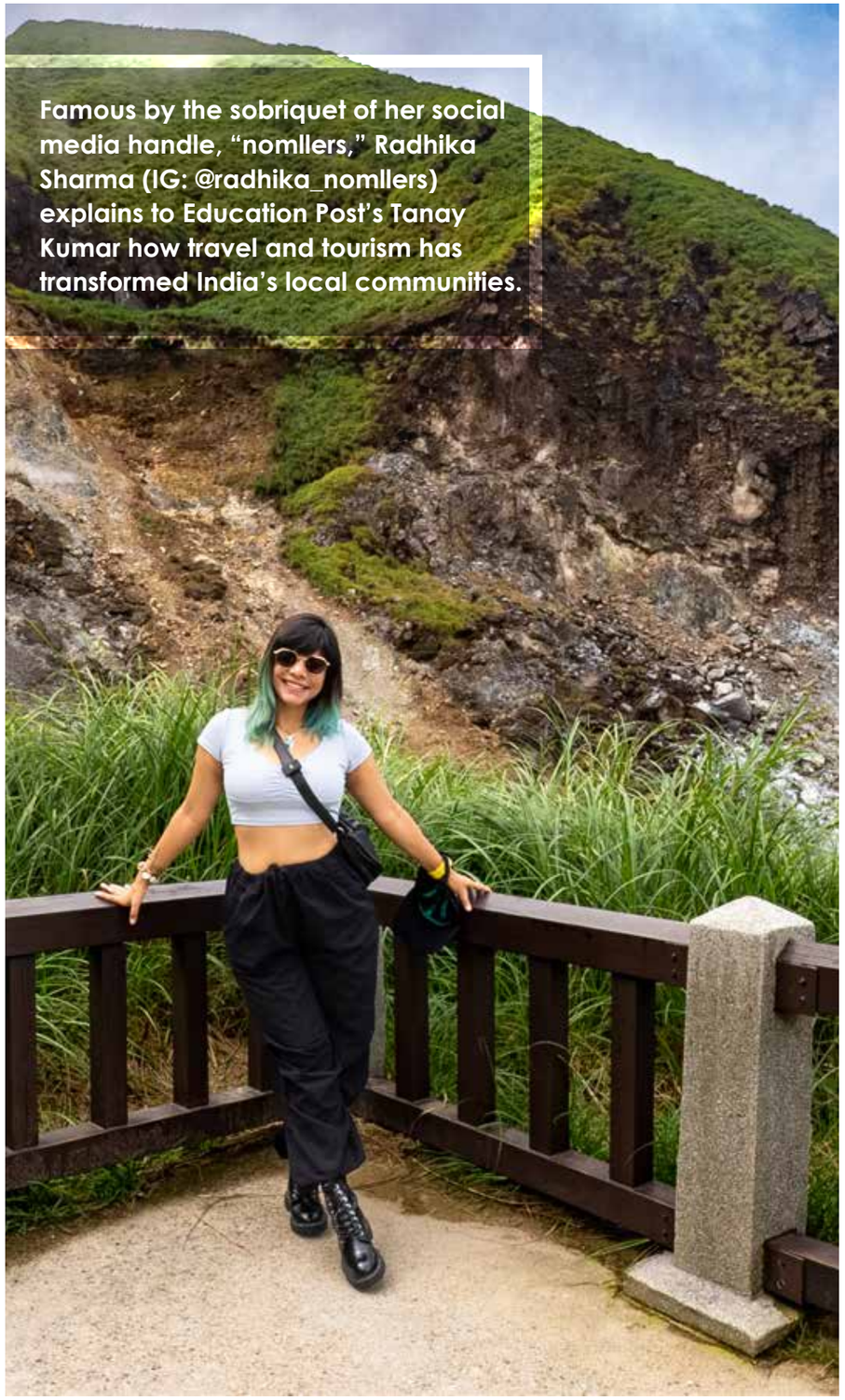
> **HOTEL SECTOR IS VERY LARGE IN INDIA, AS BIG AS FLIGHTS. AND IT IS VERY UNDER PENETRATED WHEN IT COMES TO ONLINE BOOKINGS. ALMOST 60% OF ALL FLIGHT TICKETS ARE BOOKED ONLINE, BUT THAT NUMBER FOR HOTELS IS PROBABLY 15-20%. SO, WE SEE THERE'S A LOT OF SCOPE TO DRIVE THE INDUSTRY THERE. MOVE MORE PEOPLE AND CONSUMERS INTO THE ONLINE CHANNELS. AND THIS SECTOR ITSELF IS VERY FRAGMENTED.**

Q You have spent almost a decade in Europe, a continent known for its phenomenal tourism environment. Have you come across some good travel behaviors or practices in Europe that we should learn?

I've lived in Europe for about five years. But to come back to your question, I think there is always so much things that we can learn a lot, in terms of how some of these places really preserve some of their heritage, in terms of doing a very good job of preserving their museums, their historical monuments, and making it very accessible to these generations, where people can easily visit some of these places, enjoy the experience, understand the history of the place through guided tours, and audio visual aids and many others.

Definitely a learning that India has so of a rich culture and history. I think, in many places, we have also done a good job, but I would say it's not uniform across. This is one learning that I think we can definitely take and do a much better job of preserving and showcasing our amply rich tradition. EP

BRING BACK YOUR WASTE, SUPPORT LOCALS. OH… AND DON'T BE TOO HARD ON YOURSELF, JUST GO WITH THE FLOW



Famous by the sobriquet of her social media handle, "nomllers," Radhika Sharma (IG: @radhika_nomllers) explains to Education Post's Tanay Kumar how travel and tourism has transformed India's local communities.

Q What is the story behind the word 'nomllers?'

It's a mix of two words, nomadic and travelers. I wanted to start something like YouTube way back but I and one of my friends, we both started with blogging, in the initial days. And there was a day when I was just sitting in the Delhi Metro, going to my corporate job and I was thinking about what to represent, something unique, as a brand. So, I thought of the word 'nomlers' and started taking it seriously or 'full-time' from March 2018. After that, I quit my job to give this name a better meaning. And, yes, since then, it has been a very good, long, hard but beautiful journey. And now there's no going back.

Q When you left your research analyst job for travel, what were your parents' reaction?

My parents didn't really understand this initially and they were not really aware of all of this. Initially, they didn't know that we have an Instagram platform, where we do blogging. I just told them I'm taking a break because I never took any break in life. From college I started working and after that I worked for three and a half years. So, I thought I'll take a break.

For them, it was a break for me. It was just starting my own little something. But, slowly people started recognizing and, things started coming at home. Tourism people started calling, and my parents got curious. And then, they found out and they were very happy and supportive because till then it reached a certain level of recognition.

Q You pursued B.Com and a lot of students study commerce. Many students who choose this stream later realize that this is not their cup of tea. Any thoughts on this?

I think in life, there is no guarantee. Your desires, your hobbies, everything keeps changing. You might be craving for something today, but after five years, you might not desire the same thing at all. Like, five years ago, I thought, oh, I will buy this car, I want this car, but now, my goal is like I want to visit that country. But I will say just to go with the flow. Of course, you need to, at least filter it down to science or commerce or arts. People must try to understand what is something that they really enjoy, and they are really good at, like, good in mathematics or good in biology or, psychology, or anything they like.

For me, in my12th standard, my deciding factor was that I wanted to

pursue business and I wanted to be in the finance domain. I knew that, which is now at this point in life, not the case. So, yeah, eventually you do get to know whether this is something you want to continue or not. And commerce is a field which opens a lot of opportunities. In this sense, one can do CA (Charted Accountancy), or CFA (Chartered Financial Analyst), or MBA, or can even start their own business. One can also go for GMAT, go abroad, and can also do Ph.D. There are a lot of opportunities that commerce opens up. So, yes, I think the key is not to be too hard on yourself and just go with the flow.

Q Many organizations are constantly emphasizing on sustainable tourism and travel. What is your viewpoint?

Of course, the viewpoint is that it's great. I think everyone should focus on sustainable tourism and that is what our future of travel should be like. Because, with the sudden boost of tourism and travel, there has been a lot of, ecological imbalance and people are not responsible and throwing plastic wastes, mountains. All our mountains, natural environments and ecology are very sensitive and very fragile to all these problems.

Education is definitely one of the keys that people should understand, how to travel responsibly, bring back your waste, support the locals, try to travel on public transport as much as possible. And, yes, one thing is very important that not to be loud and noisy and, just be very, mindful of how to be in that place and respect the culture and the locals. So I think everyone should adopt that for sure.

Q Travel habits, practices, manners matter a lot. From your own observations, what are some good travel habits and bad travel habits of Indians that you have come across?

I'll start with bad ones. A lot of us are not traveling for the sake of traveling or for understanding and learning about different cultures, but just to have an escape. That is not a bad thing, but travel is basically opening our mindset towards new lifestyles, new cultures as it gives a broader perspective, that the way we are living is not the only way, or the culture or the beliefs or the faith we have is not the only way, but people don't travel to understand all of this. Some people just travel to take beautiful pictures, while they don't like to interact with the local people.

Now the good travel habit, which I really love about Indians is that they are very, cost-friendly. They try to budget their travels and also take their own food, which you miss, especially in foreign countries. In many countries, one is not able to find good food, which really fills your soul. So, we will have those cheat meals or cheat snacks, which they take, which is really important. So, due to this habit, feeling of homesickness doesn't come.

Q In a good way or bad way, has Instagram changed people's perception of travel?

There's no doubt that Instagram or social media has boosted tourism, which is a very good thing because local communities are really developing and growing. A lot of their funds or jobs are now through tourism, which was not a case earlier, especially in winters when the Atal Tunnel in Manali was closed. But the bad side of it is that because of mass

tourism, there are so many people traveling today.

There's a lot of chaos happening in areas and other areas of our country and they are very fragile to the environment. So, I really believe that there should be a balance. For instance, Kedarkantha and its trek was not that famous five years ago, but now it has become so crowded. So, the government or the locals or people in general can put a cap on how many people can visit that particular area each year.

Q Then what should all the governments do in order to ensure good, economical travel which balances the ecology as well?

As I just mentioned that governments should put a cap on the number of visitors. That is the least governments can do. For instance, in Malaysia, there's a cap on the number of people that can travel on a particular day or a month. That is something the government should think about. EP

STAKEHOLDERS IN INDIA'S TOURISM SECTOR NEED TO RAISE SALARY BAR

Introducing several initiatives for students whose first priority is tourism management, **Prof. Monika Prakash,** Nodal Officer of Indian Institute of Travel and Tourism Management (IIITM) in Nellore, tells Education Post's **Tanay Kumar** that better salaries are the only way to attract good talent.

Q You have taught for 18 years. What significant changes have you witnessed in Tourism and Hospitality Management education in India?

I started my career in 1996. That was the time I was taking up a management course and I entered tourism in 2007. So, that's almost been now 13-14 years that I'm associated with tourism management academics. So, I care because I was into management. Honestly speaking, we never used to give too much weightage to tourism in those days, because probably tourism was not a kind of mainstream sector at that point of time.

Now, the good news about it is that that everybody has started talking about tourism, and people have started realizing that tourism is one very special area where there are so many job opportunities and so many things to learn. The whole study has also become a science and it definitely requires some kind of a professionalism.

In 2007, when I shifted to Gwalior and joined the Indian Institute of Tourism and Travel Management, it was that time that my journey with tourism actually started.

Q You have taken some noteworthy digital initiatives at the Ministry of Tourism. Please tell us about them?

The Indian Institute of Tourism and Travel Management is basically under the aegis of the Tourism Ministry. I would say we are an autonomous organization of the Ministry of Tourism. So, that gives us an added advantage. In 2019, tourism was actually flourishing, for example – one in 11 jobs was from tourism. There was a huge demand for tourism and its associated stakeholders.

The Tourism Ministry realized that the number of regional level guides (RLGs), were actually not able to cater to the demands of this industry. Most of the tourism was happening up in north, so there were many people in north, but there were very few numbers in south and the east. So, the programs for regional level guides used to be offline classes. Offline would mean that the aspirants have to come to the IIITM campuses, stay there for four and a half months, take up their one and a half months of internship and after completion, they would get their licenses. That would make them eligible to go to monuments under the Archeological Survey of India (ASI) and take up tour guiding jobs.

The whole process was very time consuming. At the same time, there were many people who wanted to come to the campus, but because they were unable to pay the amount, they couldn't.

So, it was at this point that the then DG of the Tourism Ministry, Meenakshi Sharma, decided that we have to come up with an initiative where we don't call people to the campus, but we reach out to them. We started the program known as Incredible India Tourist Facilitator Certification Program, as IITFC. IITTM got an opportunity to work with them.

Right now, I am the coordinator for IITFC and this particular program is an

online ad a self-paced program. It is for all those people who are interested in the tourism industry, irrespective of age or gender. It is a three-stage process. After completion, they get the IITFC badge.

After this, you get a chance to take up advanced courses. This is very much like a guide training program and till now we have been receiving good responses. The next exam will come up in December. This is a wonderful program for all those people who want to be a storyteller to showcase their own cities, who do not want to go out of their own city, but want to remain in the city that they belong to.

Q In your opinion, what skills are crucial for students aiming to excel in the tourism sector?

See, I come from the field of management. For me, anything which has a word management associated with it, means it is a serious business and it is a proper science. I think management is a subject where you really need to have a good theoretical knowledge.

For me, tourism is not easy. Anybody who thinks that if I just learn one aspect of it, I can excel in a business, is wrong. You might be able to excel at it right now because the market is not mature, but in the future, if you want to grow, you really have to take up business and tourism as a business aspect.

For example, your interest in earning knowledge about destinations, learning about societal concepts are some crucial skills. Learning about technology is something that is very important. You need to have a basic concept and understanding of everything that is required in the tourism industry.

Tourism is a multidisciplinary and interdisciplinary subject, understanding of all concepts is very important. But at the same time, since you're dealing with people, there are soft skills that are very important as well. Now that would mean your communication, your persuasion, negotiation, problem solving, stress management etc.

Time management, is literally an important aspect in this field as we as people are very unpredictable. Many times, people would want everything at the last minute.

Q As the industry continues to expand, what strategies are being employed to address the shortage of qualified faculty members in Travel and Hospitality Management programs?

To survive in the market now, you really have to be very receptive and you have to be adaptive to the changes that are happening around. There was a time when tourism was only associated with history. People thought that only a person who majored in history can take up tourism. It's not the case right now.

One good thing is that a tourism department would have a combination of people coming from all different areas. You would have a person coming from economics, research, management, psychology, and definitely there are core papers in tourism.

I think the speed at which we start up with the educational institutes is much higher than the speed at which we actually produce the teachers, so that gap along the way is always there. Although, every institute on their own part, is trying to come up with innovative ideas to address the shortages they are facing right now.

Q In recent years, India has seen rapid growth in domestic and international tourism. Are educational institutions adapting to meet the demand for skilled professionals in Travel and Hospitality Management?

There have been a large number of new inclusions. For example, when we started, digital marketing was not there too much in the scene as it is today. Nowadays, digital marketing is one of the core areas where the tourism business rests on.

MICE Tourism (meetings, incentives, conferences and exhibitions) was in a very nascent phase almost a decade ago. Now, it is a full-fledged field that is being offered to students.

Today, sustainability is a very indispensable factor and we want to inculcate the practice of sustainability as a paper, as a knowledge to the students. So, this is how the educational institutes are now adapting to the ever-changing demand that the industry speaks about.

Further, students also need to be aware of technology today. So, we have a special paper on information technology, and digital marketing, e-marketing. Thus, tourism education institutions are keeping themselves abreast of all the changes that are happening around.

Q What are the challenges that the study of Travel and Hospitality Management is facing?

I am aware my answer might annoy some people, but that's the reality which should be put forth before people. Study, job, workforce and the industry is like a circle. In a rational scenario, it would happen that one studies a course with diligence, they get employed with a decent salary in an industry and the sector or the employer gets benefitted by the student's diligence. And that's how circle's perimeter gets wider year after year.

Unfortunately, that is not the case with the tourism and hospitality course. Even if I tell a student that this is promising and rising sector in India, even the diligent and skilled students are not being paid a decent salary at the start of their professional career. The return on investment for this stream, in the starting phase of the career, is not very encouraging.

If you explain to a parent about the potential of this sector, they immediately ask, "What could be the remuneration the child might get immediately after college?" This question silences many of us.

The paradox is, it is a sector with tremendous demand but the initial remuneration in this sector is very low. This is that sector in which an employee has to be there 24*7. Smiling and pleasant always is another demand of this sector, which can't happen with someone every day. And, there is no fix time that one can retire at a particular age.

So, in conclusion, I say it with an emphasis that when an industry desires for promising people, they have to raise the bar of remuneration. And because of this elevated bar, it will become a preferred choice for many potential students.

TOURISM AND HOSPITALITY SKILL COUNCIL WANTS TO HELP COLLEGES IN THEIR VOCATIONAL TRAINING PROGRAMS

THSC Chairman

Emphasizing the importance of sustainable tourism and educating people about taking responsibility of the tourist places, **Mr. Rajan Bahadur** shares the organization's perspectives. In a conversation with Education Post's **Tanay Kumar,** he advocates of simplifying licensing procedures, reducing taxes on tourism businesses for all governments and of using renewable energy for companies in this sector.

Mr. Rajan Bahadur
CEO, Tourism and Hospitality Skill Council

Q Please enlighten us about the Tourism and Hospitality Council and its modus operandi.

Tourism and Hospitality Skill Council (THSC) is a Not-For-Profit Organization. Formed as part of the Skill India mission and under the umbrella of the Ministry of Skill Development and Entrepnuership (MSDE). It has an independent Governing Board, comprising representation from the government, industry partners/ industry associations. By encouraging the development of skills in the hospitality and tourism sectors, millions of people in India would be able to find respectable jobs serving clients and other stakeholders.

The body represents five sub sectors – Hotels, Restaurants, Facility management, Tour & Travel and Cruise Liners.

Q THSC has partnered with many renowned organizations in this industry, e.g. Oberoi Hotels, Marriot, Devyani International limited and many more. How is it bridging the gap between academics of tourism and its industry?

We are doing by partnerships with renowned organizations. These partnerships allow THSC to:

- **Provide industry insights to academic institutions:** THSC's industry partners share their knowledge and expertise with academic institutions, helping to ensure that tourism curricula are aligned with the needs of the industry.
- **Offer internships and placements to students:** THSC's industry partners offer internships and placements to students, giving them valuable hands-on experience in the tourism industry.
- **Industry Expert Involvement:** These organizations may invite industry experts to participate in academic forums, conferences, and guest lectures. This helps students and faculty stay updated on industry trends and best practices.
- **Promote industry best practices:** The THSC and its industry partners work together to promote industry best practices, such as responsible tourism practices.
- **Networking Events:** Hosting networking events such as training partners meet, industry partners meet, job fairs, etc. bring together students, academics, and industry professionals. This facilitates networking, mentorship, and job placement opportunities for students.
- **Advocacy for Curriculum Development:** Industry partners advocate for Qualification packs (curriculum) development that aligns with the current needs of the tourism and hospitality sector. They provide input on the skills and knowledge that are most relevant for graduates entering the industry.

Q How can the academic institutions offering tourism or hospitality management take the help of THSC? And, can those colleges also get an affiliation of THSC that are already affiliated with any university or bodies like UGC?

THSC offers a number of ways for academic institutions to take its help, including:

- **Affiliation:** THSC offers affiliation to vocational training partners (VTPs) that wish to deliver tourism and hospitality training based on National Occupational Standards (NOS). This affiliation provides several benefits to VTPs, including access to THSC's resources and support, as well as recognition from the industry.
- **Qualification Packs:** THSC develops Qualification Packs (QPs) for tourism and hospitality training, which are aligned with the National Occupation standards (NOS). QPs provide a framework for VTPs to develop their training programs and ensure that they are meeting the needs of the industry.
- **Training and Assessment:** THSC offers a range of training and assessment services for VTPs, including training for trainers, assessors, and industry experts. THSC also offers assessment services for VTPs to ensure that their students are meeting the required standards.
- **Industry Placements:** THSC works with industry partners to provide placement opportunities for students of tourism and hospitality VTPs. This helps students to gain practical experience and make connections in the industry.

Q You hold substantial experience of working with range of top-class hotel chains. What are your thoughts on the colleges offering hotel management and the academic synchronization with the hotel sector?

Overall, I think the quality of hotel management education in India has improved significantly in recent years. There are now a number of well-respected colleges that offer comprehensive and industry-relevant programs. However, there is still room for improvement in terms of academic synchronization with the hotel sector.

Some of the key areas where I think there is room for improvement include:

- **Curriculum:** Some hotel management programs still focus too heavily on theoretical concepts and not enough on practical skills. This is a concern, as employers are increasingly looking for graduates who can hit the ground running and make a real contribution to their teams.
- **Industry engagement:** More hotel management colleges need to develop stronger relationships with the industry. This could involve inviting industry experts to teach on campus, offering internships and placements, and conducting joint research projects.
- **Upskilling and reskilling:** The hotel sector is constantly evolving, and it is important for hotel management colleges to keep up with the latest trends and developments. This means offering upskilling and reskilling programs to their students and alumni.

Q Reports claimed that tourism is among one of the reasons behind natural disasters of Himachal Pradesh and Uttarakhand, but it is also one of the key source of revenue. What are your thoughts about this predicament?

The relationship between tourism and its impact on the environment in regions like Himachal Pradesh and Uttarakhand is a complex and multifaceted issue. It's important to recognize that tourism can have both positive and negative effects on the environment, and addressing these impacts requires careful planning and sustainable practices. Here are some thoughts on this predicament:

- **Focus on low-impact tourism:** This could involve promoting ecotourism, adventure tourism, and cultural tourism. These types of tourism are less damaging to the environment than mass tourism.
- **Invest in sustainable infrastructure:** This could involve building roads and hotels that are less likely to damage the slopes. It could also involve developing waste treatment facilities that are more environmentally friendly.

- **Educate tourists about the importance of sustainability:** This could involve providing information about the fragile Himalayan ecosystem and the steps that tourists can take to reduce their impact.

It is important to note that responsible tourism can contribute to the ecosystem by planning and practicing carefully.

Q India can generate a plethora of revenue by the tourism sector. So, all of us, in an integrated way, i.e., governments, colleges, companies in this sector, what should we all do to have a better tourism ecosystem?

Yes, building a better tourism ecosystem in India requires coordinated efforts from various stakeholders, including government bodies, colleges and educational institutions, tourism companies, local communities, and tourists themselves. Here are key actions that can help create a sustainable and thriving tourism sector in India:

Governments:

- Invest in infrastructure: This includes improving roads, airports, and other transportation links, as well as developing new tourist attractions and facilities.
- Promote sustainable tourism by developing ecotourism plans, investing in renewable energy, and educating tourists about the importance of protecting the environment.
- Protect cultural heritage: Developing conservation plans for historic monuments and artifacts and supporting traditional arts and crafts.
- Create a supportive regulatory environment: For example - simplifying licensing procedures, reducing taxes on tourism businesses, and providing financial assistance to small businesses.

Colleges:

- Develop tourism and hospitality programs that are aligned with the needs of the industry. This includes providing students with the skills and knowledge they need to succeed in the tourism sector.
- Educate the public about the benefits of tourism and the importance of sustainable tourism practices.

Companies in the tourism sector:

- Invest in sustainable practices: This could involve using renewable energy, reducing waste, and conserving water.
- Provide training to employees on sustainable tourism practices.
- Educate tourists about the importance of sustainability and how they can reduce their impact.
- Support local communities and businesses.

With an integrated approach Governments, colleges, and companies in the tourism sector can work together to promote India as a sustainable tourism destination. This could involve developing marketing campaigns and partnerships with international tourism organizations.

Q Any travel incident of your life and the lesson from that moment?

I can share a travel incident when traveling overseas I lost my wallet with all my credit cards and the lessons that can be drawn from it:

- Always be vigilant and take safety precautions when traveling, especially in unfamiliar or crowded places. Be aware of your surroundings and keep an eye on your belongings. Use anti-theft bags or pouches for important items like passports, wallets, and smartphones.
- Make photocopies or digital scans of important documents such as your passport, ID, and travel insurance. Store these copies separately from the originals, so you have a backup if your documents are lost or stolen.
- Invest in comprehensive travel insurance that covers theft, loss of belongings, and medical emergencies. Familiarize yourself with the coverage and how to make claims.
- Have access to local emergency contact numbers, including the nearest embassy or consulate. They can help if you lose important documents or face other emergencies.

NANOSCIENCE IN INDIA

UNAWARENESS IS PRIMARY CHALLENGE

Dr. Nand Gopal Sahoo, a distinguished professor at Nainital's Kumaun University, who has been recognized as one of the top scientists in the world by Stanford University, talks to Education Post's **Prabhav Anand** about India's challenges and opportunities in nanoscience, including his innovative method of converting plastic waste into reduced graphene oxide. He further highlights the vital role of technology transfer, drawing on his collaboration with Mumbai-based graphene manufacturing giant HeXorp Pvt. Ltd.

Q Firstly, congratulations on being recognized as one of the top scientists in the world for the second time. How does this recognition impact your work and the field of nanoscience and nanotechnology?

I appreciate the recognition from Stanford University, and am honored to be acknowledged as one of the top 2% of scientists in the world. Recognition by such a prestigious institution serves as a validation of my work in the field of nanoscience and nanotechnology. It reinforces my dedication to advancing knowledge in this area and motivates me to continue my research efforts. By highlighting the importance of nanoscience and nanotechnology, this recognition can draw attention to the field itself. It may also encourage more young scientists and researchers to pursue careers in nanoscience, thereby contributing to its growth and development.

In India, nanoscience or nanotechnology is still in a very nascent phase and there are only a few people who are in this stream, including you. What challenges and opportunities do you envisage in this stream in our country?

Certainly, the field of nanoscience and nanotechnology in India, while experiencing growth, still faces several challenges and offers significant opportunities. One of the primary challenges is the limited awareness and understanding of nanoscience among the general public, students, and even some professionals. Nanoscience is inherently interdisciplinary, encompassing physics, chemistry, biology, and engineering, among others. Encouraging collaboration among researchers from diverse backgrounds can be challenging due to traditional disciplinary boundaries. Developing state-of-the-art research infrastructure for nanoscience requires substantial investments, and ensuring consistent funding for research projects and maintaining advanced facilities

poses an ongoing challenge.

India boasts a wealth of talented scientists and engineers, providing a significant opportunity to leverage this talent for cutting-edge research and innovation in nanoscience and nanotechnology. Nanotechnology has broad applications in sectors such as healthcare, agriculture, electronics, and energy. India can harness nanotechnology to address local challenges in these areas. Collaborative partnerships with international research institutions can help India access advanced technologies and share knowledge, thereby accelerating progress in the field.

Q Your innovative process of manufacturing reduced graphene oxide from plastic waste holds great promise for sustainability. Can you explain how this method works and the environmental benefits it offers in terms of recycling and reducing plastic pollution?

Yes, we innovated a technology capable of converting waste plastic into fuel, and wonder material reduced graphene oxide simultaneously for the first time. The waste recycling machine, SWAYAMBHU WRM 2021, was successfully installed at the PRS-Nanoscience and Nanotechnology Centre, Department of Chemistry, DSB Campus, Kumaun University, serving our proud nation. The machine yields approximately 15-20% raw reduced graphene oxide and 25-40% crude oil from waste plastic. This breakthrough not only addresses the pervasive problem of waste plastic but also presents an opportunity to generate significant revenue by producing fuel and reduced graphene oxide. This innovation is precisely what the nation needed for sustainable and environmentally friendly waste management, promoting the vision of a Clean and Green India.

Plastic waste is collected from the local Municipal Board and mechanically shredded into smaller pieces using a shredder unit to facilitate processing. The shredded plastic waste is then mixed with a catalyst in a catalyst mixing chamber, which is a crucial component for the pyrolysis process. Next, the catalyst-mixed plastic waste undergoes primary pyrolysis in a specialized unit, where it is heated to high temperatures in the absence of oxygen. During primary pyrolysis, the plastic waste breaks down into its constituent hydrocarbons and other byproducts. The resulting material is graphitized, containing carbon atoms. The graphitized material obtained from primary pyrolysis is subsequently processed in a secondary pyrolysis unit, where further steps, likely involving additional heating and refinement, are carried out to obtain the final reduced graphene oxide material.

By converting plastic waste into valuable reduced graphene oxide, this approach helps reduce the volume of plastic waste that would otherwise end up in landfills or oceans, addressing the plastic pollution problem. Reduced graphene oxide has numerous applications, including in energy storage (such as supercapacitors and batteries), electronics, composites, and more reduced graphene oxide. Utilizing reduced graphene oxide derived from plastic waste can lead to the development of sustainable and environmentally friendly products.

The key and most innovative feature of this work is the mass-scale production of high-quality reduced graphene oxide nanosheets from waste plastics, waste tyres (converting waste to wealth), and plant leaves (renewable resources) at a cost substantially lower than similar products available in the global markets.

Q Technology Transfer is a vital aspect of your work, as evidenced by your collaboration with HeXorp for reduced graphene oxide synthesis from waste plastics. Can you elaborate on the importance of technology transfer in bridging the gap between academia and industry, and its potential to drive innovation?

Technology transfer is a symbiotic relationship that benefits both academia and industry. It facilitates the transformation of research discoveries into practical applications, drives innovation, accelerates the development of new technologies, and contributes to economic growth and sustainability. The collaboration with HeXorp for reduced graphene oxide synthesis from waste plastics exemplifies the potential of technology transfer to address pressing environmental challenges and create valuable solutions for society. Several industries are highly interested in commercializing our technology, and ongoing discussions are in progress.

Q You've been a Lee Kuan Yew fellow in Singapore. Could you describe how international experiences have shaped your research perspective and contributed to your academic journey?

I am delighted that I am one of the first Indians to receive this fellowship. International experiences, such as the Lee Kuan Yew Fellowship in Singapore, have played a pivotal role in shaping my research perspective. They have broadened my horizons, enriched my academic journey, and reinforced the significance of collaboration, innovation, and global awareness in addressing complex challenges. These experiences have not only informed my research but have also contributed to a more holistic and globally relevant approach to addressing critical issues in environmental sustainability and technology development.

Q You have done your Ph.D. from IIT Kharagpur in Material Science, which is a multidisciplinary course. Please share some examples of how your research has benefited from working with experts in other fields, such as physics, biology, or engineering.

My Ph.D. research in Materials Science at IIT Kharagpur was indeed a multidisciplinary endeavor, and collaborating with experts from various fields greatly enriched my research. Here are some examples of how interdisciplinary collaborations benefited my research: Collaboration with physicists allowed me to delve deeper into the fundamental properties of materials at the nanoscale. I gained insights into quantum mechanics and electronic properties that were crucial for understanding and characterizing nanomaterials.

Working with chemists was instrumental in developing novel synthesis methods for nanomaterials. Their expertise in chemical reactions and materials synthesis techniques helped me create customized nanomaterials with specific properties for my research.

In some aspects of my research, particularly when exploring applications of nanomaterials in biotechnology and medicine, collaborations with biologists were invaluable. They provided insights into the biocompatibility and safety aspects of the materials, which is critical for applications like drug delivery and bioimaging.

Collaborating with engineers was essential when I was working on the integration of nanomaterials into practical devices. Their expertise in device fabrication and electronics played a pivotal role in translating laboratory-scale materials into real-world applications.

Q For students and researchers interested in the field, could you recommend any essential resources, journals, or books to stay updated with the latest developments in nanoscience and nanotechnology?

As the field is rapidly evolving, it's essential to stay current with the latest literature and research findings to remain at the forefront of developments in nanoscience and nanotechnology. Here are some essential sources to consider: Nature Nanotechnology, Nano Energy, Journal of Energy Storage, ACS Nano, Nano Letters, Advanced Materials, Nano Today, and more. Additionally, conferences and symposia in nanoscience and nanotechnology offer excellent opportunities to network, learn about the latest research and access resources. Another valuable suggestion for students is to explore the websites of renowned institutes worldwide, including those in India, where you can find the latest updates on research. Continuous improvement of your research skills is crucial in this competitive world to thrive in the field. EP

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Dr. S.K. Mahapatra

BUSINESS SCHOOL TEACHERS SHOULD HAVE QUALITY WORK EXPERIENCE IN INDUSTRY

Dr. Mahapatra, Director General of JK Business School shares his insights with Education Post's **Tanay Kumar** on how private sector has opened numerous opportunities for students.

Q You are a leading example of a Professor of Practice, an industry leader who transited seamlessly to the role of Academic Leader. Do you think academicians should also work for some stint in the industry?

Yes, business school teachers should have quality work experience from the industry. But before entering full-time academics, and similarly, industry professionals should test the ground as visiting faculty as well.

Q At the peak of your corporate career, you returned to academics in a leadership role once again. What motivated you to enter the industry and coming back to academics?

I enjoyed career both in academics and industry as I always believed that practice based on a strong foundation of theory will surely be a success, and relating practice to theory, brings a lot of confidence, authenticity and encouragement to students to believe in knowledge-based decisions as managers.

Q It is evident that your wide corporate experience has been helping students at JK Business School. What's your view on a notion that heads of academic institutions must hold at least a decade of industry or corporate experience?

This has certainly helped me, but there are other ways to learn about corporate changes for a good faculty to develop leadership potential and skills. What matters is willingness to learn with an open mind about team development, agile mindset and innovation. Over emphasis on any single factor, such as research credentials or industry credentials, should be avoided. Leader should have an all-encompassing mindset and not carry any skew in designing growth strategy for the Institute.

Q Different sectors of corporates have their own way of management. In your experience, how should a business school train its students so that they could be worthy of majority sectors? What strategies does JKBS adopt?

There is no one-size fit-all formula for training students for corporate careers. The syllabus of management takes care of the fundamentals and conceptual understanding. The co-curricular training, corporate talks, value-add workshops take care of specific skill training for developing corporate readiness. The extra-curricular activities, especially in sports and culture areas, provide holistic grooming with teamwork, which are essential to internalize and

excel in situations to pool strength of diversity.

Q JKBS has in its faculty some outstanding teachers who have taught in the USA for years. How tough or time-taking is on boarding of an international academician is for an Indian institution?

Selection of good faculty is the foremost challenge for the Leadership. It's an elaborate but essential process.

Q BBA is a three-year-program and MBA or PGDM has a two-year duration. In your own views, which education has a better advantage in context to the corporate and industry sector?

The undergraduate program, BBA, is an intermediate stage in management education while a PGDM is the finishing stage, and it completes the understanding at specialization levels. Corporate recruiters have requirements for both, for different roles.

Q When you joined SAIL back in 1983, was there any placement culture in those days and how the placement situations are at JKBS?

Back in 1983, SAIL conducted all India level selection tests for recruiting management trainees each year. In our batch, out of 10,000 graduate applicants, only 100 were selected. The job was considered next to the IAS. There was no Campus Recruitment culture. Few private sector recruiters were going to IIM-A, B & C, XLRI and TISS for direct recruitment from Campus. The private sector has grown exponentially since liberalization in 1991. The first batch of JKBS graduated in 2008, and ever since, all graduates have been placed from campus in the private sector. EP

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ECO-TOURISM IN INDIA

LEAVING BEHIND NOTHING BUT FOOTPRINTS

By Prabhav Anand

Standing on the precipice of a lush green canyon in the heart of India, I see the sun's first rays paint the landscape in a warm, golden hue. The air is crisp, carrying with it the earthy scent of the forest below. The scene reminds of the remarkable beauty and fragility of our planet. It's a feeling that has driven me to explore the enchanting world of eco-tourism in the country, where nature and humanity coexist in harmony.

India, with its kaleidoscope of landscapes – from the majestic Himalayas to the sun-kissed beaches of the south – has beckoned adventurers and seekers of natural wonders for centuries. I have been fortunate enough to traverse this incredible subcontinent, from the pristine backwaters of Kerala to the rugged terrains of Himachal Pradesh. Along the way, I have witnessed both the splendor of nature and the consequences of unchecked tourism.

For years, India's tourist hotspots have grappled with issues such as overcrowding, pollution, and habitat degradation. The need for a more sustainable approach to travel became increasingly evident.

Eco-tourism, as I discovered, is not merely a buzzword but a commitment to preserving the treasures that draw travelers to India's shores. It's about finding ways to revel in the natural beauty while ensuring that our presence does not harm the fragile ecosystems that surround us. It is about giving back to the communities that call these places home and, in turn, enriching our own lives through cultural exchanges.

At its heart, eco-tourism encapsulates three fundamental principles: conservation, community involvement, and education. It isn't just about taking photographs of pristine landscapes; it's about being a steward of the environment, and an active participant in the preservation of our planet's wonders.

Understanding Eco-Tourism

Through research and discussions with avid eco-tourists, I've gained some insight into the essence of eco-tourism and its significance in preserving our planet's natural wonders.

Eco-tourism, as I have learnt, embodies a profound shift in how we perceive travel. It's a profound and conscientious connection with the environment, a commitment to leaving a positive impact on the places we visit.

The heart of eco-tourism lies in sustainability, a term often thrown around but not always understood. When we embark on an eco-tourism journey, we make a conscious choice to minimize harm and maximize benefits.

One of the defining features of eco-tourism is its emphasis on environmental preservation. It encourages us to immerse ourselves in the natural world while taking great care not to disturb it. This means staying on designated trails, avoiding noise pollution, and respecting the delicate balance of ecosystems.

But eco-tourism goes beyond preserving the physical environment. Responsible travelers engage with local communities, learning about their cultures, traditions, and way of life. This interaction isn't superficial; it is a deep appreciation of the symbiotic relationship between communities and their surroundings. When we embrace eco-tourism, we contribute to the economic well-being of these communities, often helping them protect and sustain their environment.

Furthermore, eco-tourism encourages us to become stewards of the natural world. This might involve tree planting, wildlife monitoring, or supporting conservation initiatives. These hands-on experiences forge a lasting connection between travelers and the environments they visit, fostering a sense of responsibility to protect them.

Eco-tourism is a mindful journey, a transformative experience that awakens our consciousness about the interconnectedness of all

living beings and the Earth itself. It's an invitation to savor the beauty of our planet while committing to its safeguarding.

Ecological Diversity

India's ecological diversity is a tapestry of wonders waiting to be explored. My research and conversations with avid eco-travelers have allowed me to get a glimpse of the remarkable natural beauty that awaits those who embark on eco-tourism adventures.

1. Sundarbans Mangrove Forests:

Nestled in the delta of the Bay of Bengal, the Sundarbans are a world of their own. These mangrove forests, spanning both India and Bangladesh, are home to the elusive and endangered Bengal tiger. The Sundarbans, with their tangled roots and labyrinthine waterways, are a true testament to nature's resilience.

Eco-tourism initiatives here have a special focus on responsible boat tours. These tours not only offer breathtaking views of the mangroves but also educate visitors about the delicate balance that exists between the tigers and their habitat.

2. Western Ghats:

The Western Ghats, a UNESCO World Heritage Site, extend along the western coast of India. This lush mountain range is a biodiversity hotspot, teeming with endemic species that are found nowhere else on the planet.

What's truly fascinating about eco-tourism in the Western Ghats is the emphasis on minimal-impact trekking. Trekkers are encouraged to leave no trace of their presence, ensuring that this fragile ecosystem remains intact. Reforestation efforts have also gained momentum, and travelers often participate in tree-planting initiatives, leaving a lasting positive impact on the environment.

These two examples, the Sundarbans and the Western Ghats, represent just a fraction of the eco-tourism opportunities that India has to offer. The country's ecological diversity ensures that there's something for everyone, whether you're drawn to the tranquillity of forests, the grandeur of mountains, or the serenity of coastlines.

Sustainable Getaways in India

As eco-tourism gains momentum in India, several destinations have embraced sustainable practices to cater to conscientious travelers. These eco-friendly getaways offer not only a chance to connect with nature but also an opportunity to support local communities and conservation efforts.

1. Rann of Kutch, Gujarat - Sustaining the White Desert Magic

The Rann of Kutch, often referred to as the "White Desert," is a remarkable destination for eco-tourism in western India. Famous for its vast salt desert, this region is also a critical habitat for migratory birds during the winter months.

Eco-Friendly Accommodations: Sustainable tourism initiatives in the Rann of Kutch have led to the establishment of eco-friendly accommodations such as eco-resorts and tented camps. These lodgings are designed with minimal environmental impact in mind, utilizing renewable energy sources and practicing responsible waste management.

Cultural Immersion: A significant aspect of eco-tourism in this region is the focus on cultural exchanges with the local Kutchi communities. Travelers can visit nearby villages, witness traditional crafts like tie-dye and block printing, and even stay with local families in homestays. This engagement not only benefits the communities economically but also helps preserve their unique way of life.

Bird Watching: During the winter months, the Rann of Kutch becomes a haven for birdwatchers as thousands of migratory birds, including flamingos, pelicans, and cranes, flock to the area. Responsible bird-watching tours are organized, ensuring that bird habitats are not disturbed, and travelers gain a deeper appreciation for these winged visitors.

2. Spiti Valley, Himachal Pradesh - The Himalayan Gem

Tucked away in the state of Himachal Pradesh, Spiti Valley is a remote and pristine destination for eco-tourists. Its rugged terrain, high-altitude monasteries, and serene landscapes make it a dream destination for nature enthusiasts.

Homestays and Minimal-Impact Trekking: Accommodation options in Spiti Valley often include homestays with local families. These accommodations provide an authentic experience while contributing to the income of remote communities. Additionally, trekking in Spiti is designed to minimize environmental impact, with trekkers following designated trails and

adhering to "Leave No Trace" principles.

Conservation Awareness: Many tour operators in Spiti Valley place a strong emphasis on conservation awareness. Travelers are educated about the fragile ecosystem and the challenges it faces due to climate change and tourism. This heightened awareness often translates into responsible travel practices.

Stargazing: Spiti Valley's clear night skies offer an unparalleled stargazing experience. Some eco-tourism initiatives include astronomy sessions, allowing visitors to learn about the celestial wonders while contributing to the region's growing reputation as an astronomy tourism hotspot.

3. Kaziranga National Park, Assam - Rhino Haven

In the northeastern state of Assam, the Kaziranga National Park stands as a testament to successful conservation efforts. This UNESCO World Heritage Site is home to the iconic one-horned rhinoceros and numerous other wildlife species.

Wildlife Safaris: Eco-tourism in Kaziranga primarily revolves around wildlife safaris. These safaris are conducted by trained guides who are well-versed in the park's conservation efforts. Visitors have the opportunity to spot rhinoceroses, tigers, elephants, and a plethora of bird species while supporting ongoing conservation projects.

Community Involvement: Kaziranga's neighboring communities play a crucial role in eco-tourism initiatives. Many lodges and resorts employ local residents, providing them with employment opportunities. The revenue generated from tourism also goes toward community development and anti-poaching efforts.

Conservation Education: Conservation education is a key component of eco-tourism in Kaziranga. Travelers are educated

about the challenges facing the park, such as poaching and habitat loss, and are encouraged to become advocates for wildlife conservation.

These sustainable getaways in India exemplify the essence of eco-tourism by not only preserving the natural beauty of the regions but also fostering economic growth for local communities. As travelers embark on these eco-adventures, they not only create unforgettable memories but also contribute to the larger goal of conserving India's diverse and fragile ecosystems. It's a win-win proposition where responsible tourism benefits both nature and the people who call these pristine landscapes home.

According to Dr. Ajay Pant, Director of the ECOTOURISM FOUNDATION OF INDIA, ecotourism holds immense potential for the Indian economy, offering solutions to various environmental challenges. He emphasized that ecotourism acts as a gradual yet crucial process for conserving biodiversity.

"India has taken significant strides in creating sustainable livelihoods for local communities, especially by promoting ecotourism landscapes and embracing digital marketing strategies for destination promotion. Notable ecotourism destinations in India include Uttarakhand, Jammu & Kashmir, Himachal Pradesh, and Arunachal Pradesh, with a particular focus on the conservation of the Himalayas in recent years," he says.

Dr. Pant also cited the exemplary case of Jim Corbett National Park in Uttarakhand as a pioneer in successfully integrating wildlife conservation efforts with community development initiatives.

Looking toward the future, Dr. Pant identified decentralized strategies and limited participant involvement as significant challenges. However, he also pointed out several promising opportunities, including the potential for transformative initiatives, generating income sources, developing smart destinations, and attracting foreign visitors. Dr. Pant stressed the importance of addressing these challenges through strategic planning and collaborative efforts to ensure the sustainability and growth of ecotourism in India.

Conservation Efforts and Challenges

Eco-tourism in India has sparked significant conservation efforts, but it is not without its challenges.

Conservation Success Stories

Several national parks and sanctuaries have seen an upswing in populations of endangered species, primarily due to the concerted efforts of eco-tourism and conservationists.

One such success story is the revival of the Bengal tiger population. Sanctuaries like Bandipur in Karnataka and Pench in Madhya Pradesh have not only provided safe habitats for these majestic creatures but also actively engaged in monitoring and anti-poaching measures. Through responsible tiger safaris and educational programs, tourists play a crucial role in funding these initiatives while gaining a deeper understanding of the importance of preserving apex predators in the ecosystem.

Additionally, the revival of vulture populations in regions like Panna National Park showcases how eco-tourism can inadvertently aid in preserving even the most overlooked and critical species. Education about the impact of diclofenac, a veterinary drug lethal to vultures, has led to its

reduction, allowing these scavengers to make a slow but steady comeback.

Community Involvement

Eco-tourism initiatives often prioritize the involvement of indigenous communities, ensuring they reap the benefits of tourism while actively participating in conservation efforts.

In many eco-tourism destinations across India, travelers have the opportunity to interact with local communities. This interaction goes beyond just providing employment opportunities; it fosters a sense of ownership and pride in preserving their cultural and natural heritage.

For instance, in the northeastern state of Nagaland, eco-tourism initiatives have helped the indigenous Naga tribes showcase their rich traditions and way of life to the world. Visitors can experience traditional dances, sample local cuisine, and even stay in tribal villages, all while contributing to the preservation of their unique culture and the protection of nearby rainforests.

Challenges Ahead

While eco-tourism has made significant strides in India, it continues to face substantial challenges that require ongoing attention and solutions.

Over-Tourism: Some popular eco-tourism destinations are grappling with the effects of over-tourism, which can lead to increased waste generation, habitat degradation, and disturbances to wildlife. The delicate balance between welcoming visitors and preserving the environment must be maintained.

Habitat Degradation: Despite best efforts, habitat degradation remains a concern in many areas. This is often exacerbated by infrastructure development, such as roads and hotels, which can fragment habitats and disrupt natural migration patterns.

Climate Change: India's eco-tourism destinations are not immune to the impacts of climate change. Rising temperatures, altered rainfall patterns, and extreme weather events can threaten ecosystems and the species that call them home. Conservation efforts must adapt to these changing conditions.

Balancing Conservation and Tourism: Striking the right balance between promoting tourism and ensuring conservation remains a constant challenge. Policies and regulations must evolve to address this dynamic, with a focus on minimizing the negative impacts of tourism.

As India continues its journey towards sustainable travel, addressing these challenges will be vital to ensuring that eco-tourism remains a force for positive change, benefiting both the environment and the communities that rely on it.

Responsible Traveler's Role

Responsible travelers play a pivotal role in the success of eco-tourism in India. Their choices and actions can significantly impact the conservation efforts and the well-being of local communities.

Choose Eco-Friendly Accommodations: One of the most impactful decisions a traveler

can make is selecting eco-friendly accommodations. Many resorts, lodges, and homestays in eco-tourism destinations have adopted sustainable practices that minimize their environmental footprint.

These practices may include waste management systems, energy-efficient lighting, water conservation measures, and the use of renewable energy sources. By staying at such establishments, travelers not only reduce their impact on the environment but also support businesses committed to responsible tourism.

Support Local Communities:
A key principle of eco-tourism is the empowerment of local communities. Travelers can contribute to this by purchasing locally made souvenirs and handicrafts. These purchases not only support local artisans but also promote the preservation of traditional craftsmanship and cultural heritage.

Engaging with local communities through cultural exchanges, such as cooking classes or traditional storytelling sessions, fosters mutual understanding and respect. It also ensures that the economic benefits of tourism are distributed more equitably among the people who call these destinations home.

When exploring natural habitats and wildlife-rich areas, it's imperative for travelers to adhere to guidelines provided by tour operators and national parks. Respecting the rules not only ensures personal safety but also safeguards the well-being of the ecosystem.

Maintain a respectful distance from wildlife and refrain from feeding or approaching them. The goal is to minimize stress on animals and allow them to behave naturally. Additionally, stay on designated trails to prevent soil erosion and disturbance to fragile ecosystems.

Littering is a significant issue in many eco-tourism destinations. Travelers should carry reusable water bottles and other containers, disposing of waste responsibly in designated bins. Leaving nothing behind but footprints should be a guiding principle for all eco-conscious travelers.

The Future

The future of eco-tourism in India holds immense promise, driven by a growing awareness of environmental issues and a commitment to sustainable practices.

The Indian government has recognized the importance of eco-tourism and is actively promoting it through various policy initiatives. These include funding for conservation projects, infrastructure development in eco-tourism destinations, and capacity building for local communities and tour operators.

Efforts to streamline permits and regulations for responsible eco-tourism activities are also underway, making it easier for travelers to explore pristine natural areas while ensuring that their impact remains minimal.

Emerging technologies are poised to play a significant role in the future of eco-tourism. Virtual reality (VR) and augmented reality (AR) may offer immersive experiences that allow travelers to explore and learn about ecosystems without physically visiting sensitive areas.

For instance, VR nature tours can provide a realistic experience of a rainforest, complete with interactive lessons about its biodiversity and conservation. AR apps can enhance on-site experiences by providing real-time information about wildlife and flora, all while minimizing physical disturbances to the environment.

Environmental education and awareness programs are being integrated into eco-tourism experiences to ensure that travelers understand the significance of their actions on the environment. Tour guides and interpreters are being trained to provide informative and engaging insights into the ecosystems they showcase.

Some eco-tourism destinations have established visitor centers and nature interpretation trails, where travelers can learn about the local flora, fauna, and conservation efforts. These educational initiatives not only enrich the traveler's experience but also foster a deeper sense of responsibility toward preserving these natural wonders.

Basically, the future of eco-tourism in India is promising, with a focus on policy support, technological innovation, and education. Travelers who embrace responsible and sustainable practices can be active participants in this movement, ensuring that India's natural treasures endure for generations to come.

As we navigate the challenges of a changing world, eco-tourism represents a sustainable path forward, where travelers and nature coexist harmoniously. It's not just a trend; it's a call to action for all those who seek to explore India's incredible biodiversity while safeguarding it for future generations. So, pack your bags, leave only footprints, and take away memories of a journey that truly makes a difference. EP

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TRAILBLAZING IN CYBERSECURITY DOMAIN

CAREER PROSPECTS AND PROGRAMS TO SECURE THE FUTURE!

MASOOM KHARE
Special Correspondent, Education Post

Introduction

In our fast-paced digital era, technology seamlessly integrates into our daily lives, generating a swag of valuable data with every click and action we take. This includes personal information, intellectual property, sensitive internal information, government information and so forth. Safeguarding this treasure trove of valuable information stored in the cyber world from a myriad of cyber threats is paramount, as none of us wish to see it fall into the wrong hands.

Therefore Cybersecurity, the modern shield against hacking, phishing scams, ransomware attacks, and data breaches has become more critical than ever before. It encompasses a range of strategies and technologies aimed at fortifying digital devices, software, networks, and data against unauthorised access, theft, damage, or alteration. It is also referred to as Information Security (INFOSEC), Information Assurance (IA), or System Security.

