

लोकशिक्षक श्री. संत गाडगे महाराज

डॉ. सुरेश नांदे

इतिहास विभाग,
शिवाजी महाविद्यालय,
रेणापूर, जि. लातूर

आधुनिक महाराष्ट्राच्या समाजसुधारणेच्या क्षेत्रात कार्य करणाऱ्या सुधारकांमध्ये महान कर्मयोगी, वैराग्यमूर्ती, संत गाडगे महाराज यांचे कार्य उल्लेखनीय आहे. रूढी, परंपरेच्या जंजाळातून समाजाला बाहेर काढून सत्यजीवनाकडून जीवनसत्याकडे घेऊन जाण्याचे कार्य त्यांनी केले. आपल्या कृतीने समाजासमोर असामान्य त्यागाचे दर्शन घडविले. मानवतेच्या विकासाठी पुरातन आणि जुनाट मार्ग सोडून नविन वाटेने जाण्याची डोळस दृष्टी गाडगेबाबांनी दिली आहे. संत गाडगे महाराजांच्या हातात लेखणी नव्हती, काळजाला जाऊन भिडणारी वाणी होती. आपल्या अप्रुतवाणीने महाराजांनी लोकांना 'अमृत मने' दिली. यासाठीच त्यांनी जन्मभर निष्काम कर्मयोग अंगीकरला. त्यांचे जीवन एक क्रांतीकारक आंदोलन ठरले. गाडगे महाराज हे मानवप्रेमी व विश्वधर्मी विराट पुरुष होते. तसेच एक व्यापक दृष्टीचे अत्यंत कुशल क्रांतिदूत होते. त्यांच्या उक्तीत व कृतीत आकाशाला गवसणी घालण्याची आणि समुद्राची सखोलता मापण्याची कुवत होती.

स्वतःला अक्षराची ओळख नसलेला हा माणसांचा जणू संतच होता. अर्थात तत्कालीन महाराष्ट्रीयन समाजजीवनात संताची वानवा नव्हती. ज्ञानेश्वर, एकनाथ, रामदास या संतांचे कार्य महाराष्ट्राच्या झोपड्या-झोपड्यातून पसरलं हे खरं आहे. परंतु झोपडीतला अंधार नाहीसा करणारा दिवा लोकांच्या अंतःकरणात फुलवून दाखविला तो गाडगे महाराजांनी. गरिबांना झोपडीत चार सुखाचे घास मिळावेत याच घडपडीतून ते जीवनभर निष्काम कर्मयोगी या भूमिकेतून चंदनासारखे झिजले. महाराष्ट्रातील सामाजिक अंधःपतनाने व्यथित झालेल्या बाबांनी रूढीवर, ढोंगांवर, दंभावर, स्वार्थावर, विषमतेवर, अज्ञानावर, माणुसकीशून्य वर्तनावर ठायी ठायी कडक टिका करून, स्वतःला जे पटले ते आचरणात आणून, समाजाला तत्पर पानाचा खरा अर्थ सांगितला आहे. बाबांचे व्यक्तिमत्त्व म्हणजे धगधगत्या अग्नीकुंडाची कहाणी आहे.

जीवन वृत्तांत

संत गाडगे महाराजांचा जन्म अमरावती जिल्ह्यातील दर्यापूर तालुक्यातील शेणगाव येथे २३ फेब्रुवारी १८७६ रोजी एका परीट घराण्यात झाला. त्यांच्या वडिलांचे नाव झिंगरूजी व आईचे नाव सखुबाई होते. गाडगेबाबांचे लहानपणीचे नाव डेबू. नंतर, त्यांचा डेबूजी झाला. वडिलांचा पूर्वापार व्यवसाय कपडे धुण्याचा असला तरी झिंगरूजी शेती करत असत. हळूहळू झिंगरूजींना महामासांचे व्यसन जडले. परिणामतः त्यांची वडिलोपार्जित जमीन सावकाराने गिळून टाकली. तात्पर्य दारिद्र्य, सावकाराचा तगादा, घरातील अन्नात झालेली दशा आणि समाजाकडून झालेली उपेक्षा या चौफेर मान्यामुळे अत्यंत विमनस्क स्थितीत भांबावून गेलेल्या झिंगरूजींनी एके दिवशी शेवटचा श्वास सोडला. त्यावेळी डेबूजीचे वय होते



मराठेकालीन राजपद सिध्दांतात झालेले परिवर्तन

डॉ. सुरेश नांदे
इतिहास विभाग,
शिवाजी महाविद्यालय,
रेणापूर, जि. लातूर

Research Paper - History

प्रस्तावना :-

शिवाजी महाराजांनी जी राज्यव्यावस्था निर्माण केली होती त्यामध्ये अनेक बदल पेशव्यांना करावे लागले. पेशवे काळात सातारच्या छत्रपतीचे महत्त्व हाळुहाळु कमी होत गेले आणि पेशव्यांच्या हातात सर्व सत्ता आली. कालांतराने सातारचे छत्रपती हे केवळ नाममात्र छत्रपती बनले. शाहु राजाच्या मृत्युनंतर राष्ट्राची खरीखुरी सत्ता पेशव्यांच्या हातात आली. पेशव्यांना ही सत्ता प्राप्त झाली ती ते ब्राम्हण होते म्हणून नव्हे तर त्यांनी स्वकर्तृत्वाने ते पद मिळवले. या त्यांच्या स्थाणाला मराठा राज्यसंधाने सुध्दा कायदेशीर मान्यता दिली होती.

शिवाजी महाराजांनी मराठ्यांचे राज्य स्थापण केले. व छत्रपती म्हणून स्वतःला राज्यभिषेक करून घेतला. हिच पध्दती पेशवेकाळात अंगलात राहिली. पेशवेकाळात मराठा राज्याचा घटनात्मक प्रमुख म्हणून हा छत्रपती होता. त्या छत्रपतीच्या गादीवर शाहु महाराज बसले व त्यांनीच बाळाजी विश्वनाथाला पेशवेपद बहाल केले. या शाहुच्या काळात मराठा राज्याचा विस्तार होत गेला. जो पर्यंत शाहु जिवंत होता तो पर्यंत छत्रपतीचा घाक आणि प्रतिष्ठा कायम राहिली. परंतु शाहुच्या मृत्युनंतर मात्र त्या पदावर योग्य व्यक्ती न आल्याने छत्रपतीची प्रतिष्ठा उरली नाही. जो कोणी पेशवा होईल त्याला पेशवेपदाची वस्त्रे पाठवणे इतकेच काम छत्रपतीकडे राहिले. पेशव्यांनी छत्रपतीला वेळोवेळी अनेक सवलती दिल्या व छत्रपतीचा मान राखण्याचा प्रयत्न केला.

इ.स. १७०८ मध्ये मराठा राज्यात फुट पडावी म्हणून मोगलांचा हेतु सफल झाला. राजारामाची पत्नी ताराबाईने शाहुला महाराष्ट्रात येताच विरोध केला त्यामुळे मराठ्यात यादवी युद्ध झाले. या यादवी युद्धात शाहुचा विजय झाला परंतु ताराबाईने कोल्हापुर येथे मराठ्यांची दुसरी गादी स्थापण केली त्यामुळे मराठा राज्याचे दोन तुकडे होऊन मराठा सरदारांच्या निष्ठा दुमंगल्या गेल्या. अनेकानी शाहुस राजा मानण्यास नकार देऊन ताराबाईचा पक्ष उचलून घरला यामध्ये बहुतेक लोकांचा राष्ट्र

कर्मवीर भाऊराव पाटील यांचे शैक्षणिक योगदान

डॉ. विजयकुमार तांबारे

इतिहास विभाग,
शिवाजी महाविद्यालय,
रेणापुर, जि. सातुर

महाराष्ट्राच्या शैक्षणिक क्षेत्रात अभूतपूर्व क्रांती घडवून आणण्याचे कार्य कर्मवीर भाऊराव पाटील यांनी केले. बहुजन समाजाला ज्ञानाची दारे उघडवी करून समतेवर आधारलेल्या नव्या ज्ञानी व सुजाण समाजाची निर्मिती करण्यासाठी कर्मवीरांनी आपले सर्वस्व पनाला लावले. अनेक वर्षे अज्ञानरुपी अंधःकारात खिंतपत पडलेल्या बहुजन समाजाला त्यांनी अंधारातून प्रकाशाकडे नेले. सामान्यातील सामान्य माणसापर्यंत शिक्षण पोहचविण्यासाठी त्यांनी अविरोध प्रयत्न केले. श्रम, स्वालंबन व समता इत्यादी महान तत्वांचे ते उपासक होते. स्वावलंबनाच्या बळावर समता व स्वातंत्र्य प्रस्थापित करण्यासाठी उभ्या महाराष्ट्राला ज्ञान गंगेत न्हाऊ घालण्याचे कार्य त्यांनी केले. त्यांच्या शैक्षणिक कार्यामुळे महाराष्ट्रातील ग्रामीण जीवनातील चेहरामोहरा बदलून गेला. त्यांच्या शैक्षणिक कार्याबद्दल प्राचार्य एन्. डी. पाटील म्हणतात, "इंग्रजी शिक्षण अतिशय महागडे असल्याने त्याला 'वाघिणीचे दूध' म्हटले जात असे. तथापि आण्णांनी हे 'वाघिणीचे दूध' शेळीच्या दुधाइतके स्वस्त व मुबलक करण्याची प्रतिज्ञा करून गोरगरीब शेतकऱ्यांच्या व मजुरांच्या झोपड्यापर्यंत हे शिक्षण पोहचविले." त्यांचे शैक्षणिक कार्य व त्यामागील तत्वे केवळ महाराष्ट्राच्याच नाही तर भारतीय शिक्षण व सामाजिक परिवर्तनाच्या दृष्टीने महत्त्वाचे व मार्गदर्शक आहे. अशा या थोर व्यक्तीच्या कार्याची माहिती करून घेणे आवश्यक आहे.

१) जीवनवृत्तांत

कर्मवीर भाऊराव पाटील यांचा जन्म २२ सप्टेंबर १८८७ रोजी कोल्हापूर जिल्ह्यातील हातकणंगले तालुक्यातील कुंभोज या गावी जैन कुटुंबात झाला. त्यांच्या वडीलांचे नाव पायगोंडा व आईचे नाव गंगामाई असे होते. भाऊरावांचे वडील पायगोंडा सरकारी नोकर (रोड कारकून) होते. भाऊराव पाटील हे पायगोंडाचे जेष्ठ चिरंजीव होते. भाऊरावांचे प्राथमिक शिक्षण धिटे, दहीवडी अशा वडीलांच्या बदलीच्या ठिकाणी झाले. बालवयातच त्यांच्या मामाचा मित्र सत्याप्पा भोसलेचा (चारणेचा बाघ) सहवास त्यांना लाभला. 'हा सत्याप्पा साहसी, शूर असून गोरगरिबांचा केवारी होता. तो अन्याय व अत्याचाराचा कर्दनकाळ असल्यामुळे त्याचे शत्रू त्याला चोर, दरोडेखोर म्हणत. अन्याय व अत्याचाराविरुद्ध बंड करण्याचे बाळकडू त्यांना सत्याप्पा भोसलेकडून बालपणातच मिळाले. इयत्ता पाचवी पास झाल्यानंतर त्यांना १९०२ मध्ये कोल्हापूरच्या राजाराम हायस्कूलमध्ये दाखल करण्यात आले.

२) भाऊरावांची वसतिगृहातून हकालपट्टी

भाऊरावांना १९०२ पासून कोल्हापूरच्या राजाराम हायस्कूलमध्ये दाखल करण्यात आले. त्यांच्या राहण्याची



मराठवाडा मुक्ती संग्राम : एक ऐतिहासिक अभ्यास

डॉ. विजयकुमार तांबारे
इतिहास विभाग,
शिवाजी महाविद्यालय,
रेणापूर, जि. लातूर

Research Paper - History

प्रस्तावना :-

हैद्राबाद संस्थान हे भारतातील सर्व संस्थानांत लोकसंख्येच्या दृष्टीने पहिल्या प्रतीचे संस्थान होते. आकाराने त्याचा दुसरा क्रमांक होता. हैद्राबादचे वार्षिक उत्पन्न सुमारे आठ कोटींचे तर क्षेत्रफळ ८२३१३ चौरस मैल होते. एवत्र बाजूला जूना मुंबई प्रांत तर दुसऱ्या बाजूला मद्रास प्रांत उत्तरेला मध्य प्रदेश असे भारताच्या अगदी नाभिस्थानी असलेले देशी संस्थानातील सर्वांत मोठे संस्थान होते. हैद्राबाद संस्थानात जे तीन विभाग होते त्यात तेलंगण ४१५०२ चौरस मैल मराठवाडा २७५९१ चौरस मैल आणि कर्नाटकाचे क्षेत्रफळ १३६०५ चौरस मैल होते. या संस्थानात त्रिभाषीक जिल्हे होते. हैद्राबाद, मेदक, बागत, महबूब नगर, निजामाबाद, नलगोंडा, वरंगल, करीमनगर, आदिलाबाद हे जिल्हे तेलगू भाषिक होते. औरंगाबाद, उस्मानाबाद, बीड, नांदेड आणि परभणी हे मराठी भाषिक जिल्हे होते. तर बिदर, गुलबर्गा, रायचूर हे कानडी भाषिक जिल्हे होते.

१९४१ च्या शिरगणतीनुसार हैद्राबाद संस्थानची एकूण लोकसंख्या एक कोटी ६३ लक्ष ३८ हजार ५३४ होती. त्यात दलितांची संख्या जवळ जवळ २५ लाख होती जी हिंदू लोकसंख्येच्या १/४ पट आणि मुस्लीम संख्येच्या ५/३ पट होती. एकूण लोकसंख्येच्या १/६ दलित लोकसंख्या होती. एकूण लोकसंख्येपैकी ७५ लाख २९ हजार २२९ तेलगू भाषिक, ३९ लाख ४७ हजार ८९ मराठी भाषिक, १७ लाख २४ हजार १८० कानडी भाषिक आणि २१ लाख ८७ हजार उर्दू भाषिक लोक होते. संस्थानच्या सर्व जहागिरीची मिळून लोकसंख्या पन्नास लाखावर होती. त्यांचे वार्षिक उत्पन्न ४ कोटी रूपये होते. लहान मोठे मिळून ११६७ जहागिरदार होते. जहागिरदारामध्ये सर्फेखास, पायगा, जहागिर व संस्थाने असे चार प्रकार होते. सर्फेखास ही खुद्द निजामाची जहागीर होती. निजामाच्या खर्चासाठी होती. संस्थानाच्या एकूण क्षेत्रफळापैकी १० वा भाग सर्फेखासने व्यापला होता. त्यापासून निजामांना वर्षाला एक कोटी रूपयाचे उत्पन्न मिळत असे. अनेक अरबांना व रोहील्यांना हैद्राबाद संस्थानात जहागीरी मिळाल्या होत्या. त्यात सैफनवाज आणि बाहादुरयारजंग यांचा समावेश होतो. सरकारच या रोहील्यांच्या व



EINSTEIN'S FIELD EQUATIONS WITHIN CONFORMABLE FRACTIONAL DERIVATIVE

D.-D. PAWAR, D. K. RAUT and W. D. PATIL

School of Mathematical Sciences
S.R.T.M. University
Nanded-431606, Maharashtra, India
E-mail: dypawar@yahoo.com

Department of Mathematics
Shivaji Mahavidyalaya
Renapur-413527, Maharashtra, India
E-mail: dkraut1983@gmail.com

Department of Mathematics
A.C. Patil College of Engineering
Navi Mumbai, Maharashtra, India
E-mail: walmikpatil@rediffmail.com

Abstract

In the present paper we obtained the conformable fractional curvature tensor, conformable fractional Riemann tensor and study some of its properties such as symmetry, anti-symmetry and cyclic property. Also we get conformable fractional Ricci tensor and curvature invariant. Lastly by involving conformable fractional derivative Einstein field equations are obtained. Illustrative example is presented.

1. Introduction

The general relativity is the most successful theory of gravitation [1]. There are so many generalizations had been made in the theory of general relativity. A. Einstein [2] generalized the Relativistic theory of gravitation. J. Munkhammar [3] makes the metric complex. Einstein's [4] in the year 1915

2010 Mathematics Subject Classification: 53B20, 83C21 and 26A33.

Keywords: conformable fractional curvature tensor, conformable fractional Riemann tensor, conformable fractional Ricci tensor, curvature invariant, Einstein field equations.

Received November 26, 2019; Accepted August 2, 2020

ANALYSIS OF MALARIA DYNAMICS USING ITS FRACTIONAL ORDER MATHEMATICAL MODEL

D.D. PAWAR, W.D. PATIL* AND D.K. RAUT

ABSTRACT. In this paper, we have studied dynamics of fractional order mathematical model of malaria transmission for two groups of human population say semi-immune and non-immune along with growing stages of mosquito vector. The present fractional order mathematical model is the extension of integer order mathematical model proposed by Ousmane Koutou et al. For this study, Atangana-Baleanu fractional order derivative in Caputo sense has been implemented. In the view of memory effect of fractional derivative, this model has been found more realistic than integer order model of malaria and helps to understand dynamical behaviour of malaria epidemic in depth. We have analysed the proposed model for two precisely defined set of parameters and initial value conditions. The uniqueness and existence of present model has been proved by Lipschitz conditions and fixed point theorem. Generalised Euler method is used to analyse numerical results. It is observed that this model is more dynamic as we have considered all classes of human population and mosquito vector to analyse the dynamics of malaria.

AMS Mathematics Subject Classification: 34A34, 34B60, 65L05, 92B05.
Key words and phrases: Atangana-Baleanu fractional order derivative in Caputo sense [ABCD], Atangana-Baleanu fractional order integral in Caputo sense [ABCJ], Fractional order mathematical model of malaria [FOXMM], Generalised Euler method [GEM].

1. Introduction

The concept of fractional calculus emerged through the consequences of theory of calculus in seventeenth century by Isaac Newton, a well known British scientist, as well as Gottfried Leibnitz, a self-taught German mathematician. Fractional calculus deals with the definitions of classical calculus in the form of generalised fractional order [1]. Most of the scientists like Riemann, Caputo, Liouville, Grunwald Letnikov etc. defined fractional order derivatives and integrals

Received May 28, 2020. Revised October 27, 2020. Accepted December 28, 2020.
*Corresponding author.

© 2021 KSCAM.

Fractional-order mathematical model for analysing impact of quarantine on transmission of COVID-19 in India

Pawar D. D.¹, Patil W. D.², Raut D. K.³

¹*School of Mathematical Sciences,*

Swami Ramanand Teerth Marathwada University, Nanded-431606, India

²*Department of Applied Mathematics,*

A. C. Patil College of Engineering, Navi Mumbai-410210, India

³*Department of Mathematics,*

Shriwaji Mahavidyalaya, Renapur, Latur-413527, India

(Received 6 April 2020; Revised 27 January 2021; Accepted 9 April 2021)

An outbreak of the novel coronavirus disease was first reported in Wuhan, China in December 2019. In India, the first case was reported on January 30, 2020 on a person with a travel history to an affected country. Considering the fact of a heavily populated and diversified country like India, we have proposed a novel fractional-order mathematical model to elicit the transmission dynamics of the coronavirus disease (COVID-19) and the control strategy for India. The classical SEIR model is employed in three compartments, namely: quarantined immigrated population, non-quarantined asymptomatic immigrated population, and local population subjected to lockdown in the containment areas by the government of India to prevent the spread of disease in India. We have also taken into account the physical interactions between them to evaluate the coronavirus transmission dynamics. The basic reproduction number (R_0) has been derived to determine the communicability of the disease. Numerical simulation is done by using the generalised Euler method. To check the feasibility of our analysis, we have investigated some numerical simulations for various fractional orders by varying values of the parameters with help of MATLAB to fit the realistic pandemic scenario.

Keywords: COVID-19, epidemic, fractional-order mathematical model (FOMM), reproduction number, generalised Euler method (GEM).

2010 MSC: 34A34, 34A12, 34C05, 92D30, 47H10

DOI: 10.23939/mmc2021.02.253

1. Introduction

Throughout history, diseases swept the globe, bringing down empires, weakening economies, and changing the course of history. When these infectious diseases exist as epidemics having widespread occurrence, the impact is such appalling that it continues afflicting not only the present but also the future. For instance, the recent coronavirus disease (COVID-19) pandemic has chained the world in shackles with 4307287 positive cases and 295101 deaths reported by May 15, 2020 [1, 2]. The first outbreak was reported in Wuhan, China in December 2019 [3, 4]. Despite attempted containment measures, the virus spread to other parts of the world, soon resulting in a disastrous pandemic with many countries affected.

The causative agent, the SARS-CoV2 virus is transmitted by coughing, sneezing and close personal contacts such as touching mouth, nose or eyes or shaking hands. The Centers for Disease Control and Prevention (CDC) reported a wide range of symptoms ranging from mild to severe illness. Cough, shortness of breath, fever, chills, muscle pain, sore throat and new loss of taste or smell are commonly reported symptoms which may appear 2–14 days after exposure to the virus. Other less common symptoms have been reported including gastrointestinal symptoms like nausea, vomiting or diarrhoea. Older adults and people with underlying medical conditions are seen to be at higher risk for developing more serious complications [5].



जलसिंचन आणि पर्यावरणीय बदल एक भौगोलिक अभ्यास

डॉ. अरुण केशवराव हांगे

भूगोल विभाग प्रमुख,
शिवाजी महाविद्यालय,
रेणापूर, जि. लातूर

Research Paper - Geography

प्रस्तावना :-

पाणी म्हणजे जीवन पाण्याला मानवी जीवनात अनादिकाळापासून विशेष महत्त्व प्राप्त झालेले आहे. वेगाने कमी होत असलेले उपलब्ध पाण्याचे साठे आणि याचा परिणाम म्हणून पाण्याची वाढती मागणी हा खरा देशापुढे गंभीर चिंतेचा व चिंतनाचा विषय बनला आहे.

पाणी एक व्यापारी वस्तू मानायची ? की सर्वांना उपजिविकेची सुरक्षितता मिळवून देण्याचे महत्त्वाचे साधन? हा खरा प्रश्न आहे. पाण्याची अर्थशास्त्रीय दृष्ट्या किंमत आणि तुटवडा मूल्य या गोष्टी महत्त्वाच्या आहेत. भौगोलिक दृष्ट्या पाण्याचे अनन्य साधारण महत्त्व लक्षात घेता पाण्याच्या भौगोलिक, सामाजिक व आर्थिक मुल्यांचा प्राधान्याने विचार व्हायला पाहिजे. मानवी जीवन व पर्यावरण रक्षणासाठी आवश्यक असलेले पाणी पुरवून झाल्यावर इतर पाण्याचा वापर मात्र आर्थिक वस्तू किंवा व्यापारी वस्तू म्हणून केला जाऊ शकतो असे राष्ट्रीय जलघोरणात सरकारने स्पष्ट केले आहे. मात्र या तरतुदीचा गैरवापर केला जाऊन फक्त पाण्याचा बाजार उभा केला जावू शकतो.

अन्न, वस्त्र, निवारा, आरोग्य, शिक्षण आणि संरक्षण ह्या मानवाच्या मूलभूत गरजा आहेत. त्यापैकी अन्नाची गरज पूर्ण करण्यासाठी पुरेसे अन्नधान्योत्पादन होणे व त्यासाठी जमिनीला योग्य पाणी पुरवठा करणे महत्त्वाचे आहे. पाऊस पडला तरच अन्नधान्य उत्पादन होण्याची शक्यता असते. त्यासाठी पाण्याचे नियोजन करणे महत्त्वाचे आहे. आपल्या देशात अमेरिकेच्या तुलनेत तिप्पट पाणी आहे. जगाचा विचार करता पाण्याच्या उपलब्धतेच्या बाबतीत भारताचा जगात पाचवा क्रमांक आहे. (वाझील, रशिया, चीन, कॅनडा) मोठ्या प्रमाणात पाऊस झाला तरी त्या पाण्याचा कार्यक्षम रित्या

ication, New
es", Himalaya
ransition, 2nd
शन, पुणे, क.

ना तोटा' या
विशेष प्राधान्य.
त संशोधनार्थी
नावश्यक आहे.
N नुसार

Geographical Study of Population Density in Western Maharashtra Region (M.S.)

Dr. Suryakant S. Pawar

Research Guide, Department of Geography Shivaji Mahavidyalaya, Renapur, Dist-Latur.

Abstract:

Population geography is sub branch of human geography, density is a major characteristics of population, its play important role in population distribution, growth as well as strain on basic facilities. In the present study an attempt has been made to analyse of population density of Western Maharashtra region according a 2011 census. The present study is based on secondary data; secondary data has been collected by district census handbook of Study region districts. The aim of the present paper is to study and analysed spatial variation of population density in Western Maharashtra region. Population density of the study region was continuously increases at 1991 to 2011, according to 2011 census the population density of western Maharashtra region was about 403 persons.

Keywords: Population, Density, Growth

Introduction:

Population is effective resources of nation it's indicates social, economic & cultural improvement characteristics. population geography is a branch of Human Geography. Population play significant and effective role in nation development. Population topic always dynamic that's why the resource availability and utilization pattern are closely associated with socio-economic and socio-cultural development. These characteristics are mainly depending upon physical and cultural environment of the region. Population density is the number of persons inhabited per square kilometre of the area. Population growth is directly dependent on population density the population density has continuously changed in space and time with migration and varying rates of population growth. Comparatively demographic study has been included the factors of population density, pattern, composition these characteristics is significant for understanding for planning at the local and regional level.

Objective:

The objective of the present paper is to study and analysed spatial variation of population density in western Maharashtra region.

Study Area:

The Western Maharashtra region is located in the southern part Maharashtra state, extends between 15° 45" North to 19° 24" North latitudes and 73° 19" East to 76° 15" East longitudes. It extends about 267 km. from east to west and 357 km. from north to south. This region is bounded by Konkan region from west sides, Nagpur region from North side, Marathwada region from Northeast side, Karnataka state from south and southeast side. It covers an area of 57,235 Km². and in the region of about with comprise five district these are Pune, Sangli, Satara, Kolhapur, Solapur and its includes 58 tahsils.

Database and Methodology:

Present paper is based on secondary data, secondary data has been collected in various sources which includes published and unpublished books, district census handbook of study regions district in 1991, 2001 and 2011, socio-economic review, statistical abstract etc. Collected data is processed and presented in the form of tabular and graphical method.

Following formula has been used to calculate population density,

$$\text{Population Density} = \frac{\text{Total population}}{\text{Total Geographical area (in Sq. km)}}$$

Spatial Variation of Population Density:

In the present study an attempt has been made to analyse of population density in western Maharashtra region of Maharashtra State; according to 1991, 2001 & 2011 census view of competitively. Table no.1. shown spatial variation of population density from 1991 to 2011. The average density of region was about 284 persons in 1991, 346 in 2001 and 403 in 2011 census, it was increased 119 people in 2011 compare to 1991 data. Spatial distribution of population density of the study of study region is diversely distributed in all over the region. In 1991 the highest density was shown in Kolhapur district with 389 persons and lowest in Solapur district for 217



A GEOGRAPHICAL STUDY OF SEX-RATIO IN SOLAPUR DISTRICT (M.S.)

Suryakant S. Pawar

ABSTRACT

Population Geography has study growth of population, its distribution, Density, religious and linguistic composition, Sex-ratio, age composition, migration, standard of living and economic structure etc. we also study adaption of various human groups to their respective environment in different parts of the world. The aim of present paper is study of sex ratio in Solapur district of Maharashtra state. the present paper based on secondary sources of data. The secondary data obtained from district census handbook, district gazetteers, district statistical department, District Socio-economic Review and district statistical abstract of the study region etc. Collected data is processed and presented in the forms of tabular and graphical method. According to the 2011, census figure the total population of Solapur district was 43,17,756 out of total population 22,27,852 are males and 20,89,904 are female. Thus the overall sex ratio of Solapur district is 933 females per 1000 of males.

Key Word: Sex composition, Sex ratio, Literacy, Migration.

Introduction

Sex composition is a major characteristics of population, it is the most basic since influences, the marriage and growth rate of population. Some other important population characteristics, like migration and occupation structure are also influenced by the ratio between the sexes. Since the roles of the two sexes are partly contrasting and partly complementary. The study of their ratio is of considerable interest to the population geographers. "Sex-ratio is an index of socio-economic conditions, revealing in an area and is useful tool for regional analysis". Sex-ratio also influences the volume and nature of social need and employment pattern. In India, sex-ratio is generally expressed in terms of number of female per 1000 males. sex-composition various both in time and space. The variations in sex ratio are to a large extent determined by three factors such as, sex-ratio at birth, differentials in mortality rate in two sexes and selectivity among migrants.

Objectives:

- To examine and analyze the temporal changes of Sex-ratio in Solapur district.

- To study rural-urban variation of Sex-ratio in Solapur district.
- To study Special variation of sex-ratio in Solapur district of Maharashtra State.

Data Base and Methodology

The present paper is based on Secondary Source of data. The data is collected from various sources which includes both published and unpublished books, government publication and private publications. Secondary data has been obtained from district census handbook, Census of India, District gazetteers, district statistical department, socio-economic review and district statistical abstract of Study region district. Collected data is processed and presented in the forms of tabular and graphical methods. Sex-ratio has been calculated by total number of females divided by total number of males multiply thousands.

Following formula has been used to calculate by sex ratio

$$\text{Sex ratio} = \frac{\text{Total number of females}}{\text{Total number of males}} \times 1000$$



Study of Vitamin D Status in the Western Coastal Region of Vasai-Virar City Municipal Corporation(M.S.), India

Dr. Umakant P. Kamble

Dept. of Zoology,

Shivaji Mahavidyalaya,

Renapur, Dist. Latur

2

Research Paper - Zoology

ABSTRACT

Vitamin D deficiency is becoming very prominent in this area. However, it was observed that very few physicians especially family physicians seemed to be aware of this fact as it is rarely referred. Even the patients visiting pathology laboratories were found to be rarely serious or aware of the consequences of vitamin D deficiency. The objective of this study and analyze the vitamin D levels in the population of VVCMC (Local Population)

Keywords : Vitamin D, deficiency, western, coastal region

Introduction :

Vitamin D refers to a group of fat-soluble secosteroid responsible for enhancing intestinal absorption of calcium, iron, magnesium, phosphate and zinc. In humans, the most important compounds in this group are vitamin D₃ also known as cholecalciferol and vitamin D₂ ergocalciferol. Cholecalciferol and ergocalciferol can be ingested from the diet and from supplements. Very few foods contain vitamin D; synthesis of vitamin D (specifically cholecalciferol) in the skin is the major natural sources of the vitamin. Dermal synthesis of vitamin D from cholesterol is dependent on sun exposure (specifically UVB radiation). Vitamin D is photosynthesized in the skin on exposure to UVB rays. Sun exposure alone ought to suffice for vitamin D sufficiency. However, vitamin D deficiency is widely prevalent despite plentiful sunshine even in tropical countries like



Antibacterial Activity of Lactoferrin : A Review

Dr. Umakant P. Kamble

Dept. of Zoology,
Shivaji Mahavidyalaya,
Renapur, Dist. Latur

Research Paper - Zoology

ABSTRACT

Milk is a highest quality source of well balanced nutrients and also displays a range of biological activities that affects digestion, metabolic responses to absorbed nutrients, growth & development of specific organs, and resistance to disease. Bioactive proteins such as lactoferrin (Lf) have been isolated over decades ago and showed their importance in stimulating immune system in the infants through breast milk in addition to immunoglobulin present in the milk. In addition to immune system stimulation, Lf also has antibacterial activity and antioxidant activity in infant and adult of human as well as animal health. In this review paper, antibacterial properties of lactoferrin have been discussed along with its future perspectives.

Introduction :

Milk, the only complete food or nutritious product, provides all the necessary nutrients to all the mammals including human from neonate age to adults due to its diverse content of nutritional compounds such as fats, carbohydrates, proteins, peptides, vitamins, growth factors, etc. Apart from nutritional compounds of milk, bioactive compounds are present in the milk in minor amounts as compared to other nutritional compounds. Research is in progress to extract these bioactive compounds on a large scale at minimum cost globally.



RESEARCH ARTICLE

Effect of *Trichoderma Spp.* as a Bio-control Agent on Cereal Crop Plants

S. G. Yadav

Department of Botany, Shivaji Mahavidyalaya, Renapur Dist. Latur. Pin- 413527 (Maharashtra, India)

Corresponding Author: dryadavsg@gmail.com

Manuscript Details

Manuscript Submitted : 19/07/2020
Manuscript Revised : 20/08/2020
Manuscript Accepted : 12/09/2020
Manuscript Published : 15/09/2020

Available On

<https://plantaescientia.com/ojs>

Cite This Article As

Yadav S. G. (2020). Effect of *Trichoderma Spp.* as a Bio-control Agent on Cereal Crop Plants. *Pl. Sci.* 2020; Vol. 03 Iss. 05:65-68.

Copyright



© The Author(s). 2020. Open Access
This article is distributed under the terms
of the Creative Commons Attribution
4.0 International License.
<http://creativecommons.org/licenses/by/4.0/>

Indexed In

[Crossref](#), [Index Copernicus International \(ICI\)](#), [Directory of Research Journal Indexing \(DRJI\)](#), [Scientific Indexing Services \(SIS\)](#), [CiteFactor](#).

ABSTRACT

Trichoderma is a Deuteromycetous fungus with hyphae long, creeping, conidiophores erect, phialidic, having conidial heads. *Trichoderma* species produces a chemical, trichodermin; it is the sesquiterpenoid acting as a bio-control agent on the principal of myco-parasitism, antibiosis and competition to control soil borne plant pathogens. The phytotoxic effect was screened by treating cereal crop seeds with culture filtrate of *Trichoderma* species, the effect of culture filtrate was measured in terms of seed germination percentage and results were compared with control one. The obtained results shows percentage of germination in treated seeds was more than the control. The culture filtrate of *Trichoderma harzianum* showed superior effects (95-97%) than that of *Trichoderma viridae* (90-95%) and *Trichoderma virens* (86-92%) on the seed germination of selected cereal crop seeds.

Keywords: Culture filtrates, *Trichoderma*, Cereal crop seeds.



Effect of Nutritional source on growth of *Fusarium oxysporum f.udum* causing wilt of Red gram (*Cajanus cajan*)

Yadav S.G.

Department of Botany,
Shivaji Mahavidyalaya Renapur, District – Latur (M.S.) India

Article Info

Received: 02-08-2020,

Revised: 06-09-2020,

Accepted: 18-09-2020

Keywords: : *Fusarium oxysporum f.udum*, Phosphate sources, *Cajanus cajan* L.,

Abstract

The present investigation deals with the effect of three phosphate sources on the growth of *Fusarium oxysporum f.udum* causing wilt of Tur (*Cajanus cajan*) belongs to family Fabaceae is the most important grain legume of rain-fed agriculture in semi-arid tropics. The nutritional source (phosphate sources) like ammonium dihydrogen orthophosphate, potassium dihydrogen orthophosphate and sodium dihydrogen orthophosphate were used against the pathogen. Result was recorded that 0.1% concentration of ammonium dihydrogen orthophosphate and sodium dihydrogen orthophosphate reduced the growth while potassium dihydrogen orthophosphate stimulated the growth of *Fusarium oxysporum f.udum*

INTRODUCTION

Cajanus cajan L.(Tur) has been cultivated in ancient Egypt, Africa and Asia since prehistoric times, and was later introduced to America. Now it acclimatizes in several tropical countries. The major producer is India contributing about 90% of world production. It is a rich source of vitamin A, B-6, C, D, (Ball, 2006; Koren, 2007). It is considered to be a rich source of dietary fibre, total carbohydrates, proteins also with calcium, cobalamin magnesium, potassium sodium minerals (Weaver and Heaney, 2006). Red gram it is severely affected by the various fungal, bacterial and viral diseases. The wilt is caused by *Fusarium oxysporum f.udum*. Now a day's disease management is made necessary for high yield of production. Each microorganism requires proper nutritional source for their growth. The earlier workers studied the growth of various plant pathogens in different food sources, the present study deals with the effect of different phosphate sources on the growth of *Fusarium oxysporum f.udum* to know the nutrition

requirement will help to control the growth of the pathogen.

MATERIALS AND METHODS

The infected material of tur (wilt) were collected from the different localities of Renapur area during the period of 2017 to 2018. The infected plant material were brought to the Botany laboratory and isolated the pathogen on Czapek Dox Agar (CDA) medium, the pathogen is identified with the help of standard mycological literature (Subramanian, 1971), pure culture was maintained at $23 \pm 2^\circ\text{C}$ in BOD incubator for further study. For the study three phosphates sources like ammonium dihydrogen orthophosphate, potassium dihydrogen orthophosphate and sodium dihydrogen orthophosphate were used at 0.1% in Czapek Dox Agar (CDA) medium, 4mm freshly growing 8days old pure culture of *Fusarium oxysporum f.udum* grown on agar medium and incubated at $28 \pm 2^\circ\text{C}$. The plates without source treated as control. After the 8days of incubation linear growth of mycelium was measured at different intervals for five days.

The Promoting Effect of the Extract of Blue Green Alga *Nostoc muscorum* (Agardh ex Born. et Flah. 1888) in Seed Germination of Groundnut (*Arachis hypogea* L.)

Yadav S. G.

Department of Botany Shivaji Mahavidyalaya Renapur Dist. Latur 413527 (MS) India

Abstract: Algae are also considered as rich source of fats, vitamins, minerals and antimicrobial compounds. It was also observed that the algae are found to be stimulatory for the seed germination and plant growth. In present work extracts of blue green alga *Nostoc muscorum* in different solvents were used to study their effects on seed germination of ground nut (*Arachis hypogea* L.). The hot water extract showed enhancing effects in germination and development of shoot and root. The algal extracts prepared in chloroform also shown stimulatory effects on seed germination. The extracts in Petroleum ether and Toluene inhibited seed germination. The present investigation reveals that blue green alga *Nostoc muscorum* contains certain growth promoting substances which enhances seed germination. Use of hot water algal extract can be recommended to the farmers as ecofriendly agriculture practice for attaining better germination and growth which yields crop production.

Keywords: Algal extracts *Nostoc muscorum*, seed germination, development, and groundnut

1. Introduction

Algae are important members of plant world and several of them are significant to man in many ways. They are beneficial in the field of Agriculture, Industry, Medical Science, Space research, Bio-diesel production and Bioremediation. They gain importance in the modern time not only as an alternative potential source of protein for man but also as the primary source of food for aquatic animals. Algae are considered as rich source of fats, vitamins, minerals and antimicrobial compounds. Algae contain different bioactive compounds and these bioactive compounds have certain effects on seed germination and plant growth. The biochemical present in algae improves seed germination, seedlings and development and increase plant tolerance to environmental stress. In India works on algal extracts and seed germination has been started since 1964 by Gupta. He observed that Paddy seeds treated with algal extracts shows stimulatory effects. Fouly et al. (1992) AND Mahmood (2001) found that green algae contains high percentage of macronutrients, considerable amount of micronutrients and amino acids. The main objective of present investigation was to study the effect of extracts of blue green algae on seed germination. A blue green alga like *Nostoc muscorum* found dominantly in back water of Bhandarwadi reservoir at Kamkheda. The alga in pure form was collected and used for making algal extracts in different solvents. Groundnut (*Arachis hypogea* L.) is commonly grown as oil seed crop in Renapur tehsil of Latur district in the Marathwada region of Maharashtra. The effects of algal extracts in different solvents of *Nostoc muscorum* on groundnut seed germination was studied out.

2. Materials and Methods

a) Collection of algal material and preparation of fine powder:

The blue green alga *Nostoc muscorum* is found very dominantly in the backwater of Bhandarwadi minor irrigation project at Kamkheda in Renapur tehsil of Latur district in the Marathwada region of Maharashtra. The alga was collected in a huge quantity from a village Kamkheda, backwater area of Bhandarwadi irrigation project in March 2018 and identified with the help of standard literature on algae. The after identification, algal samples washed carefully and thoroughly with fresh water to remove unwanted impurities, epiphytes and adhering sand particles and mud. The algal samples placed on filter paper sheet in shade for air drying at room temperature for 4 days. Shade drying of algal material is followed oven drying at 40°C for 8 hours. After drying fine powder was prepared in grinder and stored in acid washed air tight bottles.

b) Preparation of algal extracts in different solvents :

The algal extracts in different solvents such as cold water, hot water, acetone, methanol, chloroform, petroleum ether and toluene were prepared. For the preparation of cold water extract 1 gm of fine algal powder was taken in 100ml conical flask. 20ml cool sterile distilled water added to it, flask plugged with cotton and kept it overnight. The next day it has been filtered through Whatmann filter paper No.1 and coloured filtrate obtained and used for soaking of seeds. The hot water extract was obtained by taking 1 gm of fine algal powder in 100ml conical flask. 50ml sterile distilled water added to it and boil for 10 to 15 minutes, cooled it and filtered. The filtrate obtained used for soaking of seeds. The extracts in acetone was prepared by taking 1 gm. of fine algal powder in 100ml conical flask. 50 ml sterile distilled water added to it and boil for

Volume 9 Issue 11, November 2020

www.ijsr.net

Licensed Under Creative Commons Attribution CC BY

Influence of Mustard seed extract on biomass and photosynthetic pigments in *Mougeotia quadrangulata* Hassall, 1843

Yadav S.G.

Department of Botany, Shivaji Mahavidyalaya Renapur Dist.Latur 413527 (MS), INDIA

Abstract

The present investigation is carried out to study the effect of Mustard seed extracts with different concentrations from 0.5 to 2.0% on green filamentous alga *Mougeotia quadrangulata* for 10 days; algal growth weight and the chlorophyll contents were decreased during investigation period.

Keywords: Mustard, seed extract, different concentrations.

Introduction:

The rapid growth of nuisance of algal growth causes a number of problems in water. In the back water area of Bhandarwadi Minor Irrigation Project algae are growing very rapidly and the control on the growth of algae is very difficult by using the same other methods. The application of barley straw for controlling algae has been tested in wide range in many countries throughout the world. (James,1994;Wells et al.1994;Baret,1999).The tremendous growth of algae is controlled by using chemicals has been carried out by Lakshminarayan et al.(1965).The blue green algal control through the physical, chemical and biological methods has been studied by Lakshminarayan et al.(1972) in water supply and man-made reservoir. The present investigation is carried out to see the effect of Mustard seed extract on algal growth and the chlorophyll contents. Mustard (*Brassica juncea* L.) belongs to family Brassicaceae.Glucosinolates (GLS) are a group of secondary metabolites found almost exclusively in Brassicaceae and they are well known for their toxic effects in man and animal at high doses. According to Duke, (1983) some allyl cyanid and trace of dimethyl sulphide are found in the seeds of mustard. The effect of higher plant extract on algae and vice-versa have been studied. (Mehta et al.(1999),Mini et al.(1999),Shakuntala,(1991),Srivastava et al.(1985),Kushwaha and Gupta, (1972),Gupta and Shukla (1969)The antifungal properties of flowering plants have been reported by Sing and Madhu (1978)Mogill et al.(1984) studied leaf extract of Periwinkle on *Cladophora crispata*, effect of *Azadiracta indica* bark and root extract by Chandrakala and Vidyavati (1987,1988) and Mustard seed extract effect on *Cladophora* sp.has been worked out by Raval and Gajuria (2003).

MATERIALS AND METHODS:

For the present investigation the green filamentous alga *Mougeotia quadrangulata* was collected from the Bhandarwadi Minor Irrigation Project back water area at a village Kamkhoda in Renapur tehsil of Latur district in the Marathwada region of Maharashtra. The algal sample was collected in acid washed collection bottles and the material was washed with distilled water and cleaned off other algae, impurities and debris.Fresh healthy filamentous were selected for the experiment. Four sets including control were prepared with different concentration series of water extract of Mustard seeds (0.5% to 2.0%) with duplicates. The period of experiment was for 10 days. The seeds of Mustard were soaked for 24 hours before the preparation of extract.pH ranged from 5.5 to 6 of the extract. The observations made for algal fresh weight and chlorophyll contents. Total chlorophyll estimated was estimated by DSMO method (Short and Liem, (1976).

Filamentous Blue greens from the Marathwada Region of Maharashtra

Yadav S.G

Department of Botany Shivaji Mahavidyalaya Renapur Dist.Latur (413527) Maharashtra, India

Abstract: While working on algal taxonomy of Bhandarwadi minor irrigation project during January 2018 to December 2019, the author came across some interesting members of filamentous blue green algae. A total of 62 taxa under 7 genera have been encountered from the Bhandarwadi minor irrigation project for first time. The present paper deals with the systemic enumeration of *Oscillatoria* (27), *Phoenidium* (14), *Lynghya* (14), *Schizothrix* (2), *Symploca* (1), *Microcoleus* (2) and *Hydrocoleum* (1).

Keywords: Filamentous, Blue greens, Marathwada, Maharashtra.

INTRODUCTION

In the present century great advances have been made in the investigations of fresh water algae, marine algae and soil algae in many parts of the world and particular attention has been paid to their taxonomy, ecology and applied aspects. Review of literature reveals that, studies on algal taxonomy in abroad and in India have been done extensively by many research workers. India has a very rich and diversified algal flora. In Maharashtra tremendous work has been done on algal taxonomy by various workers. In Marathwada region of Maharashtra except few reports (Ashtekar 1979a, Andhale 2008, Jadhav 2007, Talekar 2009) very rare attention has been paid towards algal taxonomy, although the climatic conditions of Marathwada region are most suitable to grow algae luxuriantly and in diverse form, therefore to fulfil this lacuna, it has been decided to work on algal taxonomy of Bhandarwadi minor irrigation project in Marathwada region of Maharashtra.

MATERIALS AND METHODS

The present investigation was carried out for first time from the Bhandarwadi minor irrigation project, constructed on Rena River, just 15 kms away from the Renapur town, in the Latur district of Marathwada region of Maharashtra. The algal samples were collected during January 2018 to December 2019. The algal collections were made regularly from selected sampling stations. Acid washed collection bottles were used for the collection of algal samples. On return to the laboratory from field, the collections were carefully observed under the microscope and important points were noted. All collections were preserved in 4% commercial formalin added with 5% glycerine. Identification of algal taxa was performed by referring to the standard literature on algae, Desikachary (1959), Forest (1954), Prescott (1951), Smith (1950).

SYSTEMIC ENUMERATION

OSCILLATORIA Voucher, 1803

Oscillatoria amoena (Kuetzing) Gomont

Thallus blue-green; Trichome straight or curved, tapering towards the ends, with slightly constricted at the cross walls, cross walls granulated; cells 3-3.5 μ in diameter, 2.5-3 μ long; end cell globose, capitate with calyptra.

Oscillatoria amoena (Kuetzing) Gomont v. *non-granulata* Ghose

Thallus blue-green; trichomes straight or curved, tapering towards the ends, with slight constrictions at the cross walls, not granulated; cells 3-4.5 μ in diameter, 2.2- 2.5 μ long; end cell globose, capitate, with a calyptra.

Oscillatoria animalis Agardh ex Gomont

Thallus blue-green; trichomes straight, curved or bent at the ends, slightly constricted at the cross walls, not granulated at the cross walls, briefly attenuated at the ends; cells slightly shorter than broad, seldom longer, 3-4.8 μ in diameter 2-4.5 μ long; end cell conical, without a cap or a calyptra.

Oscillatoria annae Van Goor

Thallus blue-green; trichomes long, constricted at the cross walls, not attenuated at the ends; cells much shorter than broad, 5-5.5 μ in diameter, 1-1.5 μ long; end cell rounded, without a cap or a calyptra.

Oscillatoria amphibia Ag. ex Gomont



Studies on Fluoride contents and Algal diversity of Mahapur and Saai Reservoir Latur, Maharashtra

Yadav S.G

Department of Botany, Shivaji Mahavidyalaya, Renapur Dist. Latur; 413527 (M.S.)

