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# Design of Virtual Instrument for the Measurement of Ultrasonic Velocity in Liquids and Liquid Mixtures

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**Abstract:**

*The paper presents design of a Virtual Instrument (VI) for ultrasonic velocity measurements in liquids and liquid mixturesat frequencies from 1 to10 MHz. Hardware circuit designed in the laboratory with indigenous components is interfaced to PC using PCL-812 DAQ Card. Software is developed using Visual Basic. The liquid cell is designed in the laboratory and providesvariable distance between ultrasonic transducer and reflector that can be adjusted with an accuracy of ±0.01mm. This feature helps to carry out ultrasonic velocity and attenuation measurements in differential mode for increased accuracy. Ultrasonic transducers can be easily attached to liquid cell to carry out measurements at different frequencies.*

*Key words: Ultrasonic ; Virtual instrumentation; Attenuation;Velocity, DAQ.*

## 1. Introduction:

Ultrasonic measurements have been put to use for a variety of applications for many decades. Initial rapid developments in instrumentation [1, 2] provoked by the technological advances since 1950 continue even today. Through the 1980's and continuing into the present, computers have provided scientists with smaller and more robust instruments with greater capabilities in the measurements of ultrasonic parameters [3]. The application of PC have made the researchers to exploit its capabilities to sense, detect, modify, manipulate and display the acquired data in user required form [4-5]. So the conventional instrumentation is being replaced by *Virtual Instrumentation* [6-7].

Numerous techniques and instruments have been designed by researchers to cope up with the requirements of higher accuracy. V.R.Vyagra has developed a PC based high resolution velocity

# DESIGN OF AN IMPROVED SAMPLE HOLDER/CELL FOR ULTRASONIC PULSE-ECHO SETUP

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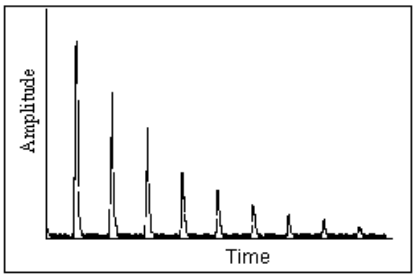
## Abstract
A Sample Holder/Cell, essential for accurate measurement of ultrasonic velocity and attenuation using Ultrasonic Pulse-Echo Setup, has been developed for the measurement of ultrasonic velocity and attenuation in liquids [1-6]. It is used for the measurements in the designed Pulse-Echo Setup. Measurement results were found to be well in agreement with quoted reference values.
**Keywords:** Liquid Sample Holder, Pulse-Echo Technique, Ultrasonic Velocity Measurement, Ultrasonic Attenuation Measurement.

## Introduction
Measurement of velocity and attenuation of ultrasonic waves has been the basis of evaluation of a wide variety of physical properties of liquids. The ultrasonicvelocity and attenuation measurementtechniques nay be categorized as optical techniques, continuous wave techniques and pulse techniques. The pulse technique is the most widely used technique for making ultrasonic measurements in liquids and solids in thefrequency range of a few KHz to tens of GHz.Owing to its high accuracy and reproductivity of the results [7-9] Pulse-echo technique has evolved to be the most popular,reliable and sustainable technique amongst all the ultrasonic techniques [10]. This technique makes it an ideal choice for variety of applications as well as hard-core research work [2, 6, 9-12].
In the Pulse-Echo Technique. a pulsed rt signal of known frequency is fed to ultrasonic transducer that convert it into a pulsed ultrasonic wave of the same frequency. Ultrasonic pulse travels through the sample and is reflected from the sample boundaries until it decays away. Each time the ultrasonic pulse strikes the sample end coupled to the transducer, an electrical signal is generated which is amplified and displayed onan oscilloscope. If the pulse duration is small compared to a round-trip transit time in the sample. a pulse-echo decay pattern(rectified and filtered)develops [Fig. 1].

Fig. 1: Screen Shot of a Typical pulse-echo decay pattern




The velocity of ultrasonic wave propagation is determined by measuring the transit time between the reference point of reflected pulses and the corresponding pulse propagation distance in the sample.The heights of train of echoes formed due to passage of short duration pulse through the sample of known thickness are measured and the absorption constant (α) is determined by fitting this data in the equation (1):

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# ETHANOL GAS SENSING MEASUREMENT USING SPIN COATED NANOCRYSTALLINE TIN OXIDE (SnO2) THIN FILM

Electronics

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## ABSTRACT

Metal oxides semiconductors like Tin Oxide (SnO2) gas sensors are widely used for the detection of toxic and hazardous gases such as CO, NH3, CH3OH, H2S and LPG etc. In the present work, SnO2 nanoparticles thin films on glass substrate were prepared using sol-gel synthesis method. The crystallographic, morphological and gas sensing properties of SnO2 nanoparticles are studied.

SnO2 nanoparticles are prepared by sol-gel route at 500 ºC using stannous chloride as a precursor, ammonia solution as a precipitating agent. X-ray diffraction (XRD) study reveals tetragonal rutile structure of SnO2 nanoparticles without any secondary phase. Scanning electron microscopy (SEM) image shows the spherical grain morphology of SnO2 nanopaticles. The average crystallite size of SnO2 nanoparticles is found to be 11.26 nm using Scherrer formula. This particle size is same as the average particle size from TEM image. Ethanol gas sensing measurement of prepared spin coated thin film (at 30 sec., 4000 rpm and 5 layers) are carried out using gas sensing chamber. It shows that the sensor with high response/selectivity and low response/recovery times based on SnO2 thin film can stand as good sensor for detection of ethanol gas.

## KEYWORDS

Nanoparticles; Sensor; SnO2 Ethanol; Thin film.

## INTRODUCTION

Tin oxide is one of the important and widely used transparent conductors with high conductivity, optical transparency in the visible region, high reflectivity in the IR region and high gas sensitivity, which makes it technologically prospective material. Tin oxide with low electrical resistance [1] and presence of oxygen vacancies, makes it a promising material for electrical applications [2-4]. Electrical conductivity in transparent materials occurs in just a few systems like 4d metal oxides $SnO_2$ and $In_2O_3$. Kilik *et al.* investigated the transparent conductivity related to the existence of shallow donor levels near conduction band formed by large concentration of oxygen vacancies [5].

Synthesis processes of nanoparticles have been to affect crystallinity, microstructure and defect structure of the nanoparticles. Several methods including sol-gel [6], hydrothermal [7], electrospinning [8] have been utilized to synthesize $SnO_2$. Among these methods, the sol-gel method seems to be the most suitable due to its simplicity, easy of adding dopants, promise for mass production and low cost. The properties of $SnO_2$ are found to be dependent on the processing conditions and nature of the precursors used. The precursors play an important role in growth, the structure and the morphology as well as optical and electrical characteristics of the doped material. Optical devices like solar cells, panel displays are mainly affected by signal loss and delay. Hence, we have to improve the conductivity without affecting the transmission. Similarly, Tin oxide play an important role for applications in solar photo-thermal conversion [9, 10]. Due to the limitation of solubility, these ions act as grain growth inhibitors and remain aggregates at the grain boundaries. Metal oxide gas sensors are widely used for the detection of toxic and hazardous gases such as CO, $NH_3$, $CH_3OH$, $H_2S$ and LPG etc.

In the present work, sol-gel synthesis is used to obtain $SnO_2$ nanoparticles thin films on glass substrate. The crystallographic, morphological and gas sensing properties of $SnO_2$ nanoparticles are studied.

### Synthesis And Characterization Of $SnO_2$ Nanoparticles

### Experimental

*Synthesis*

Nanocrystalline $SnO_2$ samples are prepared by a sol-gel route using Sn precursors taken in the form of chlorides. In a typical synthesis process of $SnO_2$, dissolve 8g of $SnCl_4$. $2H_2O$ from Merck India, in 100 ml ethanol solution (Ethanol+ Water 1:1) and Stirred about 20 min until a transparent sol is produced. Add aqueous Ammonia solution (25% Merck, India) drop wise to the solution under constant stirring and pH of solution is adjusted to a value up to 8. After 24 Hr of aging in the air resulting opal gel are centrifuged and washed with ethanol at least 5 times to remove ammonia and chloride impurity. The collected gel is dried in furnace over 80 $^0$C/4h in the air to remove moisture and then the sample is crushed and sintered at 500 $^0$C/4 Hr. Finally, an ash colored nanoparticles are formed [11-12].

