

# Journal of Education:

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Rabindra Bharti University  
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# Journal of Education:

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DEPARTMENT OF EDUCATION

Rabindra Bharti University

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Dr . Seema Agarwal

Assistant Professor, Ghanshyamdas Saraf College of Arts and commerce, Mumbai, Maharashtra

## ABSTRACT

In this paper we shall obtain growth properties in terms of the coefficients of the power series expansion of a function  $f(z_1, z_2)$  of two complex variables analytic in special domains of the type mentioned above; first, with the aid of Bergman's integral formula, along the two-dimensional surfaces common to the bounding hyper surfaces, and then, along a class of two-dimensional surfaces lying in only one of the bounding hyper surfaces and having a line of contact with another bounding hyper surface. We also obtain a mapping theorem which determines from the coefficients a convex region in the  $w$ -plane,  $w = f(z_1, z_2)$ , which must be contained in the smallest convex region of the mapping on the  $w$ -plane of the surfaces considered. In 1926 Rolf Nevanlinna initiated the value distribution theory of entire functions which is a prominent branch of Complex Analysis and is the prime concern of this paper. Perhaps the Fundamental Theorem of Classical Algebra which states that "If  $f$  is a polynomial of degree  $n$  with real or complex coefficients, then the equation  $f(z) = 0$  has at least one root" is the most well-known value distribution theorem, and consequently any such given polynomial can take any given, real or complex, value.

**Keywords:** Expansion, Dimension, Complex, Theorem, Coefficients.

## INTRODUCTION

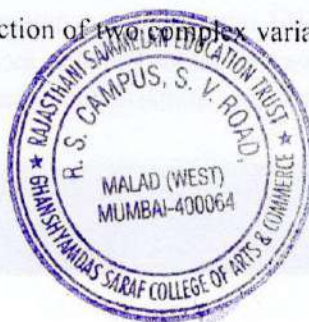
The complex plane  $C$  is the set of all ordered pairs  $(a, b)$  of real numbers, with addition and multiplication defined by  $(a, b) + (c, d) = (a + c, b + d)$  and  $(a, b)(c, d) = (ac - bd, ad + bc)$ . If  $i = (0, 1)$  and the real number  $a$  is identified with  $(a, 0)$ , then  $(a, b) = a + bi$ . The expression  $a + bi$  can be manipulated as if it were an ordinary binomial expression of real numbers, subject to the relation  $i^2 = -1$ . With the above definitions of addition and multiplication,  $C$  is a field.

If  $z = a + bi$ , then  $a$  is called the real part of  $z$ , written  $a = \operatorname{Re} z$ , and  $b$  is called the imaginary part of  $z$ , written  $b = \operatorname{Im} z$ . The absolute value or magnitude or modulus of  $z$  is defined as  $(a^2 + b^2)^{1/2}$ . A complex number with magnitude 1 is said to be unimodular. An argument of  $z$  (written  $\arg z$ ) is defined as the angle which the line segment from  $(0, 0)$  to  $(a, b)$  makes with the positive real axis. The argument is not unique, but is determined up to a multiple of  $2\pi$ .

If  $r$  is the magnitude of  $z$  and  $\theta$  is an argument of  $z$ , we may write  $z = r(\cos \theta + i \sin \theta)$  and it follows from trigonometric identities that

$$|z_1 z_2| = |z_1| |z_2| \text{ and } \arg(z_1 z_2) = \arg z_1 + \arg z_2$$

Let  $f(z_1, z_2)$  be a non-constant entire function of two complex variables  $z_1$  and  $z_2$ , holomorphic in the closed polydisc







## CERTIFICATE OF PUBLICATION

FORMULATION ON GROWTH PROPERTIES OF TWO COMPLEX VARIABLE

*Authored By*

Dr. Seema Agarwal

Assistant Professor, Ghanshyamdas Saraf College of Arts and commerce, Mumbai, Maharashtra

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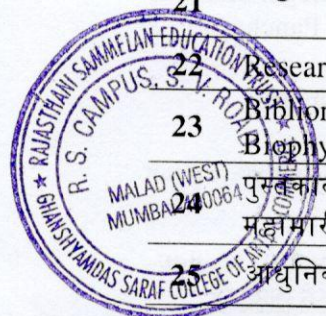
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## An Inversion Formula of Fractional Integral Operator Involving Kummer's Confluent Hypergeometric Function of Matrix Argument

**Dr. Seema Agarwal**

(Assistant Professor)

Ghanshyamdas Saraf College of Arts & Commerce, Malad (W), Mumbai.

### Abstract:

In this paper we find an inversion formula for Fractional integral operator involving Kummer's confluent hypergeometric function of matrix argument,

$$R_{\alpha}^{\beta}[f(T)] = \frac{1}{\Gamma_p(\alpha)} \int_{0 \leq U \leq T} |T - U|^{\alpha - (p+1)/2} {}_1F_1\left(\beta; \alpha; -A^{\frac{1}{2}}(T - U)A^{\frac{1}{2}}\right) f(U) dU,$$

$$R(\alpha, \beta) > \frac{p-1}{2}$$

where  $R_{\alpha}^{\beta}[f(T)]$  is known,  $f(U)$  is to be determined,  $U$  and  $T$  are real, positive, definite, symmetric matrices of order  $p \times p$ , i.e.  $U = [u_{ij}]_{p \times p}$ ,  $T = [t_{ij}]_{p \times p}$  and  $U = U' > 0$ ,  $T = T' > 0$ , prime denotes the transpose of matrix,  $|T - U| = \det(T - U)$  is the determinant of  $(T - U)$ ,  $R_{\alpha}^{\beta}[f(T)]$  and  $f(T)$  are symmetric functions of real, positive, definite and symmetric matrices of order  $p \times p$ .

By the successive application of Laplace and inverse Laplace transform of matrix argument, the inverse of the operator is obtained.

The inverse of integral operator for different values of  $R_{\alpha}^{\beta}[f(T)]$  is also tabulated.

### 1. Introduction:

The equation

$$L_Z[f(\Lambda)] = \int_{\Lambda \geq 0} \text{etr}(-\Lambda Z) f(\Lambda) d\Lambda = \Phi(Z) \quad (1.1)$$

is the integral with respect to measure  $d\Lambda$  on the space  $S_p$ , where  $\Lambda$  and  $Z$  are real,

positive, definite and symmetric, matrices of order  $p \times p$ ,  $Z = [\delta_{ij} z_{ij}]$ ,  $\delta_{ij} = 1$  for  $i = j$ ,

$\delta_{ij} = \frac{1}{2}$  for  $i \neq j$ ,  $\text{etr}(X) = e^{\text{tr} X}$  = trace of  $X$  = sum of leading diagonal elements of matrix

' $X$ ',  $f$  is symmetric function with the sense  $f(AB) = f(BA)$  and

$$d\Lambda = d\Lambda_{11} d\Lambda_{21} d\Lambda_{22} d\Lambda_{31} d\Lambda_{32} d\Lambda_{33} \dots \dots \dots d\Lambda_{p1} \dots \dots d\Lambda_{pp}$$

over the set of all real, positive, definite and symmetric matrices. If the complex analytic function  $\Phi(Z)$  is absolutely convergent in right half plane  $R(Z) > X_0$  then (1.1) is known as the Laplace transform of  $f(\Lambda)$  where  $X_0$  is a fixed value of  $X$  and

$$Z = X + iY, i = \sqrt{-1}$$

If

$$\int_0^\infty |O(X + iY)| dY < \infty \text{ for some } X > X_0,$$

then

$$\frac{1}{(2\pi i)^{p(p+1)/2}} \int_{R(Z)=X} \text{etr}(\Lambda Z) \Phi(Z) dZ = \begin{cases} f(\Lambda), \Lambda > 0 \\ 0, \text{else where} \end{cases}$$



(1.2)





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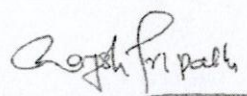
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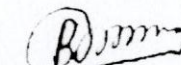
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This is to certify that Mr/Mrs/Miss/Dr/Prof. Seema Agarwal ( Assistant Professor) of Ghanshyamdas Saraf College of Arts & Commerce, Malad (W), Mumbai, India has participated and presented research paper entitled “ An Inversion Formula of Fractional Integral Operator Involving Kummer’s Confluent Hypergeometric Function of Matrix Argument” in One Day International Multidisciplinary Conference held on 30 April, 2022.



  
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# RASĀYAN

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PLANT MEDIATED GREEN AND FACILE SYNTHESIS OF SILVER NANOPARTICLES AND THEIR POSSIBLE APPLICATION AS ANTIMICROBIAL AGENTS

– A. D. Dhundhane, R. J. Takagarkar, A. K. Wankar, A. R. Somwanshi and R. D. Ghodke



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Rasayan J. Chem. 75 (1), 504-508 (2022)

**Keywords:** Silver Nanoparticles, Cassia Fictula, Antimicrobial Study, Green Synthesis, UV-Vis, SEM, XRD

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## PLANT MEDIATED GREEN AND FACILE SYNTHESIS OF SILVER NANOPARTICLES AND THEIR POSSIBLE APPLICATION AS ANTIMICROBIAL AGENTS

**A. D. Dhimdime<sup>1</sup>, R. S. Talegaonkar<sup>2</sup>, A.K. Wanjari<sup>2</sup>, A. R. Somwanshi<sup>3</sup> and R. D. Ghodile<sup>4</sup>**

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### ABSTRACT

In recent year green and eco-friendly synthesis of metal nanoparticles plays an important role in nanotechnology, medical science, industries, ceramics etc. The manuscript focuses on the green and facile synthesis of AgNPs from aqueous solution of leaf of *Cassia fistula*. UV-Visible spectra confirm the bio-formation of AgNPs at 412 nm with the witness of change in colour. Synthesized silver nanoparticle characterized further by FTIR, SEM, EDX and XRD spectroscopic technique. The shape of AgNPs is observed to be like oval, triangular and cylindrical respectively. EDX analysis confirmed the elemental percentage of silver 93.02%. FTIR shows shifting in bands from lower side to upside. The biosynthesized AgNPs shows antibacterial activity against *E. coli* and *B. subtilis* pathogens and it was found that AgNPs were more effective against *E. coli* and *B. subtilis* bacteria. The method used in this study for the biosynthesis of AgNPs from aqueous extracts of *Cassia Fistula* was green, reduce harmful chemical with no environmental hazards.

**Keywords:** Silver Nanoparticles, *Cassia Fistula*, Antimicrobial Study, Green Synthesis, UV-Vis, SEM, XRD

RASĀYAN J. Chem., Vol. 15, No. 1, 2022

### INTRODUCTION

Nanotechnology is rapidly growing field in science in the recent years. Scientist among the world working on the green and eco-friendly synthesis of metal nanoparticles because of its wide application in many areas. Plant mediated biosynthesis of metal oxides' nanoparticles has been an ideal process compared to the chemical, physical etc methods. Now a days nanotechnology is the fastest growing filed because of its wide application in many areas like pharmaceutical industry, chemical industry, photocatalyst in various organic name reaction, photovoltaic, ceramic industry, dyes industry etc.<sup>1-7</sup> There are different processes for the synthesis different types of metal nanoparticles in the shape like trigonal, tetrahedral, pentagonal, hexagonal plates, nano-rods etc.<sup>8</sup> Metal nanoparticles can be synthesised by different processes like biological, chemical and physical. Considering the harmful impact on the environment by the processes like chemical and physical methods because they produce harmful b-products and sometimes these are non-biodegradable that why plant mediated biosynthesis of nanoparticles consider to be easy and eco-friendly method.<sup>9-10</sup> Plant-mediated biosynthesis of metal nanoparticles are considered as cost-effective, economic, eco-friendly and can easy scale up to pilot level.<sup>11</sup> The importance of biologically synthesis metal nanoparticles depends on the specific size, shape and structural morphology.<sup>12</sup> AgNPs has huge application in medicinal field, especially as antioxidant and antibacterial agent.<sup>13</sup> In recent year many microbial pathogen cause various diseases up to problem like COVID 19 etc. Thus, the scientist develops various alternative ways to protect the environment from the microbial pathogens, which involve application of AgNPs.<sup>14</sup>



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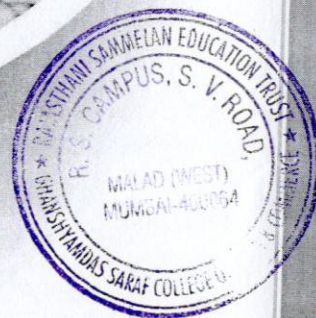
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## Magnetite Iron Oxide/Activated Charcoal ( $\text{Fe}_3\text{O}_4\text{-AC}$ ) Composite for Arsenic Removal

A.D. Dhimdhome

Department of Environmental Studies, Ghanshyamdas Saraf College of Arts & Commerce, Malad (W), Mumbai 400064, Maharashtra, India

### Abstract:

The article focuses on the development of magnetic  $\text{Fe}_3\text{O}_4$  over the activated charcoal for the removal of arsenic (III) from synthetic aqueous solution. Chemical activation of activated charcoal was done using  $\text{HNO}_3$  at  $200^\circ\text{C}$  to enhance the adsorption capacity of activated charcoal. Again, to enhance its adsorption capacity it was loaded with magnetic  $\text{Fe}_3\text{O}_4$  which was synthesized by hydrothermal process. Batch study was conducted in which effect of pH, effect of contact time, effect of adsorbent dose on the arsenic adsorption were studied. The results shows that the activated charcoal loaded with magnetic  $\text{Fe}_3\text{O}_4$  could remove arsenic very effectively at pH 8 at maximum adsorbent dose 1.2 g/L with the contact time 45 min at room temperature. Furthermore, the adsorption data were studied with Langmuir and Freundlich adsorption isotherm to analyze the equilibrium of the experiment. Langmuir model best fitted with the experimental results with the maximum adsorption capacity 7.28 mg/g, this finding indicated that the activated charcoal loaded with magnetic  $\text{Fe}_3\text{O}_4$  could be used for the removal of trivalent arsenic from aqueous solution.

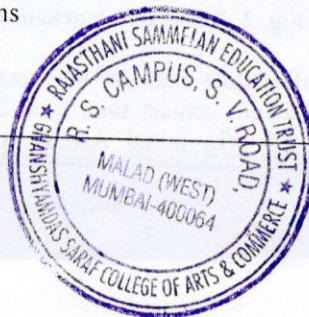
**Keywords:** Arsenic (III),  $\text{Fe}_3\text{O}_4$ , Activated charcoal, Langmuir model, Freundlich model

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### I. Introduction:

The whole countries in the world facing a problem of waste water contamination and its purification [1]. The government agencies around the world searching out the solution of wastewater contamination and its treatment by making various policies and in that Indian government specially focus on the swachh Bharat Abhiyan through that the treatment water of Ganga river is the mainline task now a days. For the treatment of wastewater and also for the removal of toxic metal ions, organic and inorganic pollutants there are many methods available like reverse osmosis, physico-chemical treatment, advance oxidation treatment, coagulation-flocculation process, ion exchange, membrane filtration etc [2]. But treatment of wastewater is not an easy task because many facts have to be considered if we are looking for the treatment of wastewater. In that first one is the process should be feasible, it should be carryout at any suitable workplace, it should be cost effective and as the green parameter consist it should not generate waste [3]. Looking in to that view the current work was carries out in which the removal of toxic metal i.e., arsenic from the synthetic aqueous solution onto the Magnetite Iron Oxide/Activated Charcoal ( $\text{Fe}_3\text{O}_4\text{-AC}$ ). The activated charcoal is well known for the purification of wastewater because of its high porosity, easy availability, cost effective and Regenerability [4-6]. Furthermore, its surface is available for the modification by using surface active agents, nanomaterial, polymers etc. which will enhance its BET surface area and ultimately the adsorption capacity increases. Arsenic contamination is the major concern the various parts of the India [7]. As per the WHO guideline the maximum permissible limit for the arsenic in groundwater is  $10 \mu\text{g/L}$  but in India highest concentration of arsenic was found to be in the range  $0.003 - 3700 \mu\text{g/L}$ . Usually inorganic arsenic is more toxic than the organic arsenic. In natural water arsenic persist in two oxidation state: arsenite (+3) and arsenate (+5). Long-term exposure to arsenic from drinking-water can cause diverse types of cancers, including skin, lungs, urinary bladder, kidney liver, and prostate cancers [8-9]. In developing countries two methods are widely used for the arsenic removal from wastewater one is precipitation and another is adsorption. A large amount of chemicals is required in precipitation method which finally creates sludge in the form of arsenic sulfide, calcium arsenate or ferric arsenate. On the other hand, adsorption method is easy to handle, cost effective and efficient and can be applied for the treatment of wastewater containing trace amount of pollutants [10]. Hence, the objective of this study was to find out the adsorption capacity of Magnetite Iron Oxide/Activated Charcoal ( $\text{Fe}_3\text{O}_4\text{-AC}$ ) composite for the removal of As (III) from aqueous solutions







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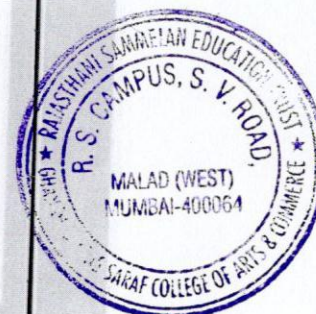
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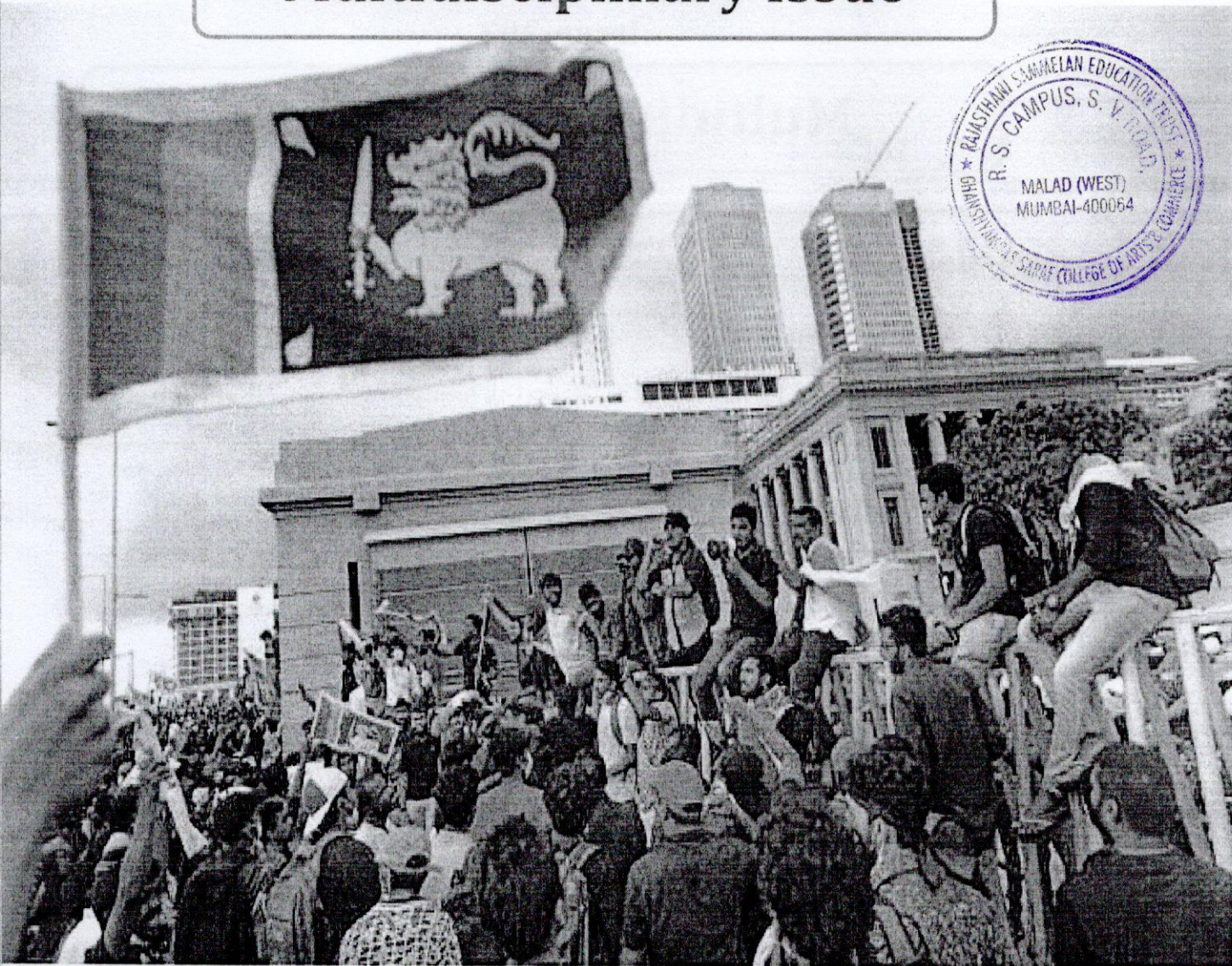
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## Future of Academic Libraries' Sustainability in Changing Information World

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### Abstract:

*This paper aimed to explore the literature on the survival of academic libraries in changing information environment and the prospect of these libraries in ever changing technology. The preferences of users in searching pattern for information are shifted. In recent years, consumers ' appetite for digital information has increased tremendously. In the current complex digital environment, academic libraries face a number of crucial challenges impacting their survival. Libraries evolve into digital gateways to information or portals that provide access to global knowledge services. Academic libraries have become diverse resource learning hubs with multiple roles and complex challenges. Academic libraries will continue to be essential for knowledge seekers in the evolving digital information world in the future when libraries will response to changes in technological innovations, information resources and user demands. To keep pace with increasing demands of end-users, they need to redefine their strategies, processes, operations, resources and responsibilities.*

**Keywords:** Changing Information Environment, Future of Academic Libraries, Technology, Sustainability of libraries

### 1. Introduction

As digital technology advances, academic libraries will face new challenges and opportunities. As rightly stated by Venkataramana (n.d.) information technology is dominating the libraries. The librarian's skills in the application of this technology is becoming the deciding factor for the efficiency of services provided by the libraries. Web technologies have profoundly altered the design and use of library tools and the ecosystem for information and services. Online information services are increasing tremendously because they can be easily accessed by many people at the same time. This shift in information environment and technology has shifted the preferences of users in their methods of finding information. Consumers' appetite for digital information has increased tremendously in recent years. In the last few years, libraries have evolved into digital gateways, providing access to global knowledge services. Academic libraries have become multifaceted learning hubs with multiple roles and complex challenges. Despite the rapid development of technology in some countries like India academic libraries are still at the same stage as hybrid libraries. Technology is changing rapidly, however, so it will take time for the libraries to keep up with the speed of change. The process of transforming libraries in an academic environment is not always straightforward, given that many factors such as funds, parents' willingness, educational patterns, and the perspective of users on obtaining



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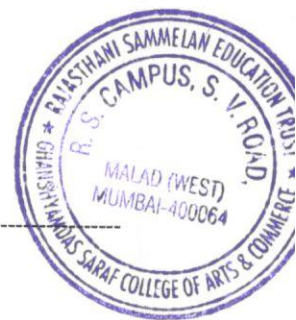




## Changing Dynamics on Sustainable Growth With Reference To Tourism Industry

Dr. Rupa Shah

Asst. Professor, Ghanshamdas Saraf College of Commerce



### ABSTRACT

Tourism has given a large intake of money for businesses with their goods and services and the opportunity for employment in the service industries associated with tourism. These service industries include transportation services, such as airlines, cruise ships and taxicabs, hospitality services, such as accommodations, including hotels and resorts, and entertainment venues, such as amusement parks, casinos, shopping malls, music venues and theatres. What applies to the world same is applicable to Indian economy.

The economic effects of tourism does not only effect the region and area. It also helps in the development of other sectors related to it and also the entire country. In areas where tourism is highly important and vital source of income for example, Delhi, Kerala, Assam, Jammu & Kashmir the state as well as the central authorities have intervened and developed it as a public sector. Since tourism is a powerful tool in stimulating economic development, it has been widely used by the government to diversify a country's economic base, to stimulate a new economic sector and develop it to regenerate urban, rural and coastal areas and to create new attractions activists for tourism. Unlike other investment opportunities, hotel companies offer favourable, risk-adjusted dividend returns. Consequently they also become major targets for leveraged private equity buyouts. Another workers concern relates to growing employment insecurity. This can result from frequent and rapid ownership changes mainly focused on short-term performance-driven demands.

Key words : tourism, sustainable growth, financial crisis, employment, transportation sectors.

### INTRODUCTION

The term financial crisis is applied broadly to a variety of situations in which some assets or sectors suddenly loses a large part of their value. Financial crisis are associated market crashes, currency crisis, credit crunches and so on. Due to this a lot of foreign benefited sectors have been directly affected. Foreign currency is a major requirement in the growth of our country, but due to the global economic downturn the arrival of foreigners have been affected and this may have led to the decrease in the tourism sector and also foreign exchange income. Global financial crisis has wrecked the tourism industry as it has been effected due to recession and has created a downfall in investments and developments in the hotel business. But due to the vast difference in the exchange rate and India's variance in culture and history, hotel business is slowly but steadily again developing its roots. And with the continuing surge in demand, many global hospitality sectors have shown keen interest in the Indian hospitality sector. Tourism in India is the largest service sector, with a contribution of 6.23% to the National Gross Domestic Product (GDP) and 8.78% of the total employment in India. A lot of efforts are being made to promote new forms of tourism such as rural, medical and eco-tourism. Tourism in India is witnessing widespread growth by improving the country's infrastructure development and promoting various successful campaigns like 'Incredible India'.

### FINANCIAL CRISIS IN INDIA

The poor state of Indian economy did not happen overnight. The deterioration of the economy began with the differences taking place in the private and public sector. The public sector remains merely a dream of those who laid the foundation aspiring to build a strong economy. At present the financial condition of the nation is not changing although various sectors such as agriculture, tourism, banking have started developing new roots in our country. India has about a million tourists a year and earns annually about Rs.2,000 crores in foreign exchange from tourism. This is by no means a commendable performance for a country which has such fantastic destinations to offer. India has less than 1% of the world tourist traffic. There has been a considerable debate about the economic analysis of tourism with regards to role of tourism in economic



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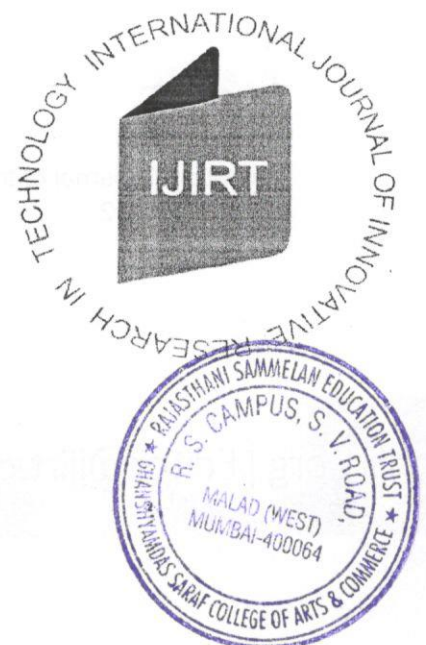
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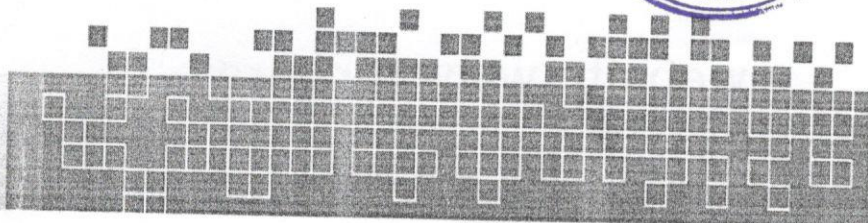
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# A Study on Effectiveness of Cultural Dimensions on Consumer Behavior

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**Abstract** - Culture has many dimensions and does not mean only the nation or a country. There can be many cultures within the same city, there will be many diversities. People with the same characteristics tend to have the same culture. Cultural thoughts and values change due to the trends of advertising. Investigating cultural differences connected with male/female gender may help both researchers and advertisers better comprehend cultural effects.

Advertisements are influencing the consumers behavior when it comes on choosing brands. This behavior is a result of many influences of a culture somebody has grown up with. The effect of advertising may have a positive or a negative effect depending upon what to adapt and how much to adapt. In India culture does influence our advertisers because the ads that are made are done keeping into mind the gender, age difference, society, effects of sudden changes in the trends etc. Trends in a society is not constant and keep on varying with competition and western impact. We try to adapt to the West but also want to be stringent with its applications as it may have a negative effect in the minds of the society. One of the most discussed issues on advertising is if it is doable to convince consumers in different markets with the same advertising message. When planning an advertising campaign it is significant to know if consumers will respond positively or if the advertising message should be adapted in order to represent the local culture. Moreover, advertising is frequently used as reflection of the cultural values. Therefore, they try to be appealing to the values that are supported by the target group. If it is not, then there is a risk that the consumer will not be able to relate to the product.

**Index Terms** - Culture; advertisers; Challenges and opportunities, Indian Initiatives.

## INTRODUCTION

Cultural impacts ensures us to adapt only that which is appealing to the mass and society and has a strong moral sense. People or mass who try to work against

this cultural impact may not be accepted with a smile but rather have to face a severe consequence. Advertisements which come with a western touch and feel also have to keep a futuristic vision and the changing cultural trends so that the consumers may readily enjoy the new changes and also no negativity is portrayed. The pressure of culture is mainly significant in transferring advertising strategy across the borders, because communication patterns are directly associated with cultural norms in each market. The degree to which people like or dislike, approve or disapprove of, advertising in general also is related to their culture. For example, the Dutch and the Scandinavians have a critical position toward advertising, whereas the Americans, the British, and especially the Japanese have made it a part of their daily lives.

Today Asian markets are the most rapidly growing, aggressive and promising throughout the world This gives the opportunity to companies to expand and increase their profits. However, the Asian culture is totally different from the European and the American ones. Asia is really a series of localized markets with their own characteristics including different economic and cultural settings due to historical reasons. They have their own exclusive sides of history, culture and consumption patterns including variations in consumer tastes and requirements that could differentially affect advertising content. Therefore, companies should be aware of this difference of culture, to make the 'right' commercials in each place and be led to success.

## REVIEW OF LITERATURE

Cook, Guy; ( 2001 ) stated that Advertising is a buyer's guide for both consumers and industrial purchasers, providing the formal with news of new merchandise and special prices the later with information about new

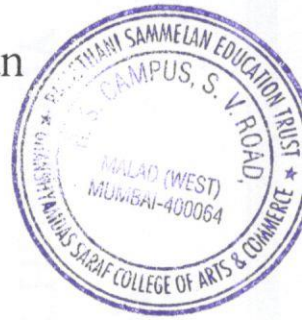




# Librarian to Cybrarian: SWOT analysis in Indian context

Dr. Neha M. Joshi

Librarian, Ghanshyamdas Saraf College of Arts and Commerce



**Abstract-** The evolution of technology is transforming the conventional approaches used by librarians into more contemporary ones. Since the advent of web 2.0, the term "librarian" has been used to refer to knowledge managers, information managers, digital librarians, and now, increasingly, cybrarians. The skill sets that librarians must build or acquire have significantly changed as a result of this evolution. The environment in which librarians work is changing with greater access to a wider range of information, faster information retrieval, and greater complexity in finding, analyzing, and linking updated information. The role of librarians in the new environment is growing exponentially. The paper is trying to do the SWOT analysis of the changing profession of librarian towards cybrarian due to rapidly changing technology and new avenues for information dissemination.

**Keywords -** Librarian, Cybrarian, skills, India

## 1. INTRODUCTION

Traditional libraries are those where the majority of management is done manually and where the access points, such as library catalogues and collections, are print-based (Dhiman & Goswami, 2008). Traditional on-campus libraries and online libraries differ significantly from one another. To improve users' access to information literacy, librarians must broaden the scope of their responsibilities. A digital library differs from a traditional one primarily in the following ways: access to materials, a wider range of inquiries, and communication style. The tasks and objectives of a digital library are identical to those of a typical print-based library, with the difference being that "the digital portion of the name simply denotes that the information is kept and accessed digitally."

The evolution of technology is transforming the conventional approaches used by librarians into more contemporary ones. Since the advent of web 2.0, the term "librarian" has been used to refer to knowledge managers, information managers, digital librarians, and now, increasingly, cybrarians. The skill sets that librarians must build or acquire have

significantly changed as a result of this evolution. Traditional libraries still perform the same essential tasks, such as selecting, making resources accessible, keeping them safe, and disseminating them, even though the services they offer have altered in appearance.

Michel Bauwens, Information Officer of BP Nutrition in Antwerp, Belgium, developed the term "Cybrarian" to characterise the personnel of a virtual library. A Cybrarian in the context of the digital age is just a traditional librarian working in an automated setting surrounded by digital items. (Dey, 2012). Cybrarian, a contraction of the terms "cyberspace" and "librarian," designates a librarian whose regular duties include information transmission and retrieval via the Internet and other online resources. As defined by Webster Online Dictionary (2015) A Cybrarian is "a person whose job it is to search, gather, and handle material that is available on the World Wide Web". According to Oxford Online Dictionary (2015) cybrarian is defined as "a librarian or researcher who uses the Internet as an information resource".

Cybrarians are specialists in the use of the Internet as a tool for research in the field of library and information science. Cybrarian, then, can be defined as an information specialist who deals with more web content in order to reach his targeted user group and who directs the implementation of technology, manages access, teaches users, and creates exciting new worlds for their constituents while implementing technology, managing change, and educating users. (Dey, 2012)

Libraries are currently transitioning to becoming Cyberspace, or information that users may access on their desktops, thanks to computers. Every user today has a huge desire for knowledge, which may be satisfied not just by library collections but also by information that is accessible from anywhere in the globe via an Internet connection.

The new web 2.0 tools, such as social networking, open source software, and online resources, are making it more difficult for librarians to stay current



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## USE OF LOCAL TRANSFORMATION OF LIE GROUPS TO OBTAIN GENERATING FUNCTIONS OF ZONAL POLYNOMIAL

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### Abstract

The object of the present paper is to use local transformation of lie group to obtain generating functions for biorthogonal polynomial  $Z_n^\alpha(x, k)$  defined by Konhauser.

**Key Words:** Zonal polynomial, Lie group, Local transformation.

### 1. introduction

The orthogonal polynomial play an important role in the theory of approximation, Quening, coding and other branches of applied mathematics, where the polynomial functions occur as weight function.

Now a days group theoretic method for obtaining generating functions have received much attention. L. Weisner [1955, 1959] made a significant study in this direction. He has derived a method for obtaining generating functions for sets of functions, which satisfy the certain conditions, Hermite, Bessel, generalized Lagurre and Gegenbauer functions. The method followed to construct a partial The Lie product is given by  $[\alpha, \beta] = \alpha\beta - \beta\alpha$  for  $\alpha, \beta \in \mathfrak{sl}(2)$ . The basis elements for the Lie-algebra of the special linear group  $\mathfrak{sl}(2)$ :

$$J^+ = \begin{pmatrix} 0 & -1 \\ 0 & 0 \end{pmatrix}, J^- = \begin{pmatrix} 0 & 0 \\ -1 & 0 \end{pmatrix}, J^3 = \begin{pmatrix} \frac{1}{2} & 0 \\ 0 & -\frac{1}{2} \end{pmatrix} \quad (1.1)$$

Which satisfies the commutation relations

$$[J^3, J^+] = J^+, [J^3, J^-] = -J^-, [J^+, J^-] = 2J^3 \quad (1.2)$$

from a basis for  $\mathfrak{sl}(2)$ .

The object of the present paper is to obtain some generating functions of Zonal polynomial  $Z_n^\alpha(x, k)$  using Local transformation of Lie groups. The method followed is different from the methods given earlier.

### Derivatives of Generating Functions

In the year 1967 Konhauser (3) defined the biorthogonal Zonal polynomial  $Z_n^\alpha(x, k)$  of  $n^{\text{th}}$  degree as:

$$Z_n^\alpha(x, k) = \frac{\Gamma(kn + \alpha + 1)}{n!} \sum_{j=0}^n (-1)^j \binom{n}{j} \frac{x^{kj}}{\Gamma(kj + \alpha + 1)}, \text{Re}(\alpha) > 1 \quad (2.1)$$

$$= \frac{(1+\alpha)_{kn}}{n!} {}_1F_k[-n; \frac{1+\alpha}{k}, \frac{2+\alpha}{k}, \dots, \frac{k+\alpha}{k}; \left(\frac{x}{k}\right)^k] \quad (2.2)$$

on putting  $k = 1$ , [2.2] reduces to Lagurre Polynomial Rainwhile [2] :





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**USE OF PROBABILITY IN STATISTICS: A  
STUDY****Dr. Seema Amit Agarwal****Vice Principal**

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**ABSTRACT**

Probability is commonly used by data scientists to model situations where experiments conducted during similar circumstances, yield different results. Probability allows data scientists to assess the certainty of outcomes of a particular study or experiment. An experiment is a planned study that is executed under controlled conditions. When a result is not already predetermined, the experiment is referred to as a chance experiment. Conducting a coin toss twice is an example of a chance experiment. Today's data scientists need to have an understanding of the foundational concepts of probability theory including key concepts involving probability distribution, statistical significance, hypothesis testing and regression.

**Key Word:** Probability, Concepts, Interpreting and Rules.

**Concepts of Statistics & Probability:**

Decisions or predictions are often based on data—numbers in context. These decisions or predictions would be easy if the data always sent a clear message, but the message is often obscured by variability. Statistics provides tools for describing variability in data and for making informed decisions that take it into account.