Abstract: Mahapur and Saai, both the reservoirs are constructed on Manjra River in Latur tehsil in the Marathwada region of Maharashtra. The Mahapur reservoir is just 10kms and Sai reservoir is just 08 kms away from the Latur town. The water bodies are, mainly used for drinking and irrigation purposes. The study was carried out over a period of one year from March 2018 to February 2019 to examine the different concentrations of fluorides and algal diversity at selected two sites. From findings an average concentration of fluoride in Mahapur water body at both sites was 0.34mg/lit., and in Saai water body it was 0.32mg/lit, at site S1 and 0.35mg/lit, at site S2. (Table.1) The fluoride concentration was maximum in the month of May and it was minimum in the month of December at each site. As far as algal diversity concern a total of 182 taxa under 63 genera were encountered from both the reservoirs. The present paper deals with only the common taxa (82) under (35) genera encountered from both the reservoirs (Table 2) belonging to chlorophyceae cyanophyceae euglenophyceae and xanthophyceae. The members of chlorophyceae were found dominant.

Key words- Fluoride, Mahapur, Saai reservoir, Manjra River, Renapur.

INTRODUCTION

The algal diversity from different aquatic habitats were extensively studied in India. In present century great advances have been made in the investigations of fresh water algae marine algae soil algae and particular attention has been paid to their taxonomy, ecology, and applied aspects, but very few workers have paid attentions on algal diversity in Marathwada region of Maharashtra, Ashtekar (1980), Andhale (2008), Talekar (2009), Yadav (2010) although the climatic conditions are most suitable to grow algae luxuriantly and in diverse form and hence, it has been decided to study the concentration of fluorides and algal diversity in water body of Mahapur and Saai reservoirs.

Water is the key element in socio-economic development of Nation. Water cannot be created though what ever technical advancements we made. It is the nature's free gift to the mankind race. Which often contains biological or chemical agents, detrimental to health? One of such chemical contents is fluoride. Fluoride is the most electronegative of all chemical elements, highly reactive so never encountered in nature in the elemental gaseous form but only in combined form.

It is well known that the excess fluoride intake is responsible for dental and skeletal fluorosis. The problem of fluorosis has been known in India for a long time. The disease earlier called "mottled enamel" was first reported by Vishanathan (1935) to be prevalent in human beings in Madras Presidency in 1933. Mahajan (1934) reported a similar disease in cattle in certain parts of old Hyderabad state. However, Shortt (1937) was the first to identify the disease as "fluorosis" in human beings in Nellore district of Andhra Pradesh. The fate of fluoride in the soil environment and groundwater is of concern for several reasons. It is generally accepted that fluoride stimulates bone formation (Richards et al., 1994) and small concentration of fluorides have beneficial effects on the teeth by hardening the enamel and reducing the incidence of caries (Fung et al. 1999).

Fluoride is present in the teeth, bones, thyroid gland and skin of animals. It plays an important role in the formation of dental enamel and normal mineralization in bones but can cause dental fluorosis and adversely affect the central nervous system, bones, and joints at high concentrations (Agarwal et al., 1997).

Fluorosis is caused by high fluoride intake from drinking water, food, air, medicines and cosmetics (Gupta et al., 1994). Fluorides also reduced the chlorophyll pigments and protein contents in the plants (Malik and Arya, 2008).

MATERIAL AND METHODS

The samples of water for the analysis were collected freshly early in the morning on dated 7th in each month from March 2018 February 2019. Fluoride content was estimated by APHA (1989). The algal samples were collected from the selected sites of reservoirs in acid washed collection bottles. The samples were immediately brought to the laboratory and preserved in 4% formalin added with 5% glycerin for further taxonomic investigations. The algae were identified under light microscope by referring standard monographs and literature, Prescott (1951), Desikachary (1959), Philipose (1967).

**WATERLAND: A CLASSIC EXAMPLE OF CONCERN OF HISTORY**

MANOJ SHIVRAJ BHUJBAL
Assistant Professor
Dept. of English
Shivaji Mahavidyalaya,
Renapur.

ABSTRACT

Graham Swift is among the foremost contemporary British writers whose novels are translated in many languages and widely read by students and general public alike. He is famous for employing various narrative techniques in his novels. In the novel *Waterland* he employed Historiographic Metafictional narrative technique which is unique in many ways. *Waterland* novel shows authors deep concern regarding history. In this novel he gives equal importance to various kinds of histories such as personal history, family history, local history of town, Nations history, World history and history of Nature alike.

Keywords: History, Narrator, Defense, Quest, Concern, Causes and Consequences

"that history is a yarn.....History itself: Grand Narrative, the filler of vacuums, the dispeller of the fears of the dark?" (Waterland 68)

Above quotation from the novel *Waterland* tries to define the function of history as a yarn as well as the filler of vacuum and point out the extraordinary quality of history itself as a grand narrative. *Waterland*, this Guardian Fiction Prize winner novel is written by the Booker Prize winner author Graham Swift. Along with *Waterland* he is the writer of the remarkable novels *The Sweet Shop Owner*, *Shuttlecock*, *Out of this world*, *Ever After*, *Last Orders*, *The Light of Day*, *Tomorrow*, *Wish You Were Here* and short story book *England and Other Stories*.

Waterland novel is the classic example of concern of history, defense of history and inescapability of history. It is a story of a history teacher Tom Crick, whose personal life and professional life mingled with each other and resulted in the state of crisis. Tom is accused for teaching his-story instead of official History syllabus in his classroom. Situation get more worse when his wife, Mary arrested and further admitted in asylum for child snatching act in Safeways in Lewisham. This act of Mary forced Tom to retire early from his job. It is not only Tom's personal loss but also loss of History subject. School authority decided to close History department and history subject from school curriculum. Tom resisted school authorities decision. He tries to defense history as Sir Philip Sydney did in his work *An apology for Poesy* for Poetry. He tries to convince his students the importance of History while doing so he tells students his own history, history of two families the Cricks and the Atkinsons.

**NARRATIVE TECHNIQUES IN THE NOVELS OF GRAHAM SWIFT****MANOJ SHIVRAJ BHUJBAL**

Assistant Professor
Dept. of English
Shivaji Mahavidyalaya,
Renapur.

ABSTRACT

Narrative techniques enrich the effectiveness and intrigue of the story. Different narrative techniques and their complete understanding improves the reader's perspectives of the novel. Narrative structure involves narrator, point of view, setting, plot, theme, characterization, and style. Graham Swift's narrative techniques create particular impact on reader's mind. Shuttlecock, Waterland, Last orders, Eyes After, Out of This World, Tomorrow The light of Day, and Wish you were Here all these novels possess various narrative techniques which spellbound the reader.

Keywords: Narrative, Narrator, Narrative techniques, Narratology

The history of narrative may be traced back to the dawn of consciousness on the planet. The discipline of telling a story is known as 'narrative', and it existed long before it was given a name. It comes so effortlessly to us that we begin to communicate our emotions through language. As soon as we begin to share our thoughts, feelings, experiences and observations, a narrative emerges. It is a form of art, which assists the storyteller in telling stories in a compelling and artistic manner. It improves the effectiveness and intrigue of the story for the reader to comprehend. 'Narratology' is the systematic study of narrative and its various aspects.

The term 'narrative' refers to a story or series of stories. It derives from the Latin verb 'narrare' which means 'to recount' and it connected to the adjective 'gnarus' means 'knowing' or 'skilled'. Eventually, it is derived from the proto indo European root; gno- means to 'know'. The word 'story' may be used as a synonym for 'narrative' and it also refers to the sequence of events portrayed in a narrative. Rimmon Kenan rightly says that, "a story is a construct created in a suitable format that describes a sequence of fictional or non-fictional events in the form of written, spoken, poetry, prose, images, song, theatre or dance gossip, newspaper, ballet, painting etc" (Kenan 55-70).

Novels, short tales, poetry, blog entries, and other types of writing are all regarded to be creative. Only the style of writing changes, the purpose of presenting a narrative stays unchanged. Narrative methods are strategies used by an author for effective narrative. It includes how the author portrays the plot's progression as well as physical and spiritual descriptions of the characters.

**'THE ROLE OF POLITICS IN THE PLAYS OF HAROLD PINTER'****DR. R. C. JADHAV**H.O.D. of English,
Shivaji College,
Renapur.**ABSTRACT:**

Harold Pinter's plays are unhappy is a gross understatement. Most critics have labeled his characters "sinister" and "malevolent." The actions within his plays are bleak, dire, and purposely without purpose. The audience leaves bewildered with a queasy feeling – an uneasy sensation, as though you were supposed to do something terribly important, but you can't remember what it was. You leave the theatre a bit disturbed, a bit excited, and more than a bit unbalanced. And that's just the way Harold Pinter wanted you to feel. Critic Irving Wardle used the term, "Comedies of Menace" to describe Pinter's dramatic work. The plays are fueled by intense dialogue that seems disconnected from any sort of exposition. The audience rarely knows the background of the characters. They don't even know if the characters are telling the truth. The plays do offer a consistent theme: domination. Pinter described his dramatic literature as an analysis of "the powerful and the powerless." Though his earlier plays were exercises in absurdity, his later dramas became overtly political.

Keywords: Play Wright And Human Right Activist, Challenging Theatre, Politics, Political Debate Contemporary Drama

Introduction:

Harold Pinter (1930-2008) was an English Nobel Laureate playwright, screenwriter, director and actor. One of the most influential modern British dramatists, his writing career spanned more than 50 years. His best-known plays are *The Birthday Party* (1957), *The Homecoming* (1964), and *Betrayal* (1978). Pinter's career as a playwright began with a production of *The Room* in 1957. Pinter's celebrity in recent times has been as much acknowledged for his contribution to political debate as to his involvement with contemporary drama. *The Independent* newspaper in December 1998 described Pinter as 'playwright and human rights activist' (Derbyshire, 2001c: 232) and it seems that his latter role is most certainly assisted by his fame as the former. Harold Pinter seemed more intent on making moral pronouncements on current affairs than producing challenging theatre in the latter years of his life. However, Pinter's position regarding the politics in his plays has constantly changes. He claimed in 1989 that he had always been 'a political playwright of a kind'. This paper seeks to explore the different ways Pinter explores politics in his writing.

The main concern of this research paper is the role of politics in Pinter's plays. Despite being a prominent playwright, Pinter's celebrity in recent times has been as much acknowledged for

१०. तुकारामांच्या अभंगातील निसर्ग आणि शेती विचार

प्रा. डॉ. चंद्रकांत शेरखाने

मराठी विभाग, शिवाजी महाविद्यालय, रेणापूर, वि. लातूर.

संत तुकारामांची अभंगवाणी हे महाराष्ट्राचं अमूल्य असं वैचारिक धन आहे. अगदी सामान्यातील सामान्यांपासून ते विद्वानापर्यंत तुकारामांचे अभंग सर्वांनाच आनंदाचा ठेवा वाटतात. लोकमानसात इतका दृढपणे रुजलेला दुसरा संतकवी नाही असं म्हटलं तर वावगं ठरणार नाही. तुकारामांच्या प्रत्येक अभंगात त्यांचा जीवनविषयक विचार प्रकट झाला आहे. प्रत्येक अभंगातून त्यांचं व्यक्तित्व स्पष्टपणे उमटलं आहे. 'तुका म्हणे होय मनासी संवाद | आपुलाचि वाद आपणासी' स्वतःशी संवाद करणारे तुकोबा समाजाशी सतत बोलत राहतात. लोकजीवन त्यांनी न्याहळलं, समाजातील धले बुरें अनुभव त्यांनी घेतले. याच अनुभवाची कहाणी त्यांनी अभंगातून सांगितली. ही कहाणी सांगताना तुकोबांच्या विचाररूपी अमृतधारा, समाज मनावर बरसात करीत राहिल्या. तुकाराम केवळ संत नव्हते आणि कवीही नव्हते तर जीवनाचा सूक्ष्म दृष्टीने शोध घेणारे तत्त्वचिंतक होते. म्हणूनच त्यांनी आपल्या कवितांतून जीवन-विचार उत्कटतेने मांडला आहे. या समाजनिष्ठ संतकवींचं त्यांच्या अभंगातून जे दर्शन घडत ते तितकच प्रसन्न तितकच उद्बोधक आणि प्रेरणा देणारं आहे. संत तुकारामांनी अत्यंत साधा - सांप्या आणि व्यावहारिक भाषेत भक्तीची ही अमोघ धारा आणि समतेची शिकवण लोकमानसात प्रवाहित केली. या भक्तीभावाला अनुभवाचे अधिष्ठान आहे. प्रसंगोपात्, उपमा, रूपकं, दृष्टांत यामुळे ही रचना क्लिष्ट, बोजड न वाटता ओघवती झाली आहे.

भंडारा डोंगर हा तुकारामांचा जीवाभावाचा सोबती, आपल्या या सख्यासोबत त्यांनी मनाशी हितगुजं केली. आपली बरीच अभंगवाणी त्यांनी आपल्या या मित्रांसोबत मनमोकळेपणाने प्रकट केली. मुंगीच्या पायातील घुंगरं वाजली तरी ती ऐकू यावीत अशी ईश्वर भक्तीसाठी लागणारी शांतता या भंडाज्याने त्यांना दिली याच डोंगरावर त्यांनी वृक्षवेलीशी संवाद साधला. आखराची किलबिल ऐकली मावळतीचे रंग पाहिले - देहूतून वाहणारी इंद्रायणी पाहिली. चराचर निसर्ग डोळ्यांत साठवून घेतानाच विश्वाभराचे दर्शनही त्यांनी घेतले.

"वृक्षवल्ली आम्हां सोयरी वनचरे |

पक्षीही सुखरे आळविते |

येणे सुखं रूचे एकांताचा वास |

नाही गुण - दोष अंगी येत |"

तुकारामांचा हा मनाला प्रसन्न करणारा आणि रसज्ञ वृत्तीचं, वत्सलतेच दर्शन घडविणारा अभंग आहे. केव्हाही हा अभंग गुणगुणताना मन समाधानानं भरून जातं. वृक्ष, वेली, वनात राहणारे प्राणी आणि सुमधुर गायन करणारे पक्षी हेच आमचे सोयरे आहेत. तुकारामांचं झाडावरचं, वेलीवरचं हे प्रेम आपल्याला प्रेरणा देत. हे सर्व पशु पक्षी माझ्या अगदी जवळचे आहेत. या

पंजीयन संख्या / RNI No. : GUJHE

-CARE Listed

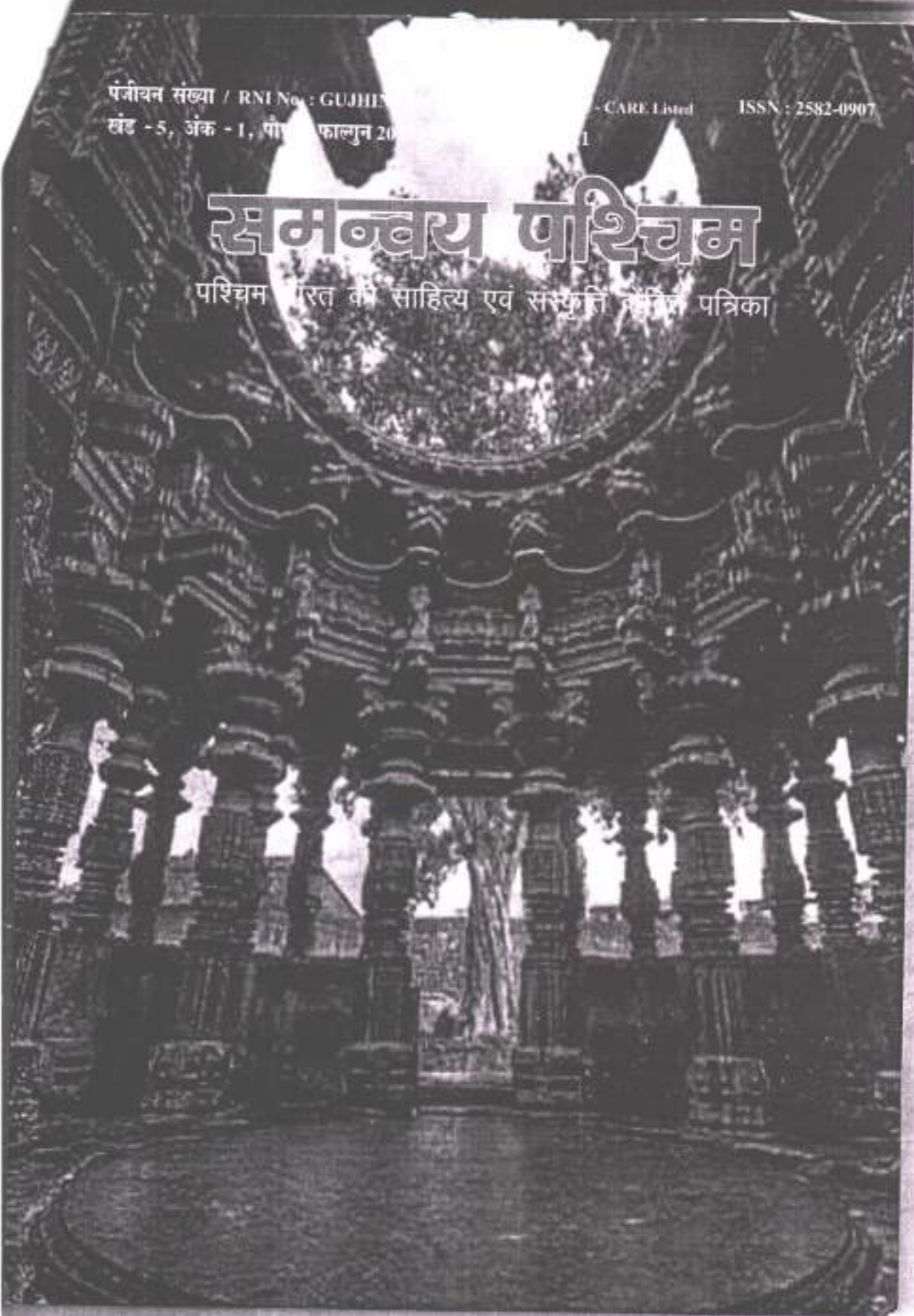
ISSN : 2582-0907

खंड - 5, अंक - 1, पौष - फाल्गुन 20

1

समन्वय पश्चिम

पश्चिम भारत की साहित्य एवं संस्कृति संबंधी पत्रिका



हिंदी के साहित्यिक समीक्षण, संकूल के प्रकांड विद्वान, श्रेष्ठ वैचारिक तथा दूसरी परंपरा के साहित्यशास्त्रकार डॉ. चंद्रशेखर सोनवणे अपने आप में एक प्रतिमान हैं। कर्नाट साहित्य, प्रशिष्य अन्वेषक तथा सीर-सीर संशोधक के रूप में सोनवणे की विद्वाना 'दे' है। माण्डवगढ़ के लक्ष्मर जिले में अंशुम तहसील के अन्तर्गत सोमराग में 04 मार्च, 1931 को आपका जन्म हुआ। अपनी अखंड शान्प्रधानता उन्नावदेही अन्वेषण वृत्ति और ज्ञान की वैज्ञानिकता ने वहाँ की भूमि को प्रकाशमान किया। सादगी भाव व्यक्तित्व आपको पहचान रही है। खैर परिश्रमशीलता से आपकी सद्गुणित सोच का विकास हुआ। स्वतंत्रता का व्यक्तित्व के धर्म होने कारण आपने अध्ययन और लेखन में अपनी स्वतंत्र मुद्रा अंकित की। किशोर अवस्था से ही आपसमाजों विचारों के प्रभाव से आपका व्यक्तित्व विकसित होता गया। श्रेष्ठ दयानंद और उनकी सोच का गहरा प्रभाव आपके व्यक्तित्व पर दिखता देता है। विन्नु सनातनी अर्थसमाजी नहीं बने। वैचारिक दृष्टांत नहीं, समन्वय, संतुलन और सामंजस्य का विवेकी संगम आपके व्यक्तित्व में वसोपुत्र होता है। इसी कारण डॉ. कुशलेखन कथयों आपने नैसर्गिक प्रतिभा का गहरी संकर देखते हैं। आत्मदय, अज्ञानधन की समर्पण वृत्ति ने माण्डवगढ़ की तीन पीढ़ियों को अपने बौद्धिक दृष्टि से तैयार किया। किताबी आदर्शवाद को दबोसलता मानते हुए व्यावहारिक अर्थशास्त्र का नाम पाठ रखा। एक अखाडतंत्र व्यक्तित्व के रूप में आपने माण्डवगढ़ की भूमि को जन्मस्थली से कर्मस्थली में बदला। अमिठ साहस, अपार उत्साह और असीम प्रेरणा के साथ प्रतीक बने। उन्म कैंटि के तथा समीक्षण, दार्शनिक निर्वाहन की आधार शाला तथा एक कर्नाट अन्वेषक के रूप में आप उभारा हुए। डॉ. सोनवणे जीवनभर प्रखर बौद्धिकता को लेकर जीते रहे। तर्कशास्त्रिक का सामर्थ्य और स्वतंत्र चिंतन की वृत्ति से आपने स्वतंत्र पहचान मिली। प्रखर बौद्धिकता, चिंतन की स्वतंत्रता, अनुभव की संयन्ता और दृष्टि की व्यापकता इन चतुर्विधों ने सोनवणे की प्रक्रिया से ही संभव हुआ, संभव होता है। सोनवणे की विचारों से प्रशिष्य वे विन्नु अपने विचारों को किसी पर लागू नहीं। खैर अग्रोहोपेक्ष न ही है वह अर्थ समीक्षकों की धर्म सभा में करने का सामर्थ्य कोई विवेकी, सीर-सीर-विवेक को माननेवाला और तटस्थ आलोचक ही मान सकता है। सोनवणे की परंपरा की समीक्षा करते हैं। ये कई बार प्रतिपात करते हैं किन्तु उनके पास ठोस सोच थी है। इसी कारण खट्टर-संदेह की क्षमता वे रखते हैं। अपनी जीवनोन्मुखी दृष्टि के कारण वे हमेशा सनरात्मक पथ का समर्थन करते हैं। उनके पास चीजों को देखने समझने, समझाने का एक ज्ञान नवीर्य है। शोधयोग्यता में निष्पाना होने कारण चीजों की अनेक अंगारों से देखने की संतना दृष्टि उनके पास थी। साथ ही गन्ध की निरीक्षण क्षमता ने आपके भीतर जीवन्त वैद्य की। परिणामतः वे एक प्रतिभा संयुक्त साहित्यकार के रूप में उभरे। किशोरावस्था हिंदी समीक्षा जगत् में आपके योगदान को हमेशा धर क्रिया करणा। अर्थात् एक समीक्षक के रूप में, एक वैचारिक के रूप में तथा एक साहित्यशास्त्रकार के रूप में आपकी उमेरा ही हुई है। विन्नु उनके योगदान का समर्थक आकरना हीना बहुत

डॉ. चंद्रशेखर सोनवणे हिंदी के बरिष्ठ समीक्षक रहे हैं। आपके आलोचना में बलभूलेपन का अभाव परर आज है। प्राचीन और अर्वाचीन में समन्वय स्थापित करते हुए मन की अमल गहलता का साथ अवलोकन करते रहे हैं। शोधयोग्यता के अन्वेषण से योग्यज्ञान की गण्टुई में अथ उभर पावे। आप परंपरा का अनुकरण करनेवाले समीक्षक नहीं हैं बल्कि पूर्व परंपरा को नकारकर प्रतिपक्ष के पाठ्यकार के रूप में अथ उभरे। आपका समग्र चिंतन दर्क की बसोटी पर खर उभरता है। किसी विषय का गंभीर वलस्यशी अन्वेषन करना आपकी वृत्ति रही है। स्थापित मान्यताओं को तबों के साथ, प्रभाव देकर खंडित करना आपके लेखन का वैज्ञानिक रण है। कोलने और लेखन में सुशुद्ध शैली के चलते विस्तार की उमेला गण्टुई में दुर्बलियाँ रचना आरंभ प्रकृत में रहा है। आपकी अनेक समीक्षणक कृतियाँ अपने श्रेष्ठ परिचयता के निदेशक हैं। उनको समीक्षित कृतियों के अध्ययन से समीक्षक सोचने की का ठोस चिंतन उभरता है।

संतुति: डॉ. सोनवणे ने अपनी समीक्षण में से पद्धतियों का अखल चिंतन है। एक सैद्धांतिक समीक्षा और दूसरी व्यावहारिक समीक्षा पद्धति। सैद्धांतिक समीक्षा के अंतर्गत दो कृतियों का समर्थन होता है। 1. साहित्यशास्त्र (1977) 2. अन्तराष्ट्र : श्रेष्ठ वंश के संदर्भ में (1990) व्यावहारिक समीक्षा के अंतर्गत आठ कृतियों का समर्थन होता है।

1. विधाए एक मुजभासक उपलब्धि (1976)
2. पार्लेडु के विचार : एक पुनर्निवार (1977)
3. कथाकार पकीकरण रणु (1979)
4. धर्मोपर भारती का साहित्य : सृजन के विविध रण (1979)
5. सभासक की कलाकियाँ : कथ्य और मिल (1981)
6. हिंदी उपन्वस : विविध आवाज (संश्लेषण 1977)
7. कथाकार पुनर्दे खट्टर (1982)
8. कलाकार अर्थव : संदर्भ और प्रकृति (1999)

इन दस समीक्षणक ग्रंथों के अन्तर्गत अर्थव सभासक का हिंदी साहित्य शोध अपनी विशिष्टता उपलब्धियों से धर हुआ है। वो भारती उपन्वसों का हिंदी में अन्वेषण तथा हिंदी साहित्य का सही श्रुतिगत आदि शोध उल्लेखनीय रहे हैं। डॉ. चंद्रशेखर सोनवणे द्वारा प्रथम शोध का उद्गार हुआ - साहित्यशास्त्र (1977) प्रस्तुत शोध उनके अनेक वर्षों के अन्वेषण का प्रतिफल है। विचारार्थियों को केन्द्र में रखते हुए इस रचना की अविश्वनीय हुई। प्रस्तुत शोध में भारतीय एवं पारंपरिक साहित्यशास्त्र विषयक चिंतन को आधारभूमि मिली है। चिंतन के दोनों धरातलों का अन्तर्गत सद्गुणित विवेचन प्रस्तुत शोध की उपलब्धि है। भारतीय एवं पारंपरिक साहित्यशास्त्र में स्थान साथ को दर्शाते हुए लेखक नवी उद्भवता की उजागर करती है। अन्वेषणक जैसे कठिन विषय को आसानी भाषा में समझाने का सफल प्रयास किया गया है। साहित्य की विविध इकाइयों का परिचय देते हुए उसे आरंभ से समझाना



डॉ. शंकर शेष के प्रमुख नाटकों की भाषा एक अध्ययन

डॉ. अर्जुन कसबे

हिंदी विभाग,

शिवाजी महाविद्यालय,

रेणापूर, जि. लातूर

प्रस्तावना:—

डॉ. शंकर शेष वर्तमान युग के प्रतिभा संपन्न, उच्चकोटी के नाटकाकारों में उनका स्थान है। उन्होंने साहित्य की विविध विधाओं में अपनी गहन अनुभूति का तथा चिंतन शक्ति का परिचय दिया है। लेकिन हम देखते हैं कि उनकी प्रतिभा सबसे अधिक नाटकों के माध्यम से अभिव्यक्त हुई है। डॉ. शंकर शेष अपनी सृजनात्मक प्रतिभा से हिन्दी नाटकों को बहुत समृद्ध किया है। उन्होंने प्रारंभ में भले ही कविता तथा कहानी आदि का लेखन किया हो, पर उनकी साहित्य सरिता का जाने हमें उनके नाटकों के रूप में ही प्राप्त होता है। सन १९५५ से लेकर सन १९८१ तक की साहित्य साधना में उन्होंने बाईस नाटक, सात एकांकी नाटक दो बाल नाटक, चार अनूदित नाटक, चार उपन्यास, तीन अनुसंधानात्मक प्रबंध एक संकीर्ण, दो पटकथा संवाद लिखकर हिन्दी साहित्य को समृद्ध बनाने का कार्य उन्होंने किया

है। अतः डॉ. शंकर शेष केवल हिन्दी साहित्य को बनाया अपितु हिन्दी भाषा को समृद्ध बनाया है। उनकी गढ़ी हुई भाषा ने उनकी शैली को भाव व्यंजक, तथा प्रौढ़ रूप प्रदान किया है। जटिल से जटिल भावों की अभिव्यक्ति अपने नाटकों में करते समय ऐसा प्रतीत होता है कि मानो शब्द उनके पास अपने आप ही दौड़े हुए चले आते हैं। वास्तव में डॉ. शंकर शेष की भाषा उनके भावों तथा विचारों को अभिव्यक्त करने में पूर्ण तथा समर्थ, सक्षम और सशक्त है। उनकी भाषा में उनकी विचार पध्दती अत्यंत सुव्यवस्थित तथा अखंडे चिंतन प्रस्तुत है। अर्थ संपन्नता, परिस्कृति, प्रौढ़ता, और संपुष्टता की दृष्टीसे वह अनुपम एवं अन्यतम है। ऐसा प्रतीत होता है मानो व्याकरणिक नियम और भाषा मिलकर एक हो गए हों। डॉ. शंकर शेष की नाटकों की भाषा में इतना कसाव, इतना घनत्व, इतनी सहानता और इतनी सक्षिप्तता है कि उनकी वाक्य-रचना से एक भी

01

नवीन कृषी कायद्याचे फायदे आणि तोटे

प्रा.डॉ. खोकले आर.के.
अर्थशास्त्र विभाग
शिवाजी महाविद्यालय, रेणापूर

प्रस्तावना :

भारत हा कृषी प्रधान देश आहे. भारतीय अर्थव्यवस्था ही अधिकस्रोत अर्थव्यवस्थेकडून विकसनशिल अर्थव्यवस्थेकडे व्हेणाने वाटचाल करणारी अर्थव्यवस्था आहे. शेती हा भारतातील सर्वांत जुना आणि परंपरागत व्यवसाय आहे. आजही देशातील 57% लोकसंख्या शेती या प्रमुख व्यवसायावर अवलंबून आहे. आर्थिक विकासाच्या दृष्टीने शेताचे महत्वाचे स्थान आहे. शेती विकासावरच उद्योग, वाहतूक व दळणवळण, वैका, विदेशी व्यापार हा अवलंबून आहे. शेती मानवाचा पोषोदा आहे. राष्ट्रीय उत्पन्नामध्ये शेतीचा वाटा 20.24% होता. वस्तुची मोठ्या प्रमाणावर निर्यात केली जाते. निर्यातीत शेतीचा वाटा 10.31% होता. विदेशी चलन प्राप्तीचे कृषी हे महत्वाचे साधन आहे. शासनाने 2007 मध्ये कृषी धोरण जाहीर केले. या सर्व बाबीने शेतीचा विकास करण्याचा प्रयत्न केला. परंतु त्या प्रमाणात शेतकऱ्यांचा विकास झाला नाही. म्हणून नवीन कृषी कायदा 2020 आमलात आणला. नवीन कृषी कायदे देशातील कृषी क्षेत्राचे भविष्य पालटतील नवीन कायदे कृषी क्षेत्राला त्रासून टाकणाऱ्या मूलभूत समस्यांचे निराकरण करतील असे वाटते.

बरीच वर्षे वंचित राहिलेला शेतकरी आता आपल्या कृषी मालाचे मूल्य ठरविण्यास सक्षम होईल. स्वतःच्या शेतातील उत्पादन कृषी उपपत्र बाजार समितीत (APMC) विकायच की खुल्या बाजारात हा पर्याय त्याला खुला राहिल. शेतामाल कोणाच्या दराने विकायचा याचेही अधिकार शेतकऱ्याला मिळालेले आहेत. नवीन कृषी सुधारणा कायदे 'एकराष्ट्र एक बाजारपेठ', जी.एस.टी.मुळे आता आपण 'एकराष्ट्र - एककर' स्विकारला आहे. राष्ट्रीय परीक्षा संस्था उभारून आपण 'एक राष्ट्र एक परीक्षा' याचा स्विकार केला. त्यानुसार कृषी कायदे हे सुध्दा 'एक राष्ट्र एक बाजारपेठ' या धोरणानुसार आहेत. केंद्र सरकारने मंजूर केलेल्या कृषी विधयकांचे काही फायदे ही आहेत आणि तोटे

ही आहेत. म्हणून नवीन कृषी धोरण 2020 काय आहे. त्याचा खरच शासन म्हणते तसा शेतकऱ्यांना फायदा होतो का नुकसान होते. याचा विचार आपणास या शोध निबंधात करावयाचा आहे. शेतकऱ्यांना खरच फायदा होत असेल तर येवढ्या दिवसा पासून शेतकरी आंदोलन करीत आहेत ते काकारतात अशा अनेक प्रश्नाची उकल करण्याचा प्रयत्न या लेखात केला आहे.

* संशोधनाचे उद्दिष्ट्ये :-

- 1) नवीन कृषी कायदे 2020 चा अभ्यास करणे.
- 2) नवीन कृषी कायद्याचे फायदे आणि तोटे सांगणे.

*संशोधन पध्दती :-

हा संशोधन लेख लिहण्यासाठी द्वितीय साधन सामग्रीचा आधार घेण्यात आला आहे. ज्यामध्ये संदर्भ ग्रंथ, मासिके, अद्यावत माहिती मिळविण्यासाठी इंटरनेटचा वापर करून माहिती गोळा करण्यात आली आहे.

* नवीन कृषी कायदे - 2020 चे स्वरूप :-

भारत सरकारतर्फे 5 जून 2020 रोजी तीन वट्टकूम निघाले. 17 ऑगस्ट, 9 सप्टेंबर व 11 सप्टेंबर रोजी त्याचा कायदा होण्यासाठी ते लोकसभेसमोर आले व मंजूर झाले. 19/20 सप्टेंबर दरम्यान ते राज्य सभेसमोर आले व मंजूर झाले. 27/28 सप्टेंबरच्या दरम्यान मा. राष्ट्रपती महोदय यांचो मंजूरी होऊन आता त्याचा कायदा झाला आहे. कायदा 5 जून 2020 या वट्टकूम निघालेल्या तारेखापासून आमलात येणार कारण कायद्याने वट्टकूम नियमित झाले आहेत. केंद्र सरकारने 20 सप्टेंबर 2020 रोजी कृषी क्षेत्राशी संबंधित तीन कायदे मंजूर केले. त्या कायद्यांना शेतकऱ्यांचा विरोध आहे. येवढ्या लाखांच्या संख्येने शेतकरी आंदोलन करीत आहेत. आंदोलन अनून संपलेले नाही. आंदोलन सुरुच आहे ते तीन कायदे हे आहेत.

- 1) शेतकरी उत्पादने व्यापार व वाणिज्य (प्रोत्साहन व सुविधा) कायदा 2020
- 2) शेतकरी (सशक्तीकरण आणि संरक्षण) किंमत अन्वयवासन आणि कृषी सेवा करार कायदा 2020
- 3) आत्यावश्यक वस्तू (दुरुस्ती) कायदा 2020

अशा पध्दतीने केंद्र सरकारने कृषी संबंधी तीन कायदे करण्यात आली आहेत. शेतकऱ्यांनी या कायद्यांना विरोध करीत आंदोलन सुरु केले आहे. त्यांचा प्रमुख अक्षेप MSP, बाजार समित्यांच अस्तीत्व आणि कंत्राटी शेती हे मुद्दे प्रामुख्याने शेतकऱ्यांनी घेतलेल्या अक्षेपांच्या अंदोलनाच्या केंद्र स्थानी आहेत. त्यामुळे हे तिन्ही कायदे पूर्णपणे मागे घेण्याची मागणी केली आहे. हे जरी खरे असले तरी

१०. शेतकऱ्यांच्या आत्महत्या भारतीय अर्थव्यवस्थेसमोरील आव्हान

प्रा. डॉ. खोकले आर. के.

अर्थशास्त्र विभाग, शिवाजी महाविद्यालय, रेणापूर.

प्रस्तावना

स्वातंत्र्यानंतर नियोजनातून आर्थिक विकास साध्य करण्याचे निश्चित करण्यात आले आहे. ब्रिटिश राजवटीत भारतीय अर्थव्यवस्थेचे झालेले मोठ्या प्रमाणावरील शोषण आणि कुटिर व लघुउद्योगाचा झालेला न्हास ह्यामुळे मोठ्या प्रमाणावर देशाचे आर्थिक नुकसान झाले होते. म्हणून भारताने पंचवार्षिक योजनेच्या माध्यमातून विकास करण्याचा प्रयत्न केला. संख्यात्मक आणि गुणात्मक कांही प्रमाणात विकास साध्य झाला. पण आजही आपल्या देशासमोर अनेक आव्हाने उभी आहेत. त्यामध्ये लोकसंख्यावाढ, दारिद्र्य, आर्थिक विषमता, बेकारी, वाढती महागाई, शेतीची कमी उत्पादकता या आणि अशा अनेक समस्या भारतीय अर्थव्यवस्थेसमोर आहेत. या सर्व आव्हानातून माझ्या मते सर्वात संवेदनशील आव्हान आहे ते म्हणजे शेतकऱ्यांच्या आत्महत्या होय. कारण इतर आव्हान आपण मानतो जसे लोकसंख्या भारतीय अर्थव्यवस्थेसमोरील आव्हाने आहेत तशाच त्या संधी सुद्धा होऊ शकतात पण शेतकऱ्यांच्या आत्महत्या ह्या संधी होऊ शकत नाहीत याचा विचार करणे माझ्या दृष्टीने महत्त्वाचे आहे. भारत हा कृषी प्रधान देश आहे. भारतीय अर्थव्यवस्था ही अविकसित अर्थव्यवस्थेतून विकसनसिल अर्थव्यवस्थेकडे वेगाने वाटचाल करणारी अर्थव्यवस्था आहे. शेती हा भारतातील सर्वात जुना आणि परंपरागत व्यवसाय आहे. आजही देशातील 57% लोकसंख्या शेती या प्रमुख व्यवसायावर अवलंबून आहेत. आर्थिक विकासाच्या दृष्टीने शेतीचे महत्त्वाचे स्थान आहे. शेती विकासावरच उद्योग, वाहतूक व दळण-वळण, बँका, विदेशी व्यापार हा अवलंबून आहे. शेती मानवाचा पोषीदा आहे. राष्ट्रीय उत्पन्नामध्ये शेतीचा वाटा 20.24% होता, वस्तुची मोठ्या प्रमाणावर निर्यात केली जाते. निर्यातीत शेतीचा वाटा 10.31% होता. विदेशी चलन प्राप्तीचे कृषी हे महत्त्वाचे साधन आहे. भारतात शेती क्षेत्रात हरितक्रांती झाली, हरितक्रांती गहू, तांदुळ आणि काही प्रमाणात मका या अन्नधान्य पिकांच्या बाबतीत झाली. भारतात जसे हरितक्रांतीचे जनक म्हणून डॉ. एम.एस. स्वामीनाथन यांचा उल्लेख केला जातो. हरित क्रांती बरोबर 1961 ते 1970 दशकात श्वेतक्रांतीची बीजे रोवण्यात आली.

डॉ. वर्गीस कुरियन यांना श्वेतक्रांतीचे जनक मानले जाते. घाँपेरेशन प्लॅट कार्यक्रम हा जगातला सर्वात मोठा एकात्मिक डेअरी विकास कार्यक्रम आहे. हा कार्यक्रम 1970 मध्ये राष्ट्रीय डेअरी विकास बोर्ड ने सुरु केला. भारतातील निळी क्रांती ही प्राथमिक क्षेत्रातील तीसरी क्रांती होय. समुद्र उत्पादनातील (मासे) प्रचंड वाढीला निळी क्रांती असे नाव देण्यात आले. जगातील समुद्री उत्पादनात भारताचा क्रमांक तिसरा आहे. धान्याच्या बाबत हरितक्रांती यशस्वी झाल्याने कृषी क्षेत्रात याचा शोध आणि संशोधनाचा पुढचा भाग म्हणून पिवळी क्रांती हातात घेण्यात आली. खाद्यतेलाच्या बाबतीत देशाला स्वयंपूर्ण करणे. हया वेगवेगळ्या क्रांत्या इ



Ammonia gas sensing properties of Al doped ZnO thin films

L.H. Kathwate^a, G. Umadevi^b, P.M. Kulal^c, P. Nagaraju^b, D.P. Dubal^{d,e}, A.K. Nanjundan^f, V.D. Mote^{a,*}

^a Thin Films and Materials Science Research Laboratory, Department of Physics, Dayanand Science College, Latur 413 512, Maharashtra, India

^b Nanosensor Research Laboratory, Department of Physics, CMR Technical Campus, Meethal, Hyderabad 501 401, Telangana, India

^c Department of Physics, Shivaji Mahavidyalaya, Ranapur, India

^d Centre for Materials Science, Queensland University of Technology, 2 George Street, Brisbane, QLD 4000 Australia

^e School of Chemistry and Physics, Queensland University of Technology, 2 George Street, Brisbane, QLD 4000 Australia

^f School of Chemical Engineering, The University of Queensland, St. Lucia, Brisbane 4072, Australia

ARTICLE INFO

Article history:

Received 27 April 2020

Received in revised form 1 July 2020

Accepted 2 July 2020

Available online 16 July 2020

Keywords:

Semiconductor

Spray pyrolysis

Stress

Quantum size effect

Gas sensor

ABSTRACT

Aluminium (Al)-doped ZnO thin films are synthesised by chemical spray pyrolysis technique and investigated their gas sensing properties. X-ray diffraction analysis of the films revealed the formation of hexagonal-phase (wurtzite) of ZnO with orientation along (002) plane. Interestingly, the lattice parameters of Al-doped ZnO films showed a decreasing trend with Al doping, suggesting incorporation of Al in the crystal lattice of ZnO. A significant change in both the volume of the unit cell and bond length with an increase in Al concentration is observed. The surface morphological analysis suggested the formation of hexagonal-like ZnO, which transform into spherical particles with Al doping. The energy dispersive spectra confirm the existence of Al, Zn and O. The optical absorption analysis showed that the bandgap of ZnO samples decreases from 3.28 eV to 3.21 eV with Al content in ZnO. The ammonia gas sensing properties of ZnO and Al-doped ZnO are studied at 25 ppm concentration of ammonia gas in air at 100 °C temperature, suggesting reasonable gas sensing characteristics.

© 2020 Elsevier B.V. All rights reserved.

1. Introduction

Zinc oxide (ZnO) is an n-type semiconducting material with wide bandgap (3.3 eV) at room temperature, high exciton binding energy (60 meV), high electron mobility, excellent thermal stability and non-toxicity [1]. Due to these characteristics, ZnO is an encouraging semiconductor material in different kinds of application such as transparent conductor, light-emitting diode, solar cell, spintronic devices, diluted magnetic semiconductor, and gas sensors [2–7]. However, ZnO film is one of the promising materials and the optical, electrical and magnetic properties widely investigated because of the potential applications such as varistors [8], photodetector [9], surface acoustic wave device [10], nanolaser [11] and thin films gas sensor [12]. ZnO thin films can be prepared by various methods such as electro-spraying [13,14], ion plating [15,16], spray pyrolysis [17,18], evaporation [19], pulsed laser deposition (PLD) [20–22], DC magnetron sputtering (DCMS) [23], radio-frequency magnetron sputtering (RFMS) [24], pulsed DC magnetron sputtering (PDCMS) [25] and RF DC magnetron sputtering [26,27] and spin

coating methods. The spray pyrolysis is the most preferred technique because of the uniform and possibility to deposit at a large area scale, which makes it industrially favourable. According to the literature, it is found that the synthesis method and experimental conditions are correlated to the properties of film such as thickness, resistivity and surface morphology etc., which significantly affect the gas sensing properties of the films [28–30]. The effect of deposition conditions on gas sensitivity of ZnO films was studied by Nunes et al. [30] and revealed that the ZnO films with low thickness and high resistivity deliver good sensing performance. Gas sensing properties of the ZnO thin films was characterised with the NO₂ and H₂S and studied that ZnO films were found to be more selective NO₂ gas at an optimum temperature 200 °C due to changes in both into grain and grain boundary resistance reported by Nisha et al. [31]. Krishnakumar et al. [32] found the ZnO nanostructures were investigated in the monitoring of carbon monoxide, showed the maximum of response around 300 °C might be attributed the small crystallite size/high surface area and potential barrier modification.

The doping in metal oxides with proper elements to improve their optical and gas sensing performance is very useful and relatively less studied. Therefore, elements like Mn, Co, Cr, Al, Cu or Mg etc. are considered as dopants, and they can serve as a donor or acceptor in ZnO, which will improve the optical and gas sens-

* Corresponding author.

E-mail address: vmote.physics@gmail.com (V.D. Mote).

FINANCIAL PERFORMANCE OF AKZONOBEL INDIA LIMITED

Mr. Hemant Sangappa Alange, Asst. Prof. Department of Commerce & Management Studies
Sangameshwar College Solapur hemantalange@yahoo.com

Dr. P.T. Pawar, Asst. Prof. Department of Commerce, ShivajiMahavidyalaya, Renapur, Dist.
Latur, Pandurang.pawar2012@gmail.com

Abstract

The financial statements such as Profit and Loss account, Balance Sheet, Fund Flow Statement and Cash Flow statements are used to evaluate and analyze the Financial Performance of a company. The process of analyzing the financial position of an industry includes in-depth study of the above mentioned financial statements. This analysis shows the stakeholders the various factors such as the profitability the long term and short term liquidity, efficiency of the firm in managing and organizing the assets and liabilities

Keywords – Paints, AkzoNobel India Limited, Ratio Analysis, Financial Performance

Introduction to Paint Industry

Paint industry in India comprises of mainly two types which include the Decorative Paints and Industrial Paints. The industrial paints consists of protective coatings, coatings used for automobile industry and it includes powder coating. The decorative paints consists of the paints used in the real estate business i.e. the paints used for coloring interior and exterior walls of buildings and houses, paints used in painting the furniture etc. out of the total value of the paint industry the decorative paints accounts for seventy five percent and the industrial paint accounts for Twenty five percent. The Indian paints industry shows an increasing trend and the business is mainly dependent on the real-estate and the automotive sector. The industrial paints business is organized whereas the decorative paint industry is organized as well as unorganized.

Financial Performance

Financial Performance is a tool of analyzing the financial position of the company. After analyzing the various financial statements of an enterprise using various financial ratios one can know how well the firm is using its assets and generating revenues. Through financial performance analysis of a single firm and inter-firm comparison is also possible during a particular period of time. The various ratios that can be used are the acid test ratio the liquidity ratio, the current ratio, the profitability ratios, the turnover ratio etc.

Financial Ratio Analysis

It is the analysis of the two numbers obtained from the trading and profit and loss account and balance sheet. It shows the relationship between two financial numbers and also states how one number is dependent on another. Various pre-defined ratios are used in this analysis.

Profile of AkzoNobel India Limited

AkzoNobel India has offices and depots spread all over India and has five operating sites in India. AkzoNobel was having various group companies which were merged under AkzoNobel

Study of Consumer Behaviour Towards Buying Mobile Phone in Nanded

Dr. P. T. Pawar

Dept. of Commerce,

Shivaji Mahavidyalaya,

Renapur, Dist. Latur

Introduction

Communication is a part and partial of human life. It is a process of sending information and receiving the same among human beings. Communication is as important as breathing. The most important role of communication is to spread information with people. It is a stepping stone to build relations among people. Human relations strengthen with the interaction with each other. It facilitates human beings to understand each other's needs and feelings through communication.

First of all, communication helps to spread knowledge and information among people. For example, authors write books to impart knowledge to the World, and teachers share their experience with their students. Also, friends or co-workers discuss their ideas with each other, and companies exchange information with their subsidiaries and customers. Besides, the advent of the Internet not only allows people to have better access to knowledge and information in all fields, but also makes it easier and faster to contact with people around the World. Undoubtedly, the sharing knowledge and information process cannot function without communication. As a result, companies cannot operate, and humanity will be drowned in the abyss of ignorance.

