



Punyashlok Ahilyadevi Holkar Solapur University

Criterion III - Research, Innovations and Extension

3.4 Research Publications and Awards

Metric No.	
3.4.6	<i>Number of books and chapters in edited volumes published per teacher during the last five years</i>
	<ul style="list-style-type: none">• Any additional information• List books and chapters in edited volumes / books published (Data Template)

3.4.6.1: Total number of books and chapters in edited volumes/books published and papers in national/ international conference proceedings year-wise during last five years

Year	2015-16	2016-17	2017-18	2018-19	2019-20
Number	10	15	37	15	14

Optimization of techno-economic cobalt doped nickel oxide electrode designed for energy storage

I. A. Dhole, Y. H. Navale, Y. M. Jadhav, R. N. Mulik, S. G. Pawar, C. S. Pawar, and V. B. Patil

Citation: *AIP Conference Proceedings* **1989**, 020011 (2018); doi: 10.1063/1.5047687

View online: <https://doi.org/10.1063/1.5047687>

View Table of Contents: <http://aip.scitation.org/toc/apc/1989/1>

Published by the *American Institute of Physics*

Articles you may be interested in

[Prominent NO₂ gas sensor based on ZnO nanowires grown by thermal evaporation](#)

AIP Conference Proceedings **1989**, 020033 (2018); 10.1063/1.5047709

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AIP Conference Proceedings **1957**, 020004 (2018); 10.1063/1.5034323

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[Influence of annealing temperature on optical properties of Al doped ZnO nanoparticles via sol-gel methods](#)

AIP Conference Proceedings **1972**, 030006 (2018); 10.1063/1.5041227

Synthesis of polyaniline - Tungsten oxide hybrid nanocomposites and its ammonia sensing performance

S. B. Kulkarni, Y. H. Navale, S. M. Ingole, M. A. Chougule, R. D. Sakhare, A. T. Mane, and V. B. Patil

Citation: *AIP Conference Proceedings* **1989**, 020020 (2018); doi: 10.1063/1.5047696

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Published by the *American Institute of Physics*

Prominent NO₂ gas sensor based on ZnO nanowires grown by thermal evaporation

Y. H. Navale, S. R. Patil, I. A. Dhole, D. K. Bandgar, Y. M. Jadhav, P. S. Kulkarni, and V. B. Patil

Citation: [AIP Conference Proceedings](#) **1989**, 020033 (2018); doi: 10.1063/1.5047709

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Articles you may be interested in

[Optimization of techno-economic cobalt doped nickel oxide electrode designed for energy storage](#)

[AIP Conference Proceedings](#) **1989**, 020011 (2018); 10.1063/1.5047687

[Effect of molybdenum content on the optostructural, morphological and photoelectrochemical properties of Bi₂Se₃Thin films](#)

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[A MATLAB program for quick estimation of characteristics of piezoresistive pressure sensors](#)

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[Synthesis and applications of ZnO nanowire: A review](#)

[AIP Conference Proceedings](#) **1989**, 020004 (2018); 10.1063/1.5047680

[Zinc oxide nano-structures: From nano-wall to nano-rod growth morphology](#)

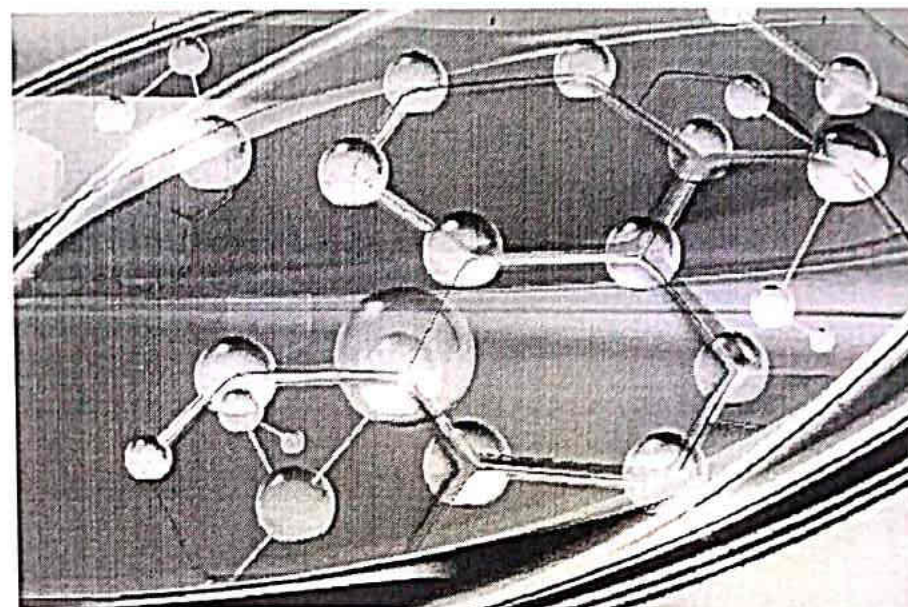
[AIP Conference Proceedings](#) **1989**, 020007 (2018); 10.1063/1.5047683

[Preface: Emerging Technologies: Micro to Nano \(ETMN-2017\)](#)

[AIP Conference Proceedings](#) **1989**, 010001 (2018); 10.1063/1.5047676

The book emphasizes on the development of gas sensors fabricated using thin films of PPy, PPy-CSA, α -Fe₂O₃, PPy/ α -Fe₂O₃ hybrid nanocomposite and CSA doped PPy/ α -Fe₂O₃ hybrid nanocomposite for the detection of various oxidizing (NO₂, Cl₂) and reducing gases (NH₃, CH₃OH, C₂H₅OH, H₂S). Gas sensing performance at different concentrations of selective gas was carried out at room temperature and the performance of the sensors is evaluated in terms of their response, selectivity, response-recovery times, and stability. Finally, sensing mechanism for the same wherever possible is discussed with the help of impedance spectroscopy.

PPy-Fe₂O₃ hybrid sensor



Vikas Patil
Sachin Navale

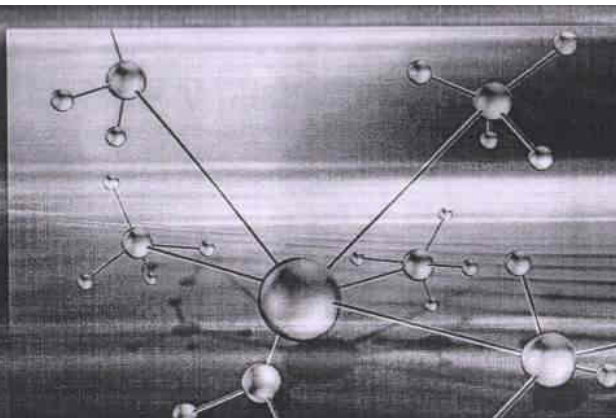
Polypyrrole-Iron Oxide Nanocomposite for Gas Sensing Application

Dr. V.B.Patil and Dr. S.T.Navale working on conducting polymer- metal oxide hybrids for gas sensing applications. Dr. Patil presently working as I/c. Head. Department of Electronics, Solapur University, Solapur, Maharashtra, India.He has published more than 100 research papers in International journal with average impact factor 2.10



In recent days the nanocomposites are grown rapidly, both in their applications and economic importance. This book deals with the synthesis and study of Polypyrrole, Nickel Oxide, Polypyrrole-Nickel Oxide nanocomposite and CSA doped Polypyrrole-Nickel Oxide nanocomposite for NO₂ gas recognition. The synthesized sensors were characterized for structural, compositional, morphological, electrical and gas sensing properties. The gas sensing performance was carried out at operating temperature in terms of their response, selectivity and response-recovery time for various oxidizing and reducing gases. The CSA doped Polypyrrole-Nickel Oxide nanocomposite sensors showed enhanced gas sensing performance.

PPy-NiO Hybrid Sensor: Synthesis & Study



Sandhya Nalage
Vikas Patil

Dr S R Nalage received Ph D from Solapur University, India. Her research area focuses on gas sensing applications & has 11 research publications. Dr V B Patil is Prof & Head, Dept of Physics (Materials Science), School of Physical Sciences, Solapur University, India. He has completed several research projects & more than 100 international publications.

PPy-NiO Hybrid Thin Film NO₂ Sensor: Development and Characterization



978-3-330-05861-3

Nalage, Patil

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The book emphasizes on the development of gas sensors fabricated using films of PPy, WO₃, PPy-WO₃ hybrid nanocomposite, PPy-DBSA and DBSA doped PPy-WO₃ hybrid nanocomposite for the detection of oxidizing (NO₂, Cl₂) and reducing gases (NH₃, CH₃OH, C₂H₅OH, H₂S). Gas sensing performance at different concentrations of selective gas was carried out at room temperature and the performance of the sensors is evaluated in terms of their response, selectivity, response-recovery times, and stability. Finally, sensing mechanism for the same wherever possible is discussed with the help of schematic sensing mechanism and impedance spectroscopy.

PPy-WO₃ HYBRID NANOCOMPOSITE GAS SENSOR



Amitkumar Mane
Vikas Patil

A. T. Mane received his M.Sc. degree in 2003 and Ph.D. in 2017 from School of Physical Sciences, Solapur University, Solapur, India (M.S.). V. B. Patil received his Ph. D. in 2001 from Shivaji University, Kolhapur. He is currently working as a Professor in the School of Physical Sciences, Solapur University, Solapur,

PPy-WO₃ HYBRID NANOCOMPOSITE FOR GAS SENSING APPLICATIONS



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Mane, Patil

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CHAPTER

X-ray photoelectron spectroscopy of nanofillers and their polymer nanocomposites

15

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15.1 INTRODUCTION

Over the past decade, semiconductor metal oxide-conducting polymer composites have been a rising area of research in different fields of science and technology. Composites are a special class of materials formed by the intermixing of two or more nanosized materials, resulting in materials having more premier properties than the single counterpart. Polypyrrole (PPy) is a p-type material and has fascinated many because of its chemical stability against atmospheric conditions, low cost, room temperature operation, easy processability, excellent conductivity, convenient processing, tunable electronic properties, and potential for semiconducting and even metallic behavior. WO_3 is a n-type metal oxide consisting of useful properties as catalytic behavior, high structural flexibility, switchable optical properties, etc. A PPy-tungsten oxide (WO_3) nanocomposite is a new class of materials with superior properties which can overcome the insufficiency of a single counterpart [1]. The PPy- WO_3 nanocomposite is a sophisticated system with strong electronic relations between organic and inorganic materials, and thus shows better chemical and physical properties [2,3].

Moreover, among various conducting polymers, PPy has attracted much curiosity due to its ease of synthesis by electrochemical and chemical methods, and disadvantages such as insolubility, poor stability, and long response time [3]. Among the semiconducting metal oxides, WO_3 is one of the best materials and has attracted much interest due to its excellent physical and chemical properties. It possesses a high operating temperature of about 300–500 °C, which increases power consumption, reduces sensor life, heat loss, and poisoning [4].

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Efficient Electrodeposited Nickel Oxide Thin Films for Supercapacitor Electrode

I.A. Dhole, Y.H. Navale, S.M. Ingole, R.N. Mulik, Y.M. Jadhav, C.S. Pawar and V.B. Patil

Keywords NiO thin film · Electrodeposition · Nanostructure · XRD · SEM · CV

1 Introduction

In recent years, supercapacitors derived from metal oxide thin films are attracting great attention as energy storage systems because of their potential applications in micro-electronic devices, household appliances, backup power sources, in clocks, video equipment, and other devices. Various transition metal oxides, such as RuO_2 , Co_3O_4 , NiO , MnO_2 , Fe_2O_3 , Ir_2O_3 , SnO_2 etc., are being studied for the supercapacitor applications with their charge storage mechanisms based on pseudocapacitance. Between these metal oxides for supercapacitor electrodes, amorphous hydrous ruthenium oxide is the most capable material for supercapacitors because of its elevated specific capacitance, excellent reversibility and long cycle-life [1, 2]. The Powder forms of amorphous and hydrous ruthenium oxide ($\text{RuO}_2 \cdot x\text{H}_2\text{O}$) have been produced by the sol-gel method and found to be capable material for electrochemical capacitor with high power density and energy density [3]. However, RuO_2 is high-priced toxic and naturally less abundant which has restricted their commercial use. Also RuO_2 requires the use of a strong acidic electrolyte such as sulfuric acid. The acidic media can liquefy the metal oxide over extended cycling leading to weaken in the specific capacitance with cycle-life. As a result, various metal oxides have also been tested as probable candidates for electrochemical supercapacitor devices. Candidate systems include IrO_2 [4] or CoO_x , [5] but they suffer from limitations similar to RuO_2 , that is, they are high-priced and require

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An Approach to Harness Energy by SnO₂ Thin Film Electrode by Thermal Evaporation

S.M. Ingole, Y.H. Navale, D.K. Bandgar, I.A. Dhole, M.A. Chougule,
P.S. Kulkarni and V.B. Patil

Keywords Thermal evaporation · SnO₂ electrode · XRD · SEM · CV

1 Introduction

In recent years, rising demands for power sources of transient high-power density have stimulated a huge importance in electrochemical supercapacitor with applications in electric vehicles, digital communications, memory back-up devices, burst power generation and other related devices which require high-power pulses. The prospective applications of electrochemical supercapacitors consist of the power enhancement and cycle life improvement of primary power sources such as fuel cells and batteries. Electrochemical supercapacitors are also attractive for other applications such as power sources for lasers, camera flash equipment, and cellular phones. Electrochemical supercapacitors are separated into two categories according to different charge-storage mechanisms (i) redox supercapacitors and (ii) electric double layer capacitors (EDLCs). In redox supercapacitor, the pseudo capacitance arises from faradic reactions happening at the electrode interface and, in electric double layer capacitors the capacitance arises from the charge separation at the electrolyte/electrode interface. The most important materials that have been deliberate for the supercapacitor electrode are (i) conducting polymers, (ii) transition metal oxides and (iii) carbon [1, 2].

Various transition-metal oxides, such as Fe₂O₃, RuO₂, NiO, Co₃O₄, IrO₂, MnO₂, SnO₂, etc. those are being studied for the supercapacitor applications. Among the

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POTENTIOSTATICALLY ELECTROPLATED MnO_2 ELECTRODE AND THEIR SUPERCAPACITIVE PERFORMANCE

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ABSTRACT:

MnO_2 thin films have been successfully prepared by controlled potentiostatic electrodeposition route. The structural, morphological and wettability properties are studied by means of X-ray diffraction (XRD), scanning electron microscopy (SEM) and contact angle study. From the XRD pattern it is clear that the MnO_2 films are amorphous in nature. The Scanning electron micrograph shows that MnO_2 film consists of nanoplatelets, well covered to the substrate exterior. MnO_2 films shows hydrophilic behavior as water contact angle is 71° . Supercapacitive properties of MnO_2 electrode are examined using cyclic voltammogram, charge-discharge technique and stability study. The cyclic voltammogram study of the MnO_2 films in 1 M KOH shows maximum specific capacitance of 605.3 Fg^{-1} at scan rate of 5 mVs^{-1} . The charge-discharge technique was employed to estimate the values of specific energy, power and coulombic efficiency as 17.13 Whkg^{-1} , 15.55 kWkg^{-1} and 95.10% , respectively. The electrode reveals a cyclic stability of 93.3% over 1500 cycles. This kind of electrode could be effectively utilized for the supercapacitor fabrication, especially for microelectronics.

Keywords: Manganese oxide; XRD; SEM; CV; CD

INTRODUCTION:

Supercapacitors have been examined commonly as the next cohort of energy storage. They play more and more major roles in power source relevance's such as in short term power sources for mobile electronic apparatus and supplementary power sources for hybrid electric automobiles [1,2]. Because of the potential relevances and outstanding electrochemical properties, the manganese oxide (MnO_2) is predicted in research in different forms as electrochromic film, fuel cell electrode, electrochemical capacitors and battery, etc. [3,4].

EXPERIMENTAL:

0.1 M manganese sulfate was used as precursor to form MnO_2 . Potentiostatic electrodeposition was carried out using three-electrode electrochemical arrangement containing

HIGHLY SENSITIVE AND SELECTIVE SOLID STATE SYNTHESIZED CuO NANOPARTICLES FOR DETECTION OF TOXIC NO₂ GAS

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ABSTRACT:

In present study, we report a NO₂ gas sensing spirit of CuO nanoparticles; prepared fruitfully on a quartz substrate by a catalyst free thermal evaporation method. Structural investigation explored the monoclinic crystal structure of CuO NPs. The morphological analysis revealed that the formation homogeneous nanoparticles on the top of substrate surface. As- prepared CuO NPs was employed to construct sensor for detection of noxious NO₂ gas. The CuO NPs sensor exhibits a elevated response of 70% with hasty response and recovery time at 150°C optimal temperature; also achieve excellent response at very low exposure (1 ppm) of NO₂ gas. Beside, CuO NPs sensor attains a fabulous selectivity, reproducibility and stability.