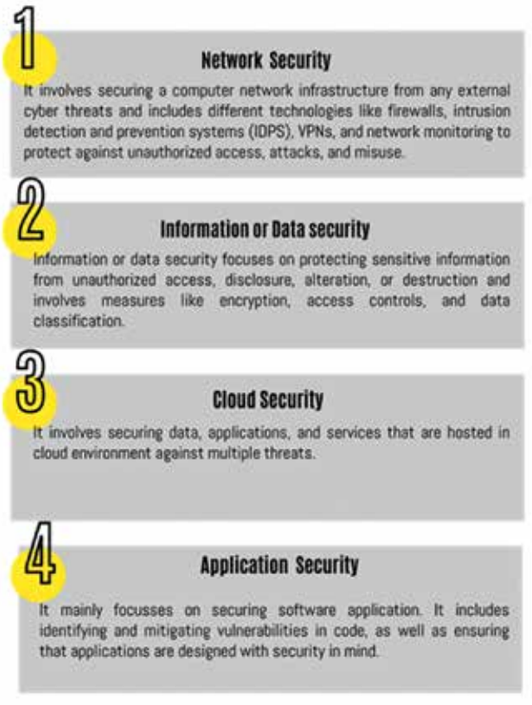
It's the discipline that stands as a bulwark against the rising tide of cyber threats, ensuring that our digital realm remains a safe space for innovation, communication, and collaboration.

As mentioned earlier, on one hand digital footprint expands exponentially, driven by relentless technological progress in IoT, AI, and ML, and on the other hand the corresponding risk posed by a multitude of cyber threats has surged. Simultaneously, companies, industries, and governments are taking proactive strides to fortify their defences, deploying cutting-edge cybersecurity measures to thwart these looming threats.

This surge in cyber-vigilance has given rise to an unprecedented demand for cybersecurity professionals equipped with advanced technical expertise in the field. These experts play a pivotal role in safeguarding the digital realm, ensuring that our interconnected world continues to thrive securely and without compromise.

Different types of Cybersecurity

Cybersecurity encompasses several specialised disciplines and areas focusing on different aspects of protecting digital information and systems from cyber threats. Here are some examples of these specialised areas:



Key Components of Cybersecurity

- **Confidentiality:** This aspect ensures that sensitive information is accessible only to those who have the proper authorisation. Different measures like encryption, access controls, and secure communication protocols help to maintain confidentiality.
- **Integrity:** It ensures that the sensitive data and systems are accurate, reliable, and secure from any unauthorised modifications or tampering. Implementing techniques such as data validation, checksums, and digital signatures helps maintain data integrity.
- **Availability:** This ensures that systems, networks, and data are accessible and operational when needed without any interruption or downtime.
- **Authentication:** Once a user or system is authenticated, authorization determines what level of access or privileges they have. Access controls, role-based access control (RBAC), and permissions are key components of authorization.
- **Authorization:** Granting specific permissions and privileges to authenticated users or systems, and allowing them to access specific resources.
- **Network Security:** Protecting the integrity and confidentiality of data during transmission over networks, such as the internet.
- **Endpoint Security:** Securing individual devices (endpoints) like computers, smartphones, and tablets to prevent unauthorised access or malicious activities.
- **Application Security:** Ensuring that software applications are designed and developed with security in mind to prevent vulnerabilities and exploits.
- **Data Security:** Protecting the confidentiality, integrity, and availability of data through measures like encryption, access controls, and backup.
- **Cryptography:** Using mathematical techniques to secure information, ensuring that it remains confidential and cannot be tampered with during transmission or storage.

The Booming Demand for Cybersecurity Professionals

There is a booming demand for Cybersecurity Professionals in the market today, and here are few statistics that illustrate this fact:

- **High Demand:** The U.S. Bureau of Labor Statistics projected 35% job growth for information security analysts from 2021 to 2031. Also 74% increase in cybersecurity job postings from 2019 to 2020, as per job market analytics, showing a rising industry demand.
- **Global Shortage of Cybersecurity Professionals:** According to the (ISC)² Cybersecurity Workforce Study, there was a global shortage of almost 3.12 million cybersecurity professionals in 2020, which is expected to rise in future.
- **Regulatory Compliance Requirements & Government Initiatives:** Data protection legislation has required organisations to recruit cybersecurity professionals to ensure compliance. It also includes funding for education and training programmes in this field.
- **Cybersecurity Ventures' Predictions:** According to Cybersecurity Ventures, the global cybersecurity market is predicted to grow at an annual growth rate of 9.4% from $167.1 billion in 2019 to $270.3 billion by 2026.
- **Emerging Technologies:** Emerging technologies like IoT and AI have created new cybersecurity challenges with the increasing demand for cybersecurity professionals.
- **High Salary Package:** According to Payscale, cybersecurity engineers have a highly competitive average base salary as compared to other jobs.

Unlock the Cybersecurity Journey: Which Level Fits Your Journey?

There are different levels of courses in cybersecurity, from diploma to Ph.D. and students can opt for them depending on their career goal. Let's have a glimpse of these courses which are being offered in top engineering colleges in India.

1. **Diploma Course in Cybersecurity:** Diploma program in Cybersecurity is a specialised program designed to provide students with foundational understanding of cybersecurity concepts, including network security, information security, ethical hacking, incident response and basic risk management.

   Course Eligibility: Candidates looking for a diploma program in cybersecurity need to have completed their high school education (10+2) or an equivalent qualification.

2. **Undergraduate Course (BSc./B.Tech in Cybersecurity):** B.Tech in Cybersecurity is a widely popular four-year undergraduate degree programme that focuses on the study of how to protect computer systems and networks from theft or damage to their hardware, software or electronic data. The course is designed to understand the process, and practices, and gain knowledge regarding unauthorised access, and protection of networks, computers, programs, and data from unknown attacks.

   Course Eligibility:The undergraduate course is offered to the students who have passed 10+2 with Maths, Biology, Physics and Chemistry from a recognized school board with an aggregate of 50% aggregate score in the final examination. The admission process is either entrance exam based or merit-based.

3. **Post-Graduate Course (M.Sc./M.Tech):** Master of Science or M.Sc. in Cyber Security is a 2-year long postgraduate level degree course mainly focussing on the advanced knowledge and skills related to major topics like network security, information security, application security, operational security, disaster recovery, and cyber laws. It includes the study of communication networks and technologies along with the analysis of legal and ethical issues in cyber security and covers all the aspects of cyber security, ethical hacking, data encryption and hacking prevention in complete detail. It includes subjects like Digital Security, Cryptography, Digital Forensics, Malware Functionality, etc.

   Course Eligibility: The candidate must have completed a B.Sc. or BE/BTech degree in Computer Science, IT, Cyber Security or any other equivalent degree from a recognized institution with a minimum aggregate score of 50% to be eligible for M.Sc. course in Cyber Security. Almost all the best colleges for cyber security in India offer this M.Sc. Courses in Cybersecurity select candidates based on the marks obtained in the last qualifying exam.

4. **PG Diploma Course in Cybersecurity:** The PG Diploma Course in cybersecurity is a two-years advanced level program that focuses on providing students with in-depth knowledge and skills in the field of cybersecurity. It is designed for individuals who already possess a foundational understanding of computer science or information technology and wish to specialise in cybersecurity. The program covers various topics including network security, cryptography, secure software development, and computer forensics.

   Course Eligibility: Candidates looking for a PG diploma course in cybersecurity required a bachelor's degree in computer science, engineering, or a related field with an aggregate score ranging between 50% to 60% marks in the final examination.

5. **Ph.D. Program in Cybersecurity:** A Ph.D. in Cyber Security is the highest research based academic credential in cybersecurity and mainly focuses on advanced concepts, theories, and practices related to cyber security. The course typically takes between 2 to 5 years to complete and requires a strong background in computer science or a related field. In this advanced program, students are required to conduct original research and defend a dissertation under the guidance of an advisor. Graduates of a Ph.D. program in cyber security may go on to pursue careers in academia, industry, or government agencies. With a doctoral degree, professionals not only qualify for the highest-level positions in the field, but also research jobs that help shape the future of cybersecurity.

   Course Eligibility: The applicant looking for admission in Ph.D. in Cybersecurity in top colleges in India should possess

- M.E./ M.Tech./ M.S., or equivalent degree
- B.E./ B.Tech./ B.S. (4-year Bachelor of Science), or equivalent Degree with a minimum of one-year academic experience
- M.Sc./ M.C.A., or an equivalent degree: The applicants should show evidence of a strong academic record. Excellent test scores on standardised graduate aptitude tests such as GATE or GRE, and publications in recognised conferences and journals are examples of such evidence.

Course Name	Duration	Course Eligibility
Diploma Course in Cybersecurity (after +2)	2 years	Candidates looking for a diploma program in cybersecurity need to have completed their high school education (10+2) or an equivalent qualification.
BSc./B.Tech in Cybersecurity	4 years	This course is offered to only those students who have passed 10+ 2 with Maths, Biology, Physics and Chemistry from a recognized school board with an aggregate of 50% aggregate score in the final examination.
(M.Sc./ M.Tech)	2 years	Candidate must have completed a B.Sc. or BE/BTech degree in Computer Science, IT, Cyber Security or any other equivalent degree from a recognized institution with a minimum aggregate score of 50%
PG Diploma Program in Cybersecurity	2 years	Candidates looking for a PG diploma course in cybersecurity required a bachelor's degree in computer science, engineering, or a related field with an aggregate score ranging between 50% to 60% marks in the final examination.
Ph.D. Program in Cybersecurity	2 to 5 years	M.E./ M.Tech./ M.S., or equivalent Degree B.E./ B.Tech./ B.S. (4-year Bachelor of Science), or equivalent Degree with a minimum of one-year academic experience M.Sc./ M.C.A., or an equivalent Degree

Emerging Job Roles in Cybersecurity Domain

The cybersecurity domain presents an expansive array of dynamic and lucrative job prospects for students. Among these, several highly sought-after roles await graduates and postgraduates who have pursued diverse courses in cybersecurity. These positions like Cybersecurity Analyst, Security Engineer/Architect, Penetration Tester/ Ethical Hacker, Incident Responder, Security Consultant, Cybersecurity Manager/Director, Threat Intelligence Analyst, and Security Auditor/ Compliance Analyst, promises not only professional growth but also the opportunity to make a significant impact in the field of digital security.