The chemical reaction for the reduction of $SnO_2$ is as follows:

$$SnCl_2.2H_2O + 2NH_3 \rightarrow SnO_2 + 2NH_4Cl(aq) + H_2 \quad ---(1)$$

*Material Characterization*

Synthesized nanoparticles are characterized using X-ray diffraction (XRD) measurements using a Bruker D8 Advance diffractometer with monochromatic CuK radiation ( =1.5406 A$^0$) by recording in the range of 20-70$^0$ in a step of 0.02$^0$. To study the surface morphology & grain sizes, Scanning Electron Microscope (SEM), JEOL JSM 5600 with Resolution: 3.5 nm, Magnification: x18 to 300,000, Accelerating Voltage : 0.5 to 30 kV and Transmission Electron Microscope (TEM) model JEOL/JEM 2100 was employed with acceleration voltage 200kV and 2000X – 1500000X magnification. ImageJ computer program was used to investigate the particle size distributions. Fourier Transform Infra-red (FT-IR) spectra of the powder was recorded using a Bruker, Germany, Model vertex 70 using the KBr pellet technique in the range 400 to 4000 cm$^{-1}$ with a resolution of 0.5 cm$^{-1}$.

Finally, ethanol gas sensing measurement of prepared spin coated thin film (at 30 sec., 4000 rpm and 5 layers) are carried out using gas sensing chamber. The ethanol sensing measurements is carried out by placing the sensor in a chamber, as ethanol gas is exposed to the sample surface by Hamilton syringe. The resistance of the sample was measured by two-point probe method using USB NI 6210 on PC. The measurement setup is interfaced with computer and automated with the help of LabVIEW program. The data is continuously measured with time, to be used for the calculation of gas sensitivity, response time, recovery time, reproducibility and stability.

**Table 1: Grain size, Volume, Microstrain (ξ), dislocation density (δ) and Intensity at (110) of $SnO_2$ nanoparticles**

| | D (nm) | a (Å) | c (Å) | V (Å$^3$) | strain ξ X 10$^{-4}$) | δ x10$^{14}$ line/m$^2$) | Intensity (110) | δ x10$^{14}$ line/m$^2$) |
|---|---|---|---|---|---|---|---|---|
| $SnO_2$ | 12 | 4.740 | 3.184 | 71.555 | 19.45 | 59.17 | 717 | 59.17 |

## RESULTS AND DISCUSSION

*Structural and Morphological analysis*

To study the crystallite size, structure and lattice parameters of $SnO_2$, XRD data is used. The X-ray diffraction patterns of $SnO_2$ nanoparticles sintered at 500 $^0$C shown in Fig. 1 XRD peaks are indexed using Powder X software and matched with the tetragonal rutile structure of $SnO_2$ and are observed to be in consistent with those in the standard card (JCPDS 77-0452), with a maximum intensity corresponding to (110) plane [13]. Further, it has been observed that lattice parameters a,

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# Mobile Phone Based Home Surveillance System

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**ABSTRACT**

This paper presents an application of the GSM technology. Using the public GSM networks, a mobile phone based home surveillance system has been designed. The system automatically sends sms messages to specified phone / phones in case any door or window is opened by some intruder. The system also allows the homeowner monitoring and controlling the electrical home appliances via the mobile phone by sending commands in the form of SMS messages and receiving the appliances status. Virtual control panel is realized using VB on windows 98. Electronic circuit to control security and electrical appliances is interfaced to PC using PCL-812 Lab card. This home surveillance system has been tested and found to very effective in security control as well as controlling and monitoring electrical home appliances virtually from any place.

**Keywords:** Home Surveillance System, GSM, SMS, Virtual Control System, Mobile Phone-PC Interfacing.

## I. INTRODUCTION

Security is the prime concern in the modern society. Using some sort of surveillance system helps to protect homes, business and even people from others who are tempted to commit a crime if the criminal thinks he or she may be on the video or home owner or some specified persons would be suddenly informed.

Also, switching on lights in the evening for security reasons, and switching on a water heater from the office so that by the time he/she arrives home hot water is available readily for a bath, remotely, would be very useful in the modern busy society. Many remote home/office automation/control applications using Internet [1-2] and GSM network [3-6] show the growing interest on the subject.

In the present work, a mobile phone based home surveillance system has been designed that can provide the security and make it possible to switch on/off electrical appliances remotely. Virtual control panel is realized using VB on windows 98. Software coding is done in VB. Nokia 6610 is interfaced to PC using USB cable. PCL-812 Lab card is used to interface electronic circuit for security and electrical devices interface. The system automatically sends sms message to specified phone / phones in case any door or window is opened by some intruder. The system also allows the home owner monitoring and controlling the electrical home appliances via the

# PRELIMINARY STUDIES OF AQATIC AND WETLAND PLANTS FROM VENA RIVER IN HINGANGHAT AREA DIST. WARDHA (M.S.)

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**Abstract:** The present investigation was conducted to study aqatic and wetland plants of Vena river in Hinganghat area. Approximate 29 species (taxa) of 15 families, and 23 genera was identified. The preliminary survey was conducted to study the flora throut the year 2020. The floral morphology was studied to confirm the taxa. As Vena River is the major river of the Wardha district. It is now facing antropogenic activities like pollution due to industrial discharge and land filling. So to monitor the flora the above preliminary work of Vena River was conducted.
**Key words**: Wetland, River, Taxa, Anthropogenic activities.

## Introduction:

Study area located geographically 20º 35'31"N, 78º 52'40"E., elevated 228M (705 Ft) and lies 3 Km North-East to Hinganghat, Dist. Wardha; In British India Hinganghat was said to be the Center of Country. At vena river pump house on an historical old stone it was written that "Hinganghat the center of India". The study site was primary source for drinking water supply to Hinganghat, irrigation purpose and industries. This region provides rich flora, Themaximum Summer Temperature reaches to 48º C while it falls to 9 º C in the Months of Winter. The annual rain fall measures around 1200 mm.

## Methodology:

The preliminary studies on aquatic and wetland plants adequate field visits were conducted as per methodology suggested by Schultes and Lipp were undertaken to record precisely and to study the floral morphology of the plant species. The photographs at study sites were taken and collected specimens were pressed, dried and mounted on herbarium boards and deposited in herbarium of R. S. Bidkar College, Hinganghat. The collected plants were identified from flora of aquatic and wetland plants of India by Cook, flora of Nagpur district (Ugemuge, 1986), flora of Maharashtra (Almeda, 1996) and were identified by consulting experts of universities of Vidarbha region of Maharashtra State. After identification, samples are properly processed after proper chemical treatment.

## Observations and Result:

Identified families are Asteraceae (4), Cyperaceae (5), Poaceae(4), Amaranthaceae (2), Convolvulaceae (4), Asclepiadaceae (1), Acanthaceae (1), Hydrophyllaceae (1), Hydrocharitaceae (1), Amaryllidaceae (1), Verbaenaceae (2), Boraginaceae (1), Commelinaceae (1), Campanulaceae (1), and Typhaceae (1). Identified genera, species and families are given in the table below.

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# EXPLORATION OF PHYTOMEDICINAL FLORA FROM COAL BELT AREA OF WANI AND MUKUTBAN REGION OF YAVATMAL DISTRICT, MAHARASHTRA, INDIA.

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**Abstract**
In the present scenario where the whole world is struggling to come upon an efficient cure for the covid-19 pandemic, many health professionals have pointed that posting the body's immune system can help dampen the effect and hasten the recovery from the disease. In these appalling times, phytomedicinal flora has surfaced as a possible cure. Since ancient times, medicinal herbs were popularly used during mass plagues or infestations. And even in recent times, the utilization of medicinal herbs is increasing day by day at a very faster pace than before. In such a state, the analysis and sustainable safeguarded commercial production of Phyto medicinal flora would be a quite advantageous agribusiness for small farming communities. So far no studies about phytomedicinal flora have been organized in coal belt area of Wani and Mukutban of Yavatmal district (MS). India. Which contain fractions of shrubby forest infiltrated with agricultural areas as well as limestone and coal mines. Due to the abundant presence of various mining sites in this region, the rate of deforestation is seen to be rapidly escalating with the passage of days. This results in the over exploitation of local medicinal plants and the raw material which is the basic commodity used as Healthcare goods by many tribes like Andh, Bhil, Gond, Pardhan, Kolam, Rajgond, wadar, gopal, etc. Who is found to be in abundance in these sites of study, therefore a meticulous exploration of Phyto medicinal flora seen under these areas of study is compiled during this investigation. During the investigation total 78 phytomedicinal species belonging to 41 families were recorded with appropriate information given by tribles, vaidus and some local peoples.
**Keywords:** Phytomedicinal, exploration, Ethnobotany, flora, Herbarium,

## Introduction

It has been estimated that 75-80 % of the world population depends on crude plant drug preparation, to tackle their health problems, though this may be mostly because of economic considerations ( Sukh Dev 2006 ). Since last three decades, economically developed countries such as Europe, the US, Japan, China are seeing an ever-growing interest in natural remedies now known as Phytomedicines or Herbal drugs. It has been pointed that the present global market for these products may be near about 20 billion US dollars and is growing at the rate of 10-15%. annually. According to the Botanical Survey of India 8000 plant species are known and used in Indian systems of medicine in our country. The commercial demand for botanical raw drugs has put the medicinal plant resources under great stress. Whereas many of the wild medicinal plant species are facing a serious threat of extinction, the supply of cultivated species is not able to match the rising demand. It has become imperative to Strengthen the phytomedicinal resource base in the country. ( Ved , D.K and G.S. Goraya 2007 )

# PHYSICO-CHEMICAL ASSESSMENT OF PADDY FIELD WATER FROM NAGBHID TEHSIL, DISTRICT-CHANDRAPUR, MAHARASHTRA, INDIA.*

BY

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**ABSTRACT**: The paddy field is a peculiar aquatic ecosystem with shallow water layers. Paddy plants are pertinent microenvironment being photic, aerobic environment where aquatic communities of producers and consumers recycle nutrients and provide organic matter to the soil. Major activities include photosynthesis, respiration and Photo dependent biological nitrogen fixation by free living and symbiotic cyanobacteria. The water is subjected to large variation in irradiance, temperature, PH, O2 concentration and nutrient status (Whitton et. al, 1988, Quesada et. al, 1995). Nagbhid Tehsil has rich rice production due to favourable factors available for abundant growth owing to fertile soil conditions, abundant rainfall and suitable climatic conditions. However continuous usage of chemical fertilizers has taken toll leading to a decrease in crop production. It is therefore mandatory to check the water standards periodically. Thus the present investigation includes the assessment of water quality in relation to physicochemical parameters from the paddy fields of Nagbhid Tehsil, District-Chandrapur, Maharashtra, India.

KEYWORDS: Physico-chemical, Aquatic ecosystem, Microenvironment, Aerobic environment, cyanobacteria

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## INTRODUCTION

Boosting up of agricultural activities with elevated use of fertilizers and pesticides and associated livestock activities have an adverse impact on water quality. Nitrates, phosphorus, and pesticides widely used in agriculture are the main water pollutants. Rising accumulation of nitrates threatens the potability conditions of drinking water, while high pesticide use contributes significantly to indirect

# A FURTHER CONTRIBUTION TO THE KNOWLEDGE OF SAHNIPUSHPAM FLOWER FROM THE NEW LOCALITY OF THE DECCAN INTERTRAPPEAN BEDS OF PUDIYAL MOHADA OF CHANDRAPUR DISTRICT, MAHARASHTRA STATE, INDIA.*

BY

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**ABSTRACT:** The present specimen incorporates the detailed morphological and anatomical description of dicotyledonous flower from the Deccan Intertrappean beds of Pudiyal Mohada, Taluka-Jiwati, Dist.-Chandrapur, Maharashtra, India. The flower is 2.5 mm in length and 2.09 mm in width. The flower is sessile, actinomorphic and monochlamydeous, septate ovary with peltate stigma. The stamens are found in weakly preserved codition. The receptacle is clearly seen in the sections of the flower. The L.S. of flower shows the basal attachment of perianth with ovary wall. The two stamens with anther and filament are seen at one side of flower besides the stigma. Perianth is tubular structure and measures about 121-286 μm in thickness. The globose lysigenous cavities are found on epidermal wall of perianth which is 1.5 μm in thickness. A very long filament arises from the base of the flower with anther at other end. One anther is large and other one is small in size. The anther is elongated dumbbell structure present at one end of filament. Large anther is 11.68 μm in length and 2.89 μm in width and small anther is 7.47 μm in length and 3.84 μm in width. The ovary is syncarpous commonly tricarpellate with three locules at upper end and three locules at lower end of ovary with three ovules. The ovary is superior, 1.65 mm long and 1.95 mm in diameter. It is 3 chambered at the extreme base and apex and trilocular in the cental region with partial septas extending inward from the periphery. All three locules contain ovules. The ovary wall is 3.56 μm in thickness. Numerous spherical oil cells which are 0.72 μm in diameter, interspersed among epidermal cells of the ovary wall. Below the epidermis there are few layers of thick walled sclerenchymatous cells while the inner region consists of many layers of thin-walled parenchymatous cells. Thus in light of the comparision with fossil and living genera and families, it becomes evident that the flower belongs to Sahnipushpam (Shukla 1950) and modern family Araceae with some minor differences hence it is named as Sahnipushpam pudiyalii

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# Benthic Macro Invertabrate Diversity of Tropical River Kolar, From Nagpur, (M.S.), India

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**ABSTRACT**

In the present investigation river Kolar, District Nagpur, Maharashtra state was studied with reference to benthic macroinvertebrates diversity, as these are the ecological indicators of aquatic habitats. The study was conducted on monthly basis for a period of two years from February 2010 to January 2012 on four sampling sites of river Kolar and statistical analysis of the analytical data was computed in this paper. The most abundant benthic macroinvertebrates in the present investigation were Molluscs belongs to order Gasropoda and Pelecypoda, while Arthopods and Annelids were moderate and Nematodes were few in number. In present investigation low species richness and low abundance of macrozoobentos observed where water body shows moderate human intervention.

***Key words:*** *Benthic Macroinvertebrates, River Kolar, Ecological indicators, Macrozoobentos*

## Introduction

Benthic macroinvertebrates are the organisms which are commonly, Molluscs, Arthropods, Annelids, Nematods etc., living at the bottom of aquatic ecosystem. They are used for biological monitoring of aquatic ecosystems worldwide because they are found in different types of habitats having limited mobility. These are relatively very easy to collect using different types of sampler as well as with established sampling techniques. Diversity pattern of macrozoobenthic fauna ensures a wide range of sensitivities to change in both water quality and habitats, Hellawell (1986) and Abel, (1989). Both geographical and physicochemical variables influenced the overall macroinvertebrate diversity in tropical rivers, Musonge *et al.* (2020)

Survival, distribution and abundance of macrozoobenthos depends on the characteristics of their environment such as organic matter content, soil texture, sediment particles, substratum and depth, Dahanayakar and Wijeyaratne, (2006), Perkins (1974) Ankit Kumar *et al.*, (2017).

The benthic macroinvertebrates are the biological community most frequently used to evaluate water quality in aquatic environments and occupy a variety of tropic levels acting in the nutrients, bottom detritus and water column dynamics (Rodrigues *et al.*, 2002). Benthic macroinvertebrates can be used as bioindicators in the evaluation of the ecological integrity of surface river and stream systems that pass through industrial zones, Mark Edward Jolejole *et al.*, (2021)

Relevant and recent studies on benthic macroinvertebrates diversity has been made by Cabrera (2021), Kosazalka and Jablonska (2020), Maria Bejar *et al.* (2020); Mohammad *et al.* (2017), Ankitkumaretal (2017), Gowalkar *et al.* (2015).

Since the studies on benthic macroinvertebrates diversity are very less in Kolar river this paper is in-

