

## **Session 2019-20**

**3.3.3 Number of books and chapters in edited volumes/books published and papers published in national/ international conference proceedings per teacher during last five years**

Sl. No.	Name of the teacher	Title of the book/chapters published	Title of the paper	Title of the proceedings of the conference	Name of the conference	National / International	Year of publication	ISBN/ISSN number of the proceeding	Affiliating Institute at the time of publication	Name of the publisher
1	<b>Dr. Anju Tanwar (Botany)</b>	Emerging trends and challenges in biosciences	Efficacy of different concentrations of refinery waste along with Acaulospora laevis on growth response and Mycorrhization of Maize, Barley and Wheat	Emerging trends and challenges in biosciences	Emerging trends and challenges in biosciences		2019	978-93-5124-988-7 (Book Chapters in edited book)	Government P.G College, Ambala Cantt	Daya Publishing House, A division of Astral International Pvt. Ltd., New Delhi
2	<b>Dr. Anju Tanwar (Botany)</b>	Emerging trends and challenges in biosciences	Response of Arbuscular Mycorrhizal Fungi and Trichoderma Harzianum on growth and flowering attributes in calendula officinalis linn	Emerging trends and challenges in biosciences	Emerging trends and challenges in biosciences		2019	978-93-5124-988-7 (Book Chapters in edited book)	Government P.G College, Ambala Cantt	Daya Publishing House, A division of Astral International Pvt. Ltd., New Delhi

3	<b>Dr. Anju Tanwar (Botany)</b>	Emerging trends and challenges in biosciences	Microbial interactions in Mycorrhizosphere of spices and their significance for sustainable development	Emerging trends and challenges in biosciences	Emerging trends and challenges in biosciences		2019	978-93-5124-988-7 (Book Chapters in edited book)	Government P.G College, Ambala Cantt	Daya Publishing House, A division of Astral International Pvt. Ltd., New Delhi
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# **Emerging Trends and Challenges in Biosciences**

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**Dr Kuldeep Yadav**

**Dr Shikha Jaggi**

**Dr Meenu Rathi**

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# Contents

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<i>Foreword</i>	v
<i>Preface</i>	vii
<b>1. Microbial Interactions in Mycorrhizosphere of Spices and their Significance for Sustainable Development</b>	1
<i>Esha Jangra, Anju Tanwar, Neetu and Ashok Aggarwal</i>	
<b>2. Enhanced Production of Cellulase and Xylanase Enzyme from <i>Bacillus Subtilis</i> by 'One-Factor-at-a-Time-Approach'</b>	25
<i>Chakarvati Sango and Jitender Sharma</i>	
<b>3. <i>In vitro</i> Study and Micropropagation of a Thaloid Liverwort: <i>Reboulia Hemisphaerica</i> (L.) Raddi.</b>	39
<i>Vishal Awasthi, Neerja Pande and Virendra Nath</i>	
<b>4. Effect of Reduced Tillage on Crop Yield and Nitrogen Use Efficiency in Rice-Wheat Systems in North-western India</b>	49
<i>Pushpa Devi, S. R. Gupta and Ashok Aggarwal</i>	
<b>5. Plant Growth Promoting Potential of Bacterial Endophytes From Medicinal Plants</b>	61
<i>Ram Kumar Pundir, Sandeep Bhat, Navpreet Kaur, Pranay Jain, Satish Kumar, Viraj K. Mishra and Rajesh Kumar</i>	
<b>6. Cytological Study on two Species of <i>Cymbopogon</i> Spreng.- A Grass with Medicinal Importance</b>	75
<i>Akshita Dhaliwal, Rajdeep Singh Dhaliwal &amp; R.C. Gupta</i>	
<b>7. Agro-biochemical Traits Variation in Indian Wheat Genotypes Grown Under Irrigated and Water Stress Field Conditions</b>	81
<i>Vandita Mittal, Sonia Sheoran and Narender Singh</i>	

- 
8. **Efficacy of Different Concentrations of Refinery Waste along with *Acaulospora laevis* on Growth Response and Mycorrhization of Maize, Barley and Wheat** 107  
*Neetu, Esha Jangra, Anju Tanwar and Ashok Aggarwal*
9. **Antibacterial Activity of Selected Bryophytes from Nainital, Uttarakhand, India** 121  
*Geetanjali Mehra, Ruchi Singh, Neeraj and Preeti Chaturvedi*
10. **Biochemical Traits for Cold Tolerance of Chickpea (*Cicer Arietinum* L.) Genotypes** 129  
*Mahesh Kumar, Neeraj Kumar, Parveen Kumar, Ajeev Kumar*
11. **Screening and Isolation of Potent Dye Decolorizing Bacteria from Textile Effluent** 141  
*Rashmi and Bindu Battan*
12. **Celiac Disease: Pathogenesis, Diagnosis, Treatment and Novel Therapeutics** 153  
*Ritu Saini, Harnek Singh Saini, Rajesh Kumar and Anjali Dahiya*
13. **Synergistic Effect of Arbuscular Mycorrhizal Fungi with *Trichoderma Viride* and *Pseudomonas Fluorescens* in Promoting Growth and Yield of Sunflower Plant for Sustainable Agriculture** 167  
*Alpa Yadav, Esha Jangra and Ashok Aggarwal*
14. **Tissue culture studies of *Tinospora cordifolia* using Different Explants** 181  
*Priti and Sulekha Rani*
15. **Phytochemical Constituents, Urease Inhibition and Antioxidant Effect of a Medicinal Plant: *Cyperus Rotundus*** 193  
*Neha Sikri and Sunita Dalal*
16. **Optimizing Production of Antimicrobial Compounds Isolated from Endophytic *Aspergillus* sp. Obtained from An Indian Medicinal Plant: *Syzygium Cumini* (L.) Skeels** 205  
*Priyanka Sharma and Pranay Jain*
17. **Production and Analysis of Various Attributes of Newly Synthesized Synbiotic Yoghurt Via Incorporation of An Indigenous Isolate of *Lactobacillus Acidophilus* and Inulin** 217  
*Suman Kandola, Meenu Rathi*
18. **Translation Initiation Regulation and Cancer: A Review** 225  
*Harnek Singh Saini and Ritu Saini, Rajesh Kumar, Anjali Dahiya*
19. **Assessing the Effect of GA3 Pretreatment and Postharvest Treatments on Quality of Spikes of *Polianthes Tuberosa* cv. Prajwal** 241  
*Pooja Rani and Narender Singh*

- 
20. **Nano-puerarin Disrupts Decidualization and Migratory Response of Human Endometrial Stromal Cells** 251  
*Ghungroo Saraswat, Aditya Konar, S.N. Kabir*
21. **Green Synthesis of Copper Nanoparticles and its Application as Antimicrobial Agent** 265  
*Abhishek Mehra, Archit Sharma and Deepak Kumar Malik*
22. **Carcinogenicity of Nickel: A Review** 273  
*Veena Vishwakarma, Sunil Kumar, Bharti Yadav, Ranjan Gupta, Neeraj K. Aggarwal and Anita Yadav*
23. **Eutrophication: A Causative Factor Behind Avian Species Decline at Regional Wetlands of Ambala, Haryana (India)** 285  
*Sarita Rana*
24. **Role of Rotifers in Water Quality Assessment** 295  
*Pooja Devi and Anita Bhatnagar*
25. **Biodiversity, Classification and Taxonomy of Arbuscular Mycorrhizal Fungi Associated with Some Spices of Haryana** 309  
*Esha Jangra, Ashok Aggarwal, Vipin Prakash and Alpa Yadav*
26. **Impact of Seed Priming with Sulfosalicylic Acid on Seed Germination and Seedlings Growth of Chickpea under different Salinity Conditions** 327  
*Savita and Somveer Jakhar*
27. **Standardization of Herbal Drugs: Challenges and Resolutions** 337  
*Prerna Sarup, Vipin Saini and Manisha Bhatia*
28. **Bioinformatics Tools in Drug Discovery** 349  
*Sangeeta Singh, Shilpi Verma, Swechha Mishra, Shikha Jaggi and Shruti Gupta*
29. **Nutraceuticals: An Emerging Era in Natural Product Studies** 369  
*Manisha Bhatia, Vipin Saini & Prerna Sarup*
30. **Response of Arbuscular Mycorrhizal Fungi and *Trichoderma Harzianum* on Growth and Flowering Attributes in *Calendula Officinalis* Linn.** 379  
*Karishma, Anju Tanwar, Kuldeep Yadav and Ashok Aggarwal*



# Chapter 1

## Microbial Interactions in Mycorrhizosphere of Spices and their Significance for Sustainable Development

Esha Jangra<sup>1\*</sup>, Anju Tanwar<sup>2</sup>, Neetu<sup>3</sup> and Ashok Aggarwal<sup>1</sup>

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### Abstract

Spices which have long been the basis of traditional medicine in many countries have also been the subject of study, particularly by the pharmaceutical, chemical and food industries, because of their potential use for improving health of human beings. To increase the production of various spices, different types of fertilizers and chemical fungicides are applied to increase the production of spices but these fertilizers and fungicides pollute the ecosystem and non-target organisms. Another way to increase the production of spices is the use of microorganisms as biofertilizers and arbuscular mycorrhizal fungi is one group of fungi which are being used as biofertilizer. AM fungi symbiosis help the spices in improving (i) rooting and plant establishment (ii) uptake of nutrients especially phosphorus (iii) nutrient cycling (iv) enhanced plant tolerance to biotic and abiotic stress and (v) improving the quality of soil. It is now clear that AMF are highly beneficial to spice cultivation and AMF inoculation must be an important factor for yield and higher biomass of spices. But a comprehensive effort to bring the literature together and provide information to how to make AM application more effective in spice cultivation is the need of the hour. Hence, an effort was made in this review article to collect information of different spices benefitted by its use and aspects of integration of AMF in spice cultivation system.

**Keywords:** Arbuscular mycorrhizal fungi, spices, nutrient uptake and biomass

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# Chapter 8

## Efficacy of Different Concentrations of Refinery Waste along with *Acaulospora laevis* on Growth Response and Mycorrhization of Maize, Barley and Wheat

Neetu<sup>1\*</sup>, Esha Jangra<sup>2</sup>, Anju Tanwar<sup>3</sup> and Ashok Aggarwal<sup>2</sup>

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### Abstract

A pot experiment was conducted to see the impact of arbuscular mycorrhizal (AM) fungi, i.e., *Acaulospora laevis* on maize (*Zea mays* L.), barley (*Hordeum vulgare* L.) and wheat (*Triticum aestivum* L.) with different concentrations of refinery waste i.e. without substrate, 25 g/pot, 50 g/pot, 75 g/pot, 100 g/pot and 200 g/pot with five replicates resulted in an effective plant height, shoot and root biomass, root length, per cent root colonization and AM spore number. Results pertaining to inoculum production of *Acaulospora laevis* with refinery waste as a substrate depicted that 25 g concentration of waste increased all growth parameters and mycorrhization of selected host plants. It was found that increasing in concentration of refinery waste decreases the plant growth and mycorrhization. Higher concentration (200g) of refinery waste was found to be inhibitory for plant growth and mycorrhization. All the inoculated host plants produced AM fungal spores and colonized roots, extramatrical and intraradical hyphae, arbuscules and vesicles. Formation of arbuscules facilitated the nutrient exchange between host plants and fungal symbionts.

**Keywords:** AM fungi, refinery waste, mycorrhization, growth response.

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# Chapter 30

## Response of Arbuscular Mycorrhizal Fungi and *Trichoderma Harzianum* on Growth and Flowering Attributes in *Calendula Officinalis* Linn.

Karishma<sup>1</sup>, Anju Tanwar<sup>2</sup>, Kuldeep Yadav<sup>3</sup> and Ashok Aggarwal<sup>1,\*</sup>

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### Abstract

An experiment was conducted under polyhouse condition to find out the response of dominating AM fungi (*Glomus mosseae* & *Acaulospora laevis*) and *Trichoderma harzianum* on growth and flowering in *Calendula officinalis* Linn. Among all the growth parameters, maximum shoot length was recorded with dual treatment of *T. harzianum* plus *A. laevis* while maximum bud formation was noticed in dual treatment of *G. mosseae* + *A. laevis*. However, all the treatment showed significant effect in all parameters in comparison to the control. The vase life under different treatments was found to be maximum up to 12 days with *A. laevis* treatment. Therefore, AM fungal treatment has not only improved the growth parameters but has also increased the vase life of the *Calendula* crop.

**Keywords:** *Calendula officinalis*, *Glomus mosseae*, *Acaulospora laevis*, *T. harzianum*.

### 1. Introduction

*Calendula officinalis*, known as Pot Marigold or Scotch Marigold, is a winter season annual grown for its loose and cut flowers owing to its orange- yellow coloured flowers, which makes very good indoor arrangements. Medicinally, it is used for the

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PP101 APPLICATIONS OF GOLD NANOPARTICLES DUE TO OPTICAL RESPONSE

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Nanoparticles (NPs) make exciting building blocks for nanostructured materials and devices. Nanostructured materials offer diverse applications in electronics, optoelectronic, energy, catalysts, medicine, and life science due to their unique chemical, physical, optical and electronic properties. Some of the interesting applications are new age bioelectronics, conversion of agricultural and food wastes to energy through enzymatic nano bioprocessing, chemical sensors, cleaning of water etc. Understanding of the optical properties of metal Nps, are important for developing optoelectronic applications. While the large diameter metal NPs exhibit strong light-scattering in the visible region, the small NPs can produce enhanced light-scattering signals on aggregation.