Conclusion

In today's digital era, cybersecurity is a vital shield against a rising tide of cyber threats. Therefore, the demand for cybersecurity professionals is booming, and a range of educational programs caters to aspiring experts at all levels. As technology advances, the role of these professionals becomes increasingly critical. A career in cybersecurity offers immense opportunity to safeguard our digital world and shape a secure future. EP

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2	Institute of Hotel Management, Catering Technology and Applied Nutrition, Mumbai	Mumbai	Maharashtra	1	West	1
3	Institute of Hotel Management, Catering Technology and Applied Nutrition, Chennai	Chennai	Tamil Nadu	1	South	1
4	Institute of Hotel Management, Catering Technology and Applied Nutrition, Bangalore	Bangalore	Karnataka	1	South	2
5	Institute of Hotel Management Catering Technology and Applied Nutrition, Hyderabad	Hyderabad	Telangana	1	South	3
6	Institute of Hotel Management, Catering Technology and Applied Nutrition, Lucknow	Lucknow	Uttar Pradesh	1	North	2
7	Institute of Hotel Management, Catering Technology and Applied Nutrition, Kolkata	Kolkata	West Bengal	1	East	1
8	Institute of Hotel Management, Catering & Nutrition, Bhopal	Bhopal	Madhya Pradesh	1	Central	1
9	Dr Ambedkar Institute of Hotel Management Catering & Nutrition, Chandigarh	Chandigarh	Chandigarh	1	North	3
10	Welcomgroup Graduate School of Hotel Administration	Manipal	Karnataka	2	South	4
11	Army Institute of Hotel Management & Catering Technology	Bangalore	Karnataka	3	South	5
12	School of Hospitality & Tourism Studies, DY Patil University	Navi Mumbai	Maharashtra	2	West	2
13	Department of Hotel Management, Christ University (deemed)	Bangalore	Karnataka	4	South	6
14	Banarsidas Chandiwala Institute of Hotel Management & Catering Technology	New Delhi	Delhi	2	North	4

*Page 6

Rank*	Institution Name	City	State	State Rank	Zone	Zone Rank
15	Institute of Hotel Management and Catering Technology, Bharati Vidyapeeth (deemed university)	Pune	Maharashtra	3	West	3
16	SRM Institute of Hotel Management	Chennai	Tamil Nadu	2	South	7
17	Department of Catering Science and Hotel Management, PSG College of Arts & Science	Coimbatore	Tamil Nadu	3	South	8
18	Institute of Hotel Management, Catering Technology and Applied Nutrition, Bhubaneswar	Bhubaneswar	Odisha	1	East	2
19	Faculty of Hospitality Management and Catering Technology, MS Ramaiah University of Applied Sciences	Bangaluru	Karnataka	5	South	9
20	Institute of Hotel Management Catering Technology and Applied Nutrition, Hajipur	Hajipur	Bihar	1	East	3
21	Institute of Hotel Management Catering & Nutrition, Gurdaspur	Gurdaspur	Punjab	1	North	5
22	Institute of Hotel Management, Catering & Nutrition, Shimla	Shimla	Himachal Pradesh	1	North	6
23	Institute of Hotel Management and Catering Technology, Trivandrum	Trivandrum	Kerala	1	South	10
24	Amity School of Hospitality	Noida	Uttar Pradesh	2	North	7
25	Institute of Hotel Management, Catering Technology and Applied Nutrition, Kurukshetra	Kurukshetra	Haryana	1	North	8
26	Bharati Vidyapeeth's College of Hotel Management and Tourism Studies	Navi Mumbai	Maharashtra	4	West	4
27	Suryadatta College of Hospitality Management and Travel Tourism (SCHMTT)	Pune	Maharashtra	5	West	5
28	Chitkara School of Hospitality	Chandigarh	Punjab	2	North	9

*Page 6

Rank*	Institution Name	City	State	State Rank	Zone	Zone Rank
29	All India Shri Shivaji Memorial Society's College of Hotel Management & Catering Technology	Pune	Maharashtra	6	West	6
30	Oriental School of Hotel Management	Wayanad	Kerala	2	South	11
31	AIMS School of Hospitality and Tourism	Bengaluru	Karnataka	6	South	12
32	Department of Hotel Management, T John College	Bengaluru	Karnataka	7	South	13
33	Faculty of Hospitality & Tourism Management, ICFAI University Sikkim	Gangtok	Sikkim	1	North-East	1
34	Sri Ramakrishna College of Arts and Science	Coimbatore	Tamil Nadu	4	South	14
35	International Institute of Hotel Management, Kolkata	Kolkata	West Bengal	2	East	4
36	Catering Science and Hotel Management department, Bishop Appasamy College of Arts & Science	Coimbatore	Tamil Nadu	5	South	15
37	KLE Society's Institute of Hotel Management	Bengaluru	Karnataka	8	South	16
38	Hindusthan College of Arts & Science (Autonomous)	Coimbatore	Tamil Nadu	6	South	17
39	Dr SNS Rajalakshmi College of Arts and Science (Autonomous)	Coimbatore	Tamil Nadu	7	South	18
40	Symbiosis School of Culinary Arts	Pune	Maharashtra	7	West	7
41	Amity School of Hospitality, Amity University, Lucknow	Lucknow	Uttar Pradesh	3	North	10
42	University Institute of Tourism and Hospitality Management, Chandigarh University	Mohali	Punjab	3	North	11
43	NSHM Institute of Hotel and Tourism Management	Durgapur	West Bengal	3	East	5
44	School of Hospitality and Tourism, Galgotias University	Greater Noida	Uttar Pradesh	4	North	12

*Page 6

Rank*	Institution Name	City	State	State Rank	Zone	Zone Rank
45	Sri Krishna Arts and Science College (Autonomous)	Coimbatore	Tamil Nadu	8	South	19
46	International Institute of Hotel Management, New Delhi	New Delhi	Delhi	3	North	13
47	Amrapali Institute of Hotel Management	Haldwani	Uttarakhand	1	North	14
48	Dr NGP Arts and Science College, Department of Catering Science and Hotel Management	Coimbatore	Tamil Nadu	9	South	20
49	MMICT & BM (Hotel Management)	Ambala	Haryana	2	North	15
50	College of Hospitality Administration	Jaipur	Rajasthan	1	North	16
51	IHM, Meerut	Meerut	Uttar Pradesh	5	North	17
52	Munnar Catering College	Munnar	Kerala	3	South	21
53	Oriental School of Hotel Management	Wayanad	Kerala	4	South	22
54	UEI Global Education, Lucknow	Lucknow	Uttar Pradesh	6	North	18
55	The Lalit Suri Hospitality School	Faridabad	Haryana	3	North	19
56	UEI Global Education, New Delhi	New Delhi	Delhi	4	North	20
57	Nehru Arts and Science College	Coimbatore	Tamil Nadu	10	South	23
58	Chandigarh College of Hospitality	Greater Mohali	Punjab	4	North	21
59	ITM Institute of Hotel Management	Navi Mumbai	Maharashtra	8	West	8
60	St Joseph's Institute of Hotel Management & Catering Technology, Palai	Kottayam	Kerala	5	South	24
61	School of Hotel Management & Catering Technology, Jaipur National University	Jaipur	Rajasthan	2	North	22

*Page 6

Rank*	Institution Name	City	State	State Rank	Zone	Zone Rank
62	Institute of Advanced Management	Kolkata	West Bengal	4	East	6
63	Chandigarh Vidya Jyoti Eduversity	Punjab	Punjab	5	North	23
64	UEI Global Education, Chandigarh	Chandigarh	Chandigarh	2	North	24
65	International Institute of Hotel Management, Jaipur	Jaipur	Rajasthan	3	North	25
66	International Institute of Hotel Management, Ahmedabad	Ahmedabad	Gujarat	1	West	9
67	VM Salgaocar Institute of International Hospitality Education	Raia	Goa	1	West	10
68	International Institute of Hotel Management, Pune	Pune	Maharashtra	9	West	11
69	Thanthai Hans Roever College (Autonomous)	Perambalur	Tamil Nadu	11	South	25
70	UEI Global Education, Pune	Pune	Maharashtra	10	West	12
71	Vels Institute of Science Technology and Advanced Studies (VISTAS)	Chennai	Tamil Nadu	12	South	26
72	International Institute of Hotel Management, Hyderabad	Hyderabad	Telangana	2	South	27
73	International Institute of Hotel Management, Bangalore	Bengaluru	Karnataka	9	South	28
74	BNG Tourism & Hospitality Management Institute	Kolkata	West Bengal	5	East	7
75	Guru Nanak Institute of Hotel Management	Kolkata	West Bengal	6	East	8

*Page 6

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Rank*	University / Institute Name	City	State	State Rank	Zone	Zone Rank
1	Lady Shri Ram College for Women - [LSR], New Delhi	New Delhi	Delhi	1	North	1
2	University School of Mass Communication - Guru Gobind Singh Indraprastha University, New Delhi	New Delhi	Delhi	2	North	2
3	Kishinchand Chellaram College - [KC College], Mumbai	Mumbai	Maharashtra	1	West	1
4	Kushabhau Thakre Patrakarita Avam Jansanchar Vishwavidyalaya, Raipur	Raipur	Chhattisgarh	1	Central	1
5	Delhi University - Delhi School of Journalism, New Delhi	New Delhi	Delhi	3	North	3
6	Delhi College of Arts and Commerce - [DCAC], New Delhi	New Delhi	Delhi	4	North	4
7	Mahatma Gandhi University - [MGU], Kottayam	Kottayam	Kerala	1	South	1
8	Kamla Nehru College for Women - [KNC], Kapurthala	Kapurthala	Punjab	1	North	5
9	St Joseph's College Devagiri, Calicut	Calicut	Kerala	2	South	2
10	St Joseph's Degree and PG College, Hyderabad	Hyderabad	Telangana	1	South	3
11	Rashtrasant Tukadoji Maharaj Nagpur University - [RTMNU], Nagpur	Nagpur	Maharashtra	2	West	2
12	Khalsa College, Amritsar	Amritsar	Punjab	2	North	6
13	I.K. Gujral Punjab Technical University - [IKG-PTU], Jalandhar	Jalandhar	Punjab	3	North	7
14	Vidyasagar College - [VSC], Kolkata	Kolkata	West Bangal	1	East	1
15	St. Joseph University, Dimapur	Dimapur	Nagaland	1	North-East	1

*Page 6

Rank*	University / Institute Name	City	State	State Rank	Zone	Zone Rank
16	Kamala Nehru College - [KNC], New Delhi	New Delhi	Delhi	5	North	8
17	L.S. Raheja College of Arts and Commerce, Mumbai	Mumbai	Maharashtra	3	West	3
18	Christ University, Bangalore	Bangalore	Karnataka	1	South	4
19	St. Xavier's College, Mumbai	Mumbai	Maharashtra	4	West	4
20	Babasaheb Bhimrao Ambedkar University - [BBAU], Lucknow	Lucknow	Uttar Pradesh	1	North	9
21	Sophia College for Women, Mumbai	Mumbai	Maharashtra	5	West	5
22	National Institute of Mass Communication and Journalism - [NIMCJ], Ahmedabad	Ahmedabad	Gujarat	1	West	6
23	B.K Birla College Of Arts Science & Commerce, Thane	Thane	Maharashtra	6	West	7
24	Loyola Academy Degree and PG College, Secunderabad	Secunderabad	Telangana	2	South	5
25	Ramnarain Ruia Autonomous College, Mumbai	Mumbai	Maharashtra	7	West	8
26	Mithibai College of Arts, Mumbai	Mumbai	Maharashtra	8	West	9
27	Jai Hind College - [JHC], Mumbai	Mumbai	Maharashtra	9	West	10
28	Institute of Information Technology & Management - [IITM], New Delhi	New Delhi	Delhi	6	North	10
28	St Andrew's College of Arts Science and Commerce, Mumbai	Mumbai	Maharashtra	10	West	11
29	Chitkara University - Chitkara School of Mass Communication - [CSMC], Patiala	Patiala	Punjab	4	North	11
30	Amity School of Communication, Noida	Noida	Uttar Pradesh	2	North	12
31	Amity School of Communication, Lucknow	Lucknow	Uttar Pradesh	3	North	13