Today, a cell phone is not just a rich man's fashion accessory in India. It is transforming the way millions of people do business in a country where even landlines were considered luxury barely a decade ago. Across the country people with low income group are now adopting cellular phones as tools for enhancing business. Cell phone technology introduces new senses of speed and connectivity to social life.

Nowadays, virtually everyone carries a mobile phone, including the young children. They have become the most important item an individual can own. They serve as a



R. C. Dutt Thoughton Famines: Nature, Causes, Effects & Policy

Dr. P. T. Pawar
Dept. of Commerce,
Shivaji Mahavidyalaya,
Renapur, Dist. Latur

2

RESEARCH PAPER - COMMERCE

Introduction :

R.C. Dutt expressed the view that the famines were clear proof of India's poverty, and their ever increasing intensity, extent, and mortality, an "infallible index" of the growing impoverishment of the country. To the British, famines were the result of nature's caprice, and had little to do with human efforts. He says that the famines which have desolated India within the last quarter of the 19th Century are unexampled in their extent and intensity in the history of ancient or modern time. While the British Indian authorities blamed the famines for the misery and material losses occurring during the years of famine and after, R. C. Dutt held that poverty of the people itself was responsible for the famines, their frequency, intensity and destructive nature. The problem, therefore, arose as to what led to famines? Famines had always been endemic in India and would remain so for an immeasurable distance of time to come; the utmost that a humane government could do was to mitigate their severity and extent.

R. C. Dutt's opinion was that Indian famines were the product not of the caprice of nature but of human failings and were, therefore, preventable. He admitted that the immediate cause of famines was failure of rains. R. C. Dutt remarked, that all crops had seldom failed simultaneously all over the country, and there had never been a year when

Drought and Farmers Suicides

Dr. Pradeep D. Shelke

Assistant Professor, Department of Commerce Shivaji Collage, Renapur

Email- pradeepdshelke@gmail.com

Abstract

Farmer's suicides are the burning issue in Indian economy. Especially in Maharashtra this problem became the headache of government because lakhs of farmers makes suicides in last few years. Especially after 1991 the government accepts the LPG (Liberalization, Privatization, and Globalization) policy. Other reasons are also responsible for farmer's suicides such as low rain fall, no rain fall, more rain fall, drought, pricing policy, increased prices of fertilizers, pesticides, labourer's wages, family expenses, etc. Indebtness is the main reasons of farmer's suicides in Maharashtra. To take poison, throat/ noose, to jump in well, to jump on tall place, to jump below railway, are some of the way of making suicides to finish the life. Many farmers use these ways for making suicides. They went in depression due to indebtiness and make the suicides. So this problem became the headache of government, society and policy makers.

Key words :- *Suicides, LPG, rain fall, indebtiness, farmers.*

Introduction

India is an agrarian economy. Most of the rural population depends upon agriculture and related activities for employment. Agriculture is the backbone and life blood of rural economy. It is the largest sector in India for giving employment to people. No other sector gives this large type of employment to rural people. But this sector has gone from a very adverse situation from last few years. There are various reasons for this adverse situation. Most of the land depends upon monsoon, there were no other permanent source for water to agriculture. Day by day pesticides, fertilizers, seeds, labour wages, expenses of family on daily needs, illness, marriage ceremony in family were increases but the income from crop were very less. Farmers produce the goods and their prices were decided in market who purchases it. So pricing policy is another reason for less income of farmers because prices are not fixed on production cost. Every farmers production cost were different. So production cost was more than the market price of agriculture goods. So agriculture business was run in loss, because expenses were more than income. Due to this reason most of the farmers were not ready to cultivate their land when they get another source of income, they leave their land. Government makes less provision in its budget for agriculture development year after year.

Objectives:

- 1) To study the reasons of farmers suicides .
- 2) To study the problems of agriculture.
- 3) To study why the income of farmers decreases day by day.
- 4) Year after year government makes less provision for agriculture in its budget.
- 5) To study why most of the farmers did not do supportive business.
- 6) To study the relation between drought and farmers suicides.

Hypothesis:

- 1) Last few years farmers make suicides due to less income and indebtiness.
- 2) Last few years agriculture sector has gone from an adverse situation.
- 3) Income of farmers decreased day by day.

Research Methodology:

For writing this research paper primary and secondary sources of data were used. In primary data discussion with farmers in Latur district were made. In secondary sources of data books, journals, internet was used. Drought may be classified in to two groups : 1) Wet drought, 2) Dry drought. When rain fall were more than necessity then crops were not come up, it is called wet drought. When rainfall were very less or no rainfall then crops were not come up is called dry drought. Drought is one of the important and major reason for farmers suicides. There were three seasons in India i.e. monsoon, summer, winter. In monsoon first season were started i.e. called kharif and second season is called rabbi, which is started in November/December. Due to any reason in these two season crops in agriculture were not grown / come up then it is called drought. When drought came then farmers did not get any income. So for fulfilling the family and other needs they get the help of borrowing from money lenders on interest. There is a close relation between drought and farmers suicides. When drought come up farmers make suicides due to no income because they unable to meet their family needs. They take the help of borrowing. When farmers unable to refund the debt. Then they choose the way of suicides. The agriculture is totally depends upon monsoon in Maharashtra. There is no permanent source of water for agriculture. Majority of the farmers in

Need of Agriculture Development

Dr. Pradeep D. Shelke

Assistant Professor, Department of Commerce, Shivaji Collage, Renapur

Email- pradeepdshelke@gmail.com

Abstract

Agriculture development is the burning issue in the Indian Economy because 70% population in India lives in rural area and directly or indirectly they depend upon agriculture for employment. But last few years due to low income, indebtness, illness in the family, marriage of daughter and sister, expenses of education, increased expenses in agriculture and less income etc. the farmer make suicides. Most of the Indian agriculture land specially in Marathwada [specially Latur district] depends upon mansoon. No permanent source of water, old pattern of doing farming, increased prices of pesticides and fertilizers, increased rate of labourers, etc. results in expences were more and income were less. So the budget of farmers in this area was always negative. So the development of agriculture is very important.

Key Words:- Agriculture, Mansoon, Development, Crop, Irrigation.

Introduction

India is second in the world for largest population after China. There are full natural resources in India. Three seasons i.e. mansoon, winter, summer were existed. These three seasons were very important for growing crop in agriculture. But most of the area in our country depends upon mansoon for need of water. Other reasons i.e. different disease on crop, increased prices of fertilizers, pesticides, old pattern of cultivating land, lack of use of modern technology, prices of agriculture goods in the market, lack of marketing of goods, etc. are the reasons which results the farmers were ready to leave their land when they get other source of income. This mentality is found in most of the farmers. But agriculture is very important because it is the only field which grows and give food and vegetables to human life for being remain alive. There is no any substitutes for this. So agriculture development is very important in every nation which were developed, developing or under developed.

Objectives of the study:-

- 1) To study why agriculture development is necessary.
- 2) To study the importance of agriculture in economy.
- 3) To study why farmers make suicides.
- 4) To study the ways of farmers income.

Hypothesis of the study:-

- 1) Agriculture development is necessary for human being.
- 2) The importance of agriculture was increased day by day.
- 3) Last few years farmers make suicides.
- 4) Agriculture crop is the main source of farmers income.

Research Methodology:-

For writing this research paper primary and secondary sources of data were used. In primary source discussion with farmers, agri officers in Latur district were made. In secondary source reference books, news papers, news on t.v. conference proceedings, internet etc. were used.

India constitutes 28 states and 9 territory sectors. Its population reaches near about 139 crores. 664369 villages were existed in India and 70% population were lived in rural area. They were depend upon agriculture and related activities for employment. Now a days this sector has gone from bad and adverse condition from last few years. So people migrate from rural to urban area for employment. But till agriculture is the biggest employment creator sector in India. It is very important sector in the economy. So its development is very necessary.

Agriculture plays a crucial role in the economy of developing nations and provides the main source of employment, food, income to the rural people. However, improvement in agriculture and use of land are fundamental to achieve the poverty alleviation, food security, employment and over all sustainable development of that nation. So agriculture development is very important and necessary as well as urgent need of our country. After British rule there is scarcity of food in our nation due to low productivity, lack of use of modern technology, lack of use of fertilizers, pesticides, etc. due to high prices, pricing policy of agriculture goods, traditional method of doing agriculture, crop method etc. So the development of agriculture is very necessary. It is the largest and biggest sector for creating employment opportunities, providing food, vegetables, milk and other reasons for agriculture development were :-

- 1) It provides directly or indirectly the employment to rural people.
- 2) It provides food grains, vegetables, milk and other necessary items to the society.



उच्च शिक्षणापुढील आव्हाने आणि उपाय

डॉ. मोहम्मद हनिफ इस्माईलसाब शेख

लोकप्रशासन विभाग

शिवाजी महाविद्यालय,

पेगापुर, जि. लातूर

9

Research Paper - Public Administration

प्रस्तावना :

भारतातील शिक्षणाचे कार्य हे केंद्रसरकार व राज्यसरकार यांच्या अधिपत्याखाली चालते. भारतीय राज्यघटनेनुसार शिक्षण हा प्रत्येक व्यक्तीचा मुलमूत हक्क आहे. भारतातील विद्यापीठावर केंद्रसरकार व राज्यसरकारचे संपूर्ण नियंत्रण असते. उच्चशिक्षण व संशोधनात सरकारी संस्थांनी मोठी भरारी घेतली आहे. कोणत्याही देशाच्या सर्वांगीण विकासात शिक्षण व्यवस्थेची भूमिका अत्यंत महत्वाची आहे. जगातील प्रगत राष्ट्रे शिक्षण व्यवस्थेकडे गुंतवणूक व एक भांडवल म्हणून पाहते.

भारतीय शिक्षणाची परंपरा दैदीप्यमान स्वरूपाची आहे. पुरातन काळात इ.स. ४५० ते ५२० वर्षांच्या दरम्यान भारतात गुरुकुल पध्दती होती. तसेच तक्षशिला, नालंदा, विक्रमशिला अशा प्रकारची विद्यापीठे अस्तित्वात होती. शिक्षणाचा प्रकार व प्रसार करण्यात महात्मा फुले महर्षी धोंडो केशव कर्वे, कर्मवीर भाऊराव पाटील, राजर्षी शाहू महाराज, महाराजा सयाजीराव गायकवाड, डॉ. बाबासाहेब आंबेडकर इ. समाजसुधारकांचे योगदान महत्त्वपूर्ण आहे. भारतात शिक्षण आणि शिक्षण पध्दतीचा विकास ब्रिटीश राजवटीत झाला ब्रिटीशांनी महाविद्यालये आणि विद्यापीठे स्थापन करून दर्जेदार शिक्षणपध्दती भारतात अस्तित्वात आणली. कला, वाणिज्यशास्त्र, अभियांत्रिकी, कृषी शिक्षणाची महाविद्यालये सुरू केली. प्राथमिक, माध्यमिक, महाविद्यालयीन शिक्षण पध्दती अस्तित्वात आणली.

भारताची सध्याची शिक्षण पध्दती सहा भागात विभागली आहे. पूर्वप्राथमिक, प्राथमिक, विद्यालयीन (सेकंडरी) ज्युनिअर कॉलेज, (हायर सेकंडरी) पदवी व पदव्युत्तर या भागात विभागणी झालेली आहे. शिक्षण पध्दतीत परिवर्तन घडवून आणण्यासाठी तसेच बदलत्या काळातील आव्हाने पेलण्यासाठी केंद्र व राज्य स्तरावर अनेक संस्था कार्यरत आहेत. अभ्यासक्रम ठरविण्यासाठी नॅशनल कौन्सिल ऑफ एज्युकेशनल रिसर्च (NCERT) ही संस्था शालेय अभ्यास क्रमासंबंधी कारभार पाहते. तसेच उच्चशिक्षणासाठी UGC ही संस्था महत्त्वपूर्ण कार्य करते. भारतीय शिक्षण



8

आरोग्य प्रशासनासमोरी आव्हाने व उपाययोजना

डॉ. मोहम्मद हनिफ इस्माईलसाब शेख
लोकप्रशासन विभाग,
शिवाजी महाविद्यालय,
रेणापूर, जि. लातूर

Research Paper - Public Administration

आरोग्य म्हणजे मनुष्य व वातावरण यांच्यातील संतुलन होय. आरोग्य हा मनुष्याचा जन्मसिद्ध हक्क आहे. आरोग्य म्हणजे शारीरिक, मानसिक, सामाजिक, आर्थिकदृष्ट्या सदृढ असणे. मानवी आरोग्याचे महत्व लक्षात घेऊन संयुक्त राष्ट्रसंघाने १९९५ मध्ये कोपनहेमन येथे भरलेल्या सामाजिक विकास शिखर परिषदेत 'आरोग्य हे सर्व विकासाचा केंद्रस्थानी असावे.' अशा प्रकारचा ठराव सर्वानुमते संमत केला. चांगल्या आरोग्याशिवाय मनुष्य, कुटुंब, समाज किंवा देश कोणताही विकास करू शकत नाही. त्या व्यक्तीचे, समाजाचे किंवा राष्ट्राचे आरोग्य चांगले असते. ते प्रगतीशील बनू शकते. म्हणूनच आरोग्याला सर्व विकासाचा केंद्रबिंदू मानण्यात आलेले आहे.

आरोग्य व प्रशासनाचा अर्थ :

१) जागतिक आरोग्य संघटनेच्या मते :

"आरोग्य म्हणजे केवळ विकारांचा किंवा रोगांचा अभाव नाही. तर शारीरिक, मानसिक तसेच सामाजिक सुस्थिती."

२) एल.डी. व्हाईट :

"एखादा हेतू साध्य करण्यासाठी अनेक व्यक्तींचे संचालन, नियोजन व नियंत्रण करणे म्हणजे प्रशासन होय."

थोडक्यात, "आरोग्य विषयक हेतू साध्य करण्यासाठी अनेक व्यक्तींचे संचालन, संयोजन, नियंत्रण करणे म्हणजे आरोग्य प्रशासन होय." अशी आपल्यास आरोग्य प्रशासनाची सर्वसाधारणपणे व्याख्या करता येईल.



E-Governance in India

Dr. Shaikh Mohanmad Hanif Ismalesab

Department of Public Administration, Shivaji Mahavidhyalya, Renapur, Latur

Introduction:

The Indian government's National E-governance plan aims, among the other things, to "Make all government services accessible to the common man in his locality through common service delivery outlets." It was clear at the conference that the plan has achieved some success through a number of pilot projects. However, it was also evident that government alone cannot ensure "efficiency, transparency and reliability of such services at affordable costs." The private sector should be actively participated in e-governance and it should play active role in spreading e-governance services across India. Thus, at the following report details, the conference recommended greater attention to public-private partnerships, policy reform and infrastructural changes as ways to deliver more efficient and effective e-governance across India.

Research Methodology

Present study is based on secondary data and primary observations. The data is collected from various sources including journals, articles, books, internet etc.