Gold nanoparticles (AuNPs) have unique structural, electronic, magnetic, optical and catalytic properties and also exhibit excellent biocompatibility which have made them a very attractive material for biosensor, chemisensor and catalysis. The dependence of these properties on the physical structure of gold Nps is the key to their wide range applications. One of the most dramatic and useful property of gold is its interaction with light. The practice of using gold nanoparticles in giving red color to stained glass is hundred year old phenomenon. When a light falls on gold nanoparticle, a strong absorption and/or scattering occurs at specific resonant wavelengths known as surface plasmon resonance (SPR). This is the origin of many of the new applications of nanoscale





gold particles. AuNPs demonstrate strong light absorption and scattering properties in the visible and near-infrared (NIR) regions because of surface plasmon resonance (SPR). In this review we will discuss the applications of optical response of Gold Nps in cancer cell imaging, as energy conversion systems and design of novel photon-based devices for sensing and drug delivery.

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# **TOURISM AND SUSTAINABLE DEVELOPMENT**

Issues, Challenges and Best Practices

**Editors**

**Dr. Sheker Naik | Dr. Joseph P.D.**



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**MANGALORE UNIVERSITY**  
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# Contents

◆ Foreword	v
◆ Acknowledgement	vii
◆ Board of Reviewers	viii
◆ Editorial Note	ix
<hr/>	
1. <b>Governance and Role of Local Government in Sustainable Tourism Development of the Destination</b> <i>Neema Mary K.J. and Dr. Remya Ramachandran</i>	1
2. <b>Impact of Tourism on Economic Growth and CO<sub>2</sub> Emissions: Evidence from India</b> <i>Shivashankar Vantepaka</i>	9
3. <b>Tourism and Economic Growth in India: An Empirical Analysis</b> <i>Mallaiah Jalle and Narasimha Rao Jadi</i>	13
4. <b>Comparison of Ridge Regression, Lasso and Elastic Net Regression Methods in Tourism Demand</b> <i>Kadek Jemmy Waciko and Ismail B.</i>	19
5. <b>Ecotourism Potential of Kuduremukh Landscape Region with the Involvement of Local Communities</b> <i>Ganesh Bhat and Sreepada K.S.</i>	27
6. <b>Destination Micro Circuit Marketing: The Case Study of Thrissur Circuit Tourism (TCT)</b> <i>Mahadevan P. and Binosh Kunjappan</i>	32
7. <b>A Study on Service Quality and Satisfaction of Tourists in Goa</b> <i>Dr. (CA) Subrahmanya Bhat and Ms. Shilpa D. Korde</i>	40
8. <b>A Study of the Laws Relating to Environment and Tourism in India</b> <i>Smt. Shubhalakshmi P.</i>	48
9. <b>Avenues, Issues and Prospects in Promoting Mangalore as a Medical Tourism Destination</b> <i>Dr. Preethi Keerthi DSouza and Mrs. P.V. Sumitha</i>	56
10. <b>Visitor Management: Key for Sustainable Tourism Development</b> <i>Dr. Rajeev Sharma, Dr. Naveen Kumar and Parveen Ranga</i>	65
11. <b>A Study on Relationship between Economic, Environmental and Socio-cultural Sustainability of Wildlife Resorts</b> <i>Nagarjuna G. and Dr. Joby Thomas</i>	73
12. <b>Green Carpet Scheme of Kerala Tourism: An Evaluation Study</b> <i>Binosh Kunjappan and Mahadevan P.</i>	82
13. <b>Impact of Tourism on Income Inequality in India</b> <i>Daravathu Venkata Ramana and Narasimha Rao Jadi</i>	87

14. **A Study on the Impact of Houseboat Tourism and its Sustainable Development with Special Reference to Alappuzha, Kerala**  
*Neepa Premodh* 91
15. **Ecotourism Perspective of Pilikula Biological Park, Dakshina Kannada, Karnataka, India**  
*Jerald Vikram Lobo and K.S. Sreepada* 99
16. **Acceptance of Blockchain Technology in Tourism and Hospitality Industry: Results from UTAUT Model**  
*Dr. Jeganathan Gomathi Sankar, M. Venkat Sai Dwarak and M. Rajeswari* 106
17. **Reviewing the Conceptual Clarity Regarding Farm and Agri Tourism**  
*Joby George and Dr. Sindhu R. Babu* 112
18. **Natural Calamities and Impacts on Tourism: A Study on the Post Flood Issues and Strategies in Wayanad Tourism**  
*Devika P., Seleena Antony and Basil* 118
19. **Strategic Approaches to Implement an Innovative Paradigm for Smart Tourism and Sustainable Development**  
*Bhat S. Sneha Ganesh* 125
20. **How Far the Wildlife Tourism Activities are from Sustainable Tourism? A Reality Check on the Sustainability of Ecotourism in Wayanad Wildlife Sanctuary**  
*Sebina Roy, V.P. Nithin and Jiya Roy* 134
21. **Beach users' Perceptions toward Beach Quality and Crowding: A Comparative Study among Top Beaches in Udupi and Dakshina Kannada District**  
*Sanath Kumar K., Naveenkumar K., Abhinandan and Yatheen* 142
22. **Role of Local Stakeholders in the Development of a Tourist Destination—A Critical Study of the Blue City, Jodhpur Rajasthan**  
*Mahesh Kumar Bairwa and Rajni Kumari* 153
23. **Blockchain Technology: A Revolution in Travel and Tourism Industry a Comparative Study**  
*Bhuvana R., Madhushree L.M. and P.S. Aithal* 165
24. **Impact of Tourism on Economic Development in Kodagu District of Karnataka**  
*Kavya M.B.* 174
25. **A Case Study on Sustainable Tourism along the Coromandel Coast**  
*A. Vaishnavi and M.S. Karthigeyan* 185
26. **A Descriptive Study of Folklore as a Paradigm for Sustainable Tourism Development**  
*Shelji Mathew and Divya Das* 191
27. **Community based Tourism for Sustainable Tourism Development: A Case Study of K.R. Nagar Taluk, Mysore Dist, Karnataka**  
*Ar. Uma S.M.* 199

AUTHOR INDEX 207

# Visitor Management: Key for Sustainable Tourism Development

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**Abstract:** Sustainable development is the buzz word in present world. Term 'sustainable' is not so old and began to use and follow at large scale from past 30 to 40 years in almost every field. Sustainable development implies fulfilling present and future needs by saving resources. In case of tourism it has acquired the centre position in the form of sustainable tourism. Sustainable tourism aims to have the full account of its present as well as future impacts on economy, society and natural environment while focusing on the needs of tourists, industry, nature and local communities. Among these stakeholders visitor enjoys the top position while the other three i.e. industry, environment and host community are on receiving hand. As visitor is always on giving side by incurring expenditure, in most of the cases he is considered as the sole cause for creating negative impacts on all three dimensions of environment if not planned well. There are various ways to mitigate these impacts and to achieve the goal of sustainable tourism development. One such attempt is visitor management.