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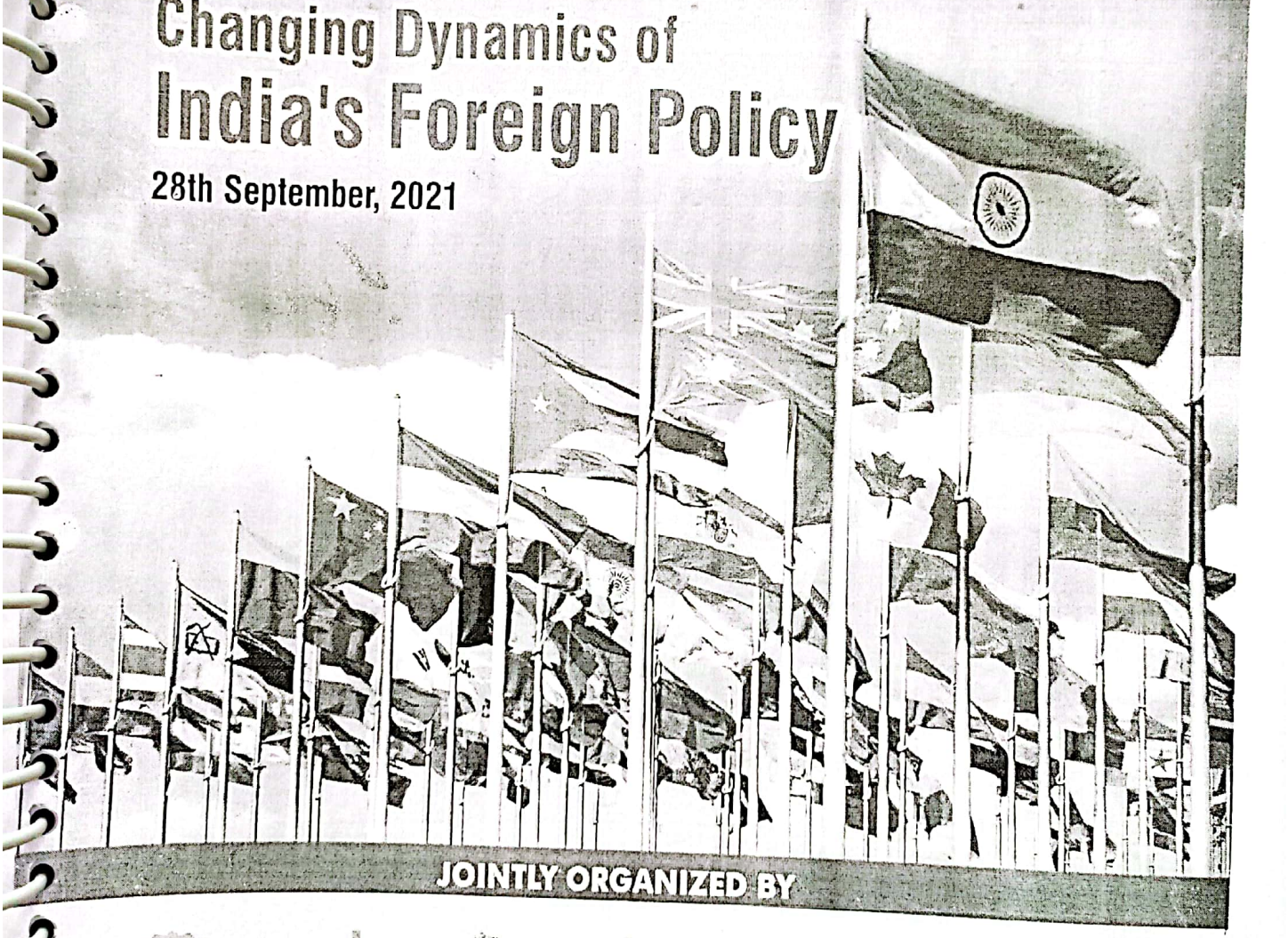

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*आनंद निकेतन महाविद्यालय, आंनदवन, वरोरा*

**सारांश**
*ब्रिक्स समूहच्या देशांनी अगदी कमी वेळात यशाची पायरी गाठली आणि आता या समूह देशाची सर्वात मोठे यश म्हणजे नवीन विकास बॅक स्थापना करणे आणि या बॅकाचे कामकाज पूर्ण करणे हे होय. तसेच जगभरात निर्माण झालेले कोवीड 19 चे संकट सोडविण्यासाठी समूह देशांना मदत करणे आणि समूह देशाची विस्कटलेली अर्थव्यवस्था सुधारणे हे ब्रिक्स चे उदिष्टये आहे.*

**गृहितक:**
*ब्रिक्स परिषद व संमेलन, ब्रिक्स परिषदेचे विश्लेषण, 12 वे शिखर संमेलन*

## प्रस्तावना

ब्रिक्स हे ब्राझिल ,रशिया, भारत, चीन ,व दक्षिण आफ्रिका या पाच प्रमुख अर्थव्यवस्थेचे एक आंतरराष्ट्रीय संघटन आहे. ब्रिक्स – BRIC हे नाव ब्राझील, रशिया, भारत, चीन व दक्षिण आफ्रिका या पाच आर्थिक शक्ती मानल्या जाणाऱ्या देशाच्या नावाच्या अध्यक्षवरून तयार झाले आहे. 2001 मध्ये गोल्डनमॅन सॅक्स या कंपनीचे अध्यक्ष जिम ओ निल यांनी Building Batter Global Economic नावाचा लेख प्रकाशित करून त्यात भाकीत केले की, पुढील 50 वर्षात ब्रिक्स देशाची अर्थव्यवस्था जगातील प्रमुख अर्थव्यवस्था राहतील. ब्रिक्स मधील झपाट्याने प्रगती करणाऱ्या विकसनशील देशांनी एकत्र येऊन काम केले तर त्यांच्यात महाशक्ती असणारऱ्या पाश्चिमात्य विकसित देशांना टक्कर किंवा आव्हान देण्याची क्षमता निर्माण होईल. कारण जगातील लोकसंख्येच्या 40 टक्के लोकसंख्या ब्रिक्स देशाची आहे तर जमिनीचे क्षेत्रफळ 30 टक्के व जीडीपी 25 टक्के आहे. 2009 मध्ये ही संघटना उदयास आली. ब्राझील, रशिया, भारत व चीन त्याच्या देशाच्या राष्ट्राध्यक्षांची पहिली परिषद रशियातील एकटरिंबर्ग येथे होऊन 16 जून 2009 मध्ये ब्रिक ची स्थापना करण्यात आली. ब्रिक या स्थापनेच्या वेळी दक्षिण आफ्रिका देश सदस्य नव्हता 21 सप्टेंबर 2010 मध्ये भरलेल्या परराष्ट्र मंत्र्याच्या परिषदेत दक्षिण आफ्रिकेला संघटित समाविष्ट करण्याचा निर्णय घेण्यात आला. 14 एप्रिल 2011 मध्ये चीन येथे भरलेल्या ब्रिक्स च्या तिसऱ्या परिषदेत दक्षिण आफ्रिकेला आमंत्रित करून सदस्यत्व देण्यात आले त्यामुळे ब्रिक्स संघटनेचे नाव ब्रिक्स; BRICS असे झाले आहे.

## ब्रिक्स चे उद्देश

1. एक देशातील गुंतवणूकदारांसाठी व उद्योजकासाठी परस्पर व्यापार गुंतवणुकीला प्रोत्साहन देणे आणि अनुकूल वातावरण तयार करणे
2. सदस्य देशांना आर्थिक मदत करून त्यांच्या आर्थिक विकासाचा वेग वाढवणे
3. ब्रिक्स देशातील नैसर्गिक संसाधनाचा उत्तम वापर करणे
4. ब्रिक्स देशातील आंतरराष्ट्रीय व्यापारातील अडथळे दूर करणे
5. सदस्य देशांना व्यापारासाठी बाजारपेठेचा विस्तार करणे
6. इतर विकसनशील देशांना पायाभूत सुविधांच्या विकासासाठी कर्ज देणे
7. सदस्य देशाच्या शिक्षण क्षेत्रात सुधारणा व वाढ करून व्यापाराचा विकास करणे
8. सदस्य देशाच्या अर्थव्यवस्थेत वृद्धि करून रोजगाराच्या संधी वाढ करणे व दारिद्य कमी करणे
9. सदस्य देशात शांतता सुरक्षा व सुव्यवस्था निर्माण करणे
10. ब्रिक्स देशांना राजकीय व सांस्कृतिक सहकार्य करणे
11. पर्यावरण संतुलित राहून सतत टिकाऊ विकास करणे.
12. संवाद कमी करण्यासाठी विविध उपाययोजना करणे

**ब्रिक्स परिषद व संमेलन.**

| परिषद | दिनांक | देश | प्रतिनिधी | स्थळ |
|---|---|---|---|---|
| पहीली परिषद | 16 जून 2009 | रशिया | दिमित्री मेदवेदेव | येकातेरिनबुर्ग |
| दुसरी परिषद | 15 एप्रिल 2010 | ब्राझील | लुईझ इनाचियो लुला दा सिल्व्हा | ब्राझीलिया |
| तिसरी परिषद | 14 एप्रिल 2011 | चीन | हु चिंताओ | |
| चौथी परिषद | 29 मार्च 2012 | भारत | मनमोहन सिंग | नवी दिल्ली |
| पाचवी परिषद | 26–27 मार्च 2013 | दक्षिण ऑफ्रिका | जेकब झुमा | डर्बन |
| सहावी परिषद | 14–16 जुलै 2014 | ब्राझील | दिल्मा रूसेफ | फोर्तालेझा आणि ब्राझीलिया |
| सातवी परिषद | 8 –9 जुलै 2015 | रशिया | ब्लादिमिर पुतिन | उफा |