Objectives

Present study is undertaken with following objectives

1. To underline the significance of e-governance
2. To survey the government efforts to develop e-governance in India
3. To highlight the spread of e-governance in India

Hypothesis

1. e-governance is innovative service having universal acceptance
2. note-worthy efforts have been made by government to develop e-governance in India
4. still there exist huge scope to popularize e-governance in India

National E-governance Plan of India:

The National Informatics centre (NIC), a part of the government of India's Department of Information Technology (DIT), was setup in 1977. Its mandate was to develop information systems for government in the centre and states to assist with planning, monitoring and decision-making. The mandate also included setting up a nationwide communications network to enable effective sharing of information among government staff. The NIC was responsible for evolving standards for data

ग्रामविकासाबाबत म. गांधीजीचे विचार

प्रा. डॉ. शंख मोहंमद हनिफ इस्माईलसाब
शिवाजी महाविद्यालय, रेणापूर, लातूर

प्रस्तावना :

ग्रामीणभागातील विंगारशेती उद्योगधंदे शेती या मुख्य व्यवसायाला पुरक अशी असल्यामुळे भारतीय गावे ही स्वयंपूर्ण बनली होती जी आज काळाची गरज आहे. आज देश देखील स्वयंपूर्ण राहिला नाही त्यामुळे सर्व धनसंपदा ही परदेशाकडे जाताना दिसून येत आहे यावर प्रभावी उपाय म्हणजे ग्रामस्वरान्य होय. भारतीय अर्थव्यवस्थेत कृषी एवढेच महत्त्व ग्रामीण उद्योगांना आहे. परंतु एककाळी ग्रामीण उद्योगांचा न्हास झालेला दिसून येतो. ग्रामीण उद्योग हे लघुउद्योग व कुटिरोद्योग या दोन प्रकाराचे असतात. लघुउद्योग हे पाच किंवा दहा कामगारांच्या साह्याने चालविले जाते ज्यात ७.५ लाखपर्यंतचे भांडवल गुंतविलेले असते. याउलट कुटिरोद्योगाचे म्हणजे जे पूर्णतः किंवा अंशतः कुटूबातील सदेस्यांच्या मदतीने चालविले जाऊन ते अल्पकालीन व्यवसायांच्या रुपात असतात. ग्रामीण उद्योगाकरिता विशेषतः कुटिरोद्योगाकरिता खंड्यामध्येच उपलब्ध असलेल्या कच्चा मालाचा पुरवठा केला जातो. ज्यामुळे अनेकांना रोजगार प्राप्त होण्यास मदत होते. ग्रामीण उद्योगामुळे खंड्याचा विकास साधल्यामुळे अर्थिक विषमता कमी होण्यास मदत होते. जुनी, परंपरागत कला व कौशल्य टिकविले जाऊन सुंदर व कलापूर्ण वस्तूंचे उत्पादन केले जाते. विशेष म्हणजे ग्रामीण उद्योगाकरिता यंत्रसामग्री ची आवश्यकता फारसी नसते त्यात विदेशी यंत्रे तर लागतच नाहीत त्यामुळे अपला पैसा आपल्याकडेच राहतो. सध्याच्या काळात भारतातील ग्रामीण उद्योगाचा न्हास झालेला दिसून येतो.

संशोधन पध्दती :

प्रस्तुत संशोधन शोधनिबंधासाठी निरक्षणात्मक व वर्णनात्मक संशोधन पध्दतीचा उपयोग करण्यात आला आहे. यात तथ्य संकलनासाठी विविध दुय्यम साधनाचा वापर करण्यात आला असून यात विविध संदर्भ ग्रंथ, मासिके व वर्तमानपत्रांचा उपयोग करण्यात आला आहे.

संशोधनाची उद्दिष्टे :

प्रस्तुत शोधनिबंधासाठी पुढील उद्दिष्ट निश्चित करण्यात आले आहेत.

१. ग्रामीण विकासाचे महत्त्व जाणून घेणे.
२. ग्रामीण विकासात गांधीजींच्या तत्त्वाचा उपयोग स्पष्ट करणे.
३. गांधीजींचे ग्रामस्वरान्याचे तत्त्व आजही ग्रामीण विकासात उपयोगी आहेत का याचा अभ्यास करणे.

संशोधनाची गृहितके :

१. ग्रामीण विकास हा अत्यंत मंद गतीने होताना दिसत आहे.
२. ग्रामीण विकासासाठी गांधीजींच्या खंड्या कडे घेता या संदेशाचा प्रभाव पडत आहे.
३. गांधीजींचे ग्रामस्वरान्याचे तत्त्व आजही ग्रामीण विकासात उपयोगी आहे.

ग्रामविकासातील महात्मा गांधीजींचे तत्त्व :

भारताच्या अर्थव्यवस्थेत ग्रामीण उद्योगाचे महत्त्व लक्षात घेता त्यांचे पुनरुज्जीवन घडवून आणण्याचे दृष्टीने उपाय आखणे आवश्यक आहे. सर्वांपरिस्थितीत या उद्योगापुढे भांडवलाची कमतरता, कच्चा मालाचा प्रश्न, उत्पादनाचे जुनेच तंत्र, अशिक्षित व अप्रशिक्षित कामगार, करांचा बोझ, वस्तूंच्या विक्रीचा प्रश्न, मोठ्या उद्योगांचा विकास घडवून आणण्याच्या दृष्टीने अनेक उपयोजना करता येतील मात्र ग्रामस्वरान्याच्या माध्यमातून यामध्ये पुढील सुधारणा करता येतील.

ग्रामस्वरान्याच्या माध्यमातून ग्रामउद्योगात चरख्याचा व्यवसाय महत्त्वपूर्ण आहे याच्या माध्यमातून ग्रामोद्योग टिकवून ठेवण्यास मदत होईल. तसेच शरिरश्रम हा व्यवसाय आणि उद्योगाचा गाथा आहेत. आणि मोठ्या प्रमाणावर

Violence Against Women In India

Dr. Hange A. K.

HOD in Geography, Shivaji Mahavidyalaya, Renapur, Tq. Renapur Dist. Latur

Abstract :

The world Health Organization (WHO's) latest report on Violence against Women that was released in June, 2013 indicates that in some regions of the world over 35 % of women suffer from partner violence with these staggering numbers, it is a very real possibility that every one of us knows a woman is facing of has faced domestic violence. Women's are homemaker, custodian of social, cultural and fundamental values of the society, and permanent change is often best achieved through them. Full community development is impossible without their understanding, cooperation and effective participation. Considering all these, women deserve better treatment but opposite are usually the case. Wife battery affects the physical and psychological well-being of the abused woman and even that of their children. It is on this premises that this paper discuss the meaning of domestic violence, child sex ratio, situation of violence against women in India, Law and Indian Penal Code, Protection of women against Domestic Violence Act (PWDVA), Effects of Domestic Violence against Women and conclusion.

KEYWORDS : Domestic violence, women, physical wife,

"Woman is the companion of man, gifted with equal mental capacity."

- Mahatma Gandhi

Introduction :

In our society, many women are violently treatment by their intimate partners while they suffer in silence. Women and girls of all ages, races, cultures religions and education level can experience violence. Violence against women and girls is a major health and human right issue. At least one in five of the world's female population has been physically or sexually abused by a man or men sometime in their life. Many, including pregnant women and young girls, are subject to serve, sustained or repeated attacks. World wide, it has been estimated that violence against women is more serious a cause of death and incapacity among women of reproductive age as cancer, and a greater cause of ill-health than traffic accidents and malaria combined. The abuse of women is effectively condoned in almost every society of the world. Prosecution and conviction of men who beat or rape women or girls is rare when compared to numbers of assaults. Violence therefore operates as a means to maintain and reinforce women's subordination.

United Nations' Definition Of Violence Against Women :

The declaration on the Elimination of Violence Against Women, adopted by the United Nations General Assembly in 1993, defines violence against women as "any act of gender-based violence that result on, or is likely to result in, physical, sexual, or psychological harm or suffering to women including threats of such acts, coercion or arbitrary deprivation of liberty, whether occurring in public or private life." It encompasses, but is not limited to, "Physical, sexual and psychological violence occurring in the family, including bettering, sexual abuse of female children in the household, dowry related violence, marital rape, female genital mutilation and other traditional practice harmful to women, non-spousal violence and violence related to exploitation; physical, sexual and psychological violence occurring within the general community; including rape, sexual abuse sexual harassment and intimidation at work, in education institution and elsewhere, trafficking in women and force prostitution and physical, sexual and psychological violence perpetrated or condoned by the state wherever it occurs.

Ban Ki-moon United Nation Secretary at 57th session of Commission on the states of women New York 5th March, 2013.

"When women and girls enjoy all their right and freedoms, we will be closer to realizing our entire goal for sustainable development and an equitable, prosperous society"

The Statistical Of Child Sex Ratio (Census 2011)

According to the census Report 2011 by Register General & census Commission, India's statistic of child sex ratio is.

1. Sex ratio is a tool to determine gender equity of the population.
2. Sex ratio, in India, is defined as the number females per 1000 males in the population.
3. Historically sex ratio in India as remained favorable to males.



7

भारतातील सुशासन : एक दृष्टीक्षेप

डॉ. प्रकाश रावसाहेब शिंदे
लोकप्रशासन विभाग,
शिवाजी महाविद्यालय,
रेणापूर, जि. लातूर

Research Paper - Public Administration

२१ व्या शतकात अनेक नवीन विचारप्रवाह व संकल्पना आल्या आहेत. आधुनिक काळात नाहिती व तंत्रज्ञानावर आधारित प्रशासन, मानव संसाधन प्रशासन पर्यावरण प्रशासन सुशासन नवीन संकल्पना लोकप्रशासनात आल्या आहेत. भारतासारख्या लोकशाही प्रधान देशात लोकल्याण देशाची सुव्यवस्था यादृष्टीने एक सक्षम कुशल निर्मितीसाठी सुशासन महत्वाचे १९८९ साली जागतिक बँकेने अहवाल सर्वप्रथम Governance हा शब्दप्रयोग केला. त्या सुशासन ही संकल्पना प्रामुख्याने चर्चेत आली. जागतिक बँकेने आपल्या 'शासन व विकास रिपोर्टमध्ये १९९२ साली सुशासन वा चांगली शासन प्रणालीला योग्य आर्थिक घोरणांसोबत पाहिजे असे स्पष्ट केले आहे. या माध्यमातून विकसनशील राष्ट्रांच्या समस्या सोडविता जागतिक बँक, संयुक्त राष्ट्रसंघ, व त्याच्या इतर यंत्रणानीही सुशासन निर्मितीस महत्व दिले तेव्हापासूनच विकसीत, विकसनशील, अविकसीत राष्ट्रात राजकीय प्रशासकीय, अनु 'सुशासन' हा शब्द वापरण्यात येऊ लागला.

सुशासन संकल्पना :

प्रशासकीय कार्यात जनतेचा सहभाग वाढविण्याच्या दृष्टीने सुशासन ही संकल्पना आहे. आधुनिक काळातील सुशासन ही संकल्पना प्राचीन काळात देखील अस्तीत्वात सुशासन हा शब्द सु + शासन या शब्दांचा मिळून तयार झाला आहे. 'सु' चा अर्थ चांगले, असा होतो. शासन म्हणजे कार्याचे संचलन, व्यवस्थापन होय.

सुशासनाला इंग्रजीत 'Good Governance' म्हणतात. Good हा शब्द शब्दापासून बनलेला असून याचा अर्थ चांगले असा होतो. 'Governance' या संज्ञेत अशासकीय संघटना, नागरी समाज, खाजगी क्षेत्र याचा समावेश होतो.



महाराष्ट्र शासनाचे जलयुक्त शिवार अभियान

डॉ. प्रकाश रावसाहेब शिंदे

लोकप्रशासन विभाग
शिवाजी महाविद्यालय,
रेणापूर, जि. लातूर

8

Research Paper - Public Administration

महाराष्ट्र शासनाने सुरु केलेली जलयुक्त शिवार ही योजना अतिशय महत्वाकांक्षी योजना आहे. पावसाचा पडणारा रेंव न रेंव अडवायचा, साठवायचा आणि त्याच ठिकाणी मुरवायचा. पिण्यासाठी व वापरण्यासाठी लागणाऱ्या पाण्यासाठी विकेंद्रित साठे निर्माण करावयाची. प्रत्येक गावासाठी स्वतंत्र जलसाठे निर्माण करावचे. या योजनेला राज्यात चांगला प्रतिसाद मिळत आहे. वरचेवर पावसाचे प्रमाण कमी होत आहे. त्याचा विचार केल्यास पाण्याच्या बाबतीत काटेकोर नियोजन आवश्यक आहे.

जलयुक्त शिवार अभियान :

वर्ष २०१२-१३ मध्ये टंचाई परिस्थितीवर कायमस्वरूपीच मात करण्यासाठी पुणे विभागातील ५ जिल्ह्यात गाव अभियान हा उपक्रम राबविण्यात आला. त्यामध्ये सर्व विभागाच्या समन्वयातून एकत्रितपणे योजना राबवून पाणी अडविण्यासाठी व भुजल पातळीत वाढ करण्यासाठी कृती आराखडा तयार करण्यात आला. या अभियानात जलसंधारणाच्या माध्यमातून विभागात पाणलोट्याची कामे, सिमेंट साखळी बंधारा, नाला बांधकामे, जुने अस्तित्वातील सिमेंट नालाबांध/ दुरुस्ती व नुतनीकरण, जलस्रोतातील गाळ काढणे, विहीर पुर्नभरण, उपलब्ध पाण्याचा कार्यक्षम वापर आणि ओढे/नाले जोड कामी हाती घेण्यात आली. या सर्व कामांच्या माध्यमातून ८.४० टी.एम.सी. क्षमतेने विकेंद्रित जलसाठे निर्माण करण्यात आली आहेत. त्यामुळे भुजल पातळीत १ ते ३ मीटर ने वाढ झाली असून पिण्याचे पाणी व शेतीसाठी संरक्षित सिंचनाची सोय झाली. त्यामुळे टंचाई परिस्थितीवर कायम स्वरूपी मात करण्यास मदत झाली आहे. सर्व कार्यक्रमांची फलश्रुती विचारात घेता सर्वांसाठी 'पाणीटंचाई मुक्त महाराष्ट्र २०१९' करण्यासाठी व टंचाई परिस्थितीवर कायम स्वरूपीच मात करण्यासाठी एकात्मिक पध्दतीने नियोजनबद्धरित्या कृति आराखडा तयार करून पाण्याची उपलब्धता वाढविण्यासाठी जलयुक्त शिवार अभियान राबविण्यात येत आहे.

अभियानाचा उद्देश :

- १) पावसाचे पाणी जास्तीत जास्त शिवारात अडविणे.
- २) भुगर्भातील पाण्याच्या पातळीत वाढ करणे.

त्यातून बाहेर
नाही. याचाच
उसाच कृतीत
शुगारुन देऊ
स्त्रिया म्हणून
। नाही. अशा
की-गती प्रकट
रते.

यांच्या कथांचे

उ.

। सापडलेल्या



One-pot synthesis of multicomponent pyrazole-4-carbonitrile derivatives under solvent-free condition by using engineered polyvinyl alcohol catalyst

Abhijeet S. Patki^{1,2} · Komal N. Patil³ · Suman Kusuma³ · Dnyanoba B. Muley³ · Arvind H. Jadhav³

Received: 20 January 2021 / Accepted: 25 March 2021
© The Author(s), under exclusive licence to Springer Nature B.V. 2021

Abstract

Heterocyclic chemistry has fascinated the researchers owing to its wide range of applications in various chemical fields. With this perspective, herein we present an environmentally benign procedure for the synthesis of pyrazole and its derivatives through multicomponent reaction by using SPVA as a heterogeneous acid catalyst. The synthesis protocol of SPVA catalyst includes functionalization of polyvinyl alcohol by sulfonic acid groups. The synthesized SPVA catalyst was then subjected to several characterization techniques to confirm its formation and study its physicochemical properties. The SPVA catalyst was then tested for its activity toward a multicomponent reaction of aromatic aldehyde, malononitrile and phenyl hydrazine. The SPVA catalyst with sufficient acidic sites displayed appreciable catalytic performance yielding 89% of the desired pyrazole product under ambient reaction conditions. The SPVA catalyst showed recyclability up to the sixth cycle without considerable loss in its activity. Furthermore, we made an effort to demonstrate the plausible mechanistic pathway for the SPVA-catalyzed pyrazole synthesis reaction. Interestingly, the present synthetic approach could effectively produce pyrazole products with high yields in the absence of base and solvent and in short reaction time making it a green and sustainable process.

Abhijeet S. Patki and Komal N. Patil have contributed equally in this work.

✉ Dnyanoba B. Muley
muleydb@gmail.com

✉ Arvind H. Jadhav
j.arvind@jainuniversity.ac.in; jadhav.ah@gmail.com

- ¹ Department of Chemistry, Shivaji Mahavidyalaya, Udgir, Maharashtra, India
- ² Department of Chemistry, Shivaji Mahavidyalaya, Renapur, Maharashtra, India
- ³ Centre for Nano and Material Science (CNMS), Jain University, Jain Global Campus, Bangalore 562112, India