Visitor Management is a component of destination management that can be applied at all parts of destination. It focuses on managing the visitors at destination in such a way that it control, influence and mitigate the negative impacts without compromising the visitor experience and service quality. Principles of visitor management can be applied in all tourist setting be it protected or conserved area, heritage sites and monuments, festival and events etc. This paper tries to identify all the possible strategies that can be adopted to achieve the aim of visitor management further leading to sustainable tourism development.

**Keywords:** Visitor Management, Sustainability, Sustainable Tourism Development

## 1. Introduction

'Sustainable' is self explanatory in itself. It is made up of two words 'sustain'+ 'able', which means adopting and evolving such practices which use resources in such a way that it can be preserved or conserved for future. Human must adopt such lifestyle and development path that respects and works within nature limits. Though term sustainable has evolved just few decades ago, but its principles were followed long ago since ancient times. However its extent was very limited and implied in different horizons viz. natural and socio-cultural sphere separately like planning of cities by Romans, traditional agricultural system etc. Industrial revolution and technological inventions led to the development, but that comes with economic and social change and deterioration of natural environment. These changes and emerging

problems cautioned the every section of society and by one way or another everyone tries to mitigate these problems separately. But these alternatives were not able to find out the main cause of these different problems. Soon it becomes necessary to look after these impacts in broad sense which leads to the emergence of idea of sustainable development.

## 2. Sustainable Development

Sustainable development can be defined in various ways but the most common and frequently used definition is the one provided by World Commission on Environment and Development (WCED) in its report *Our Common Future* popularly called as Brundtland report (1987) i.e. *"Sustainable development is the development that meets the needs of the present without compromising the ability of future generations to meet their own needs."* It can be achieved without compromising with the adoption of modern technologies but within the limits of nature. On one hand we fulfill the human requirement of improving his lifestyles and feeling of well-being and on other hand conserving the natural ecosystems and resources, which are the need of present but on them there is equal right of future generations too in order to enjoy the quality life. For eg. Walking/ cycling for short trips not only save money but also improve health. Instead of driving it is also sometimes quick and convenient too. Thus sustainable development is the process of maintaining a delicate balance between present and future needs. The principle of sustainability is to care the mother earth and sharing with other people. Humanity must not take that much from nature than it cannot replenish.

Sustainable development is interpreted differently by everyone. Often it is limited only upto natural environment. But sustainable development is much broader concept. It is also about strong and healthy society. Meaning thereby, meeting the diverse needs of all existing and future communities, promoting personal wellbeing, social cohesion and inclusion and creating equal opportunity. In terms of economics, sustainable development is an economic process in which the quality and quantity of our stock of natural resources (like forests, non renewable resources etc.) and the integrity of biogeochemical cycles (like climate, water cycle, food cycle etc.) are sustained and passed on to the future generations. In terms of financial accounting there is no depreciation in the world's natural capital.

Sustainable development Components as described by Murphy (1995) are:

- Establishing ecological limits and more equitable standards
- Redistribution of economic activities and reallocation of resources.
- Population Control
- Conservation of basic resources
- Carrying capacity and sustainable yield
- Retention of resources
- Diversification of species
- Minimize adverse impact
- Community control
- Broad National/International policy framework
- Environmental Quality and Audit



However, achieving sustainability is not so easy. Here, when we talk about conserving resources while meeting our present demand, it should be noticed that who is controlling them. Sustainability can only be possible when control of resources is in the hands of local communities to a large extent who are dependent on these resources. Moreover decision-making within the community should be participatory, open and self-governing as much as possible. The more this happens, the more we will be able to achieve sustainability.

### 3. Sustainable Tourism Development

Several Researchers denies the attempt to define the Sustainable tourism as it tends to limit the range of issues to be covered under the heading of sustainable tourism. According to UNWTO (2004), "Sustainable tourism is that form of tourism which meets the needs of tourists and host regions while protecting and enhancing opportunity for the future." Tourism development should be economically, socio-culturally and environmentally sustainable. The intent of sustainable tourism is to maintain the economic and social benefits of tourism development while reducing adverse negative impacts on the socio-cultural and natural environment. This can only be achieved by maintaining the balance between the needs of tourists with the destination. Focus is towards positive experience for locals, industries and tourists. Sustainable tourism take full advantage of the positive contribution of tourism to biodiversity conservation and accomplishment of common goal towards sustainable development. It provides vital economic incentives for poverty reduction, habitat protection and much more. Revenue received from tourist is channelized back to the destination into the form of preservation of heritage and nature and capacity building programs for local communities.

Sustainable tourism development requires the positive contribution from all stakeholders. Strong political will is also required to ensure wider involvement and consensus building. Achieving sustainable tourism is a continuous process and it requires constant monitoring of impacts, introducing the necessary preventive and/or corrective measures whenever necessary. Sustainable tourism should also maintain a high level of tourist satisfaction and ensure a meaningful experience to the tourists, raising their awareness about sustainability issues and promoting sustainable tourism practices amongst them. Thus it can be said that all key stakeholders are equally responsible for the sustainable development of tourism. If any one of them is not playing its part well, the sustainability can't be achieved. These stakeholders are interrelated to each other and good coordination is required among them for successful development. Major stakeholders in tourism are shown in figure.

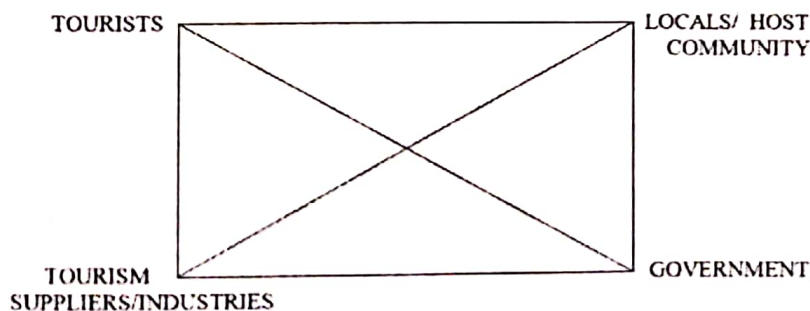


Fig. 1: Stakeholders in Tourism

Source: Developed by researcher

### **3.1 Tourist**

Tourist is the major stakeholder in tourism, as he spends his hard earned money for travel. There is no use of any such development if tourists not visit at destination. He must be satisfied with his travel purchase. But often to satisfy his need, he indulges in such activities at the destination which has negative impact on the society and natural resources of that destination. Therefore, it is the responsibility of tourists to perform a positive role to achieve the goal of sustainable development. Responsible tourism is one such strategy which helps in making tourist go for more sustainable travel.