Keywords: CuO NPs; Quartz substrate; Thermal evaporation; XRD; NO₂ sensor;

INTRODUCTION:

In last few decades, the environmental air contamination is notably increased due to the contemporary industrialization, which is tremendously harmful to environmental issue and all living organisms. NO₂ gas is one of the most regular toxic contaminants often emitted from in various fields, including the combustion of automobile engines, home heaters, furnaces and plants [1]. Thus, gas finding gadgets are desirable to control toxic gases levels, particularly at minor ppm concentrations.

A lot of physical and chemical routes are employ to prepare CuO nanostructures including a hydrothermal reaction, seed-mediated solution growth, thermal oxidation and electro spinning [2-5].

In the present study, we used simple thermal evaporation (TE) technique, for the synthesis of CuO nanoparticles on quartz substrate, which utilize for NO₂ gas sensing application.

Toxic NO₂ Gas Sensing Potential of Hydrothermally Prepared ZnO Nanorods



P. R. Godse, Y. H. Navale, R. N. Mulik, and V. B. Patil

Keywords ZnO · Hydrothermal · Nanorods · FESEM · NO₂ gas

1 Introduction

Metal oxide semiconductor gas sensors have been extremely explored for the cause of observing ecological biodiversity and detecting of harmful and hazardous gases [1]. In last few years, semiconductor nonmaterial's attracted tremendous interest in photonics, optics and electronics due to their superlative performance. Nanomaterials are categorized mainly into three groups: 0-dimensional, 1-dimensional, and 2-dimensional. One-dimensional (1D) nanostructures such as nanobelts, nanofibres, nanowires, nanotubes and nanorods. One-dimensional (1D) nanostructures form a new platform for gas sensor applications, because of their dimension, size of the molecule and high surface to volume ratio are suitable to alter the electrical properties of the sensor elements in electronic devices. Among the one-dimensional (1D) nanostructures of different metal oxides, 1D ZnO nanorod is one of the crucial and versatile nanostructures for nanotechnology in today's research [2]. One dimensional zinc oxide (1D ZnO) having a band gap of 3.38 eV with a hexagonal wurzite crystal structure has been widely preferred as a gas sensing material and prepared by a number of methods including chemical bath deposition [3], chemical vapor deposition [4] and hydrothermal method. Out of these various methods, 1D ZnO nanorods grown by hydrothermal method without presence of any type of catalyst.

Different nanostructures of ZnO have been prepared for sensing applications of distinct gases such as ammonia, ethanol, acetone, nitric oxide, chlorine, methane, hydrogen, and nitrogen dioxide [5]. Among these air pollutants, nitrogen dioxide (NO₂) gas is formed throughout combustion in industrial factories, power plants and automotive engines. Therefore, to detect NO₂ gas a sensor of an extreme sensitivity

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High-Performance Potentiostatic Electro-Polymerized Polypyrrole (PPy) Electrode for Electrochemical Performance



S. M. Ingole, Y. H. Navale, Y. M. Jadhav, A. S. Salunkhe, and V. B. Patil

Keywords Polypyrrole · Potentiostatic electrodeposition · XPS · SEM · Cyclic voltammetry · Impedance

1 Introduction

In recent years, electrochemical super capacitor (ESs) has been considered as one of the most expansively investigated energy storage devices as a result of its fast charging ability, high cyclic stability, and low maintenance cost [1–3]. ESs are primarily used in a variety of high power equipments, essentially where fast charging is desirable, like hybrid electric vehicles, laptops, and cellular phones. ESs has the capacity to fulfill the gap between capacitors and batteries. ESs are mainly divided into two types, on account of the charge storage mechanism and the electrode materials used, such as electric double layer capacitors (EDLCs) (wherein carbon materials with large surface area are utilized as electrodes) and pseudo-capacitors (in which electro-active materials for instance conducting polymers (CPs) or transition metal oxides are applied as electrodes). Generally, EDLCs consists of higher power density but it suffers from low capacitance and low rate capability. On the other hand, pseudo-capacitors employ fast and reversible surface or close to surface reactions for charge storage. As a result, pseudo-capacitors, based on conducting polymers and transition metal oxides, could provide higher specific capacitance to the active materials when compared with EDLCs. The electrodes made from metal oxides showed a high specific capacitance, according to literature survey, and rate capability hypothetically. However, a key constraint of the metal oxide based

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Electrodeposition Synthesised PANi-MnO₂ Hybrid Electrode for Energy Storage Applications



G. D. Khuspe, Y. H. Navale, M. A. Chougule, R. N. Dhanawade,
and V. B. Patil

Keywords Polymer · Hybrid supercapacitor · Efficiency · Nanosheets · Amorphous

1 Introduction

Supercapacitor (SC) or electrochemical capacitors are also known as ultracapacitor, which are very helpful electrochemical energy storage strategies with particular features such as high power density, long cycle-life, and fast charge-discharge capability at high rates [1, 2]. Electrochemical capacitors are contributing higher power along with long durability beloved for energy devices like backup resource in electrical devices and crest power sources for electrical automobiles [3].

To fabricate SC electrode, series of materials such as carbons, conducting polymers and metal oxides have been envisaged. PANi is a one of the exciting materials from polymers due to of advantage as easy synthesis ways; PANi active electrode is fabricated either by electrochemical or chemical polymerization of aniline monomer [4]. The conducting polymer, PANi has revealed potential appliances in supercapacitor electrode objects in expressions of elevated capacitance and proper electrical conductivity, but because of dilapidation through charge/discharge route it suffers from pitiable stability [5].

Semiconductor metal oxide, manganese oxide (MnO₂) have largely been deliberated because of their tall specific capacitance, elevated surface area and little-cost [6]. To date, various routes to amalgamate MnO₂ electrodes in special nanofoms have been reported as well as chemical bath deposition [7]. Powder-nature electrodes have also been fabricated by means of a soft or hard template, precipitation schemes and hydrothermal route. Specially, MnO₂ is proficient electrode substance for supercapacitors application with lots of other applications such as catalysis, electrochromic films, fuel cells and gas sensors [8].

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NO₂ Gas Sensor Based on ZnO Nanorods Synthesised by Thermal Evaporation Method



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Keywords ZnO · Nanorods · xrd · Sem · Nitrogen dioxide gas

1 Introduction

Nowadays, the efficient and low cost gas sensor setups are required for recognition and quantification of toxic gases because of increasing in environmental air pollutions. The key reasons of air pollutions are extensive industrialization activities, such polluted air is enormously damaging to living organisms and to biodiversities circumstances also [1, 2]. Hence, to protect biodiversity and living organisms; gas sensors setups have been measured capable substitutes for the detection of environmental pollutions. NO₂ is a very injurious gas among the other gases (CO, CO₂, H₂S, SO₂ etc.), and it is extremely damaging at very low concentration [3]. The lethal NO₂ gas is released largely from the automobiles, industrial factories, home heaters, power plants and furnaces also. Thus, it is necessary to buildup an immensely responsive, selective toxic NO₂ gas sensors, which can be bright to sense very low concentrations of gas through ideal gas sensing concerts. This kind of gas sensors can be worn to the supervising fruitful ecological conditions.

In the earlier period, various types of sensors were fabricated for the detection of toxic gases by using different kinds of sensing resources and a variety of materials. For gas-sensing the major used materials are semiconductor metal oxides, conducting polymers, composites of semiconductor metal oxides, and conducting polymers, and other new materials. Such materials can be sensible on diverse sensing principles including chemiresistive, quartz crystal microbalance, surface acoustic wave and MOSFET (metal oxide semiconductor field effect transistor) [4, 5]. A chemiresistive metal oxide semiconducting are the largely used prospective contender because of its low cost, lofty sensitivity, hasty response-recovery time, high stability, reproducibility and effortless electronic interface [6, 7]. Semiconducting metal oxides have two types i.e. n-type, where majority charge carrier are electrons and p-type, where holes are

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Hybrid Flexible Sensor



V. B. Patil

Abstract A novel flexible, ultra-sensitive, selective and room temperature operable polyaniline-based hybrid (PAni/ α -Fe₂O₃ PAni/WO₃) ammonia (NH₃) gas sensors were developed onto a flexible polyethylene terephthalate (PET) substrate by in-situ polymerization process. The observations were recorded to 100 ppm fixed level for various gases including NO₂, CH₃OH, C₂H₅OH, NH₃ and H₂S through monitoring the change in resistance of the developed sensor. The flexible (PAni/ α -Fe₂O₃ PAni/WO₃) hybrid sensor demonstrated better selectivity towards NH₃. The synergistic response of the flexible hybrid sensors was remarkable than that of the PAni and α -Fe₂O₃ and WO₃ alone; indicating the effective improvement in the performance of PAni flexible sensor on nanocomposite process. Moreover, the flexible sensor detected NH₃ at low concentration (5 ppm) with a fast response (27 s) and very short recovery time (46 s). Further, PAni/ α -Fe₂O₃ and PAni/WO₃ hybrid flexible sensor films were characterized by X-ray diffraction, field-emission scanning electron microscopy, UV–visible and Raman spectroscopy, Fourier transform infrared and X-ray photoelectron for structural analysis, morphological evolution, optical and surface related studies.

1 Introduction

In recent days, the development of stretchable and flexible sensors for array of functions has been accelerated by fast advances in materials and processing methods. Flexible sensors are attracting more interest due to their fascinating properties like flexibility, low cost, lightweight, shock resistance, smoothness, etc. Flexible sensors hold great assure for variety of appliances in several fields including medicine, communication, personal safety, environmental monitoring, energy storage and poisonous pollutant detection for human health [1]. The fundamental advantage of flexible sensor is that it can operate at room temperature and can be situated in compact places which make it portable, trouble-free and economical [2].

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From Nature to Nanomaterials, https://doi.org/10.1007/978-981-15-6116-0_21

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Hydrothermal Synthesis of Tungsten Oxide for the Detection of NO₂ Gas



R. N. Mulik, M. A. Chougule, G. D. Khuspe, and V. B. Patil

Keywords WO₃ sensor · XRD · XPS · no₂ sensing

1 Introduction

A fabrication gas of sensor for virtually detection of fatal gases beneath of their harmful limit is a chief concern of recent researchers. To date, a range of metal oxide based gas sensors has been worned for recognition of such noxious gases but several of the sensors detect gas at upper concentration. The sensor explained by Waghule et al. shows response above 100 ppm [1]. Revealing of gas at higher concentration restricts the use of material for gas sensing applications, as a result, it is crucial to develop a sensor which can sense gas below its harmful limit determined by EPA and have lengthy term stability. Tungsten trioxide (WO₃) is commonly known n-type semiconductor, it has many exceptional properties resulted in wide applications in many areas such as gas sensors, electrochromic devices, rechargeable lithium batteries, photocatalysts, information displays, field-emission devices, solar-energy devices and smart windows [2–4].

In technological applications and fundamental scientific interest, one of the most challenging issues is to develop innovative methods for the preparation of nanomaterials, as well as the modification of their size and morphology. Varieties of methods are presently known for the synthesis of nanomaterials. In the present

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In the 21st century, the world is growing towards the need for energy and power required for different applications. Supercapacitor/electrochemical supercapacitor (ES) or Ultra capacitor have attracted significant attention as an energy/power density resource. Supercapacitors have been received a lot of applications in the field of power/energy storage of hybrid electric vehicles, mobiles, and digital communications, military, missiles etc. To improve the performance of supercapacitor electrode, preferably it requires conducting current collectors and coated material which is chosen with multi oxidation states, good electrical conductivity, mixed capacitive behavior, semi-crystalline (amorphous as well as crystalline), porous and hydrophilic nature, ideal polarizability, low ESR etc. The aim of work is to carry out the systematic study essential to improve the performance of cobalt oxide electrodes prepared by spray pyrolysis.

Electrochemical Characterizations



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Non Aqueous Route Sprayed Mn and Ru Doped Cobalt Oxide

Supercapacitor Electrodes



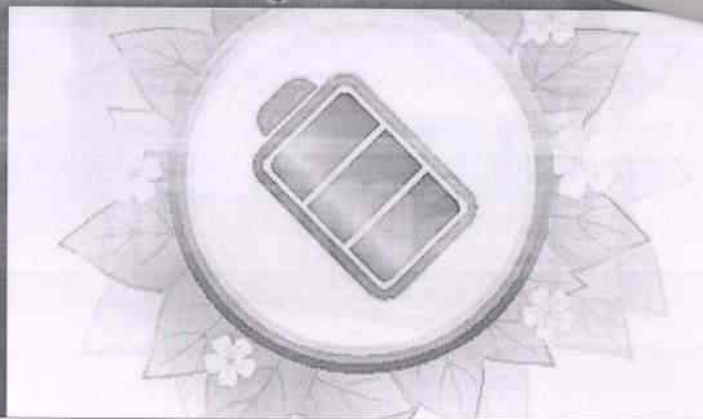
978-613-9-82951-4

Ambare, Lokhande

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Electrochemical energy storage systems are highly desirable in today's information rich modern society and technology. Supercapacitors have been received lot of attention in the field of power/energy storage of hybrid electrical vehicles, mobiles, digital communications and military, missiles etc. To improve the performance of supercapacitor electrode, preferably it requires conducting current collectors and coated material having multi oxidation states, good electrical conductivity, Faradic/non-Faradic capacitive behaviour, semi crystalline (amorphous as well as crystalline), porous and hydrophilic nature, ideal polarizability, low ESR etc. The aim of research work is to carry out the systematic study essential to improve the performance of cobalt oxide electrodes prepared by spray pyrolysis.

Supercapacitive Measurements



Balkrishna Lokhande

Supercapacitive Measurements

Spray pyrolysed Mn and Ru doped Cobalt Oxide for Supercapacitor



Projected by Balkrishna Balkrishna, Jagannath Lokhande is an Associate Professor and Head, Department of Materials Science, Solapur University, Solapur, India.

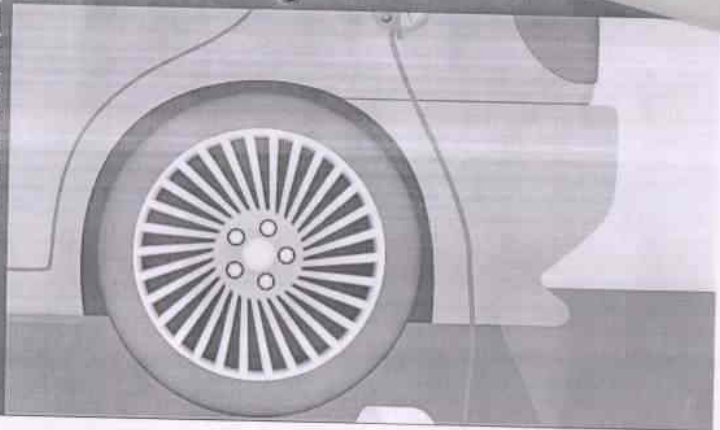


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Electrochemistry is one of the leading branch involved in the research of physics and chemistry especially in thin film preparation for supercapacitor electrodes and oxidation reduction for the synthesis of drugs. Supercapacitor has high power density than batteries and large energy density compared to conventional capacitor. Hence supercapacitor has lot of demand in energy related device technologies. Its market cost increasing day by day. There is a need to search an alternative material for its electrode to make its price down. Electrochemical analysis is the useful tool to characterize the electrode material through power and energy application point of view. Present book focus on cost effective use of optimized cadmium oxide as a electrode material in supercapacitor.



Balkrishna Lokhande



Balkrishna Lokhande

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Electrochemical Measurements

Preparation and Supercapacitive Measurements of Spray Pyrolysed Cadmium Oxide Thin Film Electrodes



978-3-659-44602-3

Lokhande

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Some characteristics properties of chemically grown $\text{Cd}_{1-x}\text{Zn}_x\text{Se}$ thin films

V. M. Prakshale, G. T. Chavan, S. T. Pawar, U. K. H. Bangi, A. Sikora, S. S. Kamble, N. B. Chaure, N. N. Maldar, and L. P. Deshmukh

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SYNTHESIS AND TEXTURAL CHARACTERISTICS OF ALUMINA-ZIRCONIA COMPOSITE AEROGELS VIA AMBIENT PRESSURE DRYING

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ABSTRACT:

The experimental results in this work reports the synthesis and textural characteristics of alumina-zirconia composite aerogels prepared via sol-gel process using a surfactant (Brij-76) as organic additives and the influence of addition of Brij-76 prior- and post-sol formation have been studied. The textural characteristics of composite aerogels were analyzed using N₂ adsorption-desorption, field emission scanning electron microscopy (FESEM) and X-ray diffraction techniques. The composite aerogels prepared using Brij-76 post- and pre-formation showed different textural characteristics.

Keywords: Brij-76; Sol-gel; Ambient pressure drying; Alumina-Zirconia, Composite aerogels

INTRODUCTION:

Aerogels, the lightest and transparent nanostructured porous materials, are obtained from a gel by the replacement of liquid with air. They are extremely low density (0.001 - 0.002 g/cm³) materials with an open cross-linked network having particle size of <10 nm and pore size of <50 nm. They possess a wide variety of outstanding properties such as high porosity (80-99.8%) and surface area (500-1200 m²/g) etc. Exhibiting such exceptional properties, aerogels are applicable in various fields such as catalysis, energy storage, thermal insulation and space technology etc. Ambient pressure drying (APD) is a simple and energy efficient method for the synthesis of aerogels. The sol-gel process to prepare gel pursued by drying of the gel via either supercritical drying (SCD) or ambient pressure drying (APD) or freeze drying (FD). Conventionally, aerogels are synthesized via expensive and energy intensive SCD method which restricts the commercialization of the aerogels. But, the recent developments have shown great potential of the APD as an alternative and very simple method for the synthesis of the aerogels. It is observed that alumina and zirconia are the most common support materials in heterogeneous catalysis [1]. Zirconia is found to be more stable than alumina; however, the use of zirconia is limited due to the tetragonal and cubic phases transformation

SOL-GEL SYNTHESIS OF ZIRCONIA THIN FILMS USING SPIN-COATING TECHNIQUE

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ABSTRACT:

In the present paper, the experimental results on some textural properties of zirconia thin films synthesized using different concentrations of polyvinyl alcohol (PVA) as a polymeric additive are reported. The zirconia thin films were prepared by sol-gel method and spin coating technique. The volume ratio of ZrO₂:PVA:EtOH:FAA:IPA:Gelatin was fixed as 0.01:0.01:0.25:0.25:0.25:0.25 throughout the experiments, and the different concentrations of PVA were varied accordingly. The BET surface area and pore size distribution of zirconia thin films were measured using N₂ adsorption-desorption analysis. Field emission scanning electron microscopy (FESEM) was employed to study the influence of various PVA concentrations on the morphology of zirconia thin films.

Keywords: Sol-gel method, Spin coating, Zirconia, Thin films

INTRODUCTION:

Sol-gel technology offers efficient and high purity production of nanoparticles, fibers, solid structures and thin films. One of the methods of thin films, sol-gel deposition of zirconia on the substrate is a simple and effective way to fabricate zirconia thin films. Zirconia is a ceramic material of excellent thermal stability, high surface area and chemical inertness [2]. Different precursors like zirconium salts, alkoxides and different deposition techniques such as spin coating, dip coating etc. are used for the synthesis of porous zirconia thin films [3, 4]. Zirconia highly reacts with water and moisture. The addition of polymeric additive have a strong impact on the properties of thin films. All these parameters influence the hydrolysis-to-condensation ratio and thereby determine the properties of the resulting sol-gel product. Therefore, in the present work attempts have been made to synthesize sol-gel based zirconia thin films by varying the concentration and influence of polyvinyl alcohol (PVA) on the surface area and pore size along with the different concentration of polyvinyl alcohol was studied.

CHEMICAL DEPOSITION AND CRYSTALLOGRAPHIC STUDIES OF CdTe THIN FILMS

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Abstract

The objective of the present work is to study crystallographic, optical and spectroscopic characteristics of CdTe thin films. The CdTe thin films were deposited onto the glass substrate using a solution growth method from the bath containing Cd²⁺ and Te²⁻ ions. The films were obtained at the deposition temperature of 70°C, speed of substrate rotation equal to 65 rpm, pH value of 10.1±0.1 and for the deposition duration of 90 min. As-grown CdTe films were thin, uniform and adherent to the substrate. Mixture of cubic and hexagonal type crystal structure were revealed by an X-ray diffraction (XRD) analysis. Grain size (D), dislocation density (ρ) and strain (ϵ) were calculated from the XRD data. The optical bandgap (E_g) value is found to be 1.42 eV with a transition index of 0.5. Chemical bondings and molecular structure were identified from FTIR studies.

Keywords: Thin films; CdTe; chemical deposition; optical bandgap; FTIR

Introduction

Cadmium telluride (CdTe) is a binary II-VI group semiconductor that exhibits both n and p-type conductivities [1]. Large absorption coefficient, of the order of 10⁵ cm⁻¹ and a bandgap of 1.45 eV makes CdTe an ideal material for the optoelectronic devices, in particular for energy harvesting by the solar cells [2]. Chemical solution deposition is an advantageous method on many grounds, viz. ease of preparation, simplest and inexpensive. Few reports are available on the chemical deposition of CdTe thin films [3-5]. Since, CdTe material is one of the hot materials that utilizes a maximum span of the solar spectrum [6-10], we attempted the synthesis of CdTe thin films under the influence of varying TEA quantity. The material morphology is found to be dependent on the deposition environment. The primeval studies pertaining to structure, optical and spectroscopic observations are reported in this paper.

Experimental Details

CdTe thin films were deposited onto the microscopic glass substrates. An aqueous precursor of Te²⁺ was obtained by refluxing Te metal powder with Na₂SO₃ at 80°C for 24 hours. The actual synthesis of CdTe was carried out as follows; 10 ml 1M cadmium sulphate solution was taken in a 250 ml beaker. To this, triethanolamine (TEA)

Influence of PVP concentrations on the microstructural characteristics of SrTiO₃ and BaTiO₃ nanoparticles: A comparative study

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Abstract

Recently, the nanoparticles of perovskite family are of vast interest owing to their outstanding ferroelectric and thermoelectric properties. Particularly, strontium titanate (SrTiO₃) and barium titanate (BaTiO₃) nanoparticles have potential applications in the size dependent optoelectronic devices. The concentration of capping ligand used during synthesis has profound effect on the structure and surface morphology of the obtained nanoparticles, the present work is an outcome of such studies. The precipitation based synthesis of SrTiO₃ and BaTiO₃ nanoparticles was carried out using various concentrations of capping ligand namely polyvinylpyrrolidone (PVP) (typically from 0.001M to 0.008 M). And the influence of varying concentration of PVP on the structural and morphological characteristics of SrTiO₃ and BaTiO₃ were studied using the X-ray diffraction and Field emission scanning electron microscopy techniques respectively.

Keywords: PVP, SrTiO₃, BaTiO₃, XRD, FESEM

1. Introduction

Nanoparticles of inorganic high-k metal oxides like PbO, HfO₂, SrTiO₃, BaTiO₃, etc. are of current interest in size dependent optoelectronic devices such as complementary metal oxide semiconductors and field effect transistors [1]. Amongst these, strontium titanate (SrTiO₃) and barium titanate (BaTiO₃) are the promising materials having an exceptional property of very high dielectric constant (>300). SrTiO₃ and BaTiO₃ exist in different polymorphic forms, i.e. orthorhombic, tetragonal, and cubic etc. For the synthesis of nanoparticles, wet-chemistry techniques such as sol-gel [2], solvothermal [3] and precipitation [4] etc. are being used. Amongst all these techniques, precipitation is a simple and cost-effective technique involving the synthesis at low pressure. It was observed that the chemistry of capping ligand in particular their concentrations play a key role in controlling the materials characteristics. Therefore, in the present study, SrTiO₃ and BaTiO₃ nanoparticles were synthesized via a simple and cost-effective method of precipitation employing polyvinyl pyrrolidone (PVP) as capping ligand by varying its concentration from 0.001 to 0.008 M.

2. Experimental

For the synthesis of SrTiO₃ and BaTiO₃ nanoparticles, strontium nitrate, barium nitrate [99.9%] and potassium titanil oxalate [PTOX or K₂TiO(C₂O₄)₂, 99%] were used as starting materials while PVP (mol. wt. 40,000 g) as capping ligand. Deionised (DI) water and ethanol (EtOH) were used for precipitate formation and

washing purpose. The experimental procedure for the synthesis of SrTiO₃ and BaTiO₃ nanoparticles was followed as reported elsewhere [5, 6] and is presented in Fig. 1.

The products were cooled to R.T. and grinded in agate mortar for the characterisation purpose. The effects of varying concentrations of PVP (0.001–0.008 M) on the structural and morphological characteristics of SrTiO₃ and BaTiO₃ were studied. The structure of SrTiO₃ and BaTiO₃ were analysed using XRD (Ultima model, Rigaku, Japan) with Cu K α radiation of wavelength 1.541 Å at 2 θ values ranging from 20° to 80°. The morphological studies of the SrTiO₃ and BaTiO₃ samples were performed using field emission scanning electron microscopy (FESEM, JSM-600F, JEOL, Japan).

3. Results and discussion

The size and shape of nanoparticles can be controlled using capping ligand which forms a protective layer around the particles' surface during the growth process. Ligand consists of a head group and a tail group (alkyl chain). The head group anchors the surface of particle and tail group floats away from the surface in the dilute medium. The broad area of head and the long alkyl chain of tail of the ligand sterically affect the size of nanoparticles. Polyvinyl pyrrolidone (PVP) was used as capping ligand for the synthesis of SrTiO₃ and BaTiO₃ nanoparticles. The influence of varying concentrations of PVP (typically 0.001, 0.005, and 0.008 M) on the structure and surface

Sodium Silicate Based Aerogels via Ambient Pressure Drying

A. Venkateswara Rao, G. M. Pajonk, Uzma K. H. Bangi,
A. Parvathy Rao, and Matthias M. Koebel

Abstract The first step in the preparation of silica aerogels is a sol–gel process producing a gel. This is followed by drying of the gel by either supercritical drying (*SCD*) or ambient pressure drying (*APD*). Traditionally, silica aerogels are prepared by the more energy-intensive and -expensive *SCD* method using *alkoxide* precursors such as tetraethoxysilane (*TEOS*) or tetramethoxysilane (*TMOS*). This choice partly restricts the commercialization of aerogels. Recent developments have shown great potential of the *APD* as an alternative method employing sodium silicate (Na_2SiO_3) as a purely inorganic precursor. The properties of such aerogels are very similar to those obtained by more conventional methods. This chapter focuses on the preparation of sodium silicate based aerogels via *APD* and the effect of various parameters on their physicochemical properties. The process chemistry is further contrasted with factors relevant for large-scale production.

5.1. Introduction

5.1.1. Silica Aerogels

Aerogels, the lightest transparent solids known, are a class of low-density solid-state materials obtained from a gel by replacing the pore liquids with air while maintaining the network structure as it is in the gel state. They are also known as frozen smoke or air-glass and are comprised of particles with typical dimensions below 10 nm and pore sizes < 50 nm in diameters. Aerogels possess a wide variety of exceptional properties such as low *thermal conductivity* (~0.01 W/m.K), high porosity (~99%), high optical transmission (90%) in the visible region, high *specific surface area* (1,000 m²/g), low dielectric constant (~1.0–2.0), low refractive index (~1.05), and low sound velocity (100 m/s) [1–4]. Owing to these properties, aerogels find applications in a number of fields such as thermal insulation, space technology, catalysis, acoustics, filtration, particle detectors, and electronics (Parts 8, 9, 10, 11).

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Effect of different nickel precursors on capacitive behavior of electrodeposited NiO thin films

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Abstract: In the present study, the effect of nickel precursors containing different anions like nitrate, chloride and sulphate on the morphology and pseudocapacitance behavior of NiO is investigated. The NiO samples were prepared by using a potentiodynamic electrodeposition technique in the three electrode cell. Cyclic voltammetry technique was exploited for potentiodynamic deposition of the films. The obtained samples were characterized by X-ray diffraction (XRD), scanning electron microscopy (SEM), etc. The XRD reveals the cubic crystal structure for all samples. The SEM micrograph shows nanoflakelike, up grown nanoflakes and honeycomb like nanostructured morphologies for nitrate, chloride and sulphate precursors respectively. The capacitive behavior of these samples was recorded using cyclic voltammetry (CV), charge-discharge and electrochemical impedance spectroscopy (EIS) in 1 M KOH electrolyte. The specific capacitance values of NiO samples obtained using CV for nitrate, chloride and sulphate precursors were 136, 214 and 893 Fg⁻¹ respectively, at the scan rate of 5 mVs⁻¹. The charge discharge study shows high specific energy for the sample obtained from sulphate (23.98 Whkg⁻¹) as compared to chloride (9.67 Whkg⁻¹) and nitrate (4.9 Whkg⁻¹), whereas samples of chloride (13.9 kWkg⁻¹) and nitrate (10.5 kWkg⁻¹) shows comparatively more specific power than samples obtained from sulphate (7.6 kWkg⁻¹). The equivalent series resistance of NiO samples observed from EIS study are 1.34, 1.29 and 1.27 Ω respectively for nitrate, chloride and sulphate precursors. These results emphasizes that the samples obtained from sulphate precursors provides very low impedance through honeycomb like nanostructured morphology which supports good capacitive behavior of NiO.

Keywords: nickel oxide, potentiodynamic technique, cyclic voltammetry, supercapacitor, etc.

INTRODUCTION

With the rapid energy depletion and worsened environmental pollution, intense research has focused on energy storage and conversion from alternative energy sources. Electrochemical capacitors are also called as supercapacitors have attracted more attention due to the advantages of delivering high power in a very short duration like dielectric capacitors and also storage of large quantity of energy like rechargeable batteries. These devices are important in power-source applications such as hybrid electric vehicles, military and space equipments, short term power sources for mobile and electronic devices [1–3]. Supercapacitors are classified as electrical double layer capacitors (EDLCs) and pseudocapacitors. Carbon-based materials with high surface area are widely used only for EDLCs applications [4]. The redox transitions due to variable oxidation states available in transition metal oxides are used for pseudocapacitor applications. Among the various transition-metal oxides RuO₂, IrO₂, MnO₂, NiO, Co₂O₃, SnO₂, V₂O₅ [5-11], nickel oxide has attracted the greatest amount of attention, because of its high theoretical capacity (2573 F g⁻¹), low cost, low toxicity, low environmental impact and sufficiently large pseudo-capacitive behavior [12]. There are different methods were employed to control the size, shape, morphology and hence morphology of such materials. Usually, layered nickel hydroxide with different morphologies can be synthesized in solutions of Ni (II) by a chemical precipitation method [13], electrodeposition [14], followed by thermal decomposition to prepare NiO. Meher *et al.* pointed that morphology and porosity of NiO is altered by the anions in the precursor salt during hydrothermal synthesis, which also affect significantly the pseudocapacitance behavior.

This book helps to explore the amazing things you can do with WSN and its application in gas leakage detection. The key features of this research and development are united together using the state-of-the-art technologies for LPG gas leakage detection, monitoring and controlling that provide alertness to the end user for preventing from health hazards. The system presented here uses ZigBee technologies for wireless communication and a LabVIEW tool and an interactive - facile GUI is also developed in the system. Thus the system presented herein is a soaring technology to replace the old wired version, which is portable and can be remotely monitored and automatically controlled. This system can be installed in kitchens, Liquefied Petroleum Gas (LPG) storage rooms, near the Natural Gas Vehicle (NGV) tank in mobile cars or any places things required. This book takes a comprehensive approach to cover wireless sensing, actuation and to cover the entire work through theoretical milieu of the technologies, model and the screenshots truly enlightening the working and exploitation of the system.

Wireless Sensor Network: A novel method



Tabbum Mujawar
Lalasaheb Deshmukh

Dr (Miss). Mujawar T.H obtained her Ph.D degree (2016) in Electronics on Wireless Sensing Networks. She has published more than 20 publications of repute and delivered more than 10 invited talks/ deliberations. Presently she is Assistant Professor in Electronics and is a life member of SPEED. Her areas of specialization are Embedded Systems & WSN.

Wireless Sensor Network for smart protection system against gasleakage

A novel method of LPG leakage detection



978-3-659-97257-7

Mujawar, Deshmukh

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This book helps to dedicate an autonomous air quality monitoring system with trouble-free method of wireless sensor network. Pollutant gases may be detected with tiny, economical sensor nodes which are situated throughout the territory and operate autonomously on a supportive basis. The planned structure comprises a group of sensors (CO₂, Temperature, Humidity, LDR and LPG) that are deployed within the environment using XBee module. In this system, we proposed two sensor nodes, the arduino UNO microcontroller for controlling the data, XBee for wireless communication and one gateway node. The sensor node collects the particular data from the environment and sends it wirelessly to the gateway node. The gateway node is interfaced to the LabVIEW by a VISA. All these data are displayed on the arduino serial monitor window and front panel of the LabVIEW. We can supervise the sensor parameter values and upload these values in web portal. The book contains information that covers the extensive assortment of the WSN capabilities, from basic concepts and common tasks to advanced technology. Each technique is explained in a book that shows you how to implement a precise competence.



Tabbsum Mujawar
Lalasaheb Deshmukh (Ed.)

Dr (Miss). Mujawar T.H obtained her Ph.D degree (2016) in Electronics on Wireless Sensing Networks. She has published more than 40 publications of repute and delivered more than 10 invited talks/ deliberations. Presently she is Assistant Professor in Electronics and is a life member of SPEED. Her areas of specialization are WSN and ANN,

A novel approach for online air quality monitoring system using WSN

Development of Wireless Sensor Network System for
pollutant gas detection and its monitoring



978-3-330-01520-3

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NOTIFICATION OF CHAPTER ACCEPTANCE

April 12, 2019, London

Dear Dr. Mujawar,

It is my pleasure to inform you that the manuscript titled "Smart Environment Monitoring System using Wired and Wireless Network: A comparative study" has been accepted for publication in the book "Atmospheric Air Pollution Monitoring."

We firmly believe that your contribution will be of great importance to the scientific community.

Sincerely yours,

IntechOpen



Online Monitoring of WSN Based Air Quality Monitoring System

T.H.Mujawar*, M.S.Kasbe, S.S. Mule and L.P.Deshmukh**

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Abstract

This paper describes a simple Wireless Sensor Network (WSN)-based air quality monitoring system (AQMS) for industrial sectors. The planned structure comprises a group of sensors (CO₂, Temperature, Humidity, LDR and LPG) that are deployed within the environment using XBee module. In this system, we proposed two sensor nodes, the arduino UNO microcontroller for controlling the data, XBee for wireless communication and one gateway node. The collected information from sensors is given as inputs to the analog inputs of the arduino UNO microcontroller. The sensor node collects the particular data from the environment and sends it wirelessly to the gateway node. The gateway node is interfaced to the LabVIEW by a VISA. All these data are displayed on the arduino serial monitor window and front panel of the LabVIEW. We can supervise the sensor parameter values and upload these values in web portal.

Keywords: WSN, SL-HS 220, LDR, CO₂, LabVIEW, Web Display.

INTRODUCTION

Hitherto, as an effect of development and urbanization there is an enormous intensification in polluting industries, construction waste, significant thrashing of forests and vehicles on roads which augmented to wellbeing endangering contamination. Consequently, it is obligatory to frequently monitor the air pollution. Air quality monitoring is indispensable for public as well as private industries in order to prevent air pollution and its hazards [1]. Hence, to monitor the air quality, a new scaffold is designed that monitors the various environmental parameters such as CO₂, LPG, temperature, light intensity and humidity using Arduino, LabVIEW and WSN. The use of WSN makes the system very precise and flexible thus has been rapidly expanded during the topical years and is paying attention not only in the industrial sectors but also in academia because of their enormous application potential and exclusive safety challenges. It's typical features are small energy consumption, self-motivated network topology and large scale exploitation and it aims to give co-ordination among the physical conditions and the internet globe owing to its reliability, accuracy, flexibility, cost effectiveness and easy access for installation.

The projected system consists of an arduino UNO Atmega 328 microcontroller and sensors to detect the humidity, CO₂ gas, LPG, temperature and light intensity integrated to form a sensor node. The data from different sensors are given as the analog inputs to the microcontroller, which process it and build a decision. The analog sensor output can be converted into digital form using an on-chip 10-bit ADC (Analog to Digital Converter). The receiving section consists of a gateway node and a PC or laptop and has the same structure as that of the sensor node except the sensor module and is responsible for establishment of the network, information reception, aggregation, processing and sending control instruction and implementation [3, 4]. The coordinator node has a ZigBee module to receive the information from the sensor node that sends it to the arduino microcontroller. The microcontroller further sends this collected data to the PC using a USB cable to update the values of monitoring sites in the PC. We propose a WSN network system using a single co-ordinator and two sensor nodes as shown in fig.1 and fig.2 (representative block systems).

An Advanced Electronic Nose (EN) System: Application to Classification of Tomato and Mint

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Abstract

An electronic nose has various applications such as in medical, agriculture and industrial sectors. Quality control and classification of fruits and vegetables are the most important parameters in this field. We are proposing an electronic nose system to classify the status of tomatoes and mints via odour sensing mechanism. This is a creative and challenging area of research through gas sensing devices and embedded technologies. Low cost portable gas sensor array with six SnO₂ based gas sensors was implemented for the detection of aroma emitted by the tomato and mint. Pattern recognition and ANN training provided a backbone for the future data sets from the collected data sets. Principal Component Analysis (PCA) and radar plots were used for the excellent interactive representation with the LabVIEW and MATLAB software as stand-alone application. PCA analysis represented 83% and 12% variations respectively in fresh and spoiled tomato data sets. The proposed system also covered 97.7 % and 1.2 % data variations respectively for PCA classification for tomato and mint datasets.

Keywords: Gas sensor array, (PCA), ANN, radar pattern, GUI.

INTRODUCTION

Odour is measurable and the most significant parameter along with other sensory properties of foods. The attribute of volatile organic compounds, so-called fingerprint, makes available the information regarding protection and precise uniqueness of food, sometimes acts as an indicator / signature of the development faults as well. Certainly, some volatile compounds can originate from biochemical processes of the food, as a consequence of technological treatments or product storage. Sometimes unnecessary smells (off-flavours) also comprise substances created since the metabolism of spoiled bacteria and fungi, which may naturally or accidentally contaminate the products prior or during its production [1].

In the last decades, electronic nose (EN) or an artificial nose has opened the possibility of developing information with performance of aroma to assess the stages of fruit ripening and the quality of fruits and vegetables. An EN is composed of a group of sensor arrays and some form of pattern recognition algorithm. The single sensor is unable to recognize certain complex odours and therefore, to increase the measuring accuracy gas sensor array with partial selectivity can be used with an appropriate algorithm. The pattern recognition therefore, plays an important role in EN technology [2]. The electronic nose offers a fast and non-destructive alternative to sense aroma, and hence, may be advantageously used to predict the optimal harvest state date of foods. Commercially available electronic noses use an array of sensors combined with the pattern recognition software. The patterns of ethylene generation and volatile organic compounds (VOC) during ripening in any fruit / vegetable differ from other fruit / vegetables. The rate of change of emitting gases can sharply rise and fall or slowly increase / decrease during respiration and ripening processes. More than 250 volatile components have been identified in fruits and vegetables. Monitoring and controlling ripeness and quality therefore hard issues in the fruit industry since the state of ripeness during harvest, storage and market distribution defines the quality of the final product which should be approved by the customer. These systems are concerned with the exploitation in sequence enclosed in the headspace of fruits/vegetables; they have been studied in the recent past with conventional analytical chemistry equipments and the correlation between the state of over-ripening and the fruit aroma has also been found both in quantitative and qualitative terms. Some specific compounds have also been identified as being responsible for the aroma of a particular fruit [3].

ENs have been applied in various food contexts, such as process monitoring, freshness evaluation, shelf-life investigation, authenticity determination and the product traceability. Those applications have been extensively reviewed in the literature; however, little emphasis was given until now to microbiological applications of chemical sensor devices, for instance, the screening of food borne pathogens contamination [4]. Neural networks learn from examples through iteration, without requiring a priori knowledge of the relationship among variables under investigation. The neural network model used in this study is a multilayer perceptron (MLP) that learns using an algorithm called backpropagation.

The objective of this study was to evaluate the capacity of electronic nose to monitor the change in ethylene, VOC and production of other gases from normal and spoiled tomatoes using a specific electronic nose (EN) with 6

WSN/Wi-Fi Microchip-Based Agriculture Parameter Monitoring using IoT

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Abstract— Automation in the agriculture system is essential these days. That is why this subject required special attentiveness. On comprehensive, this problem is solved with the help of satellite-based instruments. In the present case the monitoring system collects the agricultural parameters on a more regional level. This paper attempts to gather the data from various sensors using Wi-Fi technology with IoT, which comprises of Arduino Nano and esp8266-01. The realisation of data gathered by sensors (moisture in the soil, temperature of the soil, light intensity and humidity, status motor pump) based on open source hardware Arduino Nano. Some sensors (TSL2561, DS18B20) will directly provide the data (light intensity, temperature) to the Arduino Nano using I2C and one wire protocol respectively, while other sensors provides the raw data through Arduino Nano's 10-bit analogue to digital converter(ADC). Sensor data processed and communicated to esp8266-01(which act as a Wi-Fi node) incorporating request-send-acknowledgement method.

Further esp8266-01 uploads the sensor information on blynk android IoT application and displayed on Graphical User Interface (GUI). The complete system is cost-effective and having low power consumption. IoT is used for update and alert to the farmers through an android application. The notification of irrigation events in the farm site is continuously updated to the farmer. The trials show that the present system works fine , and it is helpful for practical applications to the personalised low-cost agricultural parameter monitoring system.

Keywords— ESP8266-01, Arduino Nano, soil temperature, soil moisture, light intensity, humidity, blynk IoT

I. INTRODUCTION

Soil moisture, humidity, light intensity and temperature, are essential parameters for agriculture. Water is the ultimately used by irrigation. This need to pursuit scheduled and controlled irrigation to the farm site. Commonly, a system used in the farming field results over or under irrigated soli. The agricultural parameters supervisory system is the key gadget to provide

environment and soil information. The agriculture parameters monitoring system for smart agriculture is a new system that replaces the traditional system incorporating sensors like soil moisture, humidity, light intensity and temperature with the support of internet of things (IoT).

The sensor hardware part of the developed system is programmed using Arduino IDE. All the values of the sensors are continuously updated on the blynk android app using pre-configured Wi-Fi chip esp8266-01. The use of the android application is to display these values continuously to the end user smartphone so also control the framing appliances by altering the values of virtual pins.

This setup will have two parts: first the develop the sensor based hardware system which can collect the data of environment from various sensors and calibrate it, second part one mobile application (blynk) which is used to supervisory monitoring, whether the soil moisture, humidity, light intensity and temperature data. The mobile application will need to communicate with a Wi-Fi module. The serviceability provided by the Wi-Fi module esp8266-01 is implanted into the application in order to the smooth functioning of an application. Fig. 1 showing the technologies involved in smart farming[1].

Monitoring the soil parameters using IoT and Android based application for smart agriculture

V. D. Bachuwar, A. D. Shligram, and L. P. Deshmukh

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Sabu Thomas
Nirav Joshi
Vijay K. Tomer *Editors*

Functional Nanomaterials

Advances in Gas Sensing Technologies

 Springer

Chapter 1

Tungsten Oxide Nanocomposites as High-Performance Gas Sensors: Factors Influencing the Sensor Performance



Digambar Y. Nadargi, Imtiaz S. Mulla, and Sharad S. Suryavanshi

1 Introduction

In the present dynamic lifestyle, amenity-with-safety is of prime importance. Amongst many other safety possessions, gas sensors have a special place as in-house safety utensils. The need and hence the demand for gas sensors in recent years have increased enormously. Going back in the history, the origin of gas sensors lies somewhere in coal mines, where the use of canary birds as an early warning mechanism was incepted in the form of the first gas alarm system. One of the first artificial gas detectors, Davy's lamp (1815), was designed to detect the presence of methane and oxygen deficiency in coal mines (Simonin 1869). The first professional product designed for the consumer market was launched in 1970 (Aswal and Gupta 2007), based on the works of Seiyama (Seiyama et al. 1962) and Taguchi (Taguchi 1962) [1–3]. Figure 1 shows the glimpse of the early history of gas sensor development. Photographic image of mining foreman showing a small cage with a canary bird used for testing carbon monoxide gas (Fig. 1a). Davy's lamp and Taguchi's schematic of a gas sensor are highlighted in Fig. 1b, c.

Prior to Industrial Revolution (year 1750), the concentration of harmful gases in the atmosphere was hardly 250–300 ppm. At present (year 2018), the value has gained a dramatic peak of 40%, which is further continuing to increase. Figure 2 illustrates the annual greenhouses gas emissions by various sectors of the society [4]. Certainly,

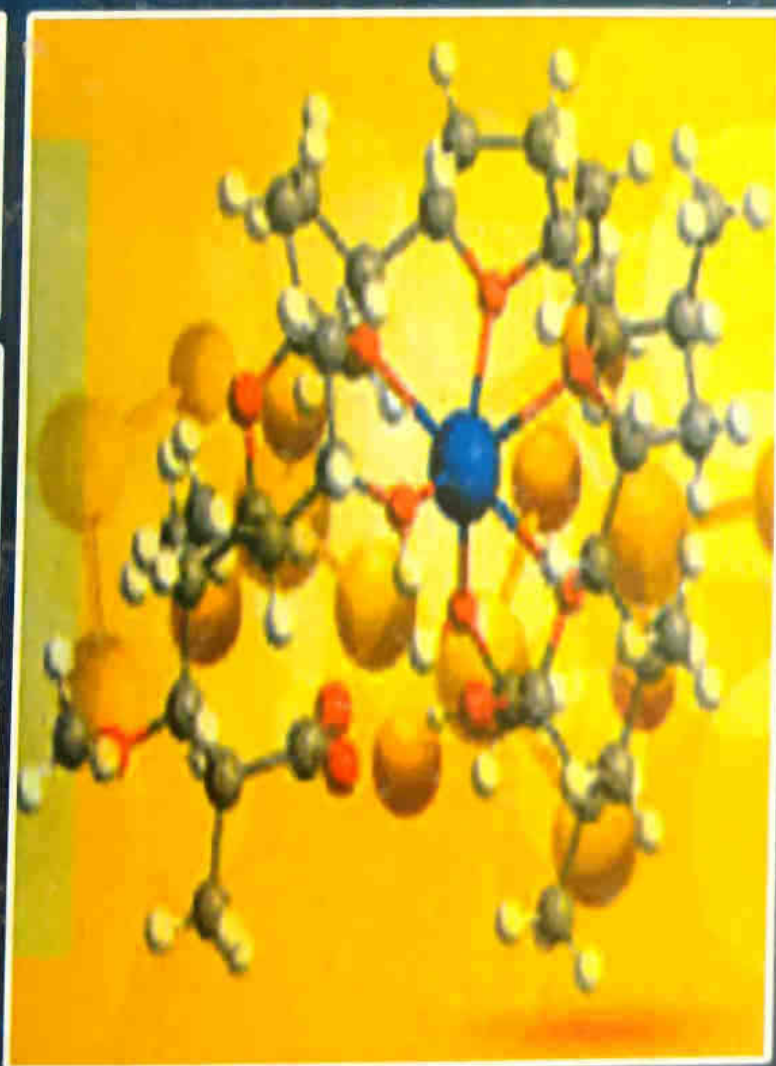
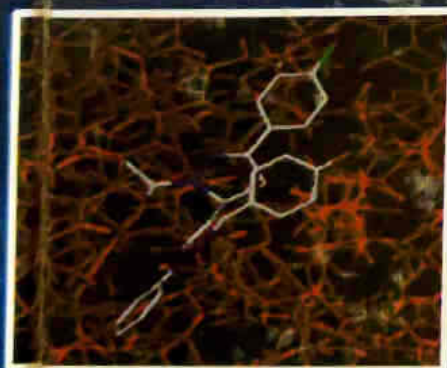
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SYNTHESIS AND MEDICINAL APPLICATIONS



Dr. Shravan Y. Jadhav & Dr. Raghunath B. Bhosale

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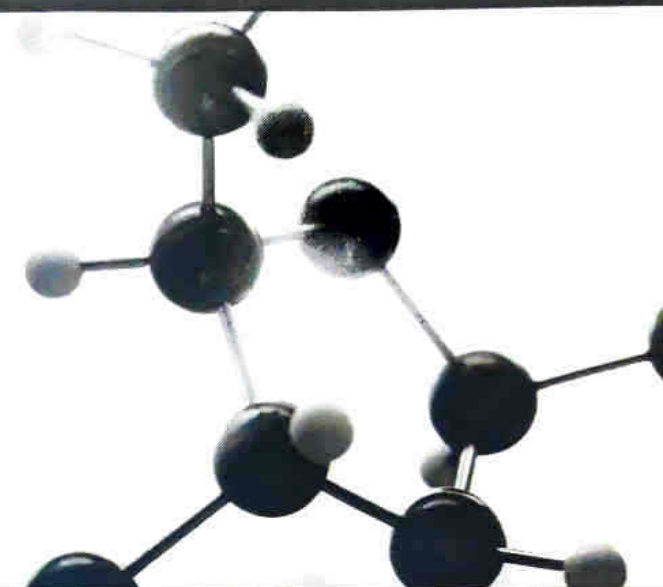
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Boc PNA Monomers

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The objective of this book is to highlight the use cyclopentanone as a starting material to design and produce several difunctional monomers such as aromatic diamines, diacids used to synthesize aromatic high performance polyamides. Important considerations in designing monomers are: i) meta-linkage introduces "kinks" to the main chain which decrease the rigidity of the polyamide backbone and inhibit packing, thus reducing the interchain interactions leading to enhanced solubility, ii) the presence of cardo cyclopentane ring in the polyamide backbone reduces strong molecular interactions of stiff-chain aromatic polyamides, producing an effective chain separation effect and which help in enhanced processability, iii) the presence of flexible methyl group on aromatic ring offers asymmetry to the polyamide backbone leading to constitutional isomerism, which could impart interesting properties to the polyamides. The second objective of this book is to present investigated effect of incorporation of pendent or cardo cyclopentane ring on the properties of polyamides, such as solubility, inherent viscosity, crystallinity, glass transition temperature and thermal stability.



Sanjay Ankushrao
Anil Ghanwat

Processable High Performance Polyamides

Synthesis, Characterization and Property of processable high performance polyamides containing cardo moiety

Dr. Anil Ghanwat is presently working as an Associate Professor in School of Chemical Sciences, Punyashlok Ahilyadevi Holkar, Solapur University, Solapur, Maharashtra, India.

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SOLAPUR UNIVERSITY SOLAPUR.



GREEN AUDIT

सोलापूर विद्यापीठ



PREFACE

Our concern for environmental study and its management reflects through our university curriculum and has a long tradition through various courses being offered in School of Earth Sciences. However, the present publication is first attempt to prepare an audit for Solapur University which pertains to green issues and hence the "Green Audit" for the campus. Generally, an environmental audit addresses the subject under legislative framework for industrial organizations. Green audit report usually addresses the issues of energy and water consumption pattern of the organization, which will reveal the way for sustainable use of these resources and thereby encouraging to follow the philosophy of reduce, reuse and recycle. Here, green refers to the sense 'environmentally sound or beneficial'. Although the environmental concern does play an important role in such audits, there is also an indirect outcome of the exercise i. e. "saving money". Under strict cost cutting regimes, savings on energy and water resources, waste management etc has added a new dimension. The green audit has gone beyond the usual benefits of health, hygiene and safety.

The present report is attempted to account the resource consumption pattern of our university with an eye on the sustainable development. In the introduction chapter, the overview of the university is given. The methodology form the chapter 2, it reveals how the data was collected. The chapter 3 contains report on energy audit in the form consumption of electrical energy across various university departments. Water audit is presented in chapter 4 which also projects the potential of roof top rain water harvesting along the university water requirement. The chapter 5 represents the solid waste management in the university campus through calculating waste generation and future recycling opportunities for the university. Like many organizations, academic institution has its own appearance which reflects the vegetation on its campus. Apart from the aesthetic looks, the trees on the campus can act as a potential sink for carbon sequestration. This aspect was brought forward in the

form of carbon sequestration potential of trees in the university campus and portrayed in the chapter 6. The last chapter is devoted to the conclusions which are the outcomes of the green audit study for the campus. We would like to state that this report may not be a compliance study or guideline based approach. However, it does provide an insight and baseline information for further sustainable development goals in the coming years. Moreover, much still remains to be done.

We are thankful to our team of mentor teachers and students from the School of Earth Sciences for actively preparing the report. The students of M.Sc Part I and II (Environmental Science) of 2014-15 batches played a crucial role, as they were our front line field reporters for the survey conducted. Without them such a herculean task would not be not be easy. We also thank various school directors, heads and their non-teaching staff for cooperation during the data collection team. We are grateful to the engineering section of our university for providing support services during the development of rain water harvesting structures. Our profound thanks to Prof N. N. Maldar, Hon. Vice Chancellor, Solapur University Solapur for encouraging us to conduct such a delightful study to document the green audit.

Prof. P. Prabhakar
Dr. R. S. Gavali
Mr. V. P. Dhulap
Mr. S. P. Baviskar



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Geospatial Technologies for Rural Development A Review

Dhaval Kulkarni

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Abstract: The Remote sensing (RS) and Geographical Information system (GIS) has rapidly developed techniques from last 20 years. These techniques play important role in the nation development. Many countries have already started applications of RS and GIS technology with various financing endeavors.

Changing weather pattern, pollution, socio-economic declinations etc. are contributing factor for migration of workers from agriculture to other new jobs. However, the modern tools like remote sensing and Geographical Information Systems (GIS) can widely be used to solve the various rural problems.

This article focuses on long-term development plan by using Geospatial techniques for everyone in the planning environment. The geospatial techniques can also be effectively applied in rural development by preparing Land Use Land cover maps, strategic plan maps, natural resources and disaster mapping.

Key word: Remote sensing, Geographical Information System, Disaster, pollution.

1.1 Introduction:

Geospatial data is a spatial data which gives information related with resources available on the surface of the earth. This information's are in the form of topographic maps, land property records, spatial plans, Soil and forest cover and a variety of social and economic data. The geospatial data

usually referred data i.e. latitude and longitude, a national coordinate grid or postal codes or some other reference system. These data can also be reflecting the changes in the features of the land over time. Now time has come for all decision makers to discuss the appropriateness of GIS technology and its applications to rural development, forest management, urban development planning, land information systems and agricultural development.

All the technocrats, bureaucrats, decision makers and some NGOs should be asking to initiate GIS technology use in sustainable development and socio-economic and educational uplifting of the Rural India. Lalan and Mishra, (2009) mention that data related with GIS should be effectively managed and linked with government offices. The development in sensor system of the satellite gives more accurate and minute data. The relationship of human and environmental interaction can be understood by Geospatial techniques (M. Duane Nellis, 2008).

1.2 GIS in India

In India, Remote sensing and GIS techniques widely used by researcher, government officials, professional etc. India can produce high resolution data through their advanced satellite launching programs. So, the growing interest in the application of geospatial techniques can lead to development of the society in the coming years. The Information Technology policy of Government of India adopted in 1999 emphasizes the availability of spatial data to GIS user community and industry, thereby enabling the widespread development of Spatial Decision- Support Information System.

Now, the interest has growing among the many states of India. They have initiated GIS programs relating to ground water studies, cadastral mapping, Land cover mapping, population and natural resource management. Some Institutes have been established in India with these sophisticated GIS

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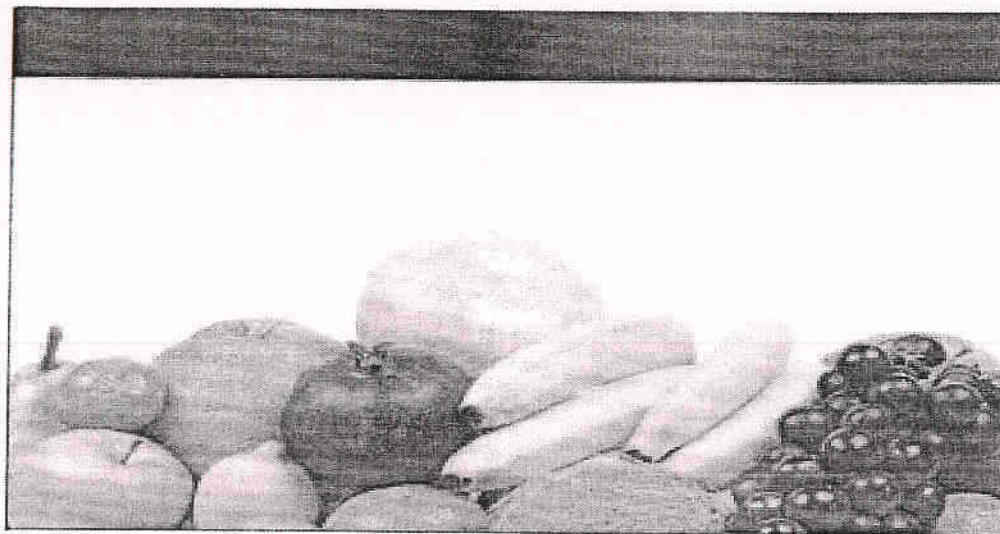
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Women and Human Rights

DR. M. J. PATIL
DR. P. G. VHANKADE



Women and Human Rights

- **Dr. M. J. Patil**
Dr. P. G. Vhankade

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Violation of Women's Human Rights in the Digital Era

Dr. Amol Gajdbane

Assistance professor, School of Commerce and Management,
Solapur University, Solapur

Abstract: *The techno-materiality in the digital form is creating violation of women's human rights in ways never imagined before. It is requiring that the digital receive a different treatment. Interactions online are always characterized by a lack of restriction, arising inter alia, from anonymity, invisibility and asynchronous communication. These subject positions result in fluidity, fracturing the body from its humanness and normalizing violence against women in new digital ways. It should come as no surprise that sexism, misogyny and violence against women are as much part of the virtual as they are of the real, harassment out women who is seen as threatening to overcome gender norms.*

The paper attempts to suggest a feminist theoretical framework adequate to this complexity, as assign post for progressive legal-institutional responses. It adopts the view that the paradigmatic shifts ushered in by the digital call for a new law in respect of violation of women's human right. The paper is identifying some of common forms of Technological violence against women. Further, this paper advises to look beyond consent to uncover harm, understood as a violation of the right to privacy, equality and dignity. The human right to privacy has been seen as an aggregation of the right to informational privacy, personal autonomy and bodily integrity.

Keywords: *Women, Human Right, Violation, Digital.*

Introduction

The Internet has liberated women and individuals with

**Violence Against Women, Matrimonial Laws,
Indian Constitution And Women's Human
Right - A Study**

Dr. Sawant Vanita Jagannath

School of Commerce and Management, Solapur University, Solapur

Abstract: *Human rights are moral principles or norms that describe certain standards of human behavior and regularly protected as natural and legal rights in municipal. Human rights are the basic rights and freedoms that belong to every person in the world, from birth until death. They apply regardless of where you are from, what you believe or how you choose to live your life. These basic rights based on shared values like dignity, fairness, equality, respect and independence.*

Women's rights are the rights and entitlements claimed for women and girls worldwide, and formed the basis for the women's rights movement in the nineteenth century and feminist movement during the 20th century. This paper contains matrimonial laws, Indian constitutional rights, and women's human right with critical view.

Key Words: *Human Right, Women's Human Right, Law, Fundamental Right, Indian Constitution.*

Introduction

Generally, rights defined as claims of the individual recognized by the society and enforced by the state. These are considered essential claims as without these no person can in general can seek to be at his best self. The Encyclopaedia says, "Human Rights mean: Powers, conditions of existence and possession on which an individual has claims or title by virtue of being human." These are those rights, which are inherent in all

“Beti Bachao Beti Padhao (Save Girl and Teach Girl)” in Past and Present Sense with Special Reference to Maharashtra

Dr. Gadhave

Assistant Professor, Dept. of Commerce, School of Commerce & Management, Solapur University, Solapur

Abstract: *National and State governments policies have initiated girls centric programmes to foster gender parity and uplift the status of women in the society. Beti Bachao Beti Padhao aims to spreading awareness as well as improving the efficiency of welfare services for the girls of India. There were limited rights to the women in education, politics, property etc. Women was largely depends upon the role of the male households. It has enabled that women to take decisions about marriage, parenthood and careers. Majority regions have shown a decline in Child Sex Ratio (0-6 Years Child) during the three decades of study period, largely declined in Aurangabad followed by Pune, Nashik, Mumbai, Amaravati in 2011. There was positively increase in female literacy rate in the 2011, which comparative to the 1991 and 2001.*

Introduction:

In India, even today long struggle have women for the purpose of property rights, voting rights, equality in civil right, right for equal participation, before the law in matters of marriage and employment. After independence, the constitution makers and the national leaders recognized the equal social position of women with men. Several measures have to assign equal status to women in the economic, political and social fields. The passage of several Acts by the Parliament

Human Right and Political Status of Indian Women

Miss. Priyanka Chippa

*Assistant Professor, School of Commerce and Management
Solapur University, Solapur*

Abstract: *Human rights are the basic rights which compulsorily available to each and every individual whether they may be male or female. The constitution of India also guarantees the equality of rights for men and women. However, in the province of women's human rights in India, there exists a wide variation between theory and practice. Indian society is a male dominated society, where men are always expected to be superior to society. The women in India very often have to face discrimination, injustice and dishonor. However, women in India have been given more rights as compared to men, even then the condition of women in India is miserable. The paper will throw light on the political human rights and status of women in India and how all the fundamental rights given to the women are being violated in India, by focusing on the various issues related to the women and political human rights in India.*

Keyword: *human right, Women, Indian Politics.*

Introduction:

India is a pluralistic, republic, multilingual, and a parliamentary system consisting of states and union territories. The country has made considerable progress since independence, economic reform and liberalization measures over the 1990s have led to strong economic growth, increased exports and reduced inflation. Despite major changes that have occurred in the status of women in some parts of the world in

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COMBINING CORPORATE FORESIGHT WITH CORPORATE SOCIAL RESPONSIBILITY

Wednesday 12th June, 13:45–15:30

Room: Goto 32

Chair: Dr Juha Kaskinen

Corporate social responsibility: A futures driver of self-development in Solapur district

Ramesh Gadhave

Solapur University, Solapur, India

Corporate Social Responsibility (CSR) is one of the key driver of rural development, which is recognized by policymakers and development specialist. Major CSR activities move towards promotional, innovative, strategic, participating and transformative future approach of self-employment. Some of the important social and economic problems of new investors could be solved through CSR activities. The main objective of the study has to examine future prospects of CSR projects for self-employment in Solapur District. Self-employment particularly in Solapur district depends upon agriculture and allied activities. There have various Government sponsored schemes for boosting rural development, but till today need to encourage self-employment activities in Solapur district. Corporates in Solapur District have interested to support for good projects related to future self-employment in rural sectors.

CSR activities divided into four groups i.e. NGOs, Policy Makers, Development Specialists and Trainers. CSR work for promoting futures of self-employment through the improvement of STEP (Social, Training, Economy and Planning) variables. A STEP drivers is to clarify that the future prospects of self-employment through CSR. EXIT model helps process of scanning field of possible futures of self-employment through CSR groups and STEP variables. EXIT model useful for planning, foresight and decision support tools for self-employment through the CSR expert direct interactions with scenario technique.

CSR activities have a pro-active approach and positive link between self-employment perspectives. A significant number of CSR interested to stimulate for rural development and seem benefit from it. It helps to improve efficiency, confidence, skills and capabilities of entrepreneurs for self-employment in rural sectors. Finally, the study desire and beneficial in terms of self-employability and standard of living to enhance development of Solapur District.

Keywords: Corporate social responsibility, Self-employment, Rural development, EXIT model, STEP variables

Working together towards common goals. The kinship and operational compatibility of corporate sustainability and foresight

Kati Rissanen

University of Turku, Finland

Corporate sustainability and corporate foresight are rooted in the same values and goals, albeit their approaches may differ from each other. This paper first discusses how these two both operate as value-rational fields, contributing to business strategy as well as benefiting the society by creating a better world. Second, it looks how these values and goals are operationalized within the framework of business in a theoretical level and reflecting on some Finnish experiences.


Turku, Finland
18 June 2019

Certificate of Attendance

This is to certify that **Dr. Ramesh Gadhve** from Solapur University, India has attended the International Conference "Constructing Social Futures - Sustainability, Responsibility and Power" from 12-13 June 2019 in Turku, Finland.

The 20th international Futures Conference was organised by Finland Futures Research Centre and Finland Futures Academy from the University of Turku. Full conference information is available at the website: www.futuresconference.fi/2019

Dr. Gadhve delivered the presentation "*Corporate social responsibility: A futures driver of self-development in Solapur district*". The presentation was part of the themed session "Combining corporate foresight with corporate social responsibility" on 12 June 2019. This session was chaired by Dr. Juha Kaskinen from Finland Futures Research Centre, University of Turku, Finland.



Dr. Juha Kaskinen
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Finland Futures Research Centre
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Thursday 13th June, 9:00–10:30

Room: Move-Sall

Chair: Dr Juha Kaskinen

Constructing futures through residents and diaspora-led social entrepreneurship

Jorge Martins & Tim Vorley

The University of Sheffield, United Kingdom

There is growing recognition of the importance of social enterprise as a driver of societal change and the collaborative construction of futures by communities has become a recognised feature of entrepreneurial economies. However, in less entrepreneurial economies, the potential benefits of social entrepreneurship are often constrained by low levels of entrepreneurial intention and the perceptions surrounding entrepreneurial opportunities. This paper discusses and documents how the philanthropic Gulbenkian Foundation has sought to foster future-oriented social enterprise to address the challenges facing Portuguese society through the programme 'DO IT: Ideas of Portuguese Origin'. We analyse how the approach and outcomes of this innovative incubation programme have stimulated the development of teams of entrepreneurially-minded Portuguese residents and diaspora. In providing philanthropic support to nascent social innovator-entrepreneurs the Gulbenkian Foundation has sought to address social challenges in Portugal which have been compounded by net-migration. Overall, this study highlights the importance of fostering global yet decentralised socially enterprising responses to both identify and address social futures challenges in Portugal not currently tackled domestically by public, private, or third sector organisations.

Keywords: Social futures, Civil society, Citizen participation, International social entrepreneurship, Philanthropy

Solapur smart city: The role and responsibilities of citizen in constructing social future

Amol Gajdhane

Solapur University, Solapur, Maharashtra State, India

Smart city is built by smart citizens; engaging citizens is especially important in an Indian context because there have already been several striking examples of failed smart city redevelopments. The objective of the paper is to use futures research methodology for increase understanding and knowledge about constructing social future. The paper summarizes some of the dynamic characteristics of citizen in today's complex global environment, identifies key trends, and highlights common strategic concerns of the citizen and its interrelationships with the smart city.

The paper explores crucial social factors that play the key role in citizens' adoption of smart city transition, such as user-friendly technology, infrastructure, management and organization. The paper examine individual and group behavioural factors and their influence on the smart city. This carried out with the help of PESTEC and Black Swans analysis methods. The analysis provides improbable and unpredictable future events that would carry drastic changes. Moreover, the study brings various scenarios and visualizations of constructing social future within smart city framework.

KITABE FARSI

Edited by
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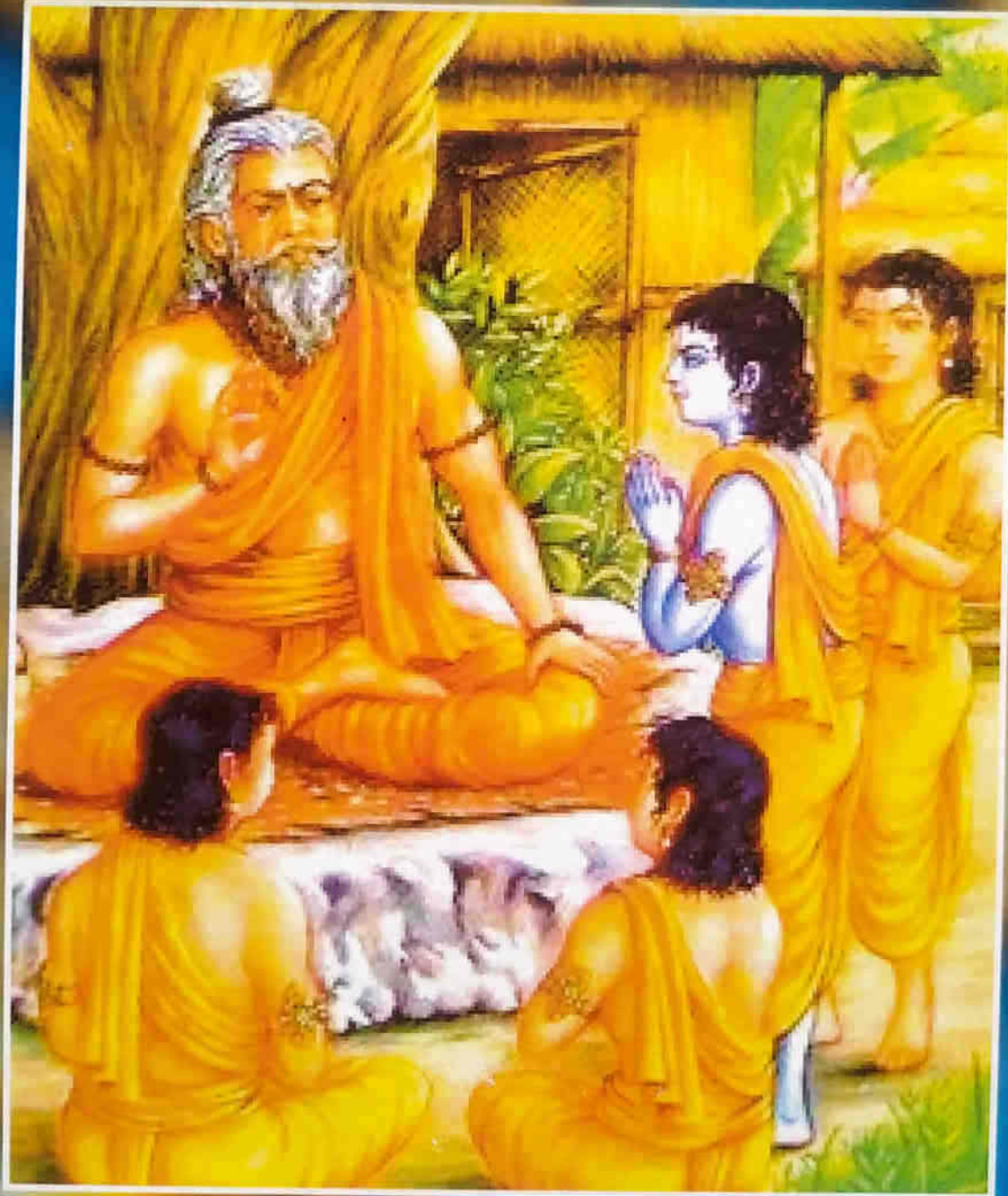
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प्राचीन शिक्षा और वर्तमान शिक्षा प्रणाली में अन्तर

प्रो. ओमप्रकाश बरबडे

प्राचीन काल से हमारे देश में शिक्षा को एक महत्वपूर्ण स्थान दिया गया है। हमारे भारत गुरुकुल परम्परा सबसे पुरानी व्यवस्था है। गुरुकुल वैदिक युग से ही अस्तित्व में है, तो आज हम गुरुकुल परम्परा क्या है, किस प्रकार से पहले शिक्षा दी जाती थी, और आज उस शिक्षा का क्या प्रासंगिकता है, इस विषय में विचार करते हैं।

देश की उन्नति और विकास तब ही हो सकता है, जब शिक्षा व्यवस्था सही हो, जीवन में सफल होने और कुछ अलग करने के लिए शिक्षा एक महत्वपूर्ण साधन है। जीवन की कठिन से कठिन चुनौतियों को इस शिक्षा के जरिए कम किया जा सकता है। शिक्षा अवधि में प्राप्त ज्ञान प्रत्येक व्यक्ति को अपने जीवन के बारे में आश्वस्त करता है। प्राचीन काल में गुरुकुल शिक्षा पद्धति से ही शिक्षा दी जाती थी। इसी कारण भारत को विश्वगुरु के नाम से जाना जाता था। अब इस परम्परा का अस्तित्व समाप्त होता जा रहा है। इसलिये आइये इस लेख के माध्यम से अध्ययन करते हैं, कि गुरुकुल परम्परा में किस प्रकार से शिक्षा दी जाती थी, और आज के युग की आधुनिक शिक्षा गुरुकुल पद्धति से कैसे भिन्न है।

Sustainable Rural Livelihood: Issues and Challenges

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Introduction

India lives in villages. Rural economy emphasize on the agrarian character. Maximum population live s in rural area. In the rural area agriculture is the main source of livelihood to the people. People living in the rural areas have to struggle to earn wages or are forced to migrate to urban areas. Rural livelihood is a complex structure rural peoples are engaged in farm and nonfarm livelihood activities. Sometime rural peoples are migrate for survive their income sources. Rural livelihood is diversified various sources so sometime rural peoples have no assurance about their income. Thus, rural peoples are facing positive and negative effects of the diversification of livelihood sources.

What is Livelihood?

A livelihood can be defined as the activities the assets and the access that jointly determine the living gained by household or individual.

When it comes to an personal level a livelihood is the ability of that individual to obtain the basic needs in life which are the water, food, shelter, clothing so all activities involved in finding food, searching water, shelter, clothing and all necessities which required for Human survival at individual or household level are referred to as a livelihood. Maximum rural peoples are involved in farming activities.

In these rural population small scale farming, raising livestock, fishing and non farm activities are some of the common livelihoods . Rural population

survive on as a source of income. A livelihood comprises the capabilities, assets (stores, resources, claims and access) and activities required for a means of living: A livelihood is sustainable which can cope with and recovers from stress and shocks, maintain or enhance its capabilities and assets, and provides sustainable livelihood opportunities for the next generation.

Thus, rural livelihood defined as the capabilities, assets and activities that rural people require for a means of living.

Objectives

- 1) To examine the nature of rural livelihood.
- 2) To study the structure and sources of rural livelihood.
- 3) To analyse the issues and challenges of rural livelihood.
- 4) To suggest measures to solve problems of Rural Livelihood

Sources of rural livelihoods: Rural livelihood depends upon various sources of income

- 1) Agriculture
- 2) Livestock
- 3) Fishing
- 4) Handicrafts
- 5) Forestry
- 6) Dairy
- 7) Poultry
- 8) Handloom
- 9) Agriculture processing Industry

Most of the people in villages earn their living through agriculture. Since the land available to each family has remained



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G. S. Kamble
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HUMAN DEVELOPMENT: MILLENNIUM DEVELOPMENT GOALS OF MARGINALIZED COMMUNITIES

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Marginalized peoples are maximum excluding the millennium development goal. In every goal their development status is very low. Marginalized peoples have not benefited and equality from development efforts. Government has attended various flagship development programs but this programs are not implemented best level.

Human development and millennium development goals are attach the human's quality of life. Marginalized peoples have important development goal otherwise life is going in to fight for every life sources. Sustained in development is important otherwise in future their every generation will be facing the problems. In the globalization marginalized peoples participation is important and they are participate, when they are maximum development their quality of life factors. Thus marginalized peoples have needed to support for their development. They have need track of development.

HUMAN DEVELOPMENT IN NORTH-EAST, INDIA: AN INTERSTATE COMPARISON

Geetali Sarma, Associate Professor, Tangla College, Assam

Development of a country is measured through Human Development Index (HDI) which was first introduced by the United Nations Development Programme (UNDP) in 1990. It measures the average achievements in a country in three basic dimensions of human development; a long and healthy life, as measured by life expectancy at birth, access to knowledge as measured by a combination of adult literacy and combined primary, secondary and tertiary enrollment ratios and a decent standard of living, as measured by real GDP per capita. These indicators are used in Human Development Report 2010 and 2011. On the basis HDI rankings calculated by UNDP, India falls in the low human development category and with a HDI value of 0.547 it is in 134 rank out of 187 countries.

Success in economic growth must ultimately judged by the quality of life and liberties. In general, economic growth cannot be disassociated from the 'end' of promoting human capabilities and of enhancing well being and freedom. Now the Government is also becoming increasingly away about the human development because without human development economic growth can become lopsided.

The North-East Region (NER) is composed of eight states, namely- Assam, Arunachal Pradesh, Meghalaya, Manipur, Mizoram, Nagaland, Tripura and Sikkim. The economy NER can be basically described as under-developed one, characterized by slow growth of State Domestic Product (SDP) and per-capita income and poor quality of human



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Dr. P. G. Vhankade

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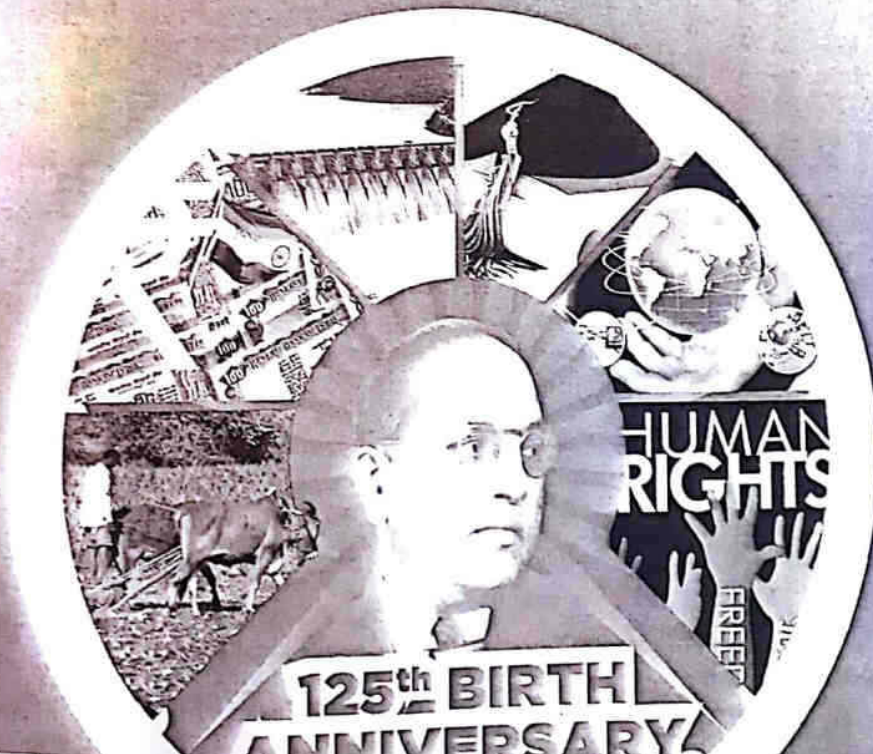
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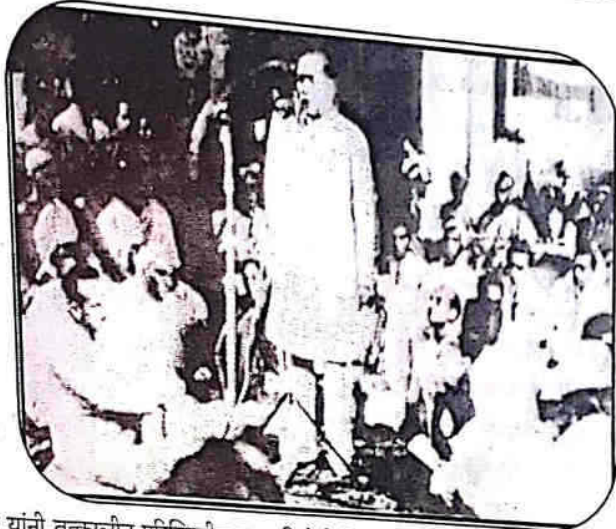
डॉ. बाबासाहेब आंबेडकर व 'बौद्ध संस्कृतीचे पुनरुज्जीवन चळवळ

डॉ. प्रभाकर नागनाथ कोळेकर

सहाय्यक प्राध्यापक, इतिहास आणि पुरातत्वशास्त्र विभाग, सामाजिक
शास्त्रे संकुल, सोलापूर विद्यापीठ, सोलापूर

प्रस्तावना :-

व सहतवादाच्या कालखंडात पाश्चात्य शिक्षण व भौतिक प्रगतीमुळे भारतीय समाजातील वैगुण्याची जाणीव भारतातील -नवशिक्षित पिढीस झाली. या नवशिक्षित पिढीने समाजात धर्म व समाजसुधारणा चळवळी आरंभिल्या. ह्या चळवळीमागील उद्देश हा समाजाची मानवकेंद्री निर्मिती करणे हा होता. समाजसुधारणा करण्यापूर्वी धर्म व विचार वर्तणूक सुधारण्याची गरज सुधारकांना वाटू लागली. त्यामुळे भारतभर धार्मिक सुधारण्यासाठी ब्राम्हो समाज, प्रार्थना समाज, आर्य समाज, सत्यशोधक समाज, रामकृष्ण मिशन यासारख्या संघटना निर्माण होऊन धर्म सुधारण्याचे प्रयत्न केले गेले.



महाराष्ट्रात गोपाळ गणेश आगरकर, न्या. रानडे यांनी तत्कालीन परिस्थितीत प्रवाहाविरोधी विचार मांडण्याचे धाडस केले. महात्मा फुले यांनी उक्तीस कृतीची जोड देऊन समाजातील वर्ण जातीव्यवस्थेवर कठोर टीका केली. समाजाची उभारणी समानतेच्या तत्त्वावर करण्याचा प्रयत्न केला. त्यांनी निर्माण केलेले साहित्य, सत्यशोधक समाज यातून विवेकशील व मानवतावादी विचार मांडला. या विचारास कृतीची जोड दिली. यामुळे समाजात एक पर्यायी विचारधारा निर्माण झाली. महात्मा फुले यांचा विवेकवाद, इहवाद, विज्ञाननिष्ठा, मानवतावाद या संकल्पनांमुळे समाजातील विषमतेची जाणीव भारतीयांबरोबरच परकीय विचारवंतांना व प्रशासकांना झाली. समाजातील या अनिष्टतेचे निर्मूलन करण्यासाठी समाजसुधारकांप्रमाणेच अनेक संस्थानिकांनी राजकीय पातळीवर प्रयत्न केले.

राजर्षी शाहू महाराज, सयाजीराव गायकवाड, म्हैसूरचे संस्थानिक ओडियार यासारख्या संस्थानिकांनी आपल्या संस्थानामध्ये समाज व धर्म सुधारणा चळवळीस प्रारंभ केला. या चळवळीचा केंद्रबिंदू मानव व त्याचे कल्याण करणे व समाजाची न्याय्य तत्त्वानुसार निर्मिती करण्यासाठी कृतीशील प्रयत्न केले. राजर्षी शाहू महाराज, सयाजीराव गायकवाड यांनी याकरिता विविध धोरणात्मक निर्णय घेतले.

विसाव्या शतकात स्वकर्तृत्व व समाज बांधवांविषयी असलेली तळमळ व अस्पृश्यतेचे आलेले अनुभव यातून डॉ. बाबासाहेब आंबेडकरांचे नेतृत्व उदयास आले. समाजाला न्याय मिळवून देण्यासाठी हिंदू धर्मात सुधारणा करणे व जातीपातीच्या भिंती उद्ध्वस्त करण्याकरिता डॉ. बाबासाहेब आंबेडकरांनी सामाजिक परिवर्तन चळवळ उभा केली. प्रथमतः हिंदू धर्मात राहून धर्म सुधारण्याचा प्रयत्न केला त्यास सनातन्यांनी विरोध केल्यानंतर 1935 साली येवला येथे हिंदू धर्म त्यागण्याची घोषणा केली. डॉ. बाबासाहेब आंबेडकरांचा महाड सत्याग्रह, मनुस्मृती दहन, मंदिर प्रवेश चळवळ याचा उद्देश समाजातील व्यवस्थेवर विजय संपादन करणे इतका मर्यादित नव्हता. समाजाची विषमतामुलक मानसिकता धर्माची ताठरता यांस झुगारून दलितांना इतर लोकांप्रमाणे जगण्याचा समान हक्क देण्यासाठीचा हा लढा होता

डॉ. बाबासाहेब आंबेडकर व नव शिकारी संघर्षाची निर्मिती आणि

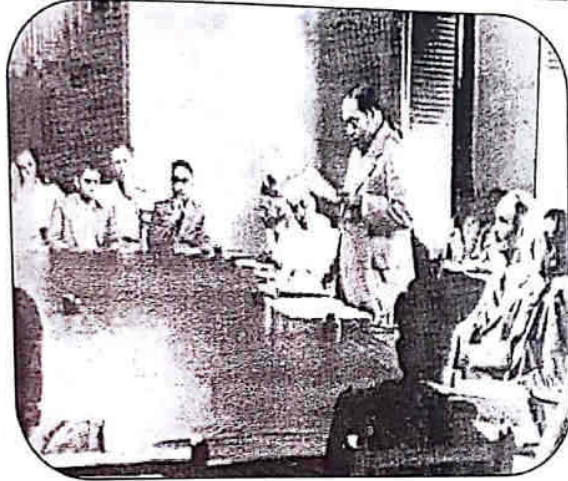
डॉ. बाबासाहेब आंबेडकरांच्या राजकीय व घटनात्मक सुधारणा चळवळी

डॉ. प्रकाश व्हनकडे

सहाय्यक प्राध्यापक, अर्थशास्त्र विभागसामाजिक शास्त्रे संकुल, सोलापूर
विद्यापीठ, सोलापूर

संज्ञावना :-

१९३५ ते १९५६ २० वर्षांचा कालखंडाने भारतीय समाज जिवावर दुरगामी परिणाम केले होते. या खंडात डॉ. आंबेडकरांनी विविध अंगांने भारतीय कारण, समाज जिवन, अर्थशास्त्र, धर्म, या विषयां वर असे चिंतन केले होते. हा, कालखंड एकंदरीत भारतीय तसेच जागतिक राजकारणाच्या दृष्टीकोनात अति महत्वाचा व स्थित्यतराचा होता १९३५ च्या काळात भारताने विदल राज्यपध्दतीची सुरुवात झाली, १९-१९४५ या काळात द्वितीय महायुध्दाने संपूर्ण जगास त्रास धरले. या पार्श्वभूमिवर भारतीय स्वातंत्र चळवळीत डॉ. बाबासाहेब आंबेडकरांच्या नेतृत्वाखाली तरुणांचा सहभाग मोठा होता. १९४२ ते १९४७ पर्यंत विविध आंदोलने, आंदोलने यामुळे वातावरण ढवळून निघाले भारतीय साम्यवादी चळवळीने जागतिक राजकारणाचा पार्श्वभूमिवर आपल्या आंदोलनाची दिशा बदलली होती. अशा धामधुमिच्या काळात डॉ. बाबासाहेब आंबेडकरांचा राजकीय व सामाजिक पातळीवर विविध संघटनात्मक कामांची मांडणी व दिशा निश्चित केली जात होती. परंपरागत अनिष्ट रूढीत आडकलेल्या अस्मृश्यांना मानाचे अधिकार मिळवून द्यावेत हा त्यांचा ध्येय व हेतू होता. डॉ. बाबासाहेब आंबेडकरांच्या राजकीय व घटनात्मक सुधारणा चळवळीची सुरुवात केली.



राजकीय सुधारणा:

परंपरागत अनिष्ट रूढीत आडकलेल्या अस्मृश्य सनातनी हिंदू समाजाला झोपेतून जागे करावे, अस्मृश्यांचे उच्चाटन करावे, अस्मृश्यांना मानाचे अधिकार मिळवून द्यावेत, अस्मृश्य माणसाला स्वतंत्रतेचे, समतेचे, स्वाधीमानाचे जीवन जगण्याचे दिवस निर्माण करावेत. अस्मृश्यांना मानाचे अधिकार मिळवून द्यावेत, अस्मृश्य माणसाला स्वतंत्रतेचे, समतेचे, स्वाधीमानाचे जीवन जगण्याचे दिवस निर्माण करावेत. अस्मृश्यांना मानाचे अधिकार मिळवून द्यावेत, अस्मृश्य माणसाला स्वतंत्रतेचे, समतेचे, स्वाधीमानाचे जीवन जगण्याचे दिवस निर्माण करावेत. अस्मृश्यांना मानाचे अधिकार मिळवून द्यावेत, अस्मृश्य माणसाला स्वतंत्रतेचे, समतेचे, स्वाधीमानाचे जीवन जगण्याचे दिवस निर्माण करावेत.

या नावाचा स्वतंत्र राजकीय पक्ष १९३६ साली सुरू केला.

या स्वतंत्र मजूर पक्षाच्या जाहीरनाम्यात समाज सुधारणेसंबंधीच्या पुढील गोष्टी आढळतात. आवश्यक त्या सामाजिक सुधारणा घडवून आणण्यासाठी आमचा पक्ष कायदा करण्याचे हाती घेईल. यकती किंवा समाज आपल्या हक्काचा व स्वातंत्र्याचा कायदाने उपभोग घेत असताना, त्यांच्याविरुद्ध, दहशत बसविणारे किंवा बहिष्कार घेणारे यांना कायदाने कडक शिक्षा करणे.

अस्मृश्यता नष्ट करणारे कायदे आमचा पक्ष करील.

या पक्षाचे कार्यक्षेत्र पूर्वीचे जुने मुंबई राज्य व मध्य - प्रांत या भागात होते. या पक्षात अस्मृश्यांचा मुख्यत्वे भरणा होता. या पक्षाचे द्वार जाती-धर्माच्या व्यक्तींना खुले असूनही केवळ डॉ. आंबेडकरांचा पक्ष, महार-मांग-चांभारांचा पक्ष, अस्मृश्यांचा पक्ष म्हणून अस्मृश्यांना मानाचे अधिकार मिळवून द्यावेत, अस्मृश्य माणसाला स्वतंत्रतेचे, समतेचे, स्वाधीमानाचे जीवन जगण्याचे दिवस निर्माण करावेत. अस्मृश्यांना मानाचे अधिकार मिळवून द्यावेत, अस्मृश्य माणसाला स्वतंत्रतेचे, समतेचे, स्वाधीमानाचे जीवन जगण्याचे दिवस निर्माण करावेत.



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Media Advocacy for Environmental Journalism

Dr. Ravindra Chincholkar*

1.1 Introduction: History of Indian press is a great legacy for all Indians. During freedom struggle of India many leaders started their newspapers to inform and stimulate the people. These newspapers were not published with business intentions but as a national or public service. Justice G.N.Ray, Former Chairman, Press Council of India rightly noted that "The Indian national press was undisputedly the backbone of the freedom struggle for independence from colonial rule. Its historical importance and prestige it enjoyed in the society are linked to the awareness and creation of public opinion"

Indian newspaper industry has faced many challenges during last 236 years of its existence. In spite of many challenges, Indian newspaper industry developed gradually and now it became the second largest newspaper industry in the world. According to the statistical data published by The Registrar of Newspaper for India the total number of registered publications number was 99660 and total circulation of these periodicals was 45,05,86,21 in year 2013 - 14.

Contribution of Marathi newspapers in independence movement was also notable. Kesari, Kal, Sandesh and many other Marathi newspapers played a key role in independence movement. This was a great example of advocacy journalism.

During last three decades newspaper industry has witnessed many changes. Due to globalization and cut-throat competition newspapers are facing many problems. Many media houses have now openly admitted that journalism today is changed into a business. Only aim of these newspapers is to fetch more money through this business. But in this darkness, there are some rays of hope. In a study of Solapur district editions of Daily Sakal, Lokmat and Divya Marathi, researcher observed news related to environmental issues.

1.2 Theoretical framework:

The press is known as fourth estate. Therefore the role of

* HOD, Department of Mass Communication, Solapur University, Solapur.

समग्र बाबासाहेब
(ऐतिहासिक ग्रंथ)
Samagra Babasaheb
(Historical Book)

■ **बाळासाहेब दत्तात्रय मागाडे**
Balasaheb Dattatraya Magade

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प्रकाशिका

रसिका राजशेखर भंडारे
थिंक टॅक पब्लिकेशन्स अँड डिस्ट्रिब्युशन, बी-३०१,
निर्मिती समृद्धी अपार्टमेंट, वामननगर, जुळे सोलापूर,
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मुद्रण

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प्रत्येकाच्या जीवनाला दिशा देण्याचे कार्य चार घटक करीत असतात. पालक, शिक्षक, मित्र आणि परिस्थिती. चांगले शिक्षक वाटयाला येणे प्रत्येकाच्या बाबतीत घडेलच असे सांगता येत नाही. मात्र माझ्या वाटयाला काही चांगले शिक्षक आले, त्यात प्रा. सुधीर गव्हाणे यांचा प्राधान्याने उल्लेख करावा लागेल.

माझी गव्हाणे सरांशी ओळख १९८२-८३ मध्ये झाली. त्यावेळी ते औरंगाबाद आकाशवाणी केंद्रावर काम करीत होते. पुढे ते डॉ.बाबासाहेब आंबेडकर मराठवाडा विद्यापीठाच्या पत्रकारिता विभागात अध्यापक म्हणून रुजू झाले. दरम्यानच्या काळात माझ्याही मनात पत्रकारितेच्या क्षेत्रात लेखनाची आवड निर्माण झाली. त्यामुळे १९८५मध्ये बी.एस्सी पदवी घेतल्यानंतर पुढे विज्ञानाचे पदव्युत्तर शिक्षण घेण्याऐवजी विद्यापीठात पत्रकारितेच्या अभ्यासक्रमास प्रवेश घेतला. त्यावेळी पत्रकारितेचा अभ्यासक्रम विद्यापीठ ग्रंथालयाच्या पहिल्या मजल्यावर चालायचा. प्रा. सुधाकर पवार, प्रा. सुखराम हिवराळे, प्रा.सुरेश पुरी, प्रा. वि.ल.धारुकर आणि प्रा.सुधीर गव्हाणे आम्हाला विविध विषय शिकवायचे. त्याचवर्षी मला लोकमत मध्ये प्रशिक्षणार्थी उपसंपादक म्हणून नोकरी लागली. तिथे आम्हाला लोकमतचे संपादक बाबा दळवी प्रशिक्षण द्यायचे. मी त्यावेळी औरंगपुऱ्यात राहात होतो. सकाळी जालनारोडला लोकमतच्या कार्यालयात बाबा दळवींच्या मार्गदर्शनाखाली पत्रकारितेचे धडे गिरवायचे आणि संध्याकाळी विद्यापीठात पत्रकारितेचे शिक्षण घ्यायचे हा दिनक्रम होता. त्यामुळे अभ्यासक्रम, प्रात्यक्षिक सोबतच पूर्ण होत होते. लोकमतमध्ये माझ्याबरोबरच रुजू झालेले यमाजी मालकर, सुरेश वांदिले हे विद्यापीठात

* विभाग प्रमुख, पत्रकारिता व जनसंज्ञापन विभाग, सोलापूर विद्यापीठ, सोलापूर
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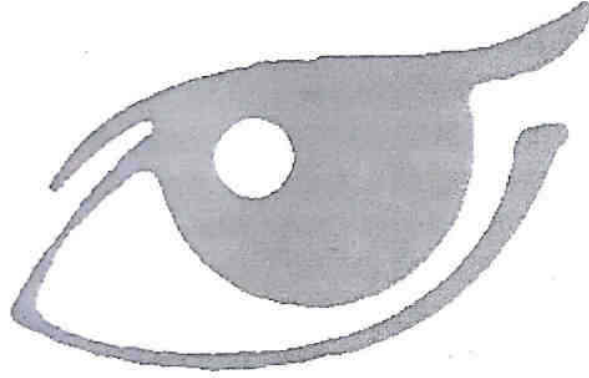
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माणूस आणि जीवसृष्टीतील इतर प्राणीमात्र यात एकच मोठा फरक आहे तो म्हणजे माणसात जिज्ञासा अथवा कुतुहल असते इतर प्राणीमात्रात ती नाही. या जिज्ञासेपोटी माणूस विचार करित गेला आणि त्याचा मेंदू अधिक तल्लख झाला. माणूस केवळ स्वतःचा विचार करित नाही तर इतरांचा, जीवसृष्टीचा व त्यापलीकडचाही विचार करतो. या मानवी जिज्ञासेतूनच माध्यमांचा जन्म झाला. 'माध्यम' हा शब्द मुळात 'मिडियम' या असिरिअन शब्दापासून तयार झालेला आहे. 'माध्यम' म्हणजे संवादाचे असे साधन आहे की ज्याद्वारे विचार, भावना, घडामोडी इतरांना कळविता येतात. जेव्हा मोठ्या जनसमुदयापर्यंत या बातम्या, संदेश पोहोचवायच्या असतात, तेव्हा एखादया यंत्राचा/तंत्राचा आधार घेतला जातो, तेव्हा याच माध्यमांना प्रसार माध्यमे (मास मिडिया) म्हटले जाते. या प्रसार माध्यमांना सर्वत्र 'माध्यमे' असेच संबोधले जाते, त्यामुळे या लेखात प्रसार माध्यमांचा उल्लेख 'माध्यमे' असाच केला आहे.

सोलापूर जिल्ह्यातील दूध उत्पादकांच्या सामाजिक-आर्थिक स्थितीचा अभ्यास

श्री. एम. कांबळे

प्रस्तावना

भारतासारख्या कृषिप्रधान अर्थव्यवस्थेत जाण्याची आणि शेती उपयोगी जनावरांची आणि गळीव प्राण्यांची उपयुक्तता खूप आहे. पशुपालन हा दूध उत्पादनाचा वाया आहे व भारतात शेती व्यवसायाबरोबरच पशुपालन व्यवसाय महत्त्वाचा बनला जातो. दूध व्यवसाय हा शेतकऱ्यांचे आणि देशाचे राष्ट्रीय उत्पन्न वाढविण्याचा एक महत्त्वपूर्ण नल आहे. कृषी क्षेत्रातील यांत्रिकीकरणामुळे पशुसंख्या ही शेतजोती संबंधित कामे केली जात असत, त्यांचे ज्ञान कमी झाले, म्हणजेच शेतीक्षेत्रातील विविध कामांसाठी शेणारा पशूंचा वापर कमी झाला. याचा परिणाम म्हणून शेतकऱ्यांच्या प्राधान्य क्रमात बदल झाला; तो असा की, सामान्यतः शेतीसाठी जनावरे पालण्याऐवजी दूध उत्पादन देणारी जनावरे पालण्याकडे शेतकऱ्यांचा कल वाढला व त्यांचेच पडसाद भारतातील पशुधनावार पडलेले दिसून येतात. स्वातंत्र्योत्तर काळातच भारतातील दूध व्यवसायाचा विकास वेगाने झाला. खाजगी आणि सहकारी अशा दोन्ही क्षेत्रांत हा व्यवसाय मुळ असून देशात दूध उत्पादन, दूध प्रक्रिया आणि दुग्धजन्य पदार्थांचे उत्पादन

करण देत आहे व त्याच बरोबर देशांतर्गत आणि आंतरराष्ट्रीय स्तरावर देवाील दुधाची विक्री व्यवसाय होत आहे व यामुळे आंतरराष्ट्रीय व्यापारात अगमूनाई बदल झालेले दिसून देत आहेत व याचे महत्त्वाचे कारण 'दुधाचा महापुर' ही योजना असून यामुळे देशात धवलक्रांती (White Revolution) घडून आली. पशुधन विकास, दूध व्यवसाय, दूध उत्पादन, पशुवैद्यकीय सेवा यांबाबत सरकारी धोरण हे या क्षेत्रातील उत्पादकांना वाढविण्यास कारणीभूत ठरते. सहकारी क्षेत्रातून पशुधन पुरवठा, कर्ज पुरवठा आणि पशु सेवांचा पुरवठा यामुळे पशुधन क्षेत्राच्या विकासात घालना मिळाली. दुग्धक महापूर योजना कार्यक्रम सरकारने सहकारांजगत राबविल्याने या क्षेत्राचा विकास अधिक गतीने झाल्याचे दिसून येते.

भारतातील दुग्धोत्पादन

भारतात थार पूर्वीगासमूलाच दुधाचे उत्पादन केले जाते व स्वातंत्र्योत्तर काळातच विविध काळात सरकारने विशेष प्रयत्न करून सहकारी दूध उत्पादन संस्थांची संख्या वाढवून दूध उत्पादन काहीसाठी विविध कार्यक्रम राबविले. सन २०११-१२ नंतर दूध उत्पादन व त्याची दरदोई उपलब्धता उक्ता क्र. १ मध्ये दाखिली आहे.

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ग्रंथाली वाचक चळवळ

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अंकात प्रसिद्ध झालेली मते ज्या त्या व्यक्तीची. 'ग्रंथाली'
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इतिहास

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संपादक

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सोलापूर जिल्ह्यात विविध धर्म, पंथांशी संबंधित तसेच तत्कालीन समाज जीवनाशी निगडित मूर्तिशिल्पे आढळतात. मूर्तिशिल्पांच्या अभ्यासावरून तत्कालीन राजा अथवा शासकांचा धर्म, पंथ कोणता होता, त्याची उपासना पध्दती कशी होती या गोष्टींची माहिती मिळते. विविध देवदेवतांची शिल्पे घडविण्याबरोबर आपणास तत्कालीन समाजाचे श्रद्धाळू मन व्यक्त होते. त्याचबरोबर आपणास तत्कालीन समाजाचे धार्मिक आचार विचार प्रवाहाची माहितीही मिळते.

सोलापूर जिल्ह्याचा इतिहास प्राचीन असून, अलीकडेच केलेल्या संशोधनामध्ये भीमा आणि सीना नद्यांच्या खोऱ्यामध्ये प्रागैतिहासिक कालखंडापासूनचे अनेक अवशेष मिळाले आहेत. प्राचीन काळी या प्रदेशाला फारच महत्त्व होते. याचा समावेश कुंतल प्रदेशात होत होता. या प्रदेशावर अनुक्रमे सातवाहन, बदामी चालुक्य, मान्यखेटचे राष्ट्रकुट, कल्याणी चालुक्य, मंगळवेढ्याचे कलचुरी, अक्कलकोटचे शिलाहार व देवगिरीचे यादव यांची सत्ता होती (सोलापूर जिल्हा गॅझेट्‌अर:१९७२;३).

सोलापूर जिल्हा हा मंदिर संपन्न जिल्हा असून जिल्ह्यामध्ये वेगवेगळ्या कालखंडातील मंदिरे व त्यावरील शिल्पाकृती अतिशय सुंदर असून मंदिराच्या बाहय

बहुगर्भगृही मंदिरे आणि पंचमुखी शिवलिंगः एक अभ्यास

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प्रस्तावना

अश्मबुगापासून मानव निसर्गातील विविध बदलाला आणि घमत्काराला भीत होता आणि त्याच्याबद्दल सुप्त आकर्षण वाटत होते. उगवणारा आणि भावळणारा सूर्य आकाशात रात्री चमकणारे तारे कोसळणारा पाऊस कडाडणाऱ्या विजा हे सर्व अनाकलनीय होते. या निसर्गापासून काही हानी होऊ नये म्हणून त्याने त्याची पूजा सुरु केली. पुनरुत्पादन महत्वाचे आहे हे समजल्यावर त्याने मातृदेवतेची पूजा सुरु केली. महा स्फोटाने विश्वनिर्मिती या सिध्दांताबरोबरच हे सर्व विश्व परमात्म्याने निर्मिते आहे. सृष्टीची उत्पत्ती, स्थिती, लय या गोष्टी परमेश्वराच्या हातात आहेत असे सुध्दा समजले गेले आणि या परमेश्वराविषयी मनात जादर निर्माण झाला आणि निर्गुण निराकार तत्व आता मूर्तीच्या स्वरूपात साकार होऊ लागले. सर्व विश्वाचा स्वामी परमेश्वर आहे असे समजण्यात येऊ लागले आणि मूर्तीच्या स्वरूपात साकारलेल्या परमात्म्याची पूजा अर्चा सुरु झाली. प्रथमतः स्वतः हाच्या घरात आणि नंतर सार्वजनिक स्वरूपात मूर्तीची प्रतिष्ठापना होऊ लागली. आपण राहतो तसे किंबहुना आपल्यापेक्षा अधिक चांगला निवारा देवाला असावा असे वाटू लागले आणि मंदिर अथवा देऊळ या संकल्पनेचा जन्म झाला. इ.स. पूर्व पहिल्या शतकाच्या शिलालेखात 'देवायातन' हा शब्द आला. माटे म.श्री. १९०४:७२. इ.स. च्या तिसऱ्या शतकापासून ते पाचव्या शतकापर्यंत तीनशे वर्षांच्या कालखंडातील मंदिरांचे अवशेष भारतात ठिकठिकाणी विखुरलेले

EXPANSION OF TRADE AND URBAN CENTRES in ANCIENT INDIA

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In peninsular India, growth of trade and emergence of urban centers were not isolated phenomena but were very much associated with the other important changes which were taking place in the region.

It has however to be remembered that all corner so India were not uniformly affected by these changes. There were, and there continued to be areas in which earlier forms of culture persisted. Secondly between the Deccan and the far south, changes were more prominent in different part of the Deccan, in the beginning, changes were slower and limited temporally in the far south. At the same time each of these regions lacked some items which were essential for its own society. The agricultural tracts produced food-grains and sugarcane but it had to depend on the coastal areas for salt and fish. The coastal area produced considerable surplus in salt and fish, but rice, the staple food, had to be brought from the areas of paddy cultivation. The hill ranges were rich in timber, spices etc. but they had to depend on agricultural tracts and coastal areas for food grains and salt. The result of this kind of interdependence was that exchange relationship had come to exist among the various geographical regions.

अद्वितीय स्थापत्य व शिल्पकला : हेमलिंग मंदिर

प्रा.डॉ. माया ज. पाटील

प्राचीन भारतीय इतिहास, संस्कृती आणि पुरातत्त्वशास्त्र विभाग,
सामाजिक शास्त्रे संकुल, पुण्यशास्त्रेक अहिल्यादेवी होळकर सोलापूर विद्यापीठ, सोलापूर.

श्री. सचिन बांडुरंग सिंदे

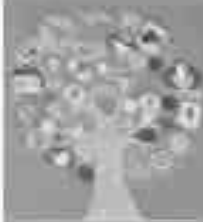
(विभाग प्रमुख) (पौ.च.डी. संशोधक विद्यापीठ)

प्रस्तावना :-

मंदिर स्थापत्य हे इतिहासाच्या अभ्यासाच्या दृष्टीने, एक दृश्य आणि भौतिक स्वरूपाचा पुरावा असतो. भारतीय समृद्ध संस्कृतीची ओळख ही इसवी सन पूर्व तिसऱ्या सहस्रकात निर्माण झालेल्या स्थापत्यामुळेच झाली. या शतकाच्या प्रारंभी भारतीय संस्कृतीचा प्राथमिक परिचय झाला आणि त्याच वेळी स्थापत्यार्थी नमुनेही जागृते आले. सिंधू संस्कृतीने निर्माणेल्या कला आणि स्थापत्यामुळे जगाला आश्चर्य वाटले. अर्थातच ह्या काळातील स्थापत्य हे उपयुक्तता या उद्देशाने निर्माणे होते. सिंधू संस्कृतीच्या विलासनेतर स्थापत्यशास्त्र हे आग्नी प्राथमिक अन्वयित राहिले. इ.स.पूर्व ३ व्या शतकात वेणी खोदली गेली. पुढे एक हजार वर्षे ही परंपरा अखंडपणे चालू राहिली. ह्या कलाविष्कार पुढे मंदिर स्थापत्याच्या रुपात आविष्कृत होत राहिले. (वेणू प्र.र. २२१/१६) हळूहळू भारतीय बांधीय मंदिर स्थापत्य विकसित होत गेले. नगर, द्वािड आणि वेसर या तीन मंदिर स्थापत्य शैली भारतात रुढ झाल्या.

शिखराच्या रचनेमध्ये उभ्या शिल्पपद्धती सारं शिखर वर अन्तःकडे जातं उभं. असा आभास निर्माण करणारे स्थापत्य वीजिष्टय या नागरशैलीत असते. द्वािड शैलीतल्या शिखर रचनेत पिरॅमिडच्या आकारान्तराचा चौकोनी आकार अवलंबून शिखर बांधण्याचा प्रयत्न रुढ झाला. शिखराची बांधणी केवळ गर्भगृहापुरती न राहता गर्भगृह, अंतराळ, सभामंडप आणि मुख्यमंडप असा सर्वच ठिकाणी शिखर उभारणी या द्वािड शैलीचे वैशिष्ट्य ठरते.

वेसर या मंदिर स्थापत्य शैलीत नागर आणि द्वािड मंदिर स्थापत्याचा संयोग घडून आलेला दिसतो. स्थपती शिल्पकारांनी चोन्ही शैलीतील त्यांचा भावलेल्या गोष्टीचा आधिष्ठात वेसर शैलीतून केला.



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Editorial

*Now what I want is facts. Teach these boys and girls writing for facts. Facts alone are wanted in life. There is nothing else, and even now everything else. The only duty left the mind of reasoning animals upon facts, nothing else will save it of any service to them. (Charles Dickens: *Half-Timber, Book the First, Being Chapter 1: The Old Thing Newish*)*

In these sporting times Gadgil's (mis)use of his belief that facts are important in making decisions is better than any. Dickens's primary goal in *Half-Timber*, therefore, is to illustrate the dangers of allowing human or human teachers, suggesting that without competence and imagination. He would be, ultimately, a regressive Victorian English's overvalued objective of individualism: that humanity is too human being, not students, by allowing the development of their senses and imaginations. This regression comes forth largely through the actions of Gadgil and his followers, specifically, as the former educates the young children of his family and his school in the ways of fact: the latter, more the worker in his factory as a worker, objects that are more important for his own self-interest. In Chapter 5 of the first book, the narrator shows a parallel between the better Hindu and the Gadgil children—both had mathematics and physics, sciences, connected by physics. Consequently, their behavior and feelings are defined and they become almost mechanical with detachment. Nevertheless, we have gone far ahead in the end, because a person.

It is no mistake to accept that modern-day life is connected by technology. The digital world is growing in leaps and bounds, and becoming more powerful. That way back when there were only desktops that were about a foot thick and ran pretty slow. Now look at today when we are able to browse the web with just the touch of fingers in our phones. Doing long air trips as going to places we have never been before, we almost see things in 3D. The web is communicating with the world as well as when to go to a museum was asking to travel in real life. The world used to work much. When we reach our destination we check it out. "Who would go now to without Navigation?" No, to someone how can it be to make a call. Digital communication is not merely when someone calls 711 for help. This is a to make a call because of the fact that we have not (done it) if we can't do a up our phone. This is a lot from a fact other than going to a person. This is

New Media Technologies and Their Impact on Children

*Dr. A. L. Bhasake

ABSTRACT

Now days the children are growing with both traditional and modern technology. Modern Technology in Smartphones, tablets and computer has been developing and it seems that children's improper use of technology device in terms of frequency, duration and content. This study focused on its main and domains of technology. The objective of the study is to know the impact of new media technology on children.

Technology changed the other aspects of everyday life, such as health care, education, job satisfaction, and leisure time activities. It has a very big impact on today's generations.

Technology can have a large impact on children's mental and physical health. All types of technology can truly have negative effects on children when used in excess because they lower children's frequency of interaction with their peers. This makes it more complicated for them to pick up on cues and develop meaningful relationships with others. New media technology means using different forms of electronic communication made possible from the use of computer technology. Usually the phrase new media describes content available on-demand through the Internet. Technology itself provides a information about positive and negative impacts on children's development and quality of life. This is not the outcome that all technology is bad or if children should not use technology. Technology provides new of great opportunities for learning and socializing but it should be used appropriately.

According to the National Association for the Education of Young Children, technology refers to digital and analog materials, including web programs, applications (apps), broadcast and streaming media, children television programming, e-books, the Internet, and other forms of com-

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Local History and Cultural Identity in India
भारतातील स्थानिक इतिहास आणि सांस्कृतिक ओळख

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Cultural Integration of Early Medieval Indian History in the Solapur Region

Dr. Prabhakar Kolekar

Introduction: Cultural history arise as a term and a concept in later eighteen century, as culture replaced earlier equivalent including sprit which was extended from individual psychology to collective mentality and literature referring to all the written remains of human cultural achievement locales when the term culture has Established itself as something like a master trope in the humanities. (John Czaplicka & Andrees Huysen: 3) in the regards cultural history is combines the approaches of anthropology and history to look at popular culture traditions and cultural interpretation of historical experience. It Examines the records and narrative descriptions of past matter encompassing the continuum of events as pertaining to a culture, cultural history means cultural history records and interprets past events involving human being through the social, cultural and political prospect of or relating to the arts and manners that a group favors cultural history studies and interprets the record of human societies by denoting the various distinctive way of living built up by a group of people under consideration. Thus, cultural history involves the aggregate of past cultural activity, such as ceremony, class in practices and interaction with early activity or events. (Encyclopaedia.Com)

Nature of Cultural History:

Classical cultural history related to Language, Human culture, anthropology, Material cultural, spiritual culture, art, literature, philosophy and religion. In early twentieth century new cultural history expanded their views and their hermeneutics. If we consider cultural as macro concept than it is connected with the our livelihood that time cultural study should be studied by the various aspect of the way of classical cultural Studies and new cultural studies adopt the several kind of research methodology such as the Ranken school scientific evidence base writing method and Marxist school of history writing method. Antineo Gramchis Subaltern School interpretation of method or French School of method, Annals School of method of cultural study needs casual analysis as the principal access to knowledge of the human condition, past and present. Explanation requires some sort of reduction of experience or evidence to crucial factor at the expense of excluding other experience or evidence which not only leads colour or as thickness of description but also qualifies simplistic and naturalistic notion of causation.(Encyclopaedia of Britanica.com)

Objective, Source and Methodology:

In this research article objective is to highlight of the perticular concept of nature of cultural history. Second objective of this paper, to link the ancient cultural history of solapur for the study of archeological and literary source. What will be the different kind of research possibilities in future regarding to the cultural history in ancient and medieval period in Solapur.

Associate Professor, Dept. of Ancient Indian History, Culture & Archaeology, School of social Sciences, Ahilyadevi Holkar Solapur University Solapur