*Page 6

Rank*	University / Institute Name	City	State	State Rank	Zone	Zone Rank
32	Jagran Lakecity University - [JLU], Bhopal	Bhopal	Madhya Pradesh	1	Central	2
33	Kasturi Ram College of Higher Education, New Delhi	New Delhi	Delhi	7	North	14
34	Punjab College of Technical Education - [PCTE], Ludhiana	Ludhiana	Punjab	5	North	15
35	SRM Institute of Science and Technology - [SRMIST], Chennai	Chennai	Tamil Nadu	1	South	6
36	Banasthali Vidyapith, Jaipur	Jaipur	Rajasthan	1	North	16
37	Maharaja Agrasen College - [MAC], New Delhi	New Delhi	Delhi	8	North	17
37	Dayananda Sagar University - [DSU], Bangalore	Bangalore	Karnataka	2	South	7
38	Lovely Professional University - [LPU], Jalandhar	Jalandhar	Punjab	6	North	18
39	KPB Hinduja College of Commerce - [KPB], Mumbai	Mumbai	Maharashtra	11	West	12
40	Kalinga Institute of Industrial Technology - [KIIT], Bhubaneswar	Bhubaneswar	Odisha	1	East	2
41	Amrita Vishwa Vidyapeetham, Coimbatore	Coimbatore	Tamil Nadu	2	South	8
42	Maharaja Sayajirao University of Baroda - [MSU], Vadodara	Vadodara	Gujarat	2	West	13
43	Telangana Mahila Viswavidyalayam, Hyderabad	Hyderabad	Telangana	3	South	9
44	Faculty of Management Sciences and Liberal Arts - Shoolini University, Solan	Solan	Himachal Pradesh	1	North	19
45	Rizvi College of Arts Science and Commerce, Mumbai	Mumbai	Maharashtra	12	West	14
46	George Group of Colleges, Kolkata	Kolkata	West Bangal	2	East	3
47	Kelkar Education Trust's V.G. Vaze College of Arts Science and Commerce, Mumbai	Mumbai	Maharashtra	13	West	15

*Page 6

Rank*	University / Institute Name	City	State	State Rank	Zone	Zone Rank
48	Mulund College of Commerce, Mumbai	Mumbai	Maharashtra	14	West	16
49	IMS Ghaziabad (University Courses Campus), Ghaziabad	Ghaziabad	Uttar Pradesh	4	North	20
50	Loreto College, Kolkata	Kolkata	West Bangal	3	East	4
51	Wilson College, Mumbai	Mumbai	Maharashtra	15	West	17
52	Lala Lajpat Rai College of Commerce and Economics, Mumbai	Mumbai	Maharashtra	16	West	18
53	Chandigarh Group of Colleges - [CGC] Jhanjeri, Mohali	Mohali	Punjab	7	North	21
54	Sam Higginbottom University of Agriculture Technology and Sciences - [SHUATS], Allahabad	Allahabad	Uttar Pradesh	5	North	22
55	J.C. Bose University Of Science And Technology - YMCA, Faridabad	Faridabad	Haryana	1	North	23
56	Guru Ghasidas Vishwavidyalaya - [GGU], Bilaspur	Bilaspur	Chhattisgarh	2	Central	3
57	SIES College of Arts Science and Commerce - [SIES ASCS], Mumbai	Mumbai	Maharashtra	17	West	19
58	Tilka Manjhi Bhagalpur University - [TMBU], Bhagalpur	Bhagalpur	Bihar	1	East	5
59	Magadh University - [MU], Gaya	Gaya	Bihar	2	East	6
60	Government Jamuna Prasad Verma Post Graduate Arts and Commerce College, Bilaspur	Bilaspur	Chhattisgarh	3	Central	4
61	Manipal University - [MUJ], Jaipur	Jaipur	Rajasthan	2	North	24
62	GITAM, Hyderabad	Hyderabad	Telangana	4	South	10
63	St. Xavier's College of Management and Technology, Patna	Patna	Bihar	3	East	7
64	Garden City University - [GCU], Bangalore	Bangalore	Karnataka	3	South	11
65	Kanya Mahavidyalaya - [KMV], Jalandhar	Jalandhar	Punjab	8	North	25

*Page 6

Rank*	University / Institute Name	City	State	State Rank	Zone	Zone Rank
66	Deen Dayal Upadhyaya Gorakhpur University - [DDU], Gorakhpur	Gorakhpur	Uttar Pradesh	6	North	26
67	Goswami Ganesh Dutta Sanatan Dharma College - [GGDSD], Chandigarh	Chandigarh	Chandigarh	1	North	27
68	Barkatullah University - [BU], Bhopal	Bhopal	Madhya Pradesh	2	Central	5
69	St. Xavier's College - [SXC], Ranchi	Ranchi	Jharkhand	1	East	8
70	CMJ University, Ri-Bhoi	Ri-Bhoi	Meghalaya	1	North-East	2
71	Dr. C.V. Raman University - [CVRU], Bilaspur	Bilaspur	Chhattisgarh	4	Central	6
72	HR College of Commerce and Economics, Mumbai	Mumbai	Maharashtra	18	West	20
73	Mar Ivanios College, Thiruvananthapuram	Thiruvananthapuram	Kerala	3	South	12
74	MIT Art Design and Technology University - [MITADT], Pune	Pune	Maharashtra	19	West	21
75	Institute of Management Studies - [IMS], Noida	Noida	Uttar Pradesh	7	North	28
76	Kalindi College, New Delhi	New Delhi	Delhi	9	North	29
77	Atal Bihari Vajpayee Hindi Vishwavidyalaya - [ABVHV], Bhopal	Bhopal	Madhya Pradesh	3	Central	7
78	Karnavati University - [KU], Gandhinagar	Gandhinagar	Gujarat	3	West	22
79	Manav Rachna International Institute of Research and Studies - [MRIIRS], Faridabad	Faridabad	Haryana	2	North	30
80	Indraprastha Institute of Technology and Management - [IITM], New Delhi	New Delhi	Delhi	10	North	31
81	Oriental University - [OU], Indore	Indore	Madhya Pradesh	4	Central	8
82	Graphic Era Hill University - [GEHU], Dehradun	Dehradun	Uttarakhand	1	North	32

*Page 6

Rank	University / Institute Name	City	State	State Rank	Zone	Zone Rank
83	Dr Babasaheb Ambedkar Marathwada University - [BAMU], Aurangabad	Aurangabad	Maharashtra	20	West	23
84	Babu Banarasi Das University - [BBDU], Lucknow	Lucknow	Uttar Pradesh	8	North	33
85	Shri Ramswaroop Memorial University - [SRMU], Lucknow	Lucknow	Uttar Pradesh	9	North	34
86	Himgiri Zee University - [HZU], Dehradun	Dehradun	Uttarakhand	2	North	35
87	LNCT University - [LNCTU], Bhopal	Bhopal	Madhya Pradesh	5	Central	9
88	Sangam University - [SU], Bhilwara	Bhilwara	Rajasthan	3	North	36
89	Lingaya's Vidyapeeth, Faridabad	Faridabad	Haryana	3	North	37
90	IIMT University - [IIMTU], Meerut	Meerut	Uttar Pradesh	10	North	38
91	Shri Ram Group of Colleges - [SRGC], Muzaffarnagar	Muzaffarnagar	Uttar Pradesh	11	North	39
92	Usha Martin University - [UMU], Ranchi	Ranchi	Jharkhand	2	East	9
93	DY Patil International University - [DYPIU], Pune	Pune	Maharashtra	21	West	24
94	Sri Sharda Group of Institutions - [SSGI], Lucknow	Lucknow	Uttar Pradesh	12	North	40
95	Kothari College Of Management Science & Technology - [KCMST], Indore	Indore	Madhya Pradesh	6	Central	10
96	Sanjay Ghodawat University - [SGU], Kolhapur	Kolhapur	Maharashtra	22	West	25
97	Maharshi Dayanand College of Arts Science and Commerce, Mumbai	Mumbai	Maharashtra	23	West	26
98	BM Ruia Girls College , Mumbai	Mumbai	Maharashtra	24	West	27
99	Apex International College, Amritsar	Amritsar	Punjab	9	North	41
100	Rani Birla Girl's College, Kolkata	Kolkata	West Bangal	4	East	10

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CMT-2020/ 46 :

For $0^\circ < \beta < 45^\circ$ *and* $n \in N$, if

$m = \tan\alpha \sqrt[7]{\cot^2\alpha} + \cot\alpha \sqrt[7]{\tan^2\alpha}$;

$1 - 1 \div n = 1 \div \sqrt[3]{45 + 29\sqrt{2}} + 1 \div \sqrt[3]{45 - 29\sqrt{2}}$;

$p = \left(\sin^7\beta + \cos^7\beta\right) \div \left(\sin^5\beta + \cos^5\beta\right)$; $q = \cos ec^2\gamma + \sec^2\gamma$;

where, $\tan\alpha + \cot\alpha = 843$; $8\sin\beta + 9\cos\beta = 12$; and,

$2^{25}\left(\sin^{32}\gamma + \cos^{32}\gamma\right)\left(\sin^{22}\gamma + \cos^{22}\gamma\right) = (2\sin\gamma\cos\gamma)^{27}$; *then*,

$\frac{5}{mn}\left\{p(1+q)^2\left(m + n^2 + 9\right) - 10n\right\} = ?$

CMT-2020/ 47 :

If $\frac{x^2}{y\sqrt{11} + z\sqrt{13}} = \frac{y^2}{z\sqrt{13} + x\sqrt{7}} = \frac{z^2}{x\sqrt{7} + y\sqrt{11}} = 1008$

then ,

$\frac{\sqrt{7}}{x + 1008\sqrt{7}} + \frac{\sqrt{11}}{y + 1008\sqrt{11}} + \frac{\sqrt{13}}{z + 1008\sqrt{13}} = ?$

ANSWERS:

CMT-2020/44 : 2 CMT-2020/45 : 1

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7. JEE ADV. AIR 3354

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Answers will be published in the next issue . You can ask any queries and send your solution to
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