### **3.2 Locals/ Host Community**

It is one of the important stakeholders. However its investment is very difficult to ascertain in monetary term as its culture, environment is on stake during tourism development. Cultural loss and degradation, commoditification etc. are some of the negative impacts visible in case of unplanned tourism development. Here, it is noticeable that sometime even locals are responsible for the negative impacts as they go for monetary benefits and didn't look after the causal effect. Rural tourism is one such strategy to look after this, where one can get monetary benefit while conserving the culture.

### **3.3 Government**

Government is responsible for the policy and planning aspect. Government willpower will decide whether tourism will develop at destination or not. It helps in development of infrastructure at destination upon which other facilities can be developed. Government policies and plans should be sustainable, so that overall aim of achieving sustainability can be achieved.

### **3.4 Tourism Suppliers (Hotels, Travel Agencies, Investors, etc.)**

These are the private sector players that are responsible for the development of superstructure on the available infrastructure like transportation, travel agencies, hotels etc. As huge sum of investment is done for development and everyone require good rate of return on investment. But it is their duty to earn profit in such way that sustainability can be achieved in their practices like ecotels, accessible tourism for all etc.

## **4. Rationale for Sustainable Tourism**

At Globe 90 conference at Vancouver following benefits of sustainable tourism were identified:

- It focuses on developing the understanding regarding the impacts of tourism on the natural and socio-cultural environments.
- It ensures a fair distribution of benefits and costs.
- Tourism generates local employment both directly in the tourism sector, and in various support and resource management sectors.
- Tourism stimulates profitable domestic industries-hotels and other lodging facilities, restaurants and other food services, transportation systems, handicrafts and guide services.

- Tourism generates foreign exchange for the country, and injects capital and new money into the local economy
- Tourism diversifies the local economy, particularly in rural areas where agricultural employment may be insufficient.
- Sustainable tourism seeks decision making among all segments of the society, including local populations, so that tourism and other resources users can coexist. It incorporates planning and zoning which ensure tourism development appropriate to the carrying capacity of the ecosystem.
- Tourism stimulates improvement to local transportation, communications and other basic community infrastructures.
- Tourism creates recreational facilities which can be used by local communities as well as domestic and international visitors. It also encourages and helps pay for the preservation of archaeological sites and historical buildings and districts.
- Nature tourism encourages productive use of lands which are marginal for agriculture, enabling large tracts to remain covered in natural vegetation.
- Cultural tourism enhances local community esteem and provides the opportunity for greater understanding and communication among people of diverse backgrounds.
- Environmentally sustainable tourism demonstrates the importance of natural and cultural resources to a community's economic and social well being and can help to preserve them.
- Sustainable tourism monitors, assesses and manages the impact of tourism, develop reliable methods of environmental accountability and counters any negative effect.

## 5. Visitor Management

Over last few decades more emphasis is given on the use of visitor management. It is due to increase in population at global level followed by increase in international tourism. This is just against the principle of sustainability. Therefore visitor management is the best tool that can be employed to mitigate the impacts and develop sustainable tourism. There are various visitor management techniques. These can be broadly classified into four strategic approaches. These are:

- Managing the Impacts
- Managing the Resources
- Managing the Demand
- Managing the Supply

### 5.1 Strategies for Visitor Management

#### 5.1.1 Responsible Tourism/ Tourist Education

Various researchers emphasize on the need of educating tourists, so that they are more concerned and responsible towards his footprints at the destination. In Cape Town Declaration (2002), responsible tourism is identified as one such form of tourism that can achieve the goal of sustainability in tourism. Responsible tourism is basically a philosophy which can be

inscribed in various form of tourism. It is more inclined towards the tourist activities in host region. The key features of responsible tourism are:

- Minimizes negative physical, social, economic, behavioral and psychological impacts.
- Generates greater economic benefits for local people and enhances the well-being of host communities
- Makes positive contributions to the conservation of natural and cultural heritage embracing diversity
- Provides more enjoyable experiences for tourists through more meaningful connections with local people, and a greater understanding of local cultural, social and environmental issues
- Provides access for physically challenged people

### 5.1.2 Ecotourism

It is defined as "Responsible travel to natural areas that conserves the environment, sustains the well-being of the local people, and involves interpretation and education" (TIES, 2015). According to IUCN (1996), "*Ecotourism is environmentally responsible travel and visitation to relatively undisturbed natural areas, in order to enjoy, study and appreciate nature (and any accompanying cultural features – both past and present), that promotes conservation, has low visitor impact, and provides for beneficially active socio-economic involvement of local populations. Ecotourism is about uniting conservation, communities, and sustainable travel.*" It means that following principles should be adopted and implemented in ecotourism activities.

- It should develop awareness and respect regarding cultural and natural environment.
- Provide monetary benefits for preservation and conservation.
- Generate economical benefits for host community as well as private industry.
- Deliver positive and memorable interpretative experiences to visitors that help raise sensitivity towards host community. Thus helping both locals and tourists.
- Design, construct and operate low-impact facilities.
- Recognize the rights and spiritual beliefs of the Indigenous People in host community and work in partnership with them to create empowerment.

## 6. Tourism Carrying Capacity

Tourism carrying capacity is often considered as obsolete approach to managing visitors. But it can be widely used in natural environment especially protected areas. Middleton and Hawkins Chamberlain (1998) define it as "the level of human activity an area can accommodate without the area deteriorating, the resident community being adversely affected or the quality of visitors experience declining." But all these things don't go side by side without tourist and visitor education. There are several types of carrying capacity.

### 6.1 Physical Carrying Capacity

This is the maximum number of tourists that can be physically accommodated in an area at any given time and still allow other visitors to move easily. This is normally assumed to be around 1m per person but varies from landscape to landscape.

## 6.2 Biophysical Carrying Capacity

This is associated with the extent to which the interference of tourists can be tolerated by the natural environment before the damage begins.

## 6.3 Economic Carrying Capacity

This is related to level of acceptable change within the local economy of a tourist destination. The number of tourist that can be welcomed and the extent to which a tourist destination is able to accommodate tourist economic functions before local community starts to suffer economic problem.

## 6.4 Social Carrying Capacity

The number and quality of visitors that can be welcomed beyond which social disruption or cultural damage will occur. It can be best understood by DOXEY Index of Irritation.

Carrying capacity is dependent on various factors.

Alien Factors	Local Factors
<ul style="list-style-type: none"> <li>• These factors are tourist related factors and particularly related to individual tourist and his environment.</li> <li>• Volume of tourist</li> <li>• Characteristic of the tourist</li> <li>• Length of stay etc.</li> </ul>	<ul style="list-style-type: none"> <li>• These factors are related to the destination visited by the tourist.</li> <li>• Fragility of the Environment</li> <li>• Social structure of the host population</li> <li>• Economic Structure</li> <li>• Availability of local resources etc.</li> </ul>

## 7. De-Marketing

This concept was coined by Phillips Kotler. It is an attempt made to discourage consumers from buying a certain product. Here it is evident that it is just discouraging demand not destroying it. It is due to reasons that supply cannot meet the demand; cost of advertising is extremely high; to reduce the effect of seasonality; crisis management and for conserving the resources. For eg. Five star hotels in order to maintain exclusivity encourage such activities that discourage the common man from using their services.

## 8. Conclusion

Visitor Management is one of the widely used tools for the development of sustainable tourism. However it is not the single one and it is always used in conjunction with other various methods like Fair Pricing by which demand can be managed and money can be channelized. Using sustainable mode of transportation often called as green transport by improving the efficiency and changing the pattern and volume. Giving more emphasis on community involvement and local control and identifying the role and responsibility of public and private sector. However it is also a point that tourism is inherently unsustainable. Therefore it is quiet difficult but not impossible to make it sustainable.

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# Contents

<i>Preface</i>	v
<i>List of Figures</i>	xv
<i>List of Plates</i>	xvii
<i>List of Contributors</i>	xxi

## Section - I : Archaeology

1. Archaeology of the River Saraswati  
-*Ashwani Asthana* 3
2. Ceramic Assemblage of the Protohistoric Haryana:  
with Special Reference to the Harappan Culture in the  
Chautang Basin  
- *Tejas Garge* 63
3. The Mystery of Copper Anthropomorphic Figures  
Identity Resolved by the Therio-Anthropomorphic  
Figure Found from Kheri-Gujjar, Tehsil Gannur,  
distt. Sonapat, Haryana  
- *Arvind Rautela & J. Manuel* 93
4. Archaeological Investigations in Hodal Area of  
District Palwal, Haryana: With Special Emphasis  
on the Ancient Site of Saundh  
- *Vinay Kumar Gupta* 101

5. Settlement Planning and Structural Remains of Early Harappan Sites of Kot Diji – Sothi Complex 111  
- *Vinay Kumar*
6. Reflection on the Archaeology of Sahibi (Sabi) River Valley: An Attempt 127  
- *Vineet Godhal and Vijay Kumar*

### **Section - II : Ancient**

7. Importance of Haryana in Ancient Historical Context 141  
- *Rajesh Sharma & Rajender Kumar*
8. Earthen Gods of Agroha 149  
- *Devendra Handa*
9. Gleanings in Corporate Life of Ancient Haryana from Seals 165  
- *Yasvir Singh*
10. Jainism in Haryana: Archaeological Evidence 169  
- *S. K. Vashishth*

### **Section - III : Medieval**

11. The Tomb of Ibrahim Sur: Epigraphs and Implications 177  
- *Catherine B. Asher*
12. Sheikh Sharfuddin Bu Ali Qalander's Contribution for the Development of Society and Culture in Panipat during 13th Century. 191  
- *S.M. Azizuddin Husain*
13. Mosques of Babur's Reign in Haryana: An Epigraphic Study (1526 - 30 CE) 207  
- *R. Nath*

14. The Persian Inscriptions from Haryana: A Survey  
- *Jagdish Parshad* 221
15. Water Architecture in Medieval India: A Study of  
Mirza Ali Jan's Takht and Jal Mahal at Narnaul  
- *Hitender Kumar* 243

### Section - IV : Culture and Heritage

16. The *Nāth* Yogis of Bābā Mastnāth Monastery:  
Their Religion and Art  
- *Anjali Duhan Gulia* 255
17. Kurukshetra: A Symbol of Composite Culture  
- *Atul Yadav* 281
18. The Traditional Sentiment of *Izzat* in Haryanvi Society  
- *Virender Singh Dhillon* 291
19. *Bahis* of *Pandas* as a Source of Historical Writings  
- *Isha Kumari* 301
20. Inventorying Intangible Cultural Heritage: An urgent  
need to safeguard ICH in Haryana  
- *Kushal Parkash* 311
21. Civil Disobedience Movement in Rohtak  
- *Mahender Singh* 317

### Plates

## Kurukshetra: A Symbol of Composite Culture

Atul Yadav\*

**K**urukshetra is a place revered all over India for its sanctity and great cultural heritage. Amidst the halo of myths and realities that shroud around it, it has alluded attention since its earliest times as a famous place of pilgrimage. It is the cradle of Vedic civilization, religion, philosophy and a great centre for learning. Discovering Kurukshetra by itself is a great pleasure as it enlightens the individual, the moral value and the meaning of life. It has appealed to everyone irrespective of his faith, creed, and cult.

Kurukshetra (29 58'; 76 50') lies 160 km from Delhi, 112 km from Chandigarh and about 5 km from Pipli on National Highway I (one) of the Delhi- Ambala stretch, is popularly known as the battleground of the epic *Mahabharata*, where the battle was fought between the two diametrically opposite and contradictory forces of good and evil. Eventually, in this battle, the forces of piety were rewarded and the evils were vanquished in the land of righteousness called Kurukshetra.<sup>1</sup> The battle of *Mahabharata* which was fought here towards the close of *Rigvedic* Period was an epoch-making event. This battle and *Bhagwadgita*

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occupy a special place in the life of the nation. There has been much controversy and speculation among the scholars on the historicity and date of the battle. The controversy has arisen due to the conflicting nature of the evidence- literary, archeological and astronomical. However, critical and comparative studies of these sources lead to a responsible inference that the battle was fought in all probability between 1200-1000 BCE.

Kurukshetra is more popularly known as a *tirtha* or pilgrimage. It is revered as the *tirtha* par excellence. The word *tirtha* means to float or it symbolises liberation of soul hence it is quite obvious the land ought to be associated with water and water bodies. In ancient time, the land was situated on the bank of *Sarasvati*. The water of *Sarasvati* has a greater sanctity not only for its spiritual benefit but also for its cultural fervor as on its ancient banks the *Sarasvati* valley civilization got incepted and flourished. The *Vedic* hymns<sup>2</sup> got conceived and chanted in the sacred ambience of *Sarasvati*. Archaeological findings unearthed from various excavated sites bear eloquent testimony to the past civilization that flourished here. The *Kauravas* and *Pandavas* were the descendants of one common ancestor called Kuru, who is considered the founder of the land. King *Kuru*, by practicing austere penance made this land righteous; hence, this land was called Dharmakshetra.<sup>3</sup>

History remembers the event Mahabharata not for its mundane warfare but for its philosophical treatise i.e. *Bhagavadgita*, which was expounded here in this sacred land by Lord Krishna for the humanity. Irrespective of the caste, creed faith, time and space people respected it as it is meant for every individual who confronts various crises every moment. It is *Gita* that provides them an appropriate solution to overcome<sup>4</sup> those crises. Even today, it has immense relevance as it shows the guideline to live a truly human life.

The earliest reference of Kurukshetra has been found in the *Taittiriya Aranyaka* of *Krishna Yajurveda* and *Satapatha Brahmana*. In the text of *Mahabharata* Kurukshetra has been identified as *Samantpanchaka* consisting of a land spread over twenty *Yojna* and situated between the two sacred rivers viz *Sarasvati* on the north and *Drishadvati* on the south bounded by four door keepers or *Yakshas* at four cardinal corners viz., *Rantuk Yaksha* at *Bid Pipli* (Kurukshetra) on the North-East, *Arantuk Yaksha* at *Behar Jakh* (between Patiala and Kaithal) on the north-west, *Kapil Yaksha* at *Pokhar Kheri* (Jind) on the south-west and *Manchakruk*

*Yaksha* at *Sinkh* (Panipat) on the South-East, as has been identified by Sir Alexander Cunningham. Popularly the area of Kurukshetra is called 48 Kos Kurukshetra *Bhumi* or a perimeter of 48 Kos or  $48 \times 4 = 192$  Kos equivalent to 378 Kilometers or approximately 94 Kilometers on each side for circumambulating the *Tirthas*. Geographically the ancient Kurukshetra comprises present revenue districts viz. Kurukshetra, Kaithal, Karnal, Jind and a little portion of Panipat.<sup>5</sup> In and around the region were located 360 pilgrimages. However, with the passage of time due to the onslaught of climatic conditions, negligence in up keeping and perpetual foreign invasions during medieval times some of the *Tirthas*, temples, and icons either have been lost in the oblivion or buried under the soil. Nevertheless, there still exist more than 150 important tirthas or pilgrimages bearing great reverence and merit. Just by remembering the name of Kurukshetra the individual can attain the highest salvation so says the 1600 years old inscription found at Laos (a South-East Asian Country bordering Cambodia and Thailand). It gives a vivid description about the merits of visiting this holy land.

The antiquity of Kurukshetra is, however, much older than the epic *Mahabharata*. Hence, it is obvious that the land Kurukshetra holds a history older than the epic. History of this land is five thousand years old as can be comprehended from its material remains unearthed from the excavations carried out at various archeological sites in and around Kurukshetra. Kurukshetra is not simply famous for the battle of *Mahabharata* but alluded as the pilgrimage<sup>6</sup> par excellence which has been visited by millions of people irrespective of their caste, creed etc.

## PILGRIMAGE HERITAGE

Pilgrimage, in general, can be defined as a journey to a holy place or shrine with the primary object of obtaining some favors-material, moral or spiritual, which the sanctity of the chosen spot is thought to confer. The concept of 'four *Dhams*' (*Badrinath* in North, *Rameshwaram* in the South, *Dwaraka* in the West and *Puri* in the East) located in the four extremities of India establishes the patterns and traditions of pilgrimage thus, proving to be a social integrator<sup>7</sup> and promoter of national unity besides the attainment of divine goals. Pilgrimage in the modern times has become a much sought-after destination primarily because of two reasons.<sup>8</sup> One, a visit to pilgrimage centers establishes a sense of affiliation with the religion thus, bestowing an exclusive identity to its followers. Secondly, it provides a reprieve from the side-effects of industrialization



and modernization. The popularity of pilgrimage centers in India owes its justification in these two contexts.<sup>9</sup> In essence, pilgrimage is a human quest-religious and philosophical in nature-that looks into human life beyond the material world. Almost all religions of the world follow a list of sacred places that associates the people with the precepts and persons of respective religion. The tradition of pilgrimage is quite ancient in India. The Vedic literature carries the references of divine status of the rivers like 'Saraswati.' The waters of the mythological rivers, the Ganges, the Yamuna and the *Saraswati* especially at their confluence were believed to have been endowed with special merit and purificatory values.<sup>10</sup> In the course of further expansion of the concept of pilgrimage, a number of places acquired divinity whose religious prowess is widely covered in the *Smriti* and *Pauranic* literature. The *Vishnu-Smriti* gives an exhaustive list of the 'Tirthas' spread over the whole of India. It also recommends 'Tirth-Yatra' which is equated with the 'Asvmedha-Yajna' as a means of expiation of all sins. The concept of 'Four-Dhamas' also gives rise to the concept of tourism as people, during the course of long journeys of 'Four-Dhamas', travelled long distances and made use of the contemporary transportation and accommodation means. In the modern times, the same spirit of pilgrimage tourism can be seen as prevailing with the only difference that travels and stays have become more defined, systematic and comfortable.<sup>11</sup>

### CENTRE OF COMPOSITE CULTURE

The land of Kurukshetra has the privilege of being the home of Indian Spiritual. The philosophy of Gita which was exposed at Kurukshetra was not a sudden and isolated creation but had behind it centuries of deep meditation and a speculation nurtured since the *Vedas*, the *Brahmanas*, the *Aranyakas* and the *Upanishads*. Kurukshetra was visited several times by many great souls and social reformers such as Bhagwan Mahavir, Lord Buddha, all the ten Sikh Gurus, famous Sufi Saints Shaikh Chehli and Baba Farid to name a few. Historians and travellers have adored this land in their records. Varahmihir, the great astronomer, has referred to the effect of the solar eclipse in his book *Brihatsamhita* dated 4<sup>th</sup> century CE. According to *Matsya Purana*, a visit to Kurukshetra on the day of solar eclipse brings great bliss. Heiun Tsang, the Chinese pilgrim who visited Kurukshetra during the reign of Harsha Vardhan, writes, 'in that country of gaiety and plenty, people were good natured, hospitable and magnanimous, devoted to their duties.' Al-Beruni in 11<sup>th</sup> century CE wrote about this

land in his accounts called Kitab-ul-Hind and Akbar's court writer Abul Fazl compared the tank of Kurukshetra with that of a 'miniature sea.'<sup>12</sup>

This virtually testifies that how the spiritual land had attracted everyone irrespective of their faiths and beliefs. The existence of Temples, *Maquabaras* (Tombs), Mosques, Stupas and Gurudwaras within this holy land (Thanesar) testimonies the visit of all those saints to this holy land.<sup>13</sup>

Kurukshetra (Thanesar) is a symbol of composite culture or it can be really called the live example of Unity in Diversity where a person can see or listen to *Aarti* in the temple, *Azan* in Mosque and *Gurbani* in a Gurudwara. All these religious centers are situated nearby to one another. The famous Sthaneshwar Mahadeva Temple and Gurudwara 9th *Patshahi* shares a common pond.<sup>14</sup>

The Bhakti movement in the Pre-Christian era had a tremendous impact on image worship concept. Resultantly like any other religious centers in Kurukshetra various architectural and sculptural activities got flourished. Temples were constructed, icons were sculptured and religious tanks got excavated with their bathing *Ghats* at various *Tirthas* of Kurukshetra. Most of those were lost with the passage of time and a few of those in their mutilated forms have survived that we find today in the vicinity of Kurukshetra.<sup>15</sup>

The antiquity of Kurukshetra dates back to the time of Indus (Saraswati) Civilization (C.3200-1700 BCE). There are many archaeological sites of immense historical and cultural importance within the 48 Kos Kurukshetra region such as Balu (Kaithal), a Pre- Indus Saraswati site (C. 2900-1700 BCE) on the bank of river *Apaya* or *Apaga*, a tributary of *Saraswati*, Bhagwanpura (Kurukshetra), a unique site showing the interlocking phase of Indus and painted Grey Ware culture identified as the culture of *Mahabharata* period on the right bank of the river *Saraswati* (1700-1300 BCE), Daulatpur (Kurukshetra), a site yielding the antiquity from Late Indus to Medieval Period, Mirjapur (Kurukshetra) another late Indus site along with the historical deposits from Kushan to Medieval period, Raja Karan Ka Qila (Kurukshetra) represented by Northern Black Polished Ware to Medieval times (800 BCE to 1600 BCE). Thanesar (Kurukshetra), the ancient capital of Harsha Vardhan<sup>16</sup> of the *Pushyabhutis*, bearing antiquity uninterruptedly from the Pre-Kushana to Late Medieval period. The scientific excavations of these sites have revealed the story of Kurukshetra, the cradle of Indian civilization. The artifacts, broken earthenware, ruins of buildings, stone

sculptures and temples and murals reported from various *Tiraths* and archeological sites throw eloquent light on the cultural heritage of the regions from its earliest time to the modern period. Throughout its history, it has been an important centre for art, culture, and religion.<sup>17</sup>

The glory of the land had even reached the south East Asian countries. In the country of Laos lies a historical seat named Vat Luong Kan, where lies one structure bearing an inscription dating back to the second half of the 5<sup>th</sup> century BCE. It begins with an invocation to Brahma, Vishnu, and Shiva. It mentions the greatness of a holy place named Kurukshetra.<sup>18</sup> It also testifies to the fact that the King of Laos, Devanika wanted to build a city called new Kurukshetra.

### KURUKSHETRA UTSAV GEETA JAYANTI SAMAROH

Kurukshetra has a special privilege of celebrating a unique festival to commemorate the birth anniversary of the song celestial the *Bhagavadgita* christened as Kurukshetra *Utsav Gita Jayanti Samaroha*. Kurukshetra Development Board along with the participation of the North Zone Cultural Centre, Public Relations & Cultural Affairs Department Haryana and Haryana Tourism has been celebrating the event of Geeta Jayanti on the banks of famous *Brahamsarovar* since 1989. The festival is celebrated at Kurukshetra for its association with *Bhagavadgita* that was born here at the outset of the battle of *Mahabharata*, on the 11<sup>th</sup> day of the bright moon fortnight (*Shukla Ekadasi*) in the month of *Margshirsh* (November-December according to the lunar calendar). These were the eternal words delivered by Lord Krishna to awaken Arjuna while the latter expressed his reluctance to fight the battle against his kin and teachers. The event is also celebrated elsewhere in India as *Moksha Ekadasi* in the month of December every year.<sup>19</sup>

The relevance of *Gita Jayanti* is to bring about a moral and cultural resurgence among the people. It becomes even more relevant today as we are living in challenging times. The song celestial *Bhagavadgita* has been immortalized over the years by its tangible and intangible heritage. One of the revered tanks here called *Brahamsarover* becomes the centre of attraction of the festival during these days.

All eyes lie in its island called *Purshottampura Bagh* to witness the cultural extravaganza performed by eminent Indian classical exponents, singers and dancers as well as regional folk artists. The event also provides an opportunity to the craft man across the country to assemble at one

platform to display their skill and acumen. This is also an opportunity for the people to witness the kaleidoscope of Indian arts and crafts. During the festival discourses and seminar on *Gita* are also organized. The children also get an opportunity to participate in various competitions pertaining to *Gita* and Indian culture. In the year 2002 *Craft Mela* became a major attraction of *Gita Jayanti* celebration which lasted for five days and was appreciated widely. In *Craft Mela*, the artisans and artist of the national level were invited to showcase their artistic skills and pursuits at the exhibition. Taking into consideration the popularity of the *Craft Mela* its duration from the year 2003 was raised for ten days. This year again the time of *Craft Mela* has been increased for 20 days. *Gita Jayanti* celebration was celebrated in 2002 for five days. After 2003 it was celebrated for ten days.

### **BRITISH AND KURUKSHETRA**

History shows that the British who used Indian religion, culture, and caste for their imperial purposes also paid respect to this holy city. Inscriptions of the British East India Company and the Colonial Period are the real proof of the donation given by the British steps taken for the protection of religious sanctity, pilgrimage, and cultural heritage of this place. *Brahmins* of Kurukshetra petitioned before the Governor General<sup>20</sup> regarding the protection of this place. An inscription on the North Bank of *Brahamsarovra* in English, Persian, and Hindi, which was signed by H M Lawrence, Assistant Envoy on February 25, 1813, and G C Clerk, Political Agent on 10th January, 1832 at Ambala explains:

*The Brahmins of Thanesar having petitioned the GOVERNOR GENERAL prays that the fish in the surrounding tanks which are all place of Teruthes or Pilgrimage may not be for the trees destroyed nor horned cattle's slaughtered at this place. His Lordship in consideration of the great sanctity in which Thanesar is held by the Hindus is pleased to direct that travelers be enjoined to regard the wishes of the Brahmins in the above respects and as far as possible in all others touching their<sup>21</sup> prejudices.*

There are four other inscriptions on the North Bank of Holy Sannihit Sarovar of Kurukshetra. The inscription near the Sun Temple of Sannihit Sarovar was repaired after broken in three pieces. Because of the repairing, some lines are covered by cement and the black ink of the bottom part is erased. Thus the inscription is not clearly readable.

The other inscription near Dukh Bhanjan Mandir is clear and translated<sup>23</sup> in Persian and Hindi. This inscription shows that how British respected the religious and social values of Hindus. Signed by GCS Black Major, Private Secretary to the Governor of Punjab, Government House, Lahore on 14-11-1921 explains:

*Excellency the Governor of the Punjab visited Thanesar in the course of his Monsoon tour on the 5<sup>th</sup> August 1921. He was very pleased to inspect the old historical and sacred tanks and temples of the Hindus and at the request of the Kurukshetra Restoration Society performed the foundation stone laying ceremony of the Kurukshetra Pushtakalya in the presence of the Brahmin priests, men of learning and leading members of the All India Sanatan Dharam Mahamandal gathered there to welcome His Excellency.*

*In commemoration of his visit Sir Edward Maclagan, KCSI, KCIE was pleased to make a donation of Rs. 250 which was divided among the Brahmin Panchayat of Thanesar in the same proportion in which the donation of Rs. 500 was distributed by the Governor General of India in 1851.*

*Sir Edward Maclagan truths that all officers of the Government who visits this place will scrupulously observe the sanctity of the place and assists in the preservation of works of archaeological interests in Thanesar and near the hood.*

Although, these inscriptions are counted as historical importance but totally neglected by Kurukshetra Development Board (KDB), which has the responsibility of caring for the Historical and Religious places of Kurukshetra.

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