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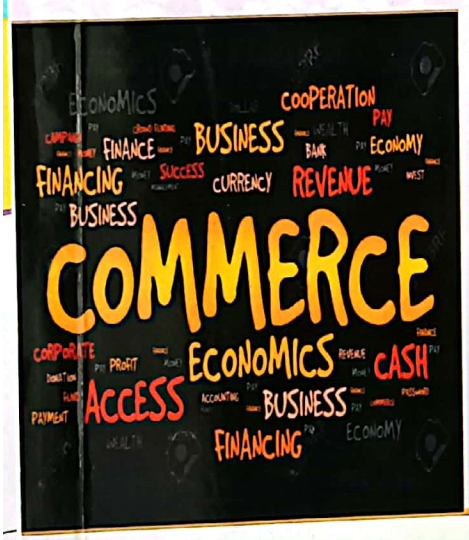


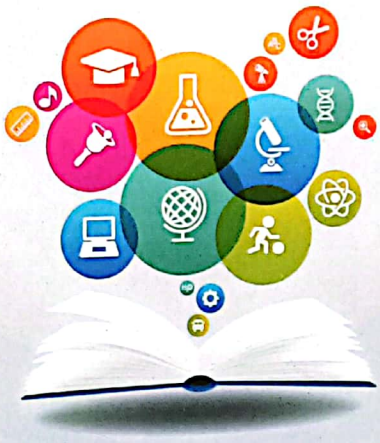




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# डॉ.बाबासाहेब आंबेडकर यांचे स्त्रीयांच्या विकासात योगदान

डॉ. नरेंद्र के. पाटील
आनंद निकेतन महाविद्यालय,आनंदवन वरोरा जि.चंद्रपूर ९६३७२७९६२३

१९ वे आणि २० वे शतक भारतीय समाज जीवनाच्या दृष्टीने अतिशय महत्त्वाचे ठरते. १९ व्या शतकाच्या प्रारंभी भारतीय समाज जीवनात नवीन पर्वाला सुरवात झाली आणि २० व्या शतकात समाज जीवनाने परिवर्तनाच्या पूर्णत्वाचा टप्पा गाठला. १९ व्या शतकात भारतात वैचारिक प्रबोधन घडून. आधुनिक भारताचा जन्म झाला आणि २० व्या शतकात स्वातंत्र्य प्राप्तीनंतर भारताने नवतेचा स्वीकार करून आपला स्वतंत्र कारभार सुरू केला. या काळात घडलेल्या परिवर्तनाने भारतीय सांस्कृतिक जीवनाचा कायापालट घडून आला.या कायापालटाचे देखण उदाहरण म्हणून भारतीय स्त्रीकडे अंगुलीनिर्देश करता येतो. या कालखंडात भारतीय स्त्री जीवनात अनेक अमूलाग्र बदल घडू आले. दीर्घकाळाच्या अंधाऱ्या मध्ययुगीन जीवनाचा शेवट होवून एका नव्या मनूची सुरवात स्त्रियांच्या संदर्भात १९ व्या शतकात झाली.

गृहितक :—समान हक्क, सहशिक्षणाचा पुरस्कार, स्त्रीमुक्ती, कुटुंबनियोजन

प्रस्तावना:

कोलंबिया विद्यापिठाने निवडलेल्या जगभरातील शंभर विद्वानांच्या यादित पहिल्या क्रमांकावर बाबासाहेबाची निवड झाली.अमेरीकेचे राष्ट्राध्यक्ष बराक ओबामा यांच्या हस्ते प्रतिमेचे अनावरन करण्यात आले.डॉ.बाबासाहेब आबेडकर हे एक अर्थनितीत होते.ते म्हणत असत की,अर्थशास्त्रातिल मागणी व पुरवठयाचा नियम भारतात सैध्दांतिकदृष्टया लागू होत नाही.कारण भारतातील अर्थव्यवस्था व समाजव्यवस्था ही धर्मव्यवस्थेने प्रभावित आहे.भारताची घटना लिहीतांनाच त्यांनी संभाव्य आर्थिक अनाचाराबद्ल इशारा दिला होता.राजकिय व सामाजिक समता ही आर्थिक समतेशिवाय प्रस्थापित होवू शकत नाही अशी त्यांचे ठाम मत होते. बाबासाहेबाचा आर्थिक विचार हा कल्याणकारी राज्यासांठीचा होता.आणि त्यांची बाधिलकी होती की रयतेशी आजही त्यांच्या आर्थिक तत्वांची प्रकर्षाने गरज भासत आहे.

आंबेडकरांचे स्त्री विषयक विचार :—

स्त्री विषयी विचार करणार नाही असा माणूस शोधूनही सापडणार नाही. किंबहुणा आपल्या आयुष्यात जास्तीत जास्त विचार पुरूष स्त्रीसंबधीच करतो. पण त्याच्या या विचार करण्याचा स्त्रीला काय उपयोग? कारण हा विचार स्त्री कल्याणाविषयी नसतोच. स्त्रीविषयी कळकळीने आणि मनापासून विचार करणारे, स्त्रीचा आदर करणारे समाजात बोटावर मोजण्याइतपत लोक आढळतात.

डॉ. बाबासाहेब आंबेडकर स्वत:च्या कतृत्वाने चकचकणारे स्वयंप्रकाशी रत्न होते. म्हणून तर स्व. पंडित नेहरूसारखा रत्न पारखी जवाहऱ्याने "आंबेडकर हे माझ्या मंत्रीमंडळातले एक झगमगते रत्न आहे."असे म्हटले होते.

समान हक्क :—

डॉ.आंबेडकरांच्या मनात स्त्रीविषयी खरीखुरी सहानुभूती व कळवळा होता. स्त्रियांसाठी अतिशय योग्य अशी विचारांची दिशा त्यांची ठरलेली होती. जे हक्क पुरूषाला आहे ते सर्व हक्क किंबहुणा मतदाणाचा हक्क सुध्दा स्त्रिला असावी असे बाबासाहेबांचे मत होते. त्याकाळात स्त्रीची स्थिती अत्यंत दयनीय होती. म्हणजे अगही सवर्ण घरातल्या स्त्रीची स्थिती दयनीय होती तर मग दलित स्त्रीची काय अवस्था असेल याची कल्पना न केलेलीच बरी.

# अर्थनाद

संपादक
डॉ आस्तीक टी.मुंगमोडे
अर्थशास्त्र विभाग प्रमुख,
श्री ज्ञानेश महाविद्यालय,
नवरगाव, जि. चंद्रपूर

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# 15 हवामान बदलाच्या भारताला झळा – कारणे व उपाय

**नरेंद्र केशव पाटील**
अर्थशास्त्र विभाग प्रमुख
आनंद निकेतन कला,वाणिज्य व विज्ञान महाविद्यालय,
आनंदवन-वरोरा जि.चंद्रपूर
Email :- narendra.anandwan gmail.com
Mo. No. 9637279623, 8329334862

**सारांश** :-
कोणत्याही हवामानात टिकून राहील अशा प्रकारच्या पायाभूत सुविधांची उभारणी भारताने करायला हवी. जागतिक हवामानात सातत्याने होत असलेल्या वाढीमुळे किनारी आणि अंतर्गत भागातील शहरांमधील रस्ते उखडलेले असतील आणि जलसाठे शुष्क पडू लागतील. तसेच अतिवृष्टीमुळे सखोल भाग जलमय होतील. सद्यःस्थितीतील पारंपरिक खर्चाच्या तुलनेत हवामान सक्षम पायाभूत सुविधांची उभारणी ही खर्चीक बाब आहे. परंतु अशा हवामान सक्षम पायाभूत सुविधांच्या उभारणीत गुंतवणूक न करणे भविष्यात महागात पडू शकते. भविष्यात होणारी तापमानवाढ भयावह आहे. या तापमानवाढीचा परिणाम गंगेच्या खो-यावर मोठ्या प्रमाणावर होणार असून त्यामुळे तब्बल 48 कोटी लोकांना त्याचा फटका बसण्याची शक्यता आहे. त्यांचे जीवन आणि उपजीविका धोक्यात येणार आहे. उष्णतेच्या लाटांमध्ये तिप्पट ते चौपट वाढ होण्याची शक्यता वर्तविण्यात आली आहे. उष्णतेच्या लाटांचा सार्वजनिक आरोग्यावर परिणाम तर होतोच, शिवाय आर्थिक उत्पादकतेवरही या लाटा परिणाम करतात. तसेच अतितापमानमुळे डासांच्या माध्यमातून उद्भवणा-या हत्तीरोगासारख्या आजारांचाही प्रादुर्भाव वाढण्याची शक्यता आहे.

**गृहितके** :- निसर्गाची नासधूस, हवामान बदल, कारणे, प्रदूषण, भारताला सर्वाधिक धोका, उपाय योजना

**प्रस्तावना** :-
जेव्हा हवामानातील बदल घडतात तेव्हा पृथ्वीच्या हवामान प्रणालीतील बदलांमुळे नवीन हवामान पद्धतींचा परिणाम होत असतो. हा काळानुसार वाढत राहतो. ही काळाचा कालावधी काही दशकांपासून ते कोट्यावधी वर्षे इतकी लहान असू शकतो. शास्त्रज्ञांनी पृथ्वीच्या भौगोलिक इतिहासादरम्यान हवामानातील बदलांचे अनेक भाग ओळखले आहेत.अलीकडेच, औद्योगिक क्रांतीनंतर ग्लोबल वार्मिंग चालविणाऱ्या मानवी क्रियांचा हवामानाचा परिणाम वाढत्या प्रमाणात झाला आहे, आणि त्या संदर्भात सामान्यत: या शब्दांचा वापर बदलला जाऊ शकतो. हवामान प्रणाली सूर्यापासून आपल्या जवळजवळ सर्व ऊर्जा प्राप्त करते. हवामान प्रणाली बाह्य जागेला उर्जा देखील देते. पृथ्वीवर येणारी आणि जाणारे उर्जा संतुलन आणि हवामान प्रणालीद्वारे उर्जा जाणे पृथ्वीचे ऊर्जा बजेट ठरवते. जेव्हा येणारी उर्जा जाणा-या उर्जापेक्षा जास्त असते, तेव्हा पृथ्वीचे उर्जा बजेट सकारात्मक असते आणि हवामान प्रणाली गरम होते. जर जास्त ऊर्जा गेली तर उर्जा बजेट नकारात्मक आहे आणि पृथ्वीला थंडपणाचा अनुभव आहे. पृथ्वीवरील हवामान प्रणाली माध्यमातून हलवून ऊर्जा अभिव्यक्ती पोहोचला आहे. हवामान भौगोलिक घटक आणि वेळ यानुसार आकर्षित करते. एखाद्या प्रदेशातील दीर्घकालीन सरासरी आणि हवामानातील बदल यामुळे प्रदेशाचे हवामान ठरते . हवामान बदल हा हवामानातील बदलाचा दीर्घकालीन आणि टिकाव आहे. जेव्हा हवामान प्रणालीच्या विविध भागांमध्ये

## International Conference on'Sustainable Asia's Problems and Prospects

The third International Conference on Sustainable Asia's Problems and Prospects (TPSAPP'21) on November, 2021. This conference will be a significant one and would provide a wonderful opportunity for the fellow educators and the research scholars to share and exchange their ideas in the recent advancements in Sustainability related issues in Asian countries.

The conference provided an opportunity to forecast the future and prepare for the transformative and the projectable change in all the spheres of societal and cultural life in the Asian countries. The topic of the conference perverts to engulf the diversities to sing the material and spiritual prosperity of all the countries in the Asian Continent. It forged the vision to minimize the problems before all the humanity to create the path for better understanding and survival.

On behalf of The Progress we are united here for third International Conference on Sustainable Asia's Problems and Prospects (TPSAPP'21) on November, 2021. However we want to put together all latest tools and techniques in a such common forum.So that overall sustainable development can be assured.

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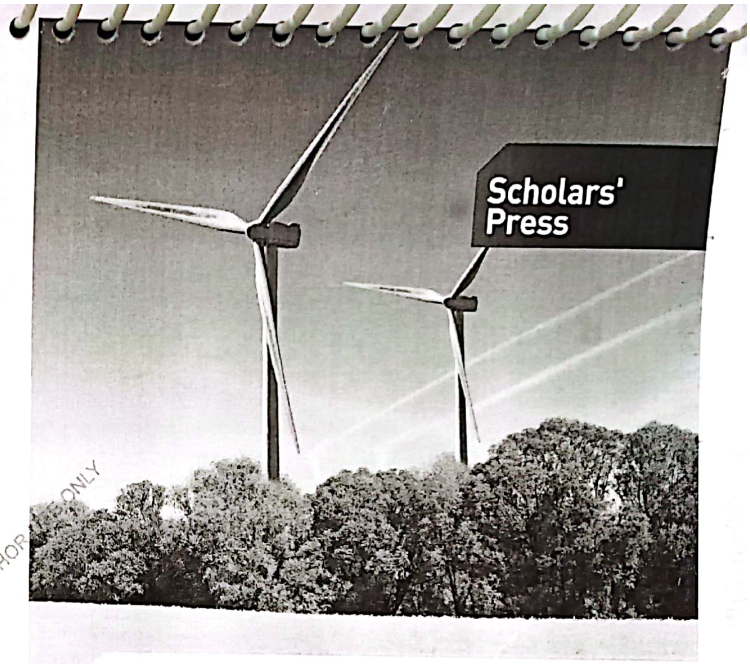


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123

**राष्ट्रसंताची प्रवचणे : तात्वीक अंग**

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राष्ट्रसंत तुकडोजी महारांजावर भारतीय धर्मविचारांचा प्रभाव होता. जो धर्म विचार हजारो वर्षापासून भारतभूमीवर राज्य करीत होता तोच धर्म विचार काही दोषांचा अपवाद वगळता कसा महत्वपूर्ण आहे हे तुकडोजी महाराजांनी वारंवार आपल्या प्रवचनांतून केलेला दिसून येतो भारतीयांचे लोकजीवन आणि धर्म हे दोन अविभाज्य घटक हे मानतात. कारण धर्म हा येथिल जीवनाच्या सर्वच क्षेत्रांना व्यापून करणारा घटक आहे. म्हणून धर्म व जीवन वेगळे काढवा येते अषक्य आहे असे ते म्हणतात पारंपरिक भारतीय धर्मशास्त्राने मान्य केलेल्या धर्म संकल्पणा राष्ट्रसंतानीही मान्य केलेल्या आहेत त्यात आता संकल्पणा पुनर्जन्म विचार कर्मफलाचा सिध्दांत यावरती त्यांचा विश्वास आहे. या सोबतच धर्माच्या क्षेत्रातील सण उत्सव सुरू करण्यामागे ही काही विचार व तत्वे होती हा विचार म्हणजे लोकांना संघटीत करने त्यांना नवी दिशा देने हा होता असे ते म्हणतात. या सर्व तत्वविचारांना एकत्र गुंफण्याचा धागा म्हणजे धर्म होय धर्म म्हणजे मनुष्याने दुसÚया मनुष्याप्रती केलेला सुयोग्य आचार - व्यवहार होय असे सांगून धर्म हे मनुष्याला प्राण्याच्या पातळीवरून मानवी पातळीवर आनण्याचे साधन त्यांनी मानलेले दिसून येते.

**Keywords:** राष्ट्रसंताची प्रवचणे : तात्वीक अंग

**नवीन शैक्षणिक धोरण 2020 : एक चिकित्सक अध्ययन**

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उच्च शिक्षण ही प्रत्येक देशातील अर्थव्यवस्था, सामाजिक स्थिती, तंत्रज्ञान अवलंबन आणि निरोगी मानवी वर्तन ठरविण्यातील एक अतिशय महत्त्वपूर्ण घटक आहे.भारत देशातील प्रत्येक नागरिकाला उच्च शिक्षणामध्ये समाविष्ट करण्यासाठी जीईआर सुधारणे ही देश सरकारच्या शिक्षण विभागाची अतिशय महत्त्वाची जबाबदारी आहे. राष्ट्रीय शैक्षणिक धोरण 2020 ही गुणवत्ता सुधारण्यासाठी नावीन्यपूर्ण धोरणे बनवून परवडणारी क्षमता, आकर्षण आणि खाजगी क्षेत्रासाठी उच्च शिक्षण सुरु करून पुरवठा वाढवण्यासाठी आणि त्याच वेळी गुणवत्ता राखण्यासाठी कठोर व कठीण नियंत्रणाद्वारे असे उद्दिष्ट साध्य करण्याकडे वाटचाल करीत आहे .प्रत्येक उच्च शिक्षण संस्थेत शिष्यवृत्तीसह गुणवत्तेवर आधारित प्रवेश यांना प्रोत्साहन देऊन, प्राध्यापकांचे सदस्य म्हणून संशोधन व गुणवत्ता आधारित सतत नवनवीन उपक्रम राबवणारे, सतत कामगिरी करणारे आणि या संस्थावर नियंत्रित करण्यासाठी गुणवत्तेवर आधारित, तंत्रज्ञान आधारित, प्रगतीच्या घोषणेवर आधारित अशी कृतीद्वारे गुणवत्तेचे कठोर निरीक्षण करणे. त्यामुळेच आज राष्ट्रीय शैक्षणिक धोरण 2020 हे 2030 पर्यंत उद्दिष्ट पूर्ण करेल अशी अपेक्षा आहे

**Keywords**: नवीन शैक्षणिक धोरण 2020 : एक चिकित्सक अध्ययन



**उदारीकरणाचा लघू उद्योगावर झालेला परिणाम**

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रोजगार, उत्पादन आणि निर्यातीमध्ये लघु उद्योगाचे लक्षणीय योगदान लक्षात घेता भारतीय अर्थव्यवस्थेत धोरणात्मक बाबीमध्ये सुद्धा लघु उद्योगाचे महत्त्वाचे स्थान आहे. तसेच, १९९१ पासून भारतातील लघुउद्योग जागतिकीकरण, देशांतर्गत आर्थिक उदारीकरण आणि क्षेत्रातील विशिष्ट संरक्षणात्मक उपाययोजनांमुळे तीव्र स्पर्धात्मक वातावरणात या उद्योगापुढे आव्हानात्मक स्वरुपात आहे असे दिसून येते. सदर शोधनिबंध लघु उद्योगांसाठी जागतिकीकरण आणि देशांतर्गत आर्थिक उदारीकरणाच्या परिणामांची तपासणी करने आणि एकक, रोजगार, उत्पादन आणि निर्यातीच्या दृष्टीने त्याच्या वाढीच्या कामगिरीचे विश्लेषण करतो. भारतातील लघुउद्योगांचे निर्वाह आणि स्पर्धात्मक वाढ सुनिश्चित करण्यासाठी धोरणात्मक शिफारशींसह शोधनिबंध लिहिण्यात येत आहे.

**Keywords:** लघु उद्योग, धोरण, जागतिकीकरण, नवकल्पना, रोजगार, आर्थिक उदारीकरण, सामाजिक क्षेत्र.

**"किसानों की समस्या और समाधान : एक चिकित्सक अध्ययन"**

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भारत एक कृषि प्रधान देश है। भारत देश की कृषि प्रधान देश ऐसी एक अलग पहचान है। यहां का वातावरण सभी उत्पादनों के लिए पोषक है। भारतीय लोगों का प्रमुख व्यवसाय कृषि है। पहले "खेती करना, या मैं किसान हूं !" ऐसे लोग गर्व से कहते थे। लेकीन आज परिस्थितीया बदल गयी। किसानों के विपरीत परिस्थितीया हो गयी। हर प्रकार से जैसे., नैसर्गीक, सामाजिक, कौटूंबिक, राजकीय इन सभी घटकों की वजह से आज किसान बेहाल हो गया है। पहले भारत को सोने की चिडीयां वाला भारत कहते थे। मुझे लगता है सोने की चिडियां कहने का मतलब यह है की भारत देश एक कृषि प्रधान देश था और किसान भी खुशाल थे, समाधानी थे, आनंद से जीवन व्यतिथ करते थे। लेकिन हम मौजुदा वर्तमान स्थिती में देखते है की समाज में और देश में की किसान पुरी तरह से बरबाद हो गए है। किसान का जीवन कठीनाइयों, परिशानीयों में और मानसिक दबाव मे अपना गुजर बसर कर रहै है। उनके अनेक कारण है। उन कारणों का विश्लेषण में आज यहां पर "किसानों की समस्या और समाधान" के बारे में अध्ययन करके बताना चाहता हुं। "किसानों की उदासिनता के कारण और उपाय : एक चिकित्सक अध्ययन" इस अध्ययन में विदर्भ के किसान आखीर आत्महत्या करते क्युं हैं ? एक आम जिंदगी क्युं नही जी

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**सारांश :**
कोणतेही राष्ट्रातील दारिद्ररेषेखाली असणाऱ्या लोकांचे प्रमाण कमी होणे हे त्या राष्ट्रात शांतता प्रस्थापित होण्याच्या दृष्टीने अत्यंत महत्त्वाचे असते. यासाठी त्या त्या राष्ट्राची शासन राष्ट्रातील विविध संस्था आणि सामाजिक जाणीव असणाऱ्या समाज प्रिय व्यक्ती अखंड प्रयत्नशील असतात. वर्तमान युग लोकशाहीची युग आहे. लोकशाहीत राजा राणीच्या पोटातून न येता तो मतपेटीतून येतो. स्त्री– पुरुष समानता हे लोकशाहीचे ब्रीद. त्यामुळे भारतानेही पूर्व परिचित अशी लोकशाही शासन व्यवस्थेला सुरुवात केली. या उद्दिष्टांच्या पूर्ततेसाठी भारतात असलेले दारिद्र्य लक्षात घेत दारिद्र्य निर्मूलनासाठी पंचवार्षिक योजनेचा प्रारंभ केला. त्यासाठी कोट्यवधी रुपयांचा वैयक्तिक पातळीवर कर्ज व अनुदान देणाऱ्या योजना आखल्या. परंतु त्यात भारत सरकारला अपेक्षित यश आले नाही. सद्यस्थितीत २६.१० टक्के जनता दारिद्र्यरेषेखालील जीवन जगत आहे व त्यात ५० टक्के महिलांचा समावेश आहे. भारतात महिलांची स्थान कुटुंबात दुय्यम समजले जाते. पुरुष प्रधान संस्कृती असल्यामुळे कुटुंबातील सर्व निर्णय पुरुष घेतात. देशा स्त्रियांची सामाजिक स्थिती , आर्थिक स्थिती काय ? या प्रश्नाचे उत्तर शोधताना स्त्रियांच्या सासरचे प्रमाण कमी, कुपोषण, आरोग्याचा अभाव, प्रति हजार पुरुषांमागे स्त्रियांचे कमी होणारे प्रमाण, हुंडाबळी, अन्याय, अत्याचार हेच निर्दशनास येते. स्त्रियांच्या विकासाकडे पंचवार्षिक योजना काळात लक्ष दिले असले तरी ग्रामीण स्त्रियांच्या सक्षमीकरणाचा खरा मार्ग स्वयंसहाय्यता बचत गटामार्फत उपलब्ध झालेला दिसतो.

**बीजशब्द :** स्वयंसहाय्यता बचत गट,महिलांचे आर्थिक –सामाजिक सबलीकरण ,बचत गटाची कार्यपद्धती

## प्रस्तावना :

आज अनेक ठिकाणी बचत गट कार्यरत आहेत. अंगणवाडी सेविका, शिक्षक कार्यकर्ते व स्थानिक विश्वासू नेतृत्व मंडळी, दूध डेअरी चे संबंधित संचालक व सचिव अशासारखे मंडळी पुढाकार घेऊन बचत गट स्थापन करीत आहेत. खाजगीरित्या चालविणे चालविल्या जाणाऱ्या निश्चित स्वरूप देण्याचा हा पर्याय .परस्परांवर विश्वास, बचतीची सवय व आर्थिक अडचणी साठी सहाय्य, लहान उद्योगधंद्यासाठी अर्थपुरवठा यासारखी वैशिष्ट्ये बचत गटाचे ह .परस्परांना सहकार्य आणि स्वयंसहाय्य वर आधारित असा गट तयार केला जातो. शक्यता समान स्थिती व समविचारी पेक्षा साधारणत जवळपास सारखे असलेली मंडळी एकत्र येतात. राजकीय हस्तक्षेप नाही. फक्त पूर्णपणे सहभाग आणि लोकशाही तत्वावर आधारित कारभाराची रूपरेषा हाच भाग महत्त्वाचा आहे. या गटाला तसे नोंदणी करण्याची आवश्यकता आहे तिच्या रूपाने जमा होत राहिलेले पैसे बचत खात्यावर एखाद्या बँकेत ठेवले जातात गरजेनुसार व व्यवसाय धंदा साठी आवश्यक त्यांना त्यातून कर्ज दिले जाते. नियमितपणे कर्ज परतफेडीसाठी भरण्याची जबाबदारी टाकली जाते. जवळजवळ १०० टक्के रिकव्हरी असल्याची स्थिती आहे. बचत गटाचे लोक आठवड्याला व पंधरा दिवसाला एकत्र जमतात चर्चेतून निर्णय घेतले जातात. वर्किंग रजिस्टर सभासदांनी नोंद होईल बचतीचा हिशोब पासबुक तेवढे ठेवले जाते. त्यासाठीचा खर्च नाममात्र आहे. पुढाकार घेणारी व्यक्ती प्रामाणिक विश्वासू व नेतृत्व तून जनसंपर्क साधणारी असते. त्यामुळे ही पद्धती पारदर्शक असते. सहाय्यता बचत गट ही पद्धतशीरपणे गुंतागुंत नसलेली किचकट पण पद्धतशीर आखणी केलेली कार्यपद्धती आहे. स्वेच्छा , स्वयंशासन, हाच, बचत गटाचा मूलाधार होय.

## स्वयंसहाय्यता बचत गटाचा इतिहास :

बांगलादेशात गरिबीचे उच्चाटन करण्यासाठी प्रा. डॉ. महंमद युनूस हे प्रयत्न करत होते. अर्थशास्त्राचे सिद्धांत व ग्रामीण भागातील वास्तव स्थिती यातील विसंगती जाणवू लागली. छोट्या रकमेचे कर्ज ही गरीब व्यक्तीच्या जीवनातील संघर्ष बदलू शकतो याचा अनुभव त्यांनी घेतला. त्यांनी बांबूपासून टोपल्या बनवणाऱ्या कारागिरांच्या वस्तीत दहा महिन्याच्या बचत गट स्थापन केला. मात्र त्यांना तारणाशिवाय कर्ज मिळू शकले नाही. तेव्हा प्रा. डॉ. मोहम्मद युनुस यांनी स्वत: मदत केली. तारणाशिवाय कोणती बँक कर्ज देऊ शकत नाही याची त्यांना जाणीव झाली. १९८२ मध्ये त्यांना महिलांचे बचत गट स्थापन करण्यास सुरवात केली व याच महिलांच्या सहकार्याने १९८३ साधी बांगलादेश ग्रामीण बँकेची स्थापना केली. या

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# INVESTIGATION OF THERMO-ACOUSTIC PROPERTIES OF ETHANOL-n-HEXANE BINARY MIXTURE AT DIFFERENT TEMPERATURES

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## ABSTRACT

Ultrasonic velocity, density and viscosity have been measured using Anton Paar DSA 5000 M in the binary mixtures of n-Hexane with Ethanol at various mole fractions from 0.1 to 0.9 with temperature ranging from 288K to 318K. Various derived parameters like adiabatic compressibility, acoustic impedance, free length and relaxation time have been calculated using standard formulae. Non covalent interaction taking place in the liquid mixture has been discussed on the basis of the values obtained from experimental parameters and derived parameters.

**Keywords:** adiabatic compressibility, acoustic impedance, relaxation time, free length, intermolecular non-covalent interactions.

## 1. INTRODUCTION

The knowledge of structure and molecular interactions of liquid mixtures is very important from fundamental and engineering point of view. Fundamental thermo-dynamic and thermo-acoustic properties are essential sources of information necessary for a better understanding of the non-ideal behavior of complex systems because of physical and chemical effects, which are caused by molecular interactions, intermolecular forces, *etc*. of unlike molecules. From a practical point of view, these properties are necessary for development of thermodynamic models required in adequate and optimized processes of the chemical, petrochemical, pharmaceutical, food processing, drugs industries, paint industries, fluid mechanics etc. [1,2]. The compositional dependence of thermodynamic properties has proved to be very useful tool in understanding the nature and extent of pattern of molecular aggregation which results from intermolecular interaction between components. Molecular interaction in liquid mixtures has been extensively studied using ultrasonic technique by many workers. The thermodynamic and acoustic properties are very essential for understanding the physicochemical behavior of the binary and multi-component liquid mixtures [3].

In the recent years, importance has been given to the behavior of multi-component liquid mixtures rather than the single component because of their widespread range of applications. Thermodynamic properties which are derived from the measurement of ultrasonic velocities, densities and viscosities for binary liquid mixtures are useful in understanding the nature and type of intermolecular interactions taking place in between the constituent molecules. In chemical process industries, materials are normally handled in liquid form and thus the physical, chemical and transport properties of liquids, assume importance. Thus, data on some of the properties associated with the liquids and liquid mixtures like ultrasonic velocity, viscosity and density invention has extensive application in solution theory models and molecular dynamics [4, 5].

Ultrasonic velocity of sound waves in a medium is fundamentally related to the binding forces between the molecules. Ultrasonic velocities of the liquid mixtures consisting of polar and non-polar components are of considerable importance in understanding inter-molecular interaction between components molecules and find application in several industrial and technological processes [6, 7]. Acoustical and thermo dynamical study of liquid mixtures provide enough knowledge about the association of molecular packing, molecular motion and strength of intermolecular

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# Investigation of Thermo-Acoustic Properties of 1-Propanol-N-Hexane Binary Mixture at Different Temperatures

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## ABSTRACT

Ultrasonic velocity, density and viscosity have been measured using Anton Paar DSA 5000 M in the binary mixtures of n-Hexane with 1-Propanol at various mole fractions from 0.1 to 0.9 with temperature ranging from 288K to 318K. Various derived parameters like adiabatic compressibility, internal pressure and relaxation time have been calculated using standard formulae. Non covalent interaction taking place in the liquid mixture has been discussed on the basis of the values obtained from experimental parameters and derived parameters.

**Key words:** adiabatic compressibility, internal pressure, relaxation time, intermolecular non-covalent interactions.

## I. INTRODUCTION

From fundamental and engineering point of view, the knowledge of structure and molecular interactions of liquid mixtures is very important. Fundamental thermodynamic and thermo-acoustic properties are essential sources of information necessary for a better understanding of the non-ideal behavior of complex systems because of physical and chemical effects, caused by molecular interactions, intermolecular forces, *etc.* of unlike molecules. From a practical point of view, these properties are necessary for development of thermodynamic models required in adequate and optimized processes of the chemical, petrochemical, pharmaceutical, food processing, drugs industries, paint industries, fluid mechanics etc.[1,2]. The compositional dependence of thermodynamic properties has proved to be very useful tool in understanding the nature and extent of patterns of molecular aggregation arising from intermolecular interaction between components. Molecular interactions in liquid mixtures have been extensively studied using ultrasonic technique by many workers which are very essential for understanding the physicochemical behavior of the binary and multi-component liquid mixtures[3]. In recent years, importance has been given to the behavior of multi-component liquid mixtures rather than the single component due to their widespread range of applications. Thermodynamic parameters derived from the measurement of ultrasonic velocities, densities and viscosities for binary liquid mixtures are useful in understanding the nature and type of intermolecular interactions taking place in between the constituent

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# EFFECT OF GAMMA IRRADIATION ON SEED GERMINATION AND SEEDLING GROWTH OF *CAPSICUM ANNUM* L.

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**ABSTRACT:**
This study was conducted to investigate the effect of seed irradiation on the seed germination and seedling growth characteristics of two varieties of *Capsicum annum.* variety Pusa Jwala and variety Bhiwapuri. Seeds were irradiated with 100,200,300,350& 400Gy gamma rays using Cobalt-60. Percentage of seed germination and growth traits such as seedling height, root length and leaf number were observed. Results showed that irradiation dose at 400Gy had highest lethal effect. Germination percentage in both the varieties decreased with increasing dosage of gamma irradiation from 200Gy to 400Gy in petri-dish method and 100Gy to 400Gy in raised bed method. Growth in terms of seedling height and root length decreased with increasing doses of gamma irradiation in both the varieties. Leaf number significantly decreased in 300, 350 and 400Gy of Bhiwapuri and in 350 and 400Gy treatments of Pusa Jwala.

**Key words:** - *Capsicum annum; Gamma rays; Induced mutation*

## INTRODUCTION:

Chili (*Capsicum* spp.) of family Solanaceae is an important spice and vegetable crop grown in Asia, Africa, and South America (Pakdeevaranporn et al. 2005). Among the five-cultivated species of chili, *Capsicum annuum* is the most widely cultivated species in India for its pungent (chili syn. hot pepper) and non- pungent (sweet pepper syn. bell pepper) fruits. The cultivation of *C. frutescence, C. Chinese and C. baccatum* is limited and usually restricted to homestead gardening in different regions (Reddy *et al.* 2014).

Mutation is a sudden heritable change in an organism (Soeranto et al. 2011; Dhanavel et al. 2012). Qualitative and quantitative characters can change through induced mutation (Muduli & Misra, 2007). One of the most important physical mutagens is the ionizing radiation- gamma rays. The free radicals formed by ionization cause damage to the living cell and affect the morphology, anatomy and physiology of plants depending on irradiation dosage (Kim et al. 2004).

More than 3,200 officially released crop varieties have been developed through induced mutation strategies in over 80 years (Mba, 2013). According to the FAO/IAEA database, more than half (60%) of the mutant-derived varieties were developed in Asia, followed by Europe (30%), Latin America, and the Caribbean, while North America and Africa contributed 2% each. Moreover, in an officially released database of mutant varieties by Joint FAO/IAEA, cereals contributed almost (48%) of all mutant crop varieties globally, followed by ornamentals (20%), legumes and pulses (14%), trees (3%), vegetables (3%), forage (3%), fiber crop (2%), root (1%) and others (3%) (Mba, 2013). Mutation has played a vital role in the improvement of crop productivity and quality, resultantly >3,000 varieties of 175 plant species