WASTEWATER TREATMENT

Cutting-Edge Molecular Tools, Techniques and Applied Aspects

Edited by
Maulin P. Shah
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CHAPTER 11

Current Treatment Technologies for Removal of Microplastic and Microfiber Pollutants From Wastewater

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11.1 Introduction

Microplastic pollutants generally defined as synthetic pollutant particles having dimensions below 5 mm (Betts, 2008) and their occurrence on freshwater and marine environment is a subject of scientific interest globally. The harmful ecological effects originated due to these micro-pollutants have stimulated the investigation focus on extraction and calculation of microplastic particles from aquatic to terrestrial habitat (Fendall and Sewell, 2009). Advancement in studies and uninterrupted progresses are being carried out to develop a consistent and uniform method (Thompson et al, 2009). The universal manufacturing of plastics augmented from 2 million tons to 300 million tons in just 40 years with 10% increase in manufacture rate yearly. The plastic waste after use has been documented as "plastic wreckage" in habitats on the environment. The floating character of plastic particles favors their spreading around the water, permitting them to gather on the seashore, where they continue for millions of years.

Plastic particles in the form of tiny fragments, synthetic fibers from apparel products, and plastic beads are releasing into the environment (Arthur et al., 2008; Barboza and Gimenez, 2015). Contaminated locations are escalating continuously because of inappropriate squander organization approaches; such pollutants mainly enter into the environment from anthropogenic activities (Bhatnagar and Kumari, 2013; Kale et al., 2015). Primary sources of these pollutants are particles from plastic products, personal hygiene products such as sanitary pads and face wash (Duis and Coors, 2016). It has also been proven that remains of the personal care products and microplastic fibers emitted during laundering of synthetic apparel products, which finally released into the environment through washing machine effluents (Mishra et al., 2019). The tiny synthetic fiber particles are ineffectually filtered during the primary wastewater treatment process because they use filters with bigger pores and finally released into river water (Carr et al., 2016). It can be predicted that these

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Emerging Microfiber Pollution and Its Remediation

9

Sunanda Mishra, Prasant Kumar Rout, and Alok Prasad Das

Abstract

Extensive allocation of synthetic microfiber (SMF) particles in the environment has harmful ecological impacts. These are tiny threads of synthetic fabrics having diameter less than 10 μm and are categorized under secondary microplastics, which are mainly composed of polyester, nylon, acrylic, polyethylene terephthalate, and polypropylene. These micropollutants are of increasing concern, especially due to their release into aquatic environments, including rivers and ocean. Primary sources of these tiny particles are laundering of apparel products, household sludge, direct throwing away of unused garments into the rivers and oceans, cosmetics, and cleaning agents. Approximately 13 million tons MFs all over the world along with coastal waste are entering the ocean yearly from which around 3 million tons are entering through rivers. Once these particles enter into aquatic sources, these are mistakenly ingested by various aquatic species and finally enter into the human body through consumption of MF-contaminated aquatic foods. Advanced microscopic and spectroscopic techniques are inspected for the successful detection of these synthetic micropollutants. Recent researches are focusing on the degradation of synthetic fibers using microbial enzymes that can be employed as an effective method. Strategies for plummeting microfiber pollution mainly focus on capturing these particles at source and consequently scheming of cost-effective remediation technologies. In the future, investigations are also required to develop techniques for an in situ remediation of these pollutants by enhancing natural attenuation using native microorganisms.

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8

Effect of Slag Addition on Compressive Strength and Microstructural Features of Fly Ash Based Geopolymer

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CONTENTS

8.1 Introduction 61
8.2 Materials and Methods 62
8.2.1 Materials 62
8.2.2 Methods 63
8.3 Results and Discussion 63
8.4 Conclusions 66
Acknowledgements 67
References 67

8.1 Introduction

Geopolymeric materials are one of the alternative binding materials known after the Ordinary Portland Cement (OPC). Geopolymers are amorphous, three-dimensional short-range order inorganic polymeric material which can be formed by the reaction between an aluminosilicate source material and an alkaline solution having a high pH value (Das & Rout, 2019). Based on the geopolymer structure, geopolymers are categorized into three basic systems, such as poly (sialates) (-Si-O-Al-O-), poly(sialate-siloxo) (-Si-O-Al-O-Si-O-) and poly(sialate-disiloxo) (-Si-O-Si-O-Al-O-Si-O-) (Yun-Ming et al., 2016; Kai, Zhang & Liew, 2020). The general empirical formula for geopolymer is (Nath et al., 2016; Marcin, Sisol & Brezani, 2016; Das & Rout, 2021a):

$$Mn\left[-\left(SiO_2\right)z-AlO_2\right]n.wH_2O$$

(Where M represents an alkaline element, symbol (-) indicates the presence of bond, z is 1, 2, 3 or higher up to 32 and n is the degree of polymerization). The mechanism of geopolymerization consists of three steps, i.e., (i) dissolution of the aluminosilicate source material in the alkaline solution (ii) transportation or orientation, (iii) polycondensation (Xu & Van Deventer, 2000). These geopolymeric binders can reduce the greenhouse gas (CO_2) emission by 80%, which was entailed by the conventional cement industry (Duxson et al., 2007). Due to their excellent mechanical properties, better thermal and chemical

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COMPUTATIONAL MODELING AND DATA ANALYSIS IN COVID-19 RESEARCH

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Rajkumar Buyya

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2 Analysis of COVID-19 Data Using Consensus Clustering Technique

Arko Banerjee, Sunandana Mukherjee, Chhabi Rani Panigrahi, Bibudhendu Pati, and Rajib Mall

CONTENTS

2.1 Introduction 17
2.2 Literature Study 19
2.3 Methodology Used 19
2.3.1 Clustering 19
2.3.2 Consensus Clustering 20
2.3.3 Problem Formulation 20
2.3.4 Pairwise-Similarity-Based Consensus Clustering Method 21
2.4 Proposed Method 22
2.5 Experimental Setup and Result Analysis 23
2.6 Conclusion 26
References 26

2.1 INTRODUCTION

Viruses are intracellular parasites whose life cycle depends on hijacking cellular functions to help spread their replication. Coronaviruses are a large family of viruses that have a wide range of hosts including humans (Paules et al., 2020). The external structure that features little crown-like spikes gives the virus family its name. Usually human coronaviruses are benign and can cause mild respiratory illