



## Jijamata Mahavidyalaya, Buldhana

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देशसेविका,समाजसेविका,कलोपासक प्रमिलाताई ओक

प्रा.डॉ.नामदेव वा. ढाले

इतिहास विभाग प्रमुख जिजामाता महाविद्यालय, बुलडाणा

स्वातंत्र्यपूर्वकाळात विदर्भभूमीत अनेकविध स्थितंतरे घडून आलीत. विदर्भात १८९१ (नागपूर), १८९७ (अमरावती), १९२० (नागपूर) असे काँग्रेसचो महत्त्वपूर्ण तीन अधिवेशने, १९४२ च्या 'चले जाव' ठराव पास होणारे वर्धा येथील ऑल इंडिया काँग्रेस वर्किंग कमिटीची बैठक, राष्ट्रपिता महात्मा गांधी यांचा सेवाग्राम येथील सहवास, राष्ट्रीय स्तरावरील पुढाऱ्यांचे दारे व सभा, इत्यादींमुळे विदर्भात स्वातंत्र्य लढयाला एक नवे रूप आले, स्वातंत्र्य चळवळीला एक नवी दिशा मिळाली. नेतृत्वाची एक साखळीच निर्माण झाली. याकाळात विदर्भात जे नेतृत्व उदयास आले ते नेतृत्व म्हणजे देशसेविका,समाजसेविका,कलोपासक प्रमिलाताई ओक होय. प्रमिलाताई ओक यांना 'वन्हाडची वाघीन' म्हटल्या जाते.

प्रमिलाताईचे बालपण, शिक्षण, विवाह :

'वन्हाड समाचार' पत्राचे ख्यातनाम संपादक नारायण खंडेराव उर्फ बापुसाहेब फडके व मातोश्री लक्ष्मीबाई उर्फ माईसाहेब फडके यांच्या पोटी रविवार दिनांक १७ एप्रिल १९१० रोजी अकोला येथे मळयातील झोपडीत प्रमिलाताईचा जन्म झाला. मुलांत खेळणे, बोरीवर चढणे, मर्दानी पोशाख, व धडाडी यामध्ये ताईचे बालपण गेले. दुर्दैव आत्मविश्वास, कमालीचा आत्मसम्मान, साहसप्रियता, साहित्य-संगीत, चित्र-काव्य-शास्त्रप्रियता, बोलण्यात घिटाई आणि विवेकी धूर्तपणा इत्यादी गुणांचे संस्कार प्रमिलाताईवर झाले. यासर्व गुणांचा त्यांनी परिपोष व उपयोग केला.

प्रमिलाताईचे प्राथमिक शिक्षण अकोला येथील ताजनापेठ पोस्ट ऑफीस जवळील पाठशाळेत झाले. १९२१ मध्ये पुणे येथील हुजूर पागेच्या शाळेत त्यांना पहिल्या वर्गात टाकण्यात आले. नंतर पुन्हा त्यांना अकोला येथे आणण्यात येवून अकोला येथील मनुताई कन्या शाळेत दाखल करण्यात आले. त्यांचे चौथी पर्यंतचे शिक्षण येथेच झाले. हायस्कूल मधील शिक्षण पुणे येथील हुजूर पागेच्या मुलींच्या शाळेत झाले. १९२४ मध्ये त्या इंग्रजी ५ वीमध्ये २५ मुलींच्या वर्गात पहिला क्रमांक नंबर येवून पास झाल्या. हा पहिला नंबर त्यांनी कायमच ठेवला होता. मॅट्रिकच्या परीक्षेत त्यांनी संस्कृत व गणित विषयांत विशेष प्रविण्य मिळविले होते. मॅट्रिकच्या परीक्षा घेण्यापूर्वीच्या प्रीलिमिनरी (उपान्त्य) परीक्षेत त्या पहिल्या आल्या होत्या. पौर्वात्य व पश्चात्य अशा दोन्ही शिक्षण पध्तीचा समन्वय साधून त्यांच्या वडीलांनी त्यांना उच्च शिक्षणासाठी रविंद्रनाथ टागोर यांच्या बोलपूर येथील शांतीनिकेतन संस्थेमध्ये दाखल करण्यात आले. परंतु दुर्दैवाने त्यांना तेथील हवामान मानवले नाही. त्या आजारी पडल्या. शेवटी त्यांना फर्ग्युसन कॉलेजमध्ये पुढील शिक्षणक्रम पूर्ण करण्यासाठी ठरविण्यात आले. अशाच काळात प्रमिलाताईच्या लग्नाची बोलणी सुरु झाली. परंतु प्रमिलाताईना बी.ए. पूर्ण झाल्याशिवाय लग्न करण्याची तयारी नव्हती. शेवटी योगायोग आल्याने प्रमिलाताई लग्नाच्या बंधनाय अडकल्याच. दिनांक २ जून १९२९ रोजी वकील विश्वनाथ रामचंद्र उर्फ काकासाहेब ओक यांच्यासोबत प्रमिलाताईचा विवाह संपन्न झाला.

खेळनाटय, संगीत कला क्षेत्रात विशेष कामगिरी :

प्रमिलाताईना विविध कलांची आवड होती. त्या बौद्धिक विकासाबरोबरच शारीरिक तसेच मानसिक विकासाबाबत जागरूक होत्या. खो-खो व टेनिस या खेळयात त्यांनी प्रविण्य मोटार ड्रायव्हिंग व रोईंग (बोट वल्लविणे) या कलादेखील त्यांनी आत्मसात केल्या होत्या. तसेच त्या गायन-वादन करतेतही निपूण होत्या. त्या नाटय व संगीत कला यावर श्री.बालगंधर्व यांच्याशी अत्यंत गंभीरपणे चर्चा करीत असे. स्त्रियांनी नाटकांत काम करावे की नाही, संगीत नाटके कोणत्या धरतीची असावीत, रंगभूमीच्या उन्नतीसाठी कोणकोणत्या सुधारणा आवश्यक आहेत, इत्यादी कलाक्षेत्राच्या महत्वाच्या विषयांवर प्रमिलाताई आपल्या घिटाईने, अधिकार वाणिने व मुद्देसूद वादविवाद पध्तीने चर्चा करीत असत.

प्रमिलाताईना नाटय,नृत्य, संगीत व वादन या कलांची नुसती आवडच होती असे नव्हे, तर त्यापैकी काही कलांत त्या पारंगत होत्या. अकोला येथे संगीत कला मंडळ (म्युझिक सर्कल) स्थापन करण्यात त्यांचा सिर्हाचा वाटा होता.त्या मंडळाच्या प्रधानमंत्री असतांना त्यांनी मंडळाचे कार्य उत्कृष्टपणे चालवून दाखविले.

प्रमिलाताईना पेटी, सतार, दिलरबा, बासरी इत्यादी संगितातील वाद्य सुध्दा चांगली वाजविता येत असत. हाती घेतलेल्या कोणत्याही कार्यांशी स्वतःला पूर्णपणे समरस होणे हे प्रमिलाताईचे एक खास वैशिष्ट्य होते. १९४४ मध्ये राष्ट्रीय महिला मंडळाच्या वार्षिकोत्सवानिमित्ताने एक विविध करमणुकीचा कार्यक्रम आयोजित केला असता त्या कार्यक्रमासाठी प्रमिलाताईनी सतत दोन महिने परिश्रम घेतले होते. ह्याच कार्यक्रमाने त्या यशस्वी कलावंत होत्या हे सिध्द करून दाखविले होते. प्रमिलाताई यांचा एक चांगल्या कलावंत होत्या. जीवनाच्या विकासाठी आवश्यक काही कलांमध्ये त्या पारंगत होत्या. कला आणि कलावंत यांचे विषया त्यांच्या अंतःकरणत आदर होता.

विदर्भातील या महान महिलेची नाटय-संगीत क्षेत्रातील योगदान पाहून व त्यांच्या कार्याची स्मृती जनतेच्या अंतःकरणत सतत तेवत ठेवण्यासाठी कला क्षेत्रातील मंडळींनी स्व. प्रमिलाताई ओक यांचे स्मारक नाटयगृह स्थाने, उभारण्याची आज्ञा पुढे





आणली. ती योजना अकोलेकरांनी प्रत्यक्षत अमलांत आणली. आज स्व. प्रमिलाताई आंक नाटयगृह अकोला येथील बसस्टॅड समोरील म.गांधी रोडवर दिमाखाने उभारले गेले आहे.

#### राष्ट्राकार्याला प्रारंभ : पिकेटिंग व सत्याग्रह

प्रमिलाताईचे विवाहानंतर बी.ए.होण्याची शक्यता उरली नव्हती. तरी त्यांनी बी.ए.होण्याच्या विचाराने खाजगी रितीने नागपूर युनिव्हर्सिटीला बसून अभ्यास सुरु केला. परंतु याकाळात झालेल्या १९२९ च्या लाहोरच्या काँग्रेस अधिवेशनातील संपूर्ण स्वातंत्र्याचा ठराव, चर्चा यावरील भाषणांचा प्रमिलाताईवर मोठा परिणाम घडून आला. त्यांनी लवकरच अकोला येथे नविन स्थापन केलेल्या भगिनी मंडळामार्फत ब्रिजलाल बियाणी यांचे व्याख्यान ठरविले. त्यावेळी दुर्गाताई जोशी यांनी ब्रिजलाल बियाणी यांच्याशी प्रमिलाताईची ओळख करून दिली. या व्याखानाच्या कार्यक्रमात त्यांनी आरंभीचे व समारंभाचे भाषण केले. राजकारणात स्वियांनी फार मोठ्या प्रमाणात भाग घ्यावा, अशी विनंती प्रमिलाताईनी उपस्थित भगिनींना केली.

१९३० मध्ये संपूर्ण देशातील अनेक शहरांप्रमाणे अकोला येथेही पिकेटिंगचे कार्य जोराने सुरु झाले. प्रमिलाताईच्या प्रमुख नेतृत्वाखाली अकोल्यातील भगिनी रोज सायंकाळी ठरल्याप्रमाणे जमू लागल्या. पिकेटिंगचे कार्यक्रमाच्या योजना आखल्या जावू लागल्या. प्रमिलाताई स्वतः पहाटेच्या प्रभात फेऱ्यापासून ती संध्याकाळच्या पिकेटिंगच्या कार्यक्रमापर्यंत जातीने लक्ष घालत अस. त्यांना विचारूनच सर्व भगिनी कार्यकर्त्या कार्यक्रमांच्या आयोजन करीत असत. थोड्याच अवधीत प्रमिलाताई पहिल्या दर्जाच्या कार्यकर्त्यांत येऊन थडकल्या. अवघ्या ३-४ महिन्यांच्या आंत वऱ्हाड प्रांतात काँग्रेसच्या कार्यकर्त्यांत प्रमिलाताईचे नांव ओळखीचे व आदराचे होऊन बसले.

काँग्रेसच्या आदेशानुसार विलायती कापडावर बहिष्कार टाकण्याची मोहिम सुरु झाली. संपूर्ण वऱ्हाड प्रांतात जागोजागी ही चळवळ सुरु झाली. अकोला येथील टिळक मैदानावर सर्वांत पहिली विलायती कापडाची होळी झाली. त्या होळीत विलायती कपडे घातलेला पुतळा जाळला गेला. त्या पुतळ्याच्या अंगावा घालण्यासाठी प्रमिलाताईना काकासाहेब आंक यांचा विलायती सूट मागण्यात आला. तेव्हा त्यांनी हसत-हसत कपाटांतून सर्वकपडे श्री दादासाहेब पंडीत यांच्यापुढे टाकले. हा विलायती सूट पुतळ्यावर चढवून त्याला जाळून टाकण्यात आले. बाकीचेही विलायती कपडे त्यांनी निकालात काढले. अशाप्रकारे प्रमिलाताईचे सार्वजनिक व राजकीय क्षेत्रात पहिले पाऊल पडले.

१९३० मध्ये जो बापूजी अणे यांच्या नेतृत्वाखालील पुसद जंगल सत्याग्रहातील कार्यक्रम आखण्यात प्रमिलाताईचा मोठा सहभाग होता. त्यांनी या जंगल सत्याग्रहासाठी स्त्रियांचे एक दल तयार केले होते. या दलाने या सत्याग्रहात महत्वपूर्ण कामगिरी बजाविली होती. यावेळी त्यांची पुसद जंगल सत्याग्रहातील शूरपणा,साहसी वृत्ती,धामधूम करणारी मूर्ती सर्वांना आठविल्याशिवाय राहवत नाही.येळूनच त्यांचा राजकारणातील दर्जा हळू हळू वाढतच गेला.

विलायती कापडाची होळी, पिकेटिंग व सत्याग्रह मोहिम मोठ्या प्रमाणात संपूर्ण वऱ्हाडात वणव्यासारखी पसरली. सर्वत्र सत्याग्रहाच्या गोष्टी सुरु झाल्या. प्रमिलाताईनी आता मात्र आपल्या अभ्यासाची पुस्तके कोपऱ्यात फेकून दिली. त्यांच्या जीवनाला यावेळी वेगळे वळण लागले.सभा, मिरवणुकी, प्रभातफेऱ्यांमध्ये त्या दंग होऊन गेल्या.प्रभातफेऱ्यांमध्ये सर्वांच्या पुढे होवून गोंड गाणी म्हणून त्या लोकांना जागे करू लागल्या. याकाळात सत्याग्रहासाठी विदर्भात स्थापन झालेल्या युद्धमंडळात प्रमिलाताईचा महत्वपूर्ण सहभाग होता. यातील प्रत्येक सत्याग्रहात त्यांनी सक्रीय सहभाग दर्शविला.प्रमिलाताई बी.ए.झाल्या नाहीत, पण गांधीजींच्या सत्याग्रह शास्त्रातील विशारद मात्र झाल्या!!

#### वैयक्तिक सत्याग्रह चळवळ :

१९३२ च्या सत्याग्रहात प्रमिलाताईना मुली व मुलगा यांच्या जन्मामुळे भाग घेता आला नाही. परंतु १९३७ नंतर त्या पुऱ्हा स्वातंत्र्य आंदोलनात सक्रीय झाल्या. १९३८ च्या फैजपूर व १९३९च्या त्रिपुरा अधिवेशनाला जावून त्यांनी हजेरी लावली. या नंतरचा काळ प्रमिलाताईचा राष्ट्रभक्तिचा काळ होता.

१९४० मध्ये महात्मा गांधींनी वैयक्तिक सत्याग्रह चळवळ सुरु केली. प्रमिलाताईनी आई,बाप व पतींची अनुज्ञा घेऊन, मुलांचा मोह आवरून दिनांक २१ नोव्हेंबर १९४० रोजी वैयक्तिक सत्याग्रह केला. या दिवशी प्रचंड जनसमुदाय जमला होता. त्यांना यावेळी ब्रिटीश सरकारने अटक केली. त्यांनी यावेळी ४ महिन्यांची शिक्षा झाली.

#### म. गांधींशी भेट : दुसरा सत्याग्रह

वैयक्तिक सत्याग्रहाची ४ महिन्यांची शिक्षा संपल्यावर मार्च १९४१ च्या पहिल्या आठवड्यात प्रमिलाताईची सुटका झाली. जमनालाल बजाज यांच्या सूचनेवरून प्रमिलाताई वर्षा येथे जाऊन महात्मा गांधींना भेटल्या.म.गांधींनी त्यांना एक सप्ताह विप्रांती येथे राहून सत्याग्रह करण्याचा व अटक झाली नाही तर सत्याग्रह करीत दिल्लीकडे पायी जाण्याचा आदेश दिला. त्याप्रमाणे दिनांक ३४ मार्च १९४१ रोजी प्रमिलाताईनी अकोला येथे दुसरा वैयक्तिक सत्याग्रह केला आणि जप्त वाड्याचे वाचन केले. परंतु स्त्री सत्याग्रहास अटक न करण्याच्या सरकारी धोरणाप्रमाणे त्यांना अटक झाली नाही. म्हणून त्यांनी व्याळा-बाळापूर मार्गे सत्याग्रह करीत वृत्ती प्रयाण केले. त्यांच्या डायरीतील नोंदी प्रमाणे, "दिनांक १५ मार्च १९४१ शनिवार आज दुपारी ४.३० वाजता व्याळा मुनकास अम्ही तिथीनी सत्याग्रह केला.....आईवडिलांचा लोभ सोडून निघाले. माझ्या भावना खोल खोल दडपून, मन घट्ट करून धरून घाटू लागले. व्याळाला माझे भाषण चांगले झाले. गर्दी बरीच होती. रात्री आठ वाजता कान्हेरीला पोहचली.....रात्री सभा..... दोन वाजता बिछान्यावर पडली.... एका उदात ध्येयाने मी निघाले होते., हाच एक मनाला विरंगळा होता....." अशाप्रकारे कान्हेरी येथील





हरीजन वस्तीला भेट देऊन प्रवास करीत त्या पुन्हा बाळापूर येथे आल्या. नंतर मलकापूर,खामखेड पर्यंत जाऊन पोचल्या. तेथे त्यांना अटक करून अकोला येथे आणण्यात आले. पुन्हा त्यांना ४ महिन्यांची शिक्षा देण्यात आली. या कारावासात त्यांची प्रकृती बरोच ढासळली. नंतर जेलमधून सुटका झाल्यावर त्यांना प्रकृती स्वास्थ लाभले.

**१९४२ चा काळ:**

१९४२ च्या काळात त्यांनी मातृभूमीच्या संपादकपदी असतांना त्यांनी चळवळीच्या संदर्भात बरेच लेखन कार्य केले व चळवळ लोकांपर्यंत पोहाचविली. 'काँग्रेस आणि गांधीजी म्हणजे राष्ट्रीय स्वातंत्र्य आणि मानवी शांति यांचा समन्वय आहे.' असे प्रतिपादन दिनांक २ जानेवारी १९४२ च्या मातृभूमीच्या अंकात लिहिले. इंग्रजांची त्रिमंत्री योजना असफल झाल्यावर त्यांनी त्यावर सामान्य वाचकांस समजेल अशी एक पुस्तिका काढली.

१९४२ च्या 'चले जाव' चळवळीचा महात्मा गांधींचा संदेश घेऊन येतांना अनेकांना मलकापूर येथे अटक करण्यात आली. तेव्हा उरलेल्या चळवळीचा कार्यक्रम पार पाडण्यासाठी प्रमिलाताई व-हाडात परतल्या. मुंबईहून येण्याच्या अगोदर अटक न झालेल्या पुढाऱ्यांच्या मुंबईच्या बैठकीस प्रमिलाताई हजर होत्या. त्यांनी अकोल्याहून व-हाडातील कार्यकर्त्यांना आदेश पाठवून दिनांक ८ ते १३ ऑगस्ट पावेतो चळवळीचे मार्गदर्शन केले.

**प्रमिलाताईंना अटक:तिस-यांदा कारावास**

दिनांक १३ ऑगस्ट १९४२ रोजी अकोला येथे मोठ्या प्रमाणात निरोधने सुरु झाली. शाळा बंद झाल्या मील मधील मजूर बाहेर पडले. काँग्रेस मैदानावर जनसमुदाय जमू लागला. पोलीसांनी लाठी हल्ला सुरु केला. लोक सैरावैरा पळू लागली. याच लोकांपुढे भर दुपारी कांटन मार्केटमध्ये प्रमिलाताईंचे भाषण झाले. या पळत्या जमावाला "अरे असं पळता कां..... या माझ्या मागे " असे म्हणून प्रमिलाताई सिंहलीप्रमाणे तेजस्वितेने तळपुं लागली. परतणाऱ्या समुदायावर परत लाठीमार झाला. प्रमिलाताईंनाही पोलीसांचा मार खावा लागला. त्यांचे त्यावेळचे शौर्य राणी लक्ष्मीबाई प्रमाणेच लोकांना भासले. त्यांना अटक झाली. अकोला येथील या भाषणाचा गोषवारा एका इंग्रजी दैनिकात प्रसिध्द झाला.

"Two prominent Congress workers (one being a woman i.e. **Pramilatai oak**),in Akola addressed lightning meeting.....on १३ th and urged them to sabotage communications,march on banks,post offices and burn them down= As a result of these speedhes the mill-harfd's succeeded in destroying some telephone poies and wires before they were dispersed by the police. "

दिनांक १३ ऑगस्ट रोजी अटक झाल्यानंतर त्यांची तुरुंगातून दिनांक १.९.१९४३ रोजी सुटका झाली. त्यांनंतर सुटका होताच प्रमिलाताईंनी 'मातृभूमी' संपादनाची जबाबदारी उचलली. हिंदी प्रांताच्या १३ कलमी राजवटीत, अत्यंत जबाबदारपणे 'मातृभूमी' चे प्रकाशन केले. १९४५ ते १९४७ काळात त्यांनी काँग्रेसच्या विविध कमिटींवर जबाबदारीने कामकाज सांभाळले. सर्वत्र व-हाड समितीत महत्वाचे कार्य व व-हाड निजाम प्रकरणी जनतेला जागृत करण्यासाठी अहोरात्र प्रमिलाताईंनी धडपड केली. १९४८ च्या काळात संयुक्त महाराष्ट्र व महाविदर्भ परिषदेच्या कार्यात हिरीरिने भाग घेतला.

दिनांक ७ डिसेंबर १९४८ रोजी दिल्ली येथे एकाएकी मंदूतील रक्तस्त्रावामुळे प्रमिलाताईंचे दुःखद निधन झाले.त्यांच्या अकाली निधनाने संपूण प्रांत शोकसागरात बुडाला. सर्वत्र शोक दिवस पाळण्यात आला.जागजागी शोक सभा होऊन अनेक संस्थामधून दुखवटयाचे उराव पास झाले. जयपूर येथील काँग्रेसच्या अधिवेशनात दिनांक २८.१२.१९४८ रोजी दुखवटयाचा उराव सर्वांनी उभे राहून पास केला.

अशाप्रकारे मृत्युपर्यंत प्रमिलाताईंचे देशसेवेचे कार्य सुरुच होते. प्रमिलाताईंचे संस्मरणीय कार्य वर्तमान व भावी पिढीला प्रेरणादायी व मार्गदर्शक ठरणारे आहे. त्यांचे स्वातंत्र्य चळवळीतील योगदान हे अविस्मरणीय असून सर्वांना कार्यप्रवृत्त करणारे आहे.

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४. अर्धसाप्ताहिक मातृभूमी वृत्तपत्र: अकोला, दिनांक १९४९ ते १९४३ चे अंक

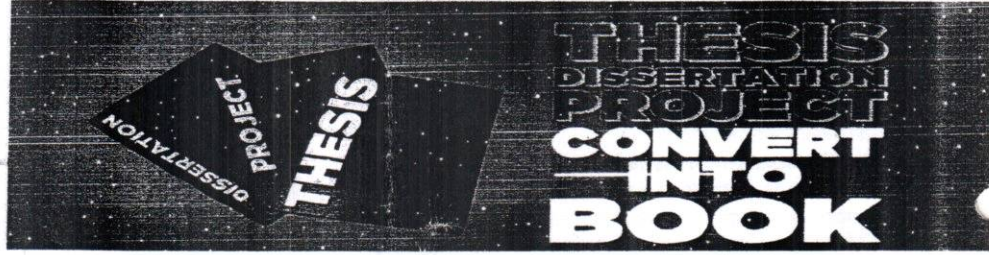
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## FEMINISM IS THE RELEVANT THEME OF INDIAN ENGLISH WOMEN NOVELIST

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### ABSTRACT:

*Indian women novelist raises the voice of women who are subjugated by patriarchal society. Indian women want to come out of all taboos and orthodox frame but as an Indian tradition and culture she can't tolerate the loss of marriage yet they want to emerge as an assertive woman, new woman. The present paper is a glance at Indian women novelist's feminist perspective.*

**Keywords:** Feminism, Women Rights, Patriarchy, Identity, New Woman, Indian Tradition.

### Introduction:

In the English Literature Indian women novelists play the vital role. The development of novels carries different trends from rational to psychological and patriarchal society to feminist perspective. Feminism is the ever present theme of the Indian novelist. In the Indian context the feminist perspectives are different than the western. This is because of different culture, tradition, language and family relation. Feminism brings many things including not only a variety of particular moral and political claims, but ways of asking and answering questions, critiques of majority philosophical views and methods, and new topics of inquiry. Feminist helps and interventions in typical philosophical debates are covered in entries under Feminist interventions. Women have been depicted by both male and female writer as their protagonist in the role of daughters, wives, mothers or widows. In the present literary scenario, Indian women novelist articulates the role and status of the woman. Indian women novelist makes their voice loud to hear everybody through their literature and they are also able to write about every aspects of human life. Due to their literature they have achieved global recognition. In India, there are many languages, religions, caste, traditions, races and cultures. This diversity offers different themes for Indian literature. Indian women novelist discussed the historical, philosophical, social themes with context to humanity. Earlier writers had often glorified women's suffering. As Elaine Showalter says about three phases,

*"Feminine, Feminist and Female. "In the Female phase, ongoing since 1920" women turned to express the "female experience as the source of an autonomous art." (p.405)*

Post 1920 or after 1960 in India women writer speaks about woman. However; Indian novelists in the last two or three decades have presented condition of woman with much greater reality. Modern Indian novelists presented women's struggle, women's craving for self-identity, self-consciousness, new vision, new role in society. In the last few decades, novelists like Kamala Markandaya, Kamala Das, Nayantara Sahgal, Anita Desai,

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Mahashweta Devi, Bharati Mukharji, Namita Gokhale, Gauri Deshpande, Shashi Deshpande, Shobha De, Sudha Murthy have presented their protagonist as an educated woman, career oriented woman, modern visionary woman, earning woman, self-reliant, independent, assertive woman.

In modern Indian novelist, Kamala Markandaya depicted Indian woman issues in her novels. Kamala Markandaya's female characters search constantly, meaning and value of their life. Feminism plays important role in all her novels. Her first famous novel, '*Nectar in a Sieve*' (1954) represented Rukmini as a strong and great character than her husband. Rukmini's life depicts as full of hopes and frustrations, happiness and sorrows, victory and loss, rise and fall. In her another novel '*The Nowhere Man*' (1972) presented the theme of identity crisis and feminism. Vasantha a female protagonist struggles for her existence. In her novels women are shown as more dignified than men because their great virtues.

Nayantara Sahgal depicts more strong and stern women protagonist as well as liberal woman. Her woman wishes to drink, smokes, dine as like male and don't accept male as a superior. Her protagonist believes she needs man only to fulfill the sexual desire. Her woman wants to expose the futility of male and their extra marital affairs. Sahgal's novel '*Rich Like Us*' (1985) is feminist text which discuss the patriarchy, imperialism and feminist view of the novelist.

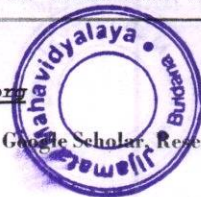
Anita Desai is one of the contemporary voices in the modern Indian English novel. Her first novel '*Cry, the Peacock*' (1963) followed by '*Bye-Bye Blackbird*', '*Where Shall We Go This Summer?*', '*Fire on the Mountain*', '*Clear Light of the Day*', '*In Custody*', and '*The Village by Sea*' all these novels represents women character most of them focused on their damaged relationship. Anita Desai tries to highlight the tension between family members and loneliness of her woman. Her characterization of man woman relationship is influenced and presented with complex social issues. Her women suffered very much but try to overcome and achieved fulfillment in their career.

Mahashwetadevi is a very famous for her poetry, novels and short stories, she has written in Bengali language also. Her works present the exploitation of women due to the patriarchal society. Her woman characters are from downtrodden, very bottom of the socio-economic class. Mahashweta Devi has written in Bengali language the Breast Stories, translated by Gayatri Spivak in 1997. The stories entitled as '*Draupadi, Behind the Bodice and Breast Giver*'. All these stories present marginalization and exploitation of women. Bharati Mukharji, another feminist novelist who represents immigrant's female protagonist who suffers due to cultural changes. Mukharji's woman undertook heroic journey and try to put forth her identity. In her first novel '*The Tiger's Daughter*' the protagonist, Tara came India from U.S. after seven years. She couldn't adjust in Indian culture and return to America. Her second novel, '*Wife*', Dimple is a Bengali girl marries Basu and lives in America but she came to know the futility of married life.

Amita Gokhale presented Paro as a strong woman in her '*Paro Dreams of Passion*'. In her another novel '*A Himalayan Love Story*' Gokhale depicted professional restrictions for women and hardships in marriage. Namita Gokhale in her works speaks about the women's sensibility and genuinely. Shashi Deshpande is a modern and award winning Indian novelist. She was awarded with Sahitya Academy award for her novel '*That Long Silence*'. As a feminist novelist she has written about women's struggle and their suffering as well as

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presented women's quest for self-identity and freedom of life. Her women suffer in every role as a daughter, sister, wife and mother; they are subordinated and exploited by male dominated society. Although, her women tolerate too much in every role but they desire for self-identity. Shashi Deshpande discusses the issue of exploitation of women whether physical, mental or emotional by patriarchal society.

'A Matter of Time' (2001) is a predicament woman of three generations of the same family. The story of Kalyani and Sumi is a lot of suffering and losing their life in the hands of male in material life. 'The Dark Holds No Terror' deals with protagonist Saru, a successful lady doctor and her husband Manohar is underpaid college professor. In her marital life she is mentally and sexually harassed by her own husband. Saru introspects herself, thinks her past and present reality, she says,

*My life is my own....somehow she felt as if she had found it now, the  
Connecting link. It means you are not just a strutting grimacing puppet,  
Standing futility on stage for a brief while, between areas of darkness.  
If I have been puppet it is because I made myself one.  
(The Dark Holds No Terror, 220)*

Another novelist, Shobha De, is an eminent Indian feminist novelist in English literature. De is a very special and different novelist from other Indian novelist. She is a very free in her expression and narration of personal incident with open heartedness. Shobha De represents her women protagonist as a 'new woman'. Her heroines are not helpless or love slaves. 'The Socialite Evening' (1989), the first novel of Shobha De, is about Karuna. Her husband accused her for being low moral woman. He was expecting her plead full response but Karuna darely confess:

*"I love this friend of yours and I want to be with him Venice  
There is good change" (Socialite Evening)*

Here, Karuna's rebel shows how she suffered and now she was seeking revenge against men dominated society. In the novel 'Second Thought' (1996), is a story of Maya, she was also an oppressed wife. She suffers due to husband's orthodox behavior. Sudha Murthy is also one of the famous feminist novelist but her women stick to the Indianans, tradition. Anupama in 'Mahashweta', shows as a very strong woman but she finds her own path and quit her husband. In 'Gently Falls the Bakula' Shrimati left her husband and finds her own way to complete her PhD.

#### Conclusion:

Indian women novelist portrays the Indian society, different issues of women, patriarchal domination which experienced by themselves. Women can be two kinds, 'woman as a reader' and woman as a writer'. Here, Indian women novelist depicted different issues of Indian woman, their suffering, exploitation, patriarchal domination, unsuccessful marital life. In such domination also Indian women novelist presented strong, rebellious and free woman who is ready to prove themselves as a new woman.

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## Societal Veracity in Superstar India : An Overview

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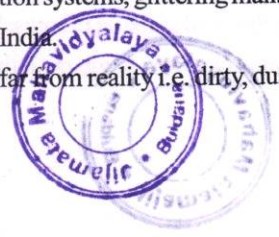
### Research Paper - English

India is well-known to the globe for its affluent tradition and civilization. The same India has eyewitnessed a lot of developments in social, cultural and political aspects. The post-Independent developments in India, especially civilizing developments can be viewed from both the constructive and unconstructive facet. Many images of the country have been depicted in the writings in the hands of many writers. Shobha De's *Superstar India* is one such writings in which the writer writes about Indian populace and their place in the society. She gives her response on what is happening at domicile i.e., in India and in the world.

In the beginning of the novel, De illustrates India as a Superpower and its people as super people. She considers that India's major strength lies in its super people, billions in numbers living in poverty, with diseases and in malnutrition. De observes, "It is a fact that 77% of India live on less than twenty rupees a day". (1) And this is the reality of superstar India. Surprisingly Urban India was rejoicing wildly and talking about being India a Super Power; and feeling proud about the foreign tourist visiting India for three significant heritage sites. They are the magnificent Agra Fort, Fatehpur Sikri and the Taj mahal. When the foreign tourists and VVIP's take the same high way they see only great roads, great infrastructure, great communication systems, glittering malls, dizzying cars which make them see only the prosperity of India.

The actual India can be seen sideways far from reality i.e. dirty, dusty and uneven

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roads. One can also see teenage girls venture into the fields behind Dhabas as they find no toilets- “Just the fields welcoming natural fertilizers”. (2) Still open air toilets exists and this is the reality of India. The writer proceeds to say that Indians do not care for privacy issues. “May be Indians conduct their ablutions in public views—— weird! (3) And this is the social reality of incredible India.

The spectacle of underprivileged farmers is very heart touching. For miles on end, one could pass through dry fields, tiny vegetable patches without any crops and greenery. The writer finds it too unlikable to see the agony of poor farmers. “Our people looked poor ... were poor... had always been poor... would they remain poor?” (4) We all know pretty well that the poverty badly influences not only the health of poor people but also explains their backward, social and cultural conditions. A sociologist appositely points out. “The immense poverty of the Indian Agriculturist is proverbial and presents the fundamental problem of the programme of national economic reconunstruction.” (5)

The true India can be discovered when beggars pester for alms in the streets. The view of beggars on the streets and their escort for alms has become a nuisance in cities. When the signal falls, the motor riders become sick of pollutions and the noise of beggars. The writer expresses her disappointment and wishes the government to take some drastic steps to do something for the beggars, for they trouble the foreigners more than the Indians. “Can’t you get rid of those beggars ...? Why can’t the Government do something?” (5) On seeing the beggars on the streets, foreigners do not dare to step out of their five star hotels and into the mean streets of Mumbai. And on streets they view lepers, drunkards, drug addicts, maimed kids and many more. And this is the social reality of incredible India.

The writer portrays the event of a German couple who tried to take a walk along Marine Drive; but they turn around and run back, trembling with fright. And on reaching the hotel they change their tainted dress and their travel itinerary and take the flight home, vowing never to return. Such happenings show us how the beggars create a mess and bother people around. If they are not paid any alms they even venture to curse people with their unwashed and stinking mouths. This is very disgusting and sickening for the people who come across the beggars on the roads.



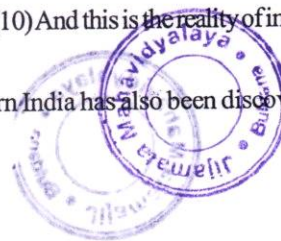




The writer divulges that India is known for its traditional values which make India exclusive or different from the other countries. Indians talk about respecting the elders, respecting authority, family members, teachers, spiritual leaders and so on. But the situation in India has changed. "Indian tradition pays homage to the old. But when it comes to the ground reality, millions of Indians are having a terrible time." (6) Currently there is a huge demand for Old Age Homes. A canny politician in Mumbai came up with the idea of a 'Naana-Naani' park in one corner of Chowpatty Beach in central Mumbai. Nowadays, the older generation in India is marginalized; no place to call their own and the daily humiliations have become a routine for them. There was a time in India, when sons and families assumed it as their duty to look after their old parents. But in the present Indian society the condition of older generation and senior citizens has worsened. "Times have changed... nobody wants old people these days... the world belongs to the youth ...." (7)

According to the writer majority of adolescents have seldom any contact with their grand and old parents. They give many excuses saying- "Where is the time, yaar? We have our studies, tuitions, sports, movies, TV ...." (8) Recently our Newspapers were crammed with the stories of the brutal murders of senior citizens over money issues, robbery and much more. When asked by the press, a son of a slain widow (who lived next door) answered, "Senior citizens must learn to look after themselves .... I have my own life to handle." (9) Such incidents force us to think that what happened to traditional values of India? The writer suggests the youth, sons and families to think about the ageing problems and problems of deserted senior citizens and pleads the government to take necessary measures for the welfare, safety and security of older generation. A Columnist, Patralekha Chatterjee observes: "The safety net of the extended family can no longer be taken for granted as young people, in growing number, move elsewhere in search of work and better life. More and more of the elderly are living alone, or just with their spouse. In Tamilnadu, this figure is perhaps as high as 45 percent, says as UNFPA (United Nations Population Funds background document.... The agencies like Helpage are asking for the universalisation of social pension." (10) And this is the reality of incredible India.

The appalling state of women in the modern India has also been discovered by







the writer. De strike a chord to her readers about the assaults on women all over India. She refers to horrifying happenings involving rape, acid attacks, domestic violence, dowry deaths and other crimes. And crimes are taking place in urban as well as rural society; in the illiterate as well as learned society. In order to control these crimes, there is a legislation to protect women. The domestic Violence Bill has been peddled. But, unfortunately many women, mostly illiterates are unaware of the Women's Organizations which support, assist and extend a helping hand for the victims in getting justice. The World Conference on Human Rights stresses the importance working towards the elimination of violence against women in public and private life, the elimination of all forms of sexual harassment, exploitation and trafficking in women . . .”(11) At present Indian society is terrified by the increase in number of rapes day by day. And this increasing menace in our country reflects the attitude and manners of contemporary society, especially youth. A socialist rightly observes: “The increasing number of gangrapes indicates specifically peculiar features, significant to our society. They indicate the manner in which young men are growing up and what kind of value systems they appear to have imbibed within the family structure.”(12)

The writer induces readers to contemplate over the future of India. Despite its progress in the Industrialization and IT sector, its cultural, traditional and social values have been declining. In order to resume the peace, harmony, reduce poverty and menace, there is a need to change the mind set of our society. The efforts should also be made to retain ethics and moral values, so as to improve the value systems in Indian family structure leading to a healthy society. It is the youth of this country which is approximate to take the initiation to save India from all kinds of evils and make our country, a Superstar India rich with its conventional and cultural standards.

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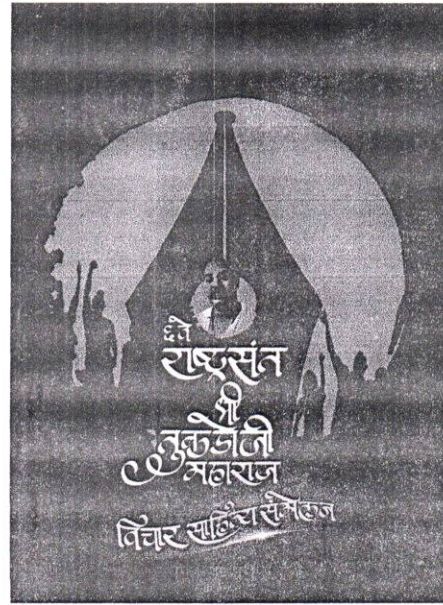




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III





## २५. राष्ट्रसंताच्या खंजरी भजनांद्वारे समाजप्रबोधन

प्रा. गजानन एम. लोहटे

संगीत, सहायक अधिव्याख्याता जिजामाता महाविद्यालय, बुलढाणा.

### प्रस्तावना

भारत ही संत मंहातांची भुमी म्हणून ओळखली जाते. अशा या विशालमय देशाकरीता ग्रामगीतेच्या माध्यमातून आपले संपूर्ण जीवन देश सेवेकरीता तसेच समाज उन्नतीकरीता अर्पण करणारे असे थोर राष्ट्रसंत तुकडोजी महाराज होत. खंजरी भजनाच्या माध्यमातून अनेक विषयावर आधारित विभिन्न गीतांना, काव्यांना स्वतः निर्माण करून स्वरबध्द करण्याचे महान कार्य वंदनीय महाराजांनी केले. मध्ययुगीन काळामध्ये संत साहित्याची चळवळ महाराष्ट्रत सुरू झाली. सर्व संप्रदायातील संतानी आपापली भजने, ओव्या, पद, दोहा इ. साहित्यांद्वारे व विविध गीतप्रकाराच्या माध्यमातून समाजाचे प्रबोधन केले. त्यामध्ये जसे की, वारकरी सांप्रदायातील संतानी भजनाचा प्रचार प्रसार संपूर्ण भारतभर केला. तेवढ्याच उंचीवर राष्ट्रसंतानी सुध्दा विदर्भामध्ये मोझरी येथे श्री गुरुदेव मंडळाची स्थापणा करून खंजरी भजनाच्या माध्यमातून एक चालते बोलते विद्यापीठच सुरू केले.

समाजामध्ये असलेल्या अनिष्ट रूढी, परंपरा इत्यादीचे निर्मुलन महाराजांनी भजन, कीर्तनाच्या माध्यमातून केले. एवढेच नव्हे तर तीच परंपरा आजतागायत गुरुदेव सेवा मंडळाच्या माध्यमातून केली जात असल्याचे दिसून येते. तुकडोजी महाराजांनी समाज प्रबोधना करीता केलेल्या साहित्याचा विचार शैलीचा उपयोग समाजाकरीता करण्यासाठी संगीत अर्थातच खंजरी भजन हे माध्यम प्रामुख्याने वापरल्याचे दिसून येते. महाराजांच्या साहित्य निर्मितीत राष्ट्रभक्ती, उपदेश, स्त्री-पुरुष समानता, राष्ट्रनिर्मिती मानवीकल्याण, स्फूर्तिगीते, पोवाडे, किर्तन, गझल, कव्वाली. इत्यादी विषयाच्या माध्यमातून वंचीत घटकांपर्यंत समाज प्रबोधन करण्याचे महान कार्य केले.

राष्ट्रसंतांच्या भजनांचा उद्देश मनोरंजनातून समाजजागृती हा होता. वंदनीय महाराजांनी समाजप्रबोधनालाच महत्व दिले आहे. राष्ट्रसंतांचा संगीत विषयक दृष्टिकोन बघतांना महाराजांच्या मते 'भजन हे लोकांच्या मनावर उत्तम आणि परिणामकारक संस्कार घडवून आणण्याचे प्रभावी साधन आहे. अर्थातच समाजाला जर संजीवनी दयायची असेल तर भजना शिवाय तरणोपाय नाही. म्हणून वंदनीय महाराजांनी करून त्यावेळी असलेल्या जुण्या चालीमध्ये स्वर रचना काव्या रचना केल्या. तसेच तत्कालीन चित्रपटावर आधारित चालीच्या सोप्या शैलीमध्ये खंजरी भजनाच्या रचना तयार करून लोकांच्या गळी उतरविण्याचे महान शिवधणुष्य लिलयापणे पार पाडल्याचे दिसून येते. सामान्य जनतेला रूचेल आणि पचेल अश्या मार्गाने महाराजांनी आपले विचार समाजामध्ये रूजवून समाजप्रबोधनाचे मौलिक कार्य संगीताच्या माध्यमातून केले.

त्यांच्या मते माणुस घडला तर समाज घडत असतो याउलट माणुस बिघडला तर समाज सुध्दा बिघडतो म्हणुन माणुस हा घडला पाहिजे हि राष्ट्रसंताच्या अंतःकरणातील तळमळ होती. देश कुडलाही असो त्या त्या देशाच्या विकासामध्ये युवा वर्गाचा वाटा महत्वपूर्ण असतो. म्हणुन वंदनीय महाराजांनी खंजरी भजनाच्या माध्यमातुन युवा वर्गाला आकर्षित करण्या कारता भजनांच्या जुन्या व नविन चालीचा समावेश केल्याचे दिसुन येते.

भजन हा विषय केवळ ग्रंथालय, मंदिर किंवा समाजातील विशिष्ट वर्गासाठी नसुन त्यामध्ये दैनंदिन जीवनाचा अनुभव आणि त्याची भावाभीव्यक्ती काव्याच्या रूपाने संगीताच्या माध्यमातुन अर्थातच भजनांद्वारे लोकापर्यंत पोहचवीने होय. खंजरी सारख्या छोट्याशा वाद्यातुन अखिल विश्वाच्या मनामध्ये झंकार निर्माण करून भजनाच्या माध्यमातुन नव्या युगाचे स्वप्न साक्षात साकार करण्याचे महत्वपूर्ण कार्य संगीताच्या माध्यमातुन केले. महाराजांच्या अनेक कार्यांपैकी उदाहरणच दयावयाचे झाल्यास जपानमधील परिषदेमध्ये खंजरीची गुंज सर्व जगाला दाखवून खंजरी भजनाचा प्रचार प्रसार केला. ही अत्यंत महत्वपूर्ण बाब आहे.

भजन म्हणजे काय? हे सांगतांना राष्ट्रसंताच्या मते 'लोकांच्या मनावर उत्तम संस्कार घडवून आणण्याचे साधन म्हणजे भजन होय' भजनाचे स्वरूप सांगतांना राष्ट्रसंतानी भजनी मंडळासाठी एक संहिता घालून दिल्याचे दिसते याविषयीचे सविस्तर वर्णन भजनप्रभाव प्रकरणात स्पष्ट केलेले आहे. म्हणजेच भजनाची जागा, आसनव्यवस्था इत्यादी संदर्भातील नियमावली महाराजांनी आगोदरच सांगुन भजनाचे स्वरूप स्पष्ट केले आहे. भजनाचे विविध प्रकार व संप्रदाय दिसुन येतात जसे की, वारकरी संप्रदाय, खंजरी भजन, एकतारी भजन, अवधुती भजन, देवीचे भजने इत्यादी सारख्या अनेक भजन परंपरा आस्तित्वात असल्या तरी राष्ट्रसंतानी आपली स्वतंत्र 'खंजरी भजन शैली' मानवी कल्याणा करीता सर्वात्कृष्ट साधन मानले. महाराजांच्या मते,

म्हणोनी भजनाचे महत्व । भाषनाशी येते गौणत्व । हे समजोनी संतानी तत्व । भजन केले प्रेमाणे ॥

एब्रढेच नव्हे तर महाराजांनी भजनाचे महत्व सांगतांना भजना सारखा दुसरा प्रभावी उपाय लोकशिक्षणा करीता कुडलाच नाही

भजनाची चालता परंपरा । जना मिळे सत्प्रवृत्तीचा झरा । लोकशिक्षणाचा यापरी दुसरा । उपाय नाही सत्त्विक ॥

अर्थातच, समाजाला संजीवनी दयायची असेल तर भजना शिवाय तरणोपाय नाही. महाराजांच्या भजनाचे विषय हे मानवता, विश्व शांती असल्याचे उदाहरणादाखल खालील भजनाद्वारे देती येईल उदा.

हरं देश मे तु। हर भेष में तु। तेरे नाम अनेक। तु एक ही है॥ तेरी रंग भुमी यह विश्व भर

सुख खेल में मेल में तु ही तो है ॥

अशा प्रकारे महाराजांच्या हिंदी मराठी भजनातुन राष्ट्रिय एकात्मता, सामाजिक व अध्यात्मिक प्रबोधन गावोगावी जेव्हा आपल्या खंजरीच्या माध्यमातुन लोकांना मंत्रमुग्ध करून देशांप्रती देशप्रेम रूजवीण्याचे आणि





जागविवण्याचे महान कार्य महाराजांनी केले. एवढेच नव्हे तर जनता जनार्धनाच्या अंतःकरणात स्वातंत्र्याची ज्योत प्रज्वलीत करून स्वतंत्र चळवळ प्रभावी करण्याचे अलौकीक कार्य महाराजांनी केले. म्हणून एके ठिकाणी महाराज म्हणतात, 'दिलसे गांडगा तेरा भजन उंचा उठा दे मेरा वतन' किंवा 'या भारतात बंधुभाव नित्या असु दे। दे वरची असा दे ।

#### निष्कर्ष

भजन हे लोकांच्या मनावर उत्तम संस्कार करण्याकरीता प्रभावी साधन असल्याने महाराजांनी भजनाचा उपयोग खास करून समाज प्रबोधनासाठी केला.

आदर्श समाज निर्माण करण्यासाठी आदर्श अशा काव्या रचना तयार करून त्यांना स्वरबद्ध करून खजरी भजनाव्दारे जनतेला अर्पण केले


विविध महत्वपूर्ण विषयांना एकत्रित बांधण्याचे आणि भजनाच्या माध्यमातून जनसमुदाय एकत्रित करण्याचे महान कार्य महाराजांनी केले.

अभंगातील तत्व आणि ग्रामगीता हे जीवन मुल्यांचा शोध घेतात.

अखिल मानवाच्या कल्याणाकरीता वंदनीय महाराजांनी सामुदायिक प्रार्थनेला महत्व दिलेले आहे. अधुनिक काळात सुध्दा राष्ट्रसंताच्या अनेक योजनांची अथवा विचारची गरज देशाला वाटू लागली आहे. जसे की, मुल्य शिक्षण स्वच्छता अभियान, ग्रामविकास सर्व शिक्षा अभियान इ. अभ्यासक्रमाचे विषय होतांना दिसतात. म्हणून शेवटी एवढेच म्हणवेसे वाटते की, या भारतात बंधुभाव नित्य असु दे। दे वरची असा दे ।

#### संदर्भ ग्रंथ

- ग्रामगीता - राष्ट्रसंत तुकडोजी महाराज, श्रीगुरुदेव प्रकाशन मौझरी
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# PANI-ZnO Cladding-Modified Optical Fiber Biosensor for Urea Sensing Based on Evanescent Wave Absorption

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In the present investigation, we demonstrated a simple, rapid, and highly sensitive cladding-modified optical fiber urea sensor based on the evanescent wave absorption (EWA) technique. Cladding modification was performed over a 2-cm unclad portion of optical fiber using a polyaniline-zinc oxide (PANI-ZnO) matrix with enzyme-Urease (Urs) cross-linked to it using glutaraldehyde as a cross-linking agent. The PANI-ZnO matrix was characterized by X-ray diffraction, scanning electron microscopy, ultraviolet-visible, and Fourier transform-infrared spectroscopy to explore its various properties. The developed sensor shows a linear response to urea concentration in the range 10 nM–1 M in the form of the absorption spectrum at a wavelength of ~250 nm with specific selectivity. Under the proper conditions (storage at temperature 4°C after each measurement), it shows 40-day stability without any decrement in the intensity of the absorption spectrum. Thus, the developed sensor is highly sensitive, stable, and specific, with a lower detection limit of a urea concentration of 10 nM.

**Keywords:** optical fiber, urea, PANI-ZnO, evanescent wave absorption, cladding modification

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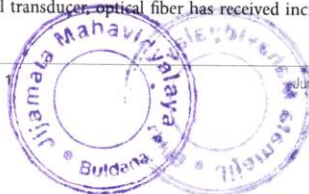
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## INTRODUCTION

Biosensors are utilized in multidimensional fields, including medicine, home diagnosis (Mehrotra, 2016), agriculture (Velasco-García and Mottram, 2003), the military (Rossi et al., 2000), environmental monitoring (Rodríguez-Mozaz et al., 2005), food preservation, fishery industries (Terry et al., 2005) etc. A biosensor is an analytical device that has extraordinary characteristics such being compact, cost-effective, ultra-sensitive, and specific and having shorter response and recovery times along with very low analyte concentration detection limits (Luong et al., 1997). Generally, a biosensor comprises three main components, viz. a bioreceptor (enzyme, nucleic acid, cells, etc.), a physicochemical transducer (electrochemical, optical, piezoelectric, thermometric, ion-sensitive, magnetic, or acoustic, etc.), and an immobilization matrix. Each component contributes to improving the reliability of the biosensor in practical applications (Turner et al., 1987; Monošik et al., 2012). The worldwide scientific and academic community has invented various types of schemes and materials for fabricating biosensors (Banica, 2012). In a sense, biosensors can be classified according to the bioreceptor and transducers used for their fabrication. As regards the selection of a physicochemical transducer, optical fiber has received incredible consideration for





chemical and biosensing applications. This is because of its distinct features viz. its miniature size, low response time, immunity to electricity, robustness in use, high sensitivity, low weight, requirement of a small sample amount, remote controllability, and facility to use in various geometries etc. (Monk and Walt, 2004; Fan et al., 2008; Martins et al., 2013). In optical fiber biosensors, the evanescent wave absorption (EWA) scheme has become popular, promising, and much used due to the enhanced sensitivity, high resolution, and low detection limit it provides (Zawawi et al., 2013; Zhong et al., 2016). Principally, an evanescent wave (EW) field is generated in optical fiber due to light decaying exponentially into a small portion of the cladding, and this is utilized for the fabrication of cladding-modified intrinsic optical fiber sensors (Sai et al., 2010; Bharadwaj et al., 2011). When applying this scheme, several critical factors arise, such as the proper incidence angle, the adjustable geometry of optical fiber (bending, tapering, etc.), and the thickness of the immobilization matrix. However, enhanced sensor credibility and performance can be achieved by the proper optimization of these factors (Iadicicco et al., 2011).

Technically, in an optical fiber biosensor, the immobilization matrix plays a considerable role, as it decides the performance as well as the efficiency of the biosensor. In biosensors, the immobilization matrix is used to maintain the stable reactivity and safe residency of bioreceptor (Ramakrishna and Sai, 2016). In an optical fiber sensor, it is used as a modified cladding that responds to chemical and biochemical reactions occurring on its surface. Thus, diverse materials with attractive properties have been synthesized and used as an immobilization matrix. For biosensor applications, intrinsic conducting polymers (ICPs) are emerging as a new class and are used as an immobilization matrix. Due to their extraordinary morphological, structural, optical, mechanical, and electrical properties, they are considered the most promising candidate for the immobilization of bioreceptor species. In the field of biosensors, two types of ICPs are considered to be especially promising: polyaniline (PANI) and polypyrrole (PPy). Polyaniline has many desirable features and properties, such as intriguing physical properties, ease of synthesis, low cost, extraordinary electrical, and optical properties, a sufficiently large surface area (morphology), adjustable transport properties, and environmental stability (Kim et al., 2010). As well as being synthesizable via a variety of methods, its sufficient solubility in innumerable solvents and capability to fabricate versatile composites/nanocomposites due to its functionality-rich chemical skeleton can be efficiently exploited for biosensor applications. With the incorporation of metal oxide nanoparticles, the properties of pure PANI change drastically, which is useful for sensing applications and improving sensitivity, selectivity, and stability (Tahir et al., 2005; Prakash et al., 2013). Owing to their good structural and optical properties and biocompatibility, PANI-metal nanoparticle composites have proven to be promising candidates for bioreceptor immobilization (Dhawan et al., 2009).

Urea ( $\text{NH}_2\text{CONH}_2$ ) is a chemical species found everywhere in nature. Urea is present in the human body due to protein metabolism (Singh et al., 2008). A concentration of urea above the optimal level generates various dangerous diseases,

included kidney and liver malfunction, chronic or acute renal failure, urinary tract obstruction, dehydration, shock, burns, and gastrointestinal bleeding, whereas, below a certain level, it produces hepatic failure, nephritic syndrome, and cachexia (Mostafaei and Ashkan, 2012; Mostafaei and Nasirpour, 2014). However, urea is also found in agriculture, dairy industries, and fishery industries and performs various roles. Thus, the selective and rapid determination of urea concentration is a vital need for the abovementioned fields. Worldwide, different groups are working on the development of biosensors for detection of urea. In earlier years, various research groups have devoted their efforts to fabricating a urea biosensor using different techniques and different matrices for enzyme immobilization. Ahmad et al. reported a ZnO nanorod-based urea sensor using an electrochemical technique. The fabricated sensor shows high sensitivity toward urea in the linear range 0.001–24.0 mM, with a 10- $\mu\text{M}$  lower detection limit (Ahmad et al., 2014). By modifying the ZnO structure, i.e., creating nanosheets, the same research group developed a potentiometric urea sensor and detected urea concentration with the linear range 0.05–2.0 mM with a lower detection limit of 0.019  $\mu\text{M}$  and with a very short response time of  $\sim 5$  S (Ahmad et al., 2015). Babu et al. prepared a freestanding and binder-free electrospun PVdF-HFP/Ni-Co nanofiber-based urea biosensor. The developed sensor showed a rapid response time (5 S), a lower detection limit of 12  $\mu\text{M}$ , and a wide linear range of 20  $\mu\text{M}$ –2 mM for urea concentration detection (Babu et al., 2017). A Ali et al. reported on a potentiometric urea biosensor based on urease immobilization onto chitosan/cobalt oxide (CS/Co<sub>3</sub>O<sub>4</sub>) nanocomposite for the detection of urea within the range  $1 \times 10^{-4}$ – $8 \times 10^{-2}$  M with a 12-s response time (Ali et al., 2015). In a previous study, we reported on a urea sensor using pure polyaniline for cladding modification but did not achieve the desired results in terms of linearity, stability, detection limit, etc. (Botewad et al., 2018). Thus, improvement in the abovementioned characteristics of the PANI-ZnO nanocomposite sensor is required, and cladding modification and enzyme immobilization have been selected as the means to do so.

Herein, we present the EWA optical fiber intrinsic biosensor for the selective sensing and quantification of urea. The biosensor is fabricated by cladding modification with PANI-ZnO nanocomposite as an immobilization matrix. The sophisticated straight geometry of the optical fiber transducer and the experimental setup have been adapted for the development of the sensor. Using the PANI-ZnO cladding-modified matrix provides superior sensing parameter values for the developed biosensor for selective detection of urea.

## EXPERIMENTAL

### Materials

In the present investigation, all provided chemicals were of analytical reagent (AR) grade and used as received without any further purification. Aniline (monomer), ferric chloride (oxidant), zinc chloride, and sodium hydroxide were purchased from Fisher Scientific, India, and used to synthesize PANI-ZnO nanocomposite. The bio-receptor enzyme-urease (Urs) was



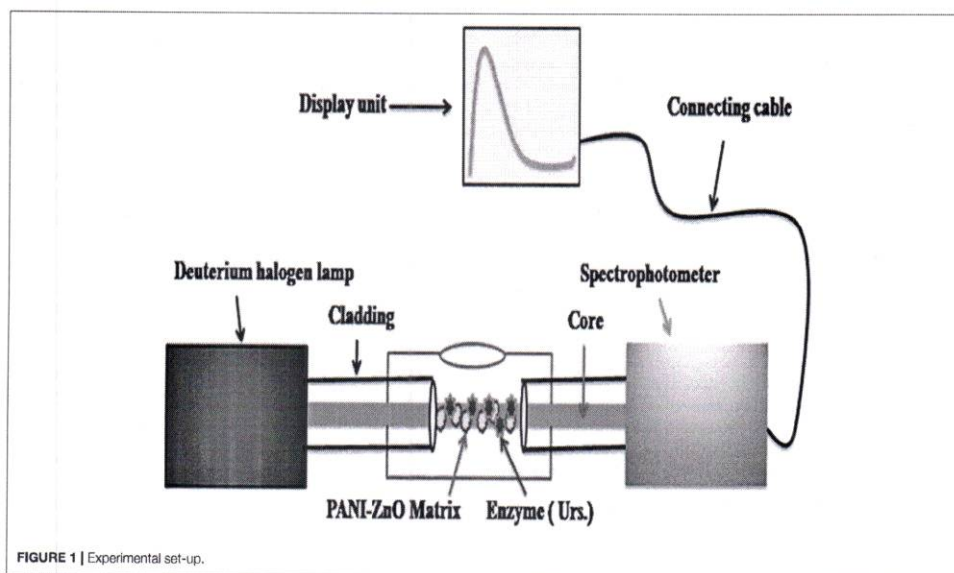


FIGURE 1 | Experimental set-up.

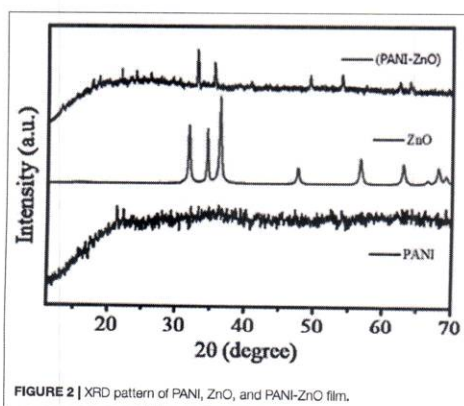


FIGURE 2 | XRD pattern of PANI, ZnO, and PANI-ZnO film.

repetition of benzenoid and quinoid rings in PANI chains and the low crystallinity of the PANI-ZnO nanocomposite shows that it is in a semiconducting state (Ali et al., 2015). Scherer's equation gives the crystalline size,  $D$ , of the PANI-ZnO nanocomposite as 33 nm.

Figure 3 shows SEM photographs of the PANI (Figure 3A) and PANI-ZnO (Figure 3B) films and reveals their morphological features. The amorphous nature and high

agglomeration of pure PANI is clear in Figure 3A. The PANI-ZnO nanocomposite shows a cauliflower-like structure, comprising small globular particles, which is suitable for the immobilization of biomolecules. Figure 3B also shows that the PANI-ZnO nanocomposite has a porous morphology and is very efficient for enzyme-Urs immobilization. Figure 3C shows an SEM image of the cladding-modified region, confirming its uniform thickness on the nude core.

## Spectroscopic Analysis

### Optical Study (UV-Vis)

Optical spectroscopy provides information about the conducting states of PANI, i.e., the leucoemeraldine, pernigraniline, and emeraldine states. These states of PANI emerge from variation in the ratio of oxidant and monomer, the synthesis technique used, and the duration of the synthesis process. In biosensors, the emeraldine state of PANI is used due to this semiconducting state having better morphology (Kavitha et al., 2012).

In the present investigation, UV-visible absorption spectra of the as-synthesized PANI and PANI-ZnO nanocomposite were recorded and analyzed in the range 210–500 nm; these are shown in Figure 4. The absorption spectrum clearly reveals two characteristic absorption peaks at 233 and 287 nm for both PANI and PANI-ZnO nanocomposite. The observed peaks confirm that the emeraldine state of PANI is not modified due to incorporation of ZnO within it. The observed peak at 233 may occur due to the presence of an aniline moiety (Babu et al., 2017), and the peak at 280 corresponds to the  $\pi-\pi^*$  transition of the benzenoid ring in polyaniline (Patil et al., 2015).



procured from Sisco Research Laboratories (SRL), India. The analyte urea, cross-linking agent glutaraldehyde solution (25%), interference species glucose, thiourea, ascorbic acid, L- alanine, L-arginine were purchased from SD Fine Chemicals, India. For the formation of buffer solution (Phosphate buffer pH 7.4), potassium dihydrogen orthophosphate and sodium hydroxide were purchased from SD Fine Chemicals, India. Hydrofluoric acid and acetone for the cladding removal process and cleaning were procured from Fisher Scientific, India. All of the synthesis processes were carried out in double-distilled water. In a typical sensing procedure, the stock solutions of Urs in the proportion 1 mg/ml and urea were prepared in 0.1 M phosphate buffer of pH 7.4.

### Synthesis of PANI-ZnO Nanocomposite Matrix

ZnO nanoparticles ~26 nm in size were synthesized by a co-precipitation method using zinc chloride (oxidant) and sodium hydroxide (1:2 ratio) as source material. PANI-ZnO nanocomposite was synthesized with an *in-situ* chemical oxidation polymerization method. Initially, 0.02 M aniline was dissolved in 100 ml double-distilled water and stirred until the solution became transparent. The as-synthesized ZnO nanoparticles (0.2 M) were poured into the aniline solution, followed by constant stirring for 30 min. Further, 1 M HCl was added into the mixture of aniline-ZnO for homogeneity. An already-prepared 100 ml of stock solution of FeCl<sub>3</sub> (0.05 M) was added dropwise into the aniline-ZnO mixture with constant stirring for 1 hour. The precipitate was further centrifuged and washed several times with distilled water before characterization.

### Development of Sensing Element

Half a meter of multimode plastic-clad silica (PCS) optical fiber with a specified core/cladding diameters of 450/300  $\mu\text{m}$  (750  $\mu\text{m}$  in total) and attenuation of 3 dB/km was selected for preparation of the sensing element. In the middle, a ~2-cm portion of the cladding was removed carefully with a surgical blade. The unclad core was cleaned with hydrofluoric (HF) acid, acetone, and distilled water, respectively. Both ends of the optical fiber were polished with silicon carbide and very fine polish papers optimize the numerical aperture and acceptance angle. SMA905 connectors were then connected to both ends of the optical fiber. In the process of cladding modification, *in-situ* deposition on the unclad portion of the optical fiber was achieved by submerging it in the PANI-ZnO reaction container for 15 min at room temperature. Coating by this technique allows control of the thickness of the modified cladding on the core via the treatment time. Further, the enzyme-Urs was immobilized over the hydrophobic modified PANI-ZnO matrix through a cross-linking technique via 1% glutaraldehyde and provided physical and chemical stability of the bio-receptor material. After that, loosely bound Urs molecules were leached out under gentle washing with phosphate buffer, followed by half an hour of drying. An adequate concentration of Enzyme-Urs was chosen to provide higher enzyme loading with excellent optical response and high retention.

### Characterization

The as-synthesized ZnO nanoparticles, PANI matrix, and PANI-ZnO nanocomposites were characterized by different techniques. The structures of all synthesized materials were characterized by X-ray diffraction (XRD) and recorded on a Bruker AXS (D8 Advance, Germany) diffractometer in the scanning range 20–800 (2 $\theta$ ) using Cu K $\alpha$  radiation with a wavelength of 1.5405 Å. Absorption spectrum studies of the materials were performed using a UV-Vis portable spectrometer (BLACK-Comet-SR, SL5-DH, Stellar Net, USA) with unpolarized light from temperature-controlled and intensity-stabilized deuterium and halogen lamps (UV-vis light source). The FTIR spectrum was recorded using an IR double beam spectrophotometer (8400S, Shimadzu, Japan) for the confirmation of functional groups in the prepared materials. The morphology of the prepared materials was studied by scanning electron microscopy (SEM) with a JEOL JSM-6360 (USA). The sensor parameters of the developed biosensor were analyzed by acquiring the absorbance spectrum by UV-Vis spectrophotometer, using an indigenously prepared sensing element connected between deuterium halogen lamps (UV-Vis light source) and the spectrophotometer. The sensing experiment was carried out in a completely dark environment to avoid interference from external light. Throughout the experiment, buffer solution (pH 7.4) was used. The sensing experimental setup shown in Figure 1. For the sensing parameters study, a 10 nM–1 M range of urea concentration in buffer solution was selected, with a 2-min exposure time for each concentration.

## RESULTS AND DISCUSSION

### Structural (XRD) and Morphological (SEM) Analysis

The structures of the incorporated ZnO nanoparticles, PANI, and PANI-ZnO nanocomposites were explored by XRD characterization, and the results are shown in Figure 2. The XRD pattern of the ZnO nanoparticles reveals that it is polycrystalline in nature. Their XRD pattern includes the (100), (002), (101), (102), (110), (103), (200), (112), and (201) diffraction peaks. All the observed diffraction peaks are in good agreement with ICDD pdf card No. 01-071-6424, which is for a hexagonal ZnO structure. The lattice constants of the prepared ZnO nanoparticles are found to be  $a = 3.249 \text{ \AA}$ ,  $b = 3.249 \text{ \AA}$ , and  $c = 5.205 \text{ \AA}$ . The average crystallite size was determined by the standard Scherrer's formula and was found to be 26.06 nm. Figure 2 shows the XRD pattern of PANI, which confirms its amorphous nature because of the absence of the characteristic peaks of the used oxidant (Kavitha et al., 2012). The XRD pattern of the ZnO-incorporating PANI matrix, also shown in Figure 2, provides confirmation to the formation of conducting organic-inorganic nanocomposites. The amorphous nature of PANI is affected by the incorporation of ZnO, and some characteristic peaks are observed because of the formation of hydrogen bonds between the H-N of PANI and the oxygen of ZnO. Thus, some of the peak shifts from the blue line of the PANI-ZnO matrix to the red and black lines may arise due to the interaction of ZnO nanoparticles (Deshpande et al., 2009). The



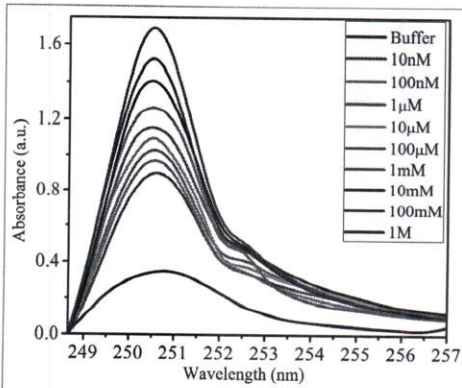


FIGURE 6 | Sensing response of developed biosensor.

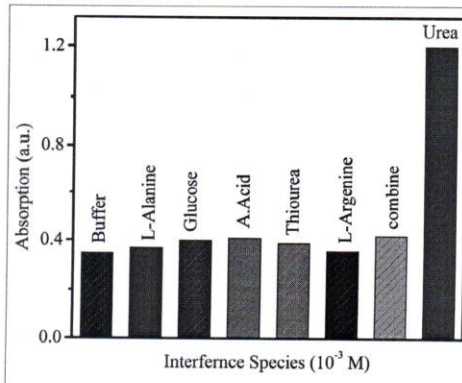


FIGURE 8 | Selectivity of developed biosensor.

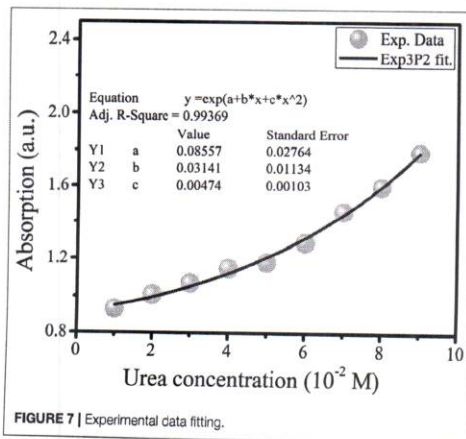


FIGURE 7 | Experimental data fitting.

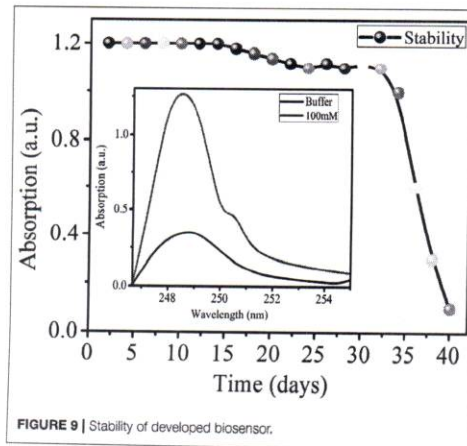


FIGURE 9 | Stability of developed biosensor.

### Sensitivity

A urea concentration range from 10 nM to 1 M was used for the sensitivity study, and a 15-min incubation time was apportioned for each sample. Using the portable UV-Vis spectrophotometer, the absorption spectrum was obtained by connecting the sensing element between the light source and the spectrophotometer. The sensing response of the prepared sensor is depicted in Figure 6 in the form of the absorption spectrum. The result obtained of sensitivity does not follow a linear function; instead, it follows an Exponential 3P2 function, as shown in Figure 7, with an Adj. R. Square value of 0.99369. To study the repeatability, the same conditions of the sensing element were maintained, such as the length of cladding removed, the deposition time of new cladding, the quantity of enzyme over the cladding modified region, and

the light source. Five sensors were developed, and each developed sensor showed approximately the same response toward urea.

The sensing mechanism of the developed sensor is discussed here briefly. Generally, for sensing the urea species, enzyme-Urs was used as a bioreceptor, which hydrolyzed the urea effectively with an approximate rate 1,014 times that of the non-catalyzed reaction (Kavitha et al., 2012). When the sensing element is exposed to a concentration of urea, the enzymatic reaction between urea and Urs occurs in two stages. Firstly, Urs react with urea to produce ammonia and carbamate, while in the second stage, the carbamate hydrolyzes to ammonia and carbonic acid in the following reaction (Kavitha et al., 2012).





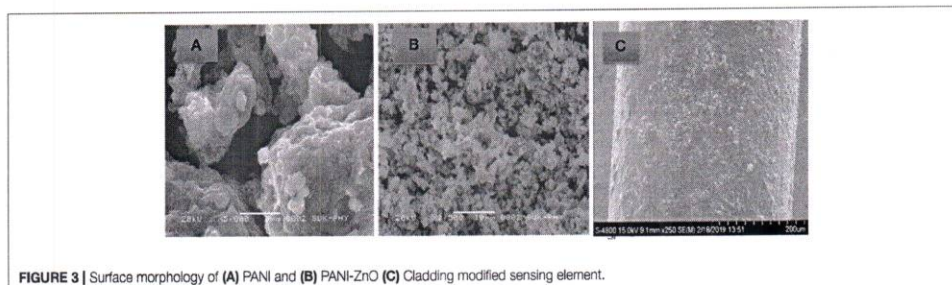


FIGURE 3 | Surface morphology of (A) PANI and (B) PANI-ZnO (C) Cladding modified sensing element.

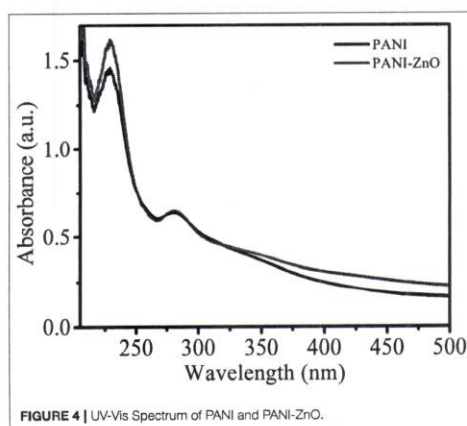


FIGURE 4 | UV-Vis Spectrum of PANI and PANI-ZnO.

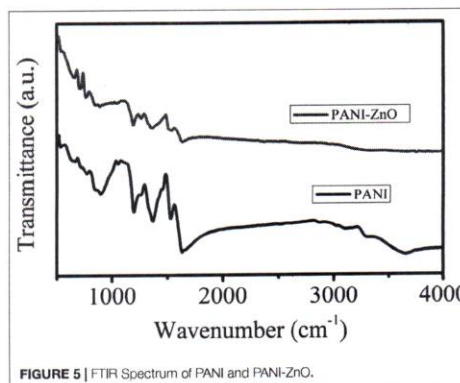


FIGURE 5 | FTIR Spectrum of PANI and PANI-ZnO.

#### Fourier Transform-Infrared (FTIR)

Pure PANI and PANI-ZnO nanocomposite were studied by FTIR spectroscopy, and the spectra are shown in Figure 5. All of the characteristic peaks of concern for the PANI and PANI-ZnO nanocomposite are exhibited. The FTIR spectra of PANI and PANI-ZnO nanocomposite show peaks within the range 643–761.21  $\text{cm}^{-1}$  that are due to C–C bonding and aromatic C–H out-of-plane bending vibration. The peaks appearing at 1254.88 and 1269.65  $\text{cm}^{-1}$  may be attributed to the C–N stretching of the secondary aromatic amine. The peaks at 1,364 and 1,287  $\text{cm}^{-1}$  are assigned to asymmetric and symmetric stretching vibrations of the C=C ring. The peaks at 1358.65 and 1365.28  $\text{cm}^{-1}$  correspond to C–N stretching and C–H bending in PANI and PANI-ZnO, respectively. The peaks at 1,412 and 1,462  $\text{cm}^{-1}$  are attributed to C–H mixed vibrations and C–C stretch in the benzenoid ring, respectively. Because of the C=C stretching of the quinoid and benzenoid rings, a band originates at 1519.91 in both PANI and PANI-ZnO. Strong peak at 1638.16  $\text{cm}^{-1}$  is attributed due to the C=C stretching mode of the quinoid rings results of both PANI and its composite with ZnO in emeraldine

salt form (Deshpande et al., 2009; Kavitha et al., 2012). Distinct absorption peaks in PANI seen at 3657.92, 3289.42, and 3098.17  $\text{cm}^{-1}$  are assigned to O–H stretching, N–H bending, and cross-linking moieties (Ali et al., 2015). The peaks around 3,855  $\text{cm}^{-1}$  correspond to N–H band stretching vibration, and a broad peak appears at 3,747  $\text{cm}^{-1}$  that can be associated with the interaction between ZnO nanoparticles and PANI, with hydrogen bonding occurring between H–N and the oxygen of ZnO (Patil et al., 2015). All of the characteristics bands of PANI are also found in the PANI-ZnO nanocomposite; however, some peaks are merged and decreased in intensity due to the incorporation of ZnO nanoparticles. This study confirms that the ZnO nanoparticles are properly incorporated into the PANI matrix.

#### SENSOR PERFORMANCE

The sensing parameters of the developed sensor viz. sensitivity, selectivity, stability, response time, and reusability were analyzed by studying the absorption spectrum in the evanescent wave field. The absorption spectrum of the developed sensor was studied in the wavelength range 246–256 nm.

biomedical industries for the detection of urea due to its features of high sensitivity, specific selectivity, stability, and low detection limit.

## DATA AVAILABILITY STATEMENT

All datasets generated for this study are included in the article/supplementary material.

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**TABLE 1** | Comparison of other earlier urea sensors with that of the current study.

Immobilization matrix	Transducer	Detection technique	Detection limit	Linear range	Response time	Stability	References
ZnO nanowire	Gold-coated plastic substrates	Potentiometric	0.1 mM	0.1–40 mM	<4s	3 weeks	Usman Ali et al., 2011
ZnO nanorods	Ag sputtered glass substrate	Amperometric	10 $\mu$ M	0.001–24.0 mM	–	–	Ahmad et al., 2014
ZnO-MWCNT	Indium tin oxide coated glass slides	Cyclic voltammetry	0.23 mM	0.8–16.6 mM	4 s	>16 weeks	Tak et al., 2013
PANI grafted PAM-PVA membrane	Glassy carbon electrode	Impedance spectroscopy, differential pulse voltammetry	60 nM and 14 $\mu$ M	1.5–1,000 $\mu$ M	–	60 days	Das and Sarkar, 2016
PANI-ZnO matrix	Optical fiber	Absorption spectroscopy	10 nM	1 M–10 nM	45–50 s	40 days	Present work

This reaction is very beneficial for changing the microenvironment around the core, and it alters the optical properties of the modified cladding. The reaction rate and ammonia evolution from the reaction changes with change in the concentration of urea. Because of this, the refractive index of the modified cladding changes and causes this change in the intensity of the absorption spectrum. Moreover, the structural properties of the modified cladding may also change due to the effect of the reaction on the benzoid and quinoid segments of PANI-ZnO (in this study). The absorption peak at  $\sim$ 250 nm seen in the sensitivity study may originate due to the immobilization of enzyme-Urs over the matrix and interaction with analyte urea. Thus, due to the alteration of the optical and structural properties of the modified cladding, the sensing response changes for each concentration of urea.

### Selectivity Study

The specific selectivity toward urea for the developed sensor was studied by comparing its response to common interfering species generally found in living species. L-arginine, L-alanine, glucose, ascorbic acid, thiourea, and a combination of all of these species were used as interference species. A 100-mM solution of each interference species was prepared in buffer solution and used for the study of selectivity. Figure 8 shows the response to the selected interfering species compared with that to urea. The absorption spectra for these species did not show any considerable response compared to that to urea, though slight variation occurred due to the refractive index of the surrounding solution. Thus, the prepared sensor is highly selective toward urea compared with the selected interference species.

### Stability

The practical applicability of a sensor depends on its high sensitivity along with specific selectivity, repeatability, and stability. The stability study of the developed sensor was carried out for 52 days until there was negligible response. A 100-mM urea concentration in buffer solution was made freshly for each measurement. The stability graph is shown in Figure 9.

The precaution was taken of storing it at a temperature of 40°C after each day of measurement. The sensor demonstrated a stable response for 40 days and decreased slowly after that up to 52 days. The decreased response of the prepared sensor toward urea may be due to loss of the reactivity of the enzyme. The 40-day stability of the prepared sensor makes it very useful for practical applications.

### Response Time and Detection Limit

Rapid response is an important feature of a sensor, and in the present study, response time was determined by considering the saturated intensity of the absorption spectrum. The developed sensor achieved a maximum saturated absorption intensity at  $\sim$ 45–50 s, and this was considered as the response time of the sensor. The developed sensor showed a considerable response to a 10 nM urea concentration compared to buffer solution. Thus, for the developed sensor, we consider the response time to be  $\sim$ 45–50 s and the lower limit of detection to be 10 nM.

Some earlier studies are compared with the present study in Table 1.

### CONCLUSION

In the present report, we have successfully developed a cladding-modified intrinsic optical fiber urea sensor using PANI-ZnO as a modified cladding matrix. The properties of the PANI-ZnO matrix were explored by various characterization techniques, viz. XRD, UV-Vis, FTIR, and SEM. The developed sensor does not show a linear response but rather an exponential response toward urea concentration in the range 10 nM–1 M, with specific selectivity. The developed sensor exhibits a 10-nM lowest detection limit and a  $\sim$ 45–50 s response time. The stable lifetime of the sensor was found to be 40 days when stored at 4°C after each measurement. According to the study of the sensor response, the PANI-ZnO matrix is a suitable and ideal candidate for cladding modification in an optical sensor as well as for enzyme immobilization. Lastly, we concluded that the developed sensor is efficient and useful for practical application in



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**Conflict of Interest:** The authors declare that the research was conducted in the absence of any commercial or financial relationships that could be construed as a potential conflict of interest.

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# ***B.Aadhar***

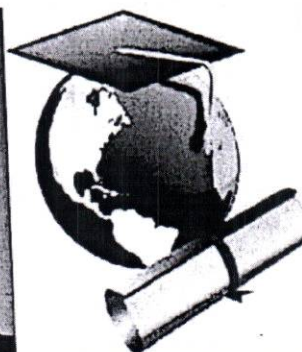
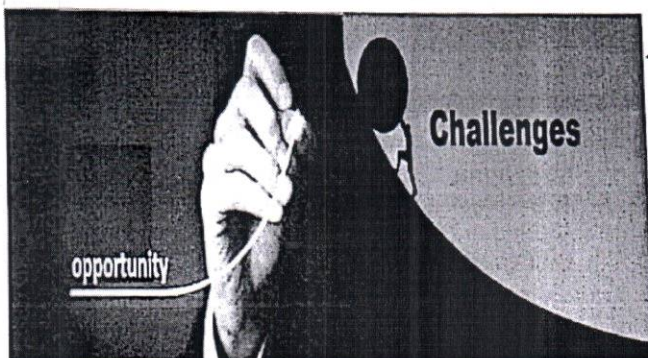
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## Opportunities And Challenges In Commerce Education

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- **Sub Theme - Opportunities And Challenges In Start Up**

- **ABSTRACT :** The research paper tries to describe and to motivate to commerce students to make a bright career in this faculty. This is an attempt to guide the them regarding the practical path, where at many opportunities are found as well as providing the guidelines for the challenges in to make start up their career with commerce education.

- **OBJECTIVES :** The objectives of this research paper are given as follow.

1. To guide to commerce students for career
2. To build confidence among commerce student
3. To remove the fear from the mind of commerce student
4. To reveal practical career
5. To make cautious to commerce students that what and how much preparations they have to do

### INTRODUCTION :

- This research paper is expressing its views before commerce students who are watching a dream to make their bright career in commerce field. Many students have taken admission in commerce faculty without knowing the facts. And thereafter they become confused after having the completion of their commerce degrees (UG and PG). In this situation the students cannot find an appropriate way what to do next. This research paper is an attempt to guide those confused commerce students. There are many opportunities created to make a bright career for commerce students, also there are many challenges which commerce students have to face in future. If we talk about opportunities in commerce field, there are many more opportunities in this field, since government has introduced GST, there have created much opportunities and work in market for commerce students. Many Chartered Accountants are needed skilled man power to assist their work. And for this purpose they are in search of commerce students. In this respect commerce students are highly demanded in market and if students paid their attention towards commerce education they have a great amount of opportunities in future.

- **LITERATURE REVIEW :** While preparing this research paper, many reference books, news papers, magazines, websites are taken to help. Some of the management books of Philip Kotler, the news papers like Times of India, Hitwada, Economic Times etc., magazines like RBI Bulletin, SBI magazines etc., many websites and economic articles and views are taken into consideration. These all the literature reviews have helped a lot in preparation of this research paper.

- **ANALYSIS :** Followings are some facts which are analysed with the help of many references, and after doing study the points given below are found in analysis.

### OPPORTUNITIES AND CHALLENGES IN START UP :

There are many opportunities and challenges found in commerce field while starting any occupation like business of self professions. The opportunities which are found are discussed bellow, also some of the challenges which a commerce student has to face in future are discussed as well.

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**OPPORTUNITIES :** There are many opportunities in commerce field to start up career. followings are given the opportunities while doing start up in commerce.

- 1) **FINANCIAL CONSULTANCY :** This is the first opportunities for commerce students to open their own financial consultancy. This such a profession which does not require Any capital. This is a capital less profession in which no capital or very less capital is require. What require in this profession is only knowledge and intellectual ability. Once a commerce student obtained the practical knowledge regarding this field and been updated, he has lot of opportunities in this field. Many people have much more money to them but they can not find the right way how to do with money and how to enhance business. Here a commerce student can earn much money by consulting to such people.
- 2) **COMMERCE TUTOR :** There are many opportunities in teaching field also. A commerce student can open his own tutorial centres those are coaching classes for commerce students. Now a days the demand for commerce education has increased and many students are being fascinated towards commerce faculty. A commerce student who entered into tutorials can grab this opportunity to make his career bright.
- 3) **FREELANCE ACCOUNTANT :** After having the completion of commerce degree a student can earn money by being as a freelance accountant. Freelance accountant is an accountant who provides his services of accountancy by reaching at doorstep of client. This can provide more income. Many students are being stand by providing such types of services. Once a student obtained the practical accountancy knowledge he can make a good career by being freelance accountant. Since businesses are expanding, the demand for commerce students is increasing to maintain their financial records.
- 4) **CHARTERED ACCOUNTANT :** Being a Chartered Accountant is a prestigious status for a commerce student. So he can make a bright career in this regard. But for this purpose the commerce student has to complete his degree of Chartered Accountant. Once this degree has completed, the commerce student can earn lot of money also he creates many jobs for his juniors who are belonging to commerce faculty. Since the size of Indian economy is increasing day by day, the business opportunities also increasing. As well as the existed businesses are expanding. For this purpose the demand for commerce students is increasing to maintain their financial records.
- 5) **BANKING CAREER :** To make the start up in commerce field, banking career is one of the best options. Once a commerce student has completed his degree in commerce, he has an opportunity to go with banking career. A commerce student has a door to make his career in banking sector. A bank is required a skilled man power to handle its banking business. For this purpose it recruits students as its employees. For this purpose, a commerce student has to make well preparation of banking competitive examinations. And once he or she successfully qualified this banking examination he or she is recruited in bank and make his career bright in future. Thus, above are given the opportunities which a commerce student can get after having completion of his or her commerce degree.

**CHALLENGES :** There are many opportunities in commerce field to start up career, also there are some challenges which have to be taken into consideration while making career in commerce. Those challenges are discussed below.

- 1) **PRACTICAL KNOWLDGE :** This is the first challenge for a commerce student while making career in commerce field. Many times a student gets commerce degree but he has only theoretical knowledge. He does not bother to practical knowledge. In this situation while he starts his career, he finds lot of negative things. He has to face many challenges. Because the theoretical knowledge which he got is completely deferent than practical commerce career.

Therefore it is very essential to get the practical knowledge first before starting career in commerce field.

- 2) **CHANGING GOVERNMENT POLICIES** : Changing government policies is an another challenge for a commerce student to start career in commerce field. However, while starting government policies and changing nature of business world. Otherwise the career may get spoiled. Government is changing the way of doing business also it is completely changing the business environment. In this situation it becomes so difficult to accept changes. So changing ourselves with changing government policies is very essential, but it is not that much easy. Therefore it is considered as a challenge in commerce start up.
- 3) **HEAVY COMPETITION** : Heavy competition is one of the major challenges in commerce career start up. The admissions for commerce degree course are increasing day day. Thousands of students are passing out from many colleges and universities every year. And everybody wants either employment or self employment. Therefore, the competition level in commerce career is increasing day by day. In this cut throat competition, every commerce student suffers. But those commerce students will still get successful who have skill and ability to face challenges in market. Therefore, it is considered that heavy competition is a challenges in commerce career start up.
- 4) **TECHNOLOGICAL CHALLENGES** : The technological challenges means the challenges created due to the introduction of technology. There are many easy software are being introduced in market at a very low cost. These software depriving students from employment. Many people are being jobless. They are losing their jobs due to the introduction of innovative software and new machines. For example, earlier a commerce student was demanded for maintaining financial records and accounts in a business. But since tally software has introduced in market, many accountants have lost their jobs. Like these there are many technological challenges in commerce career start up.
- 5) **PROBLEM OF CAPITAL** : While a commerce student goes to start up his career, generally he requires some capital to initiate self employment. Even many times while he tries to find a job, there too he is demanded a heavy amount of money. In this situation, those students can start their career who are financially strong, but the question raised for the students who are financially weak. In this position many students whose financial condition is not good or poor have to face many challenges to initiate their career in commerce field.  
Thus, above challenges are discussed for the purpose not to demotivate commerce students but to be alert for making bright commerce career after having completion of his or her commerce degree.
- **CONCLUSION** : There are many opportunities and challenges found in all fields, wherever a student of any faculty goes for doing career. Similarly, there are many opportunities as well as challenges are found while a commerce student starts his career. Despite of this situation, a commerce student has many opportunities in commerce. Because there are many government positive policies like GST, Digital India, Start Up India, Stand Up India etc. which ideally effect the commerce of nation. These situations create good opportunities for commerce students, as well as Indian economy is one of the fastest growing economies in the world. This indicates that there are good day in future for Indian trade and commerce which will bring many opportunities for commerce students to make their career bright.

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## Species diversity and abundance of avifauna at the Sawargaon Kanhoba Lake of Washim dist-(M.S)

R.M.Yewale dept.of zoology ✓

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**Abstract-** Birds are always attracted to nutritive rich reservoirs for feeding, breeding and nesting activities. The avifaunal diversity of sawargaon Kanhoba Lake, washim, Maharashtra was studied for a period of one year from january 2008 to 2009 December. These water bodies are wonderful and natural habitats acting as potential foraging grounds for a variety of resident and migatory birds. Observations take place daily in morning. In this observation total 63 birds species fond belong to different 14 orders.

**Keywords-** birds, nutritive, habitats, migatory, sawargaon kanhoba

### Introduction

Monitoring of bird populations is essential as many species are declining in number mainly due to habitat loss and biotic interference. Expansion of urbanization and increase in the number of buildings has been causing scous to the avifaunal composition of various regions. The species diversity of an ecosystem is often related to the amount of living and non-living organic matter present in it. Research at community level of birds in the Indian subcontinent is essential as large scale changes have been taking place in natural habitat of birds. There is a need to study community structure and dynamics of birds of different areas of this country to investigate the impact of changing natural habitat (Jose & Jacharias, 2003).





### Material method

This lake is man made in 1979 max depth 17.20m, length 430 m and the catchment area of lake is 12.14 kms.

The longitude and latitude of the Sawargaon Khnoba Lake is 77-23 and 20-13 respectively.

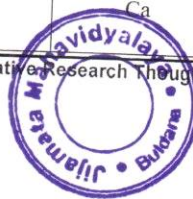
There are two local nallahs which are major source of water for the lake. First nallah enters at South-East side while second at South-West side of the lake. The Bund is constructed at North side of the lake. Lake has waste weir at North-East side and canal outlet at North-West of the lake. The temple of Lord Krishna [Kanhoba] is few meters away on North-West side of the lake.

The present study was carried in around the Sawargaon Lake in washim dist. To conduct this investigation the equipments used were compass, digital camera (Nikon cool pix p-510 )having 42 X auto zoom ,14 mega pix ,extra battery, pencil, eraser and notebook and also the bird book by Salim AI

### Observations

Table:- Avifauna of Sawargaon [Kanhoba] Lake and its surrounding area

Sr. No.	Common Name	Scientific Name	Feeding Habbit	Distributional Status
	Order Podicipitiformes			
	Family Podicipitidae			
1	Little Grebe	<i>Tachybaptus ruficollis</i>	Ca	Common
	Order Pelecaniformes			
	Family Phalacrocoracidae			
2	Little Cormorant	<i>Phalacrocorax niger</i>	P	Common
	Order Ciconiiformes			
	Family Ardeidae			
3	Large Egret	<i>Ardea alba</i>	Ca	Rare
4	Purple Heron	<i>Ardea purpurea</i>	Ca	Rare
5	Grey Herron	<i>Ardea Scinerca</i>	Ca	Rare
6	Indian Pond Heron	<i>Ardeola grayii</i>	Ca	Common
7	Cattle Egret	<i>Bubulcus ibis</i>	Ca	Common
8	Median Egret	<i>Egretta intermedia</i>	Ca	Common

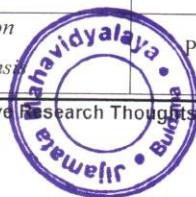


9	Little Egret	<i>Egretta garzetta</i>	Ca	Common
	Family Ciconiidae			
10	Painted Stork	<i>Mycteria leucocephala</i>	Ca	Less Common
11	Whitenecked Stork	<i>Ciconia episcopus</i>	Ca	Common
12	Black Stork	<i>Ciconia nigra</i>	C	Common
13	Blacknecked Stork	<i>Ephippiorhynchus asiaticus</i>	Ca	Less Common
	Order Falconiformes			
	Family Accipitridae			
14	Blackshouldered Kite	<i>Elanus caeruleus</i>	Ca	Less Common
15	Shikra	<i>Accipiter badius</i>	Ca	Common
16	Pallid Harrier	<i>Circus macrourus</i>	Ca	Common
	Order Galliformes			
	Family Phasianidae			
17	Indian Peafowl	<i>Pavo cristatus</i>	O	Less Common
	Order Gruiformes			
	Family Rallidae			
18	Whitebreasted Waterhen	<i>Amaurornis phoenicurus</i>	O	Common
19	Common Moorhen	<i>Gallinula chloropus</i>	O	Common
20	Purple Moorhen	<i>Porphyrio porphyrio</i>	O	Common
21	Common Coot	<i>Fulica atra</i>	O	Common
	Order Charadriiformes			
	Family Charadriidae			
22	Redwattled Lapwing	<i>Vanellus indicus</i>	Ca	Common
23	Grey Plover	<i>Pluvialis squatarola</i>	I	Less Common

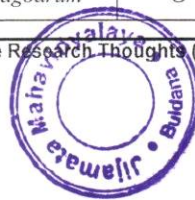




24	Littleringed Plover	<i>Charadrius dubius</i>	I	Less Common
	Family Laridae			
25	Common Tern	<i>Sterna hirundo</i>	P	Common
26	River Tern	<i>Sterna aurantia</i>	P	Common
	Order Columbiformes			
	Family Columbidae			
27	Orangebreasted Green Pigeon	<i>Treron bicincta</i>	G	Common
28	Blue Rock Pigeon	<i>Columba livia</i>	O	Common
29	Redcoloured Dove	<i>Streptopelia tranquebarica</i>	G	Common
30	Spotted Dove	<i>Streptopelia chinensis</i>	G	Common
31	Little Brown Dove	<i>Streptopelia senegalensis</i>	G	Common
	<b>Order Psittaciformes</b>			
	<b>Family Psittacidae</b>			
32	Roseringed Parakeet	<i>Psittacula krameri</i>	F	Common
33	Alexandrine Parakeet	<i>Psittacula eupatria</i>	F	Rare
34	Plumheaded Parakeet	<i>Psittacula cyanocephala</i>	F	Less Common
	Order Cuculiformes			
	Family Cuculidae			
35	Asian Koel	<i>Eudynamys scolopacea</i>	O	Common
36	Greater Coucal	<i>Centropus sinensis</i>	O	Common
	Order Strigiformes			
	Family Striginae			
37	Eurasian Eagle-owl	<i>Bubo bubo</i>	O	Less Common
38	Spotted Owlet	<i>Athene brama</i>	O	Rare
39	Smallblue Kingfisher	<i>Alcedo atthis</i>	P	Less Common
40	Lesser pied Kingfisher	<i>Ceryle rudis</i>	P	Less Common
41	Whitebreasted Kingfisher	<i>Halcyon smyrnensis</i>	P	Common



Sr. No.	Common Name	Scientific Name	Feeding Habbit	Distributional Status
	<b>Family Meropidae</b>			
42	Small Bee Eater	<i>Merops orientalis</i>	I	Common
	<b>Family Coraciidae</b>			
	<b>Family Coraciidae</b>			
43	Indian Roller	<i>Coracias benghalensis</i>	I	Common
	<b>Family Upupidae</b>			
44	Common Hoopoe	<i>Upupa epops</i>	I	Common
	<b>Family Bucerotidae</b>			
45	Indiangrey Hornbill	<i>Ocyctetus birostris</i>	O	Common
	<b>Order Piciformes</b>			
	<b>Family Capitonidae</b>			
46	Coppersmith Barbet	<i>Megalaima haemacephala</i>	F	Common
	<b>Family Picidae</b>			
47	Yellowfronted Pied Woodpecker	<i>Picoides mahrattensis</i>	I	Less Common
48	Common Goldenbacked Woodpecker	<i>Dinopium javanense</i>	I	Common
	<b>Order Passeriformes</b>			
	<b>Family Hirundinidae</b>			
49	Wiretailed Swallow	<i>Hirundo smithii</i>	I	Common
	<b>Family Lanidae</b>			
50	Great Grey Shrike	<i>Lanius excubitor</i>	Ca	Less Common
51	Baybacked Shrike	<i>Lanius vittatus</i>	Ca	Common
52	Rufousbacked Shrike	<i>Lanius schach</i>	Ca	Less Common
	<b>Family Oriolidae</b>			
53	Golden Oriole	<i>Oriolus oriolus</i>	O	Rare
	<b>Family Dicruridae</b>			
54	Black Drongo	<i>Dicrurus adsimilis</i>	I	Common
	<b>Family Sturnidae</b>			
55	Brahminy starling	<i>Sturnus pagodrum</i>	O	Common





56	Common Myna	<i>Acridotheres tristis</i>	O	Common
57	Jungle Myna	<i>Acridotheres fuscus</i>	O	Less Common
	Family Corvidae			
58	Indian Tree Pie	<i>Dendrocitta vagabunda</i>	O	Less Common
59	House Crow	<i>Corvus splendens</i>	O	Common
60	Common Raven	<i>Corvus corax</i>	O	Common
61	Jungle Crow	<i>Corvus macrorhynchos</i>	O	Less Common
	Family Pycnonotidae			
62	Redvented Bulbul	<i>Pycnonotus cafer</i>	O	Common
	Family Irenidae			
63	Common Iora	<i>Aegithina tiphia</i>	I	Common

Key :- Ca = Carnivorous ; P = Piscivorous ; I = Insectivorous ; H = Herbivorous  
 F = Frugivorous ; G = Granivorous ; N = Nectar Feeding ; O = Omnivorous

### Discussion

Scientific studies on the birds of India are commenced with Hume (1876, 1878) reporting the first and second list of avifauna of Travancore, Kerala. Later many studies were conducted on forest avifauna in Western Ghats of India such as Ali (1969), Gatson (1979), Vijayan (1979), Zacharias (1979), Shukkur & Joseph (1980), Yahya (1980), Vijayan (1984), Zacharias & Mathews (1988), Satheesan (1990), Neelakantan et.al., (1993), Santharam (1995a), Joseph (1999), and Jayson & Mathews (2000a, 2000b). Mahabal (2000) Yeole & Patil (2007) while studying the hydrobiology of Yedshi lake, Ta. Mangrulpir, Dist. Washim and showed presence of 71 species of birds belonging to 15 orders and 33 families.

Aviandiversity in and around the waterbodies was examined during the study period. Avifauna of Sarsi-Both lake was composed of 61 species, Sawargaon [Kanhoba] lake of 77 species and from Shaha lake of 68 species.

Rich avifauna was recorded in Sawargaon [Kanhoba] lake which may be due to the presence of diversified feeding niches in the area.



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Bianchi Type-I Cosmological Model with Linearly Varying Decelerating Parameter and Varying  
Cosmological Constant in C-field Cosmology

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**Abstract:**

Bianchi type-I cosmological model with varying cosmological constant  $\Lambda$  has been studied in Hoyle-Narlikar's Creation-field (C-field) theory of gravitation. We consider cosmological constant in the form of  $\Lambda \propto H^2$ , where  $H = \frac{\dot{a}}{a}$  is Hubble parameter (Carvalho, Lima and Waga, 1992). The field equations have been solved by applying linearly varying deceleration parameter proposed by Akarsu and Dereli (2011). The physical aspects of the models are also discussed.

**Keywords:** C-field cosmology, Linearly varying deceleration Parameter, Cosmological constant  $\Lambda$ .

**1. Introduction:**

The Deceleration parameters ( $q$ ) are useful in studying expansion of the universe. We know that the universe has (i) Decelerating expansion if  $q > 0$ , (ii) An expansion with constant rate if  $q = 0$  and (iii) Accelerating expansion if  $q < 0$ . Special law of variation for Hubble's parameter proposed by Berman [1] to obtain the cosmological solutions called the models with Constant Deceleration Parameter (CDP) by assuming the deceleration parameter  $q$  as constant. Akarsu and Dereli [2] have modified Berman's special law of variation for Hubble's parameter by setting  $q = -kt + m - 1$ , where  $k$  and  $m$  are constants which yields Linearly Varying Deceleration Parameter (LVDP) models of universe. They have investigated accelerating cosmological solutions for Robertson-Walker space-time by considering LVDP. Ramesh and Umadevi [3] have investigated Cosmological models with linearly varying deceleration parameter in (R,T) gravity. Recently, Desikan [4] analyzed Cosmological Models in Lyra Geometry with Linearly Varying Deceleration Parameter.

The present day observations of smallness of Cosmological constant ( $\Lambda \leq 10^{-36} \text{ cm}^{-2}$ ) support to assumed the cosmological constant  $\Lambda$  is time dependent. Ram & Verma [5] have studied cosmological models in favor of time dependent  $\Lambda \sim t^{-2}$  in different contexts. Gbate *et al.* [6] have studied N-Dimensional ERW dust filled universe with time dependent  $\Lambda(t)$  in creation field theory of gravitation.

In the late eighties, the astronomical observations revealed that the predictions of the big-bang model do not always exactly meet our expectations as was believed earlier [7]. So, alternative theories of gravitation were proposed by the researchers. The most popular theory was put forward by Bondi & Gold [8] called steady state theory. The remarkable approach of this theory is that the universe neither have any singular beginning nor an end on the cosmological background and statistical properties of large scale features of the universe do not change. To maintain the constancy of matter density, they contemplate a very slow but continuous creation of matter in contrast to explosive creation at  $t = 0$  of standard model. The theory fails for not giving any physical justification for continuous creation of matter and the principle of conservation of matter was violated in this formalism. To overcome this difficulty, Hoyle & Narlikar [9] adopt a field theoretical approach by introducing a massless and chargeless scalar-field  $C$  in the Einstein-Hilbert action to account for matter creation. The theory proposed by Hoyle and Narlikar called as C-field theory which has no big-bang type singularity as in Bondi & Gold steady state theory. Some Researchers [10-12] investigated some cosmological models in Creation field cosmology. Recently Malekolkalami and Khalafi [13] have studied LRS Bianchi Type I in C-Field Cosmology with Varying  $\Lambda(t)$ .

In this paper, we have investigated Bianchi type-I space-time with varying cosmological constant  $\Lambda$  in creation field theory of gravitation. By using special form of deceleration parameter, the solutions of field



equations are obtained. This work is organized as follows. In Section 2, the Metric and field equations have been presented. The field equations have been solved in Section 3. The physical aspects of the model have been discussed in Section 4. In the last Section 5 concluding remarks have been expressed.

## 2. Metric and Field Equations:

We consider the Bianchi type-I metric in the form of

$$ds^2 = dt^2 - a_1^2 dx^2 - a_2^2 dy^2 - a_3^2 dz^2, \quad (1)$$

where metric potentials  $a_1, a_2, a_3$  are functions of cosmic time  $t$  only.

It is assumed that creation field  $C$  is a function of time  $t$  only

$$\text{i.e. } C(x, t) = C(t) \quad \text{and} \quad {}^*T_{(m)}^j = \text{diag}(\rho, -p, -p, -p). \quad (2)$$

The Einstein field equations modified by Hoyle and Narlikar [9] by introducing a massless scalar field called as creation field viz.  $C$ -Field were given by

$$R_{(m)}^j - \frac{1}{2} R g_{(m)}^j = -8\pi G \left( T_{(m)}^j + T_{(c)}^j \right) - \Lambda(t), \quad (3)$$

where  $T_{(m)}^j$  is matter tensor of Einstein's theory given by

$$T_{(m)}^j = (\rho + p)v^j v^j - p g_{(m)}^j. \quad (4)$$

Here  $\rho$  is the energy density of massive particle and  $p$  is the pressure.  $v^j$  are co-moving four velocities which obeys the relation  $v^j v^j = 1$ .

$T_{(c)}^j$  is matter tensor due to creation field given by

$$T_{(c)}^j = -f(c, c^j - \frac{1}{2} g_{(c)}^j C^u C_u), \quad (5)$$

where  $f > 0$  is the coupling constant between matter and creation field.

The Hoyle-Narlikar field equations (3) for the metric (1) with the help of equations (4) and (5) given by

$$\frac{\ddot{a}_1 \dot{a}_2}{a_1 a_2} + \frac{\ddot{a}_2 \dot{a}_1}{a_2 a_1} + \frac{\ddot{a}_3 \dot{a}_1}{a_3 a_1} = 8\pi G \left( \rho - \frac{1}{2} f \dot{C}^2 \right) + \Lambda, \quad (6)$$

$$\frac{\ddot{a}_1}{a_1} + \frac{\ddot{a}_2}{a_2} + \frac{\ddot{a}_3 \dot{a}_1}{a_3 a_1} = 8\pi G \left( -p + \frac{1}{2} f \dot{C}^2 \right) + \Lambda, \quad (7)$$

$$\frac{\ddot{a}_2}{a_2} + \frac{\ddot{a}_1}{a_1} + \frac{\ddot{a}_3 \dot{a}_1}{a_3 a_1} = 8\pi G \left( -p + \frac{1}{2} f \dot{C}^2 \right) + \Lambda, \quad (8)$$

$$\frac{\ddot{a}_1}{a_1} + \frac{\ddot{a}_3}{a_3} + \frac{\ddot{a}_2 \dot{a}_1}{a_2 a_1} = 8\pi G \left( -p + \frac{1}{2} f \dot{C}^2 \right) + \Lambda, \quad (9)$$

where overhead dot ( ) denotes differentiation with respect to time  $t$ .

## 3. Solution of the Field Equations:

The average scale factor  $a$  of Bianchi type-I metric is defined as

$$a = (a_1 a_2 a_3)^{1/3}. \quad (10)$$

The Spatial Volume is given by

$$V = a^3 = a_1 a_2 a_3. \quad (11)$$

From equations (10) and (11), the generalized Hubble parameter  $H$  for Bianchi type-I metric given by



$$H = \frac{\dot{a}}{a} = \frac{1}{3} \sum_{i=1}^3 H_i = \frac{1}{3} (H_x + H_y + H_z) = \frac{1}{3} \frac{\dot{V}}{V} \quad (12)$$

where the directional Hubble parameter  $H_i$  ( $i=1, 2, 3$ ) in the direction  $x$ ,  $y$  and  $z$ , respectively defined as

$$H_x = \frac{\dot{a}_1}{a_1}, \quad H_y = \frac{\dot{a}_2}{a_2} \quad \text{and} \quad H_z = \frac{\dot{a}_3}{a_3} \quad (13)$$

Subtracting equation (8) from (9), we get

$$\frac{d}{dt} \left( \frac{\dot{a}_1}{a_1} - \frac{\dot{a}_2}{a_2} \right) + \left( \frac{\dot{a}_1}{a_1} - \frac{\dot{a}_2}{a_2} \right) \left( \frac{\dot{a}_1}{a_1} + \frac{\dot{a}_2}{a_2} + \frac{\dot{a}_3}{a_3} \right) = 0, \quad (14)$$

From equations (11) and (14), we have

$$\frac{d}{dt} \left( \frac{\dot{a}_1}{a_1} - \frac{\dot{a}_2}{a_2} \right) + \left( \frac{\dot{a}_1}{a_1} - \frac{\dot{a}_2}{a_2} \right) \frac{\dot{V}}{V} = 0, \quad (15)$$

Integrating above equation, we get

$$\frac{a_1}{a_2} = d_1 \exp \left( x_1 \int \frac{dt}{V} \right), \quad (16)$$

where  $d_1$  and  $x_1$  are integration constant.

Similarly, Subtracting equation (8) from (7) and equation (9) from (7), we obtained

$$\frac{a_1}{a_3} = d_2 \exp \left( x_2 \int \frac{dt}{V} \right), \quad (17)$$

$$\frac{a_2}{a_3} = d_3 \exp \left( x_3 \int \frac{dt}{V} \right), \quad (18)$$

where  $d_2, d_3, x_2$  and  $x_3$  are integration constants.

In view of the relations  $V = a_1 a_2 a_3$ , we find the relation between constants  $d_1, d_2, d_3, x_1, x_2$  and  $x_3$  as

$$d_2 = d_1 d_3, \quad x_2 = x_1 + x_3.$$

Using equations (16), (17) and (18), the directional scale factors in the explicit form are

$$a_1(t) = D_1 V^{1/3} \exp \left( X_1 \int \frac{dt}{V} \right), \quad (19)$$

$$a_2(t) = D_2 V^{1/3} \exp \left( X_2 \int \frac{dt}{V} \right), \quad (20)$$

$$a_3(t) = D_3 V^{1/3} \exp \left( X_3 \int \frac{dt}{V} \right), \quad (21)$$

$$\text{where } D_1 = \sqrt[3]{d_1 d_2}, \quad D_2 = \sqrt{\frac{d_1}{d_2}}, \quad D_3 = \sqrt{\frac{1}{d_2 d_3}}$$

$$\text{and } X_1 = \frac{x_1 + x_2}{3}, \quad X_2 = \frac{x_1 - x_2}{3}, \quad X_3 = \frac{-(x_2 + x_3)}{3}.$$

These constants  $D_i$  ( $i=1, 2, 3$ ) and  $X_i$  ( $i=1, 2, 3$ ) satisfies the following relations

$$D_1 D_2 D_3 = 1, \quad X_1 + X_2 + X_3 = 0. \quad (22)$$

In order to solve this system completely, we use a linearly varying deceleration parameter. Akarsu and Dereli proposed this linearly varying deceleration parameter which is linear in time with a negative slope.

The linearly varying deceleration parameter  $q$  is defined as

$$q = \frac{a\ddot{a}}{\dot{a}^2} = -kt + m - 1, \quad (23)$$



where  $k \geq 0$ ,  $m \geq 0$  are constants.

For  $k = 0$ , the equation (10) reduces to the Berman's law of constant deceleration parameter

Assuming that the deceleration parameter is not a constant quantity i.e.  $k \neq 0$  and solving equation (10), we get

$$a = a_0 e^{\frac{2}{m^2 - k} \arctan \left( \frac{kt - m}{m^2 - k} \right)} \quad \text{for } k > 0 \text{ and } m \geq 0 \text{ are constants} \quad (24)$$

where  $a_0$  and  $c_1$  are constant of integration.

For  $c_1 = 0$ , the volume of the universe is

$$V = a_0^3 e^{\frac{6}{m^2 - k} \arctan \left( \frac{kt - m}{m^2 - k} \right)} \quad (25)$$

Using equations (13), (19), (20), (21) and (25), the directional Hubble parameter as

$$H_1 = \frac{-2}{(kt^2 - 2mt)} + \frac{X_1}{a_0^3 e^{\frac{6}{m^2 - k} \arctan \left( \frac{kt - m}{m^2 - k} \right)}} \quad (26)$$

$$H_2 = \frac{-2}{(kt^2 - 2mt)} + \frac{X_2}{a_0^3 e^{\frac{6}{m^2 - k} \arctan \left( \frac{kt - m}{m^2 - k} \right)}} \quad (27)$$

$$H_3 = \frac{-2}{(kt^2 - 2mt)} + \frac{X_3}{a_0^3 e^{\frac{6}{m^2 - k} \arctan \left( \frac{kt - m}{m^2 - k} \right)}} \quad (28)$$

Substituting equations (26), (27) and (28) in equation (12), the generalized Hubble parameter  $H$  obtained as

$$H = \frac{-2}{(kt^2 - 2mt)} \quad (29)$$

We consider cosmological constant in the form of  $\Lambda \propto H^2$ , where  $H = \frac{\dot{a}}{a}$  is Hubble parameter (Carvalho,

Lima and Waga, 1992 [14]). Hence cosmological constant ( $\Lambda$ ) becomes

$$\Lambda = \frac{4}{(kt^2 - 2mt)^2} \quad (30)$$

To obtain energy density ( $\rho$ ), add equation (6) and equation (7), we get

$$\frac{\ddot{a}_1}{a_1} + \frac{\ddot{a}_2}{a_2} + 2 \frac{\dot{a}_1 \dot{a}_2}{a_1 a_2} + \frac{\ddot{a}_3}{a_3} + \frac{\dot{a}_3 \dot{a}_1}{a_3 a_1} + \frac{\dot{a}_3 \dot{a}_2}{a_3 a_2} = 8\pi G(\rho - p) + 2\Lambda \quad (31)$$

The energy density  $\rho$  is related to the pressure  $p$  by the equation of state as

$$p = \gamma \rho \quad (32)$$

where the of equation of state parameter varies between the interval  $0 \leq \gamma \leq 1$ . The  $\gamma = 0$  describes the dust universe,  $\gamma = \frac{1}{3}$  presents radiation universe,  $\frac{1}{3} \leq \gamma \leq 1$  shows hard universe and  $\gamma = 1$  corresponds to stiff matter.

Using equation (19), (20), (21), (30) and (32), equation (31) yields the value of the energy density ( $\rho$ ) as

$$\rho = \frac{1}{\pi G(1-\gamma)} \left[ \frac{kt - m + 2}{(kt^2 - 2mt)^2} \right] \quad (33)$$

Using equations (19), (20), (21), (30) and (33) in equation (6), we get

$$\dot{C} = \frac{1}{4\pi Gf} \left[ \frac{8(kt - m + 1 + \gamma)}{(1-\gamma)(kt^2 - 2mt)^2} - X \left( a_0^3 e^{\frac{6}{m^2 - k} \arctan \left( \frac{kt - m}{m^2 - k} \right)} \right)^{-2} \right] \quad (34)$$

where  $X = X_1^2 + X_2^2 + X_3^2 + X_1 X_2$ .





from equation (32) and (33), we obtained the pressure ( $p$ ) as

$$p = \frac{\gamma}{\pi G(1-\gamma)} \left[ \frac{kt - m + 2}{(kt^2 - 2mt)^2} \right] \quad (35)$$

The cosmological model using equation (19), (20) and (21) in equation (1) written as

$$ds^2 = dt^2 - \left[ D_1 V^{1/3} \exp\left(X_1 \int \frac{dt}{V}\right) \right]^2 dx^2 - \left[ D_2 V^{1/3} \exp\left(X_2 \int \frac{dt}{V}\right) \right]^2 dy^2 - \left[ D_3 V^{1/3} \exp\left(X_3 \int \frac{dt}{V}\right) \right]^2 dz^2 \quad (36)$$

**4. Physical Aspects of the Model:**

The physical parameters of cosmological model (36) such as the Expansion Scalar ( $\theta$ ), the mean anisotropic parameter ( $\Delta$ ) and Shear Scalar ( $\sigma^2$ ) are defined as

$$\theta = 3H = \frac{-6}{(kt^2 - 2mt)} \quad (37)$$

$$\Delta = \frac{1}{3} \sum_{i=1}^3 \left( \frac{H_i - H}{H} \right)^2 = \frac{X_1^2 + X_2^2 + X_3^2}{12} \left[ \frac{(kt^2 - 2mt)}{a_0^3 e^{\frac{6}{m} \arctan h\left(\frac{kt}{m-1}\right)}} \right]^2 \quad (38)$$

$$\sigma^2 = \frac{3}{2} \Delta H^2 = \frac{X_1^2 + X_2^2 + X_3^2}{2} \left[ a_0^3 e^{\frac{6}{m} \arctan h\left(\frac{kt}{m-1}\right)} \right]^{-2} \quad (39)$$

**8. Conclusion:**

Bianchi type-I cosmological models with varying cosmological constant  $\Lambda$  has been investigated in Hoyle-Narlikar's creation field theory of gravitation. The creation field  $C$  is directly proportional to time  $t$ . Hence the creation of matter increases as time increases which follows the results as obtained by Hoyle and Narlikar.

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## Impact of GST on Indian Economy

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### Abstract:

GST is a single national uniform tax levied across India on all goods and services. In GST, all Indirect taxes such as excise duty, central sales tax (CST) and value-added tax (VAT) etc. will be subsumed under a single regime. Introduction of The Goods and Services Tax (GST) expected as a significant step towards a comprehensive indirect tax reform in the country, which would lead India for its economic growth. The Proposed study is designed to know the impact on GST on Indian Economy with the Help of Its individual effect on different sectors. The Study is Exploratory in nature and Secondary Data has been used for the study. The data will be collected from different Journals, Periodicals, Newspapers and Internets. Key Words: GST, Economy, cascading effect of taxes, GST Council, Cess, taxation reforms

### Impact of GST on Indian Economy

To remove cascading effect of taxes and also to provide for a common national market for goods and services, the Government of India proposed for amendments to introduce the goods and services tax for conferring concurrent taxing powers on the union as well as states including union territory with legislature to make laws for levying goods and services tax on every transactions. GST is an indirect tax has introduced on 1 July 2017 in India and was applicable throughout India which replaced multiple cascading taxes levied both by central and state governments. The GST is governed by a GST Council. Under GST, goods and services are taxed at the following rates, 0%, 5%, 12%, 18% and 28% and there is a special rate of 0.25% on rough precious and semi-precious stones and 3% on gold. Further in addition a Cess of 15% or other rates on top of 28% GST applies on few items like aerated drinks, luxury cars and tobacco products. Expert viewed it as biggest tax reform in India founded on the notion of "one nation, one market, and one tax". The GST rollout has converted India into a unified market of 1.3 billion citizens. The rollout has a positive hope of India's fiscal reform program regaining momentum and widening the economy of the nation. The idea behind implementing GST in the country in 29 states and 7 Union Territories is that it would offer a win-win situation for every citizen. The entire taxation base will be shared between the assessment mechanism of the center and the states that would get to collect tax on the economic activities taking place in Indian territorial waters. At the ninth GST council meeting the center made significant concessions to bring states, including the defiant ones. The administrative decisions will be as follows. The state will administer 90 percent of the tax players, including service providers with annual turnover up to rupees 1.5 core with scrutiny, and audit powers and the balanced 10 Percent will be controlled by the Centre. Tax players above that threshold turnover, including those pay integrated (interstate imports) GST will be equally shared between the center and state, and this will lead to significant shifting of the tax players base from center to state.

### Objectives:

- To understand the concept of goods and service tax.
- To find out short effect of GST on Economy.
- To find out the Impact of GST in future.







**Methodology:**

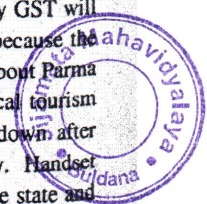
The proposed study is a Desk research and is an attempt of descriptive research, based on the secondary data sourced from journals, Internet, articles, previous research paper, parliament library and reference research ,Documentation and information service(LARRDISJ]

**Review Literature:**

Nishita Gupta in her study „Goods and service tax: it's impact on Indian Economy” stated that The goods and services Tax (GST) will indeed be a significant improvement towards a comprehensive indirect tax reforms in India and it would give India a world class tax system and improve tax collections. It would end distortions of differential sectors .Further viewed that it would lead to the abolition of taxes such as central sales tax, state level sales tax, octopi, entry tax, stamp duty, telecom license fees, and axon consumption. GST is expected to create a business friendly environment in India, as a result price levels and inflation rates would come down overtime because of application of uniform tax rate. Moreover It will also improve government's fiscal health as the tax collection system would become more transparent, making tax evasion difficult. Nitin Kumar wrote in his research paper “Goods and Services tax in India: A way forward that The Goods and Service Tax (GST) is one of the biggest taxation reforms in India The central idea behind this form of taxation is to replace existing levies like VAT, , service tax ,excise duty and sales tax by levying a comprehensive tax on the manufacture and consumption of goods and services in the country. GST is expected to unite the country economically as it will remove various forms of taxes that are currently levied at different points. Dr. Ambrishstates in his study “Goods and Service Tax and Its Impact on startups “that GST is expected to unite the country economically as it will remove various forms of taxes that are currently levied at different points. Based on a 2015 NASSCOM report this paper also analyzed how the GST has impact on startup of the country and how the has The impact on GDP. Dr. R. Vasanthagopal, Studied “GST in India: A Big Leap in the Indirect Taxation System”, and found that the positive impacts are dependent if design of the GST is rational and if balance the conflicting interests of various stakeholders. Further he said GST would be a big leaf ion the indirect tax system and also give a new impetus to India's economic change. further he mentioned that the implementation of the GST would be pegged as one of the biggest game changing reforms of the Indian government, which will help India to become an economically integrated economy and help to reduce business costs and facilitate seamless movements of goods and services eliminating local charges.

**An overview of GST and Its impact on different sectors**

If talk about impact of GST on manufacturers, distributor and retailers It is believe GST is expected to boost competitiveness and performance in India's manufacturer due to tax structure. High infrastructure spending and declining export are just some of the concerns of this sector. Single tax system will decrease the administrative costs for manufacturers and distributors and this sector will grow more strongly. If thrown glance on impact of GST on Service Providers it is observe that most of the tax burden is borne by domains such as telecommunication services, Insurance industry, business support services, Banking and Financial services , IT services etc. Introduction of GST will decrease burden The Logistic industry forms the backbone of the economy. We can fairly assume that a well organized and mature logistics industry has the potential to shoot ahead the “Make in India” initiative of the Government of India and has positive impact on economy. Simultaneously GST will help the ecom sector's growth but the long-term effects will be particularly interesting because the model GST law specifically proposes a tax collection at source (TCS) mechanism, if talk about Parma industry GST is expected to benefit the Parma and healthcare industries. It boosts medical tourism with simplified tax structure. Telecommunications sector prices are expected to come down after GST. Manufacturers will save on costs through efficient management of inventory. Handset manufacturers will find it easier to sell their equipment as GST will negate the need of the state and





will also save up on logistics costs. Textile industry generates employment to a large number of skilled and unskilled workers. It contributes about 10% of the total annual export, and this value is likely to increase under GST. GST would affect positively to the cotton value chain of the textile industry which lead economic growth. The real estate sector is also plays important role in the Indian economy; it plays an important role in employment generation in India. The sector will see substantial benefits from GST implementation. Agricultural sector is the largest contributor of GDP. It covers 16% of GDP. The major issues faced by the agricultural sector, is transportation of agri products across state lines. It is expected that GST will resolve the issue of transportation. FMCG sector could rise significant savings in logistics and distribution costs as the GST will eliminate the need for multiple sales depots. The GST rate for this sector is expected to be around 17% which is way lesser than the 24-25% tax rate paid currently by FMCG companies. Under the current tax system, there are several taxes applicable on automobile sector like excise, VAT, sales tax, road tax, motor vehicle tax, registration duty which will be subsumed by GST.

#### **An analysis on GST and its impact on Indian Economy**

The implementation of goods and service Tax(GST) coupled with a digitized economy ushered in by demonstration, will make India's economy "look much cleaner and bigger" said union finance minister Arun Jaitley at the vibrant Gujarat global Summit. Further he said, it is going to be a major step towards the integration of informal economy and this itself is going to increase the transactions, which are covered within the Banking system transactions and may lead to higher revenue in the future. He said "A new India Has Emerged". It is inevitable that with the increase in level of demand, the level of supply would respond likewise. The GST council is being asked by the ministry of Commerce to keep exporters of the plantation, leather and cement out of its framework and suggested to impose lower tax on them to boost output and increase employment generation. With this the producers increase productivity and perform better in global market's council retained its proposed definition of Agriculturist to allow a land to have been personally cultivated only if its farmed by individuals and family members of HUF and its exempted under GST. Manufacturers and traders would benefit from fewer tax filings, transparent rules and overall a sound book keeping system. Consumers would be paying less for the goods and services and lead to change their expenditure pattern and livelihood, the government would generate more revenues as revenue leaks would be plugged by GST implementation. How has GST really impacted India in current economy situation and in future? Firstly: from the viewpoint of the consumer, the consumers have paid more tax for most of the goods and services they consume. The GST implementation has a cost of compliance and tax on most of the goods attached to it. It examine that this cost of compliance will be prohibitive and slightly high for the small scale manufacturers and traders. Resulted to this pricing of goods will go high and has direct impact on cost of living of the society. Secondly: If long term effect of GST analyses it is expected that GST would not just mean a lower rate of taxes, but also minimum tax slabs imposed on. In many Countries where the Goods and Service Tax has helped in reforming the economy, apply only 2 or 3 rates. GST is designed to minimize the rate with a lower rate for essential commodities, and a higher tax rate for the luxurious commodities. Currently, in India, there are 5slabs, but there will be a shift soon. thirdly; Impact of GST on macroeconomic indicators is likely to be very positive in the medium-term. Inflation would be reduced as the cascading (tax on tax) effect of taxes would be eliminated in the country and at the same time revenue from the taxes for the government is very likely to increase with an extended tax net, and the fiscal deficit is expected to remain under the checks and GST would be a change maker on this. Moreover, exports would grow while FDI (Foreign Direct Investment) would also increase. The experts believe that the country would grow economically in the ease of doing business with the implementation of the most important tax reform ever in the history of the country.







### Conclusion

A single taxation system would encourage new businesses and entrepreneurs to engage in service and manufacturing sector. GST levied only on consumption of goods or services. This leads to eliminate economic distortions in taxation amongst states and also helps in free movement of goods, further it also minimize the complexity of taxation. It will also beneficial to individuals as the prices will go down due to GST and decrease in price leads to increase in consumption and directly increase the GDP. As GST implementation applied at a time for all states lack of policy barrier will removed. Directly GST will increase the investment in FDIs which increase the foreign exchequer of the country and indirectly increase the employment opportunities. It will promote new startups in India for its business-friendly tax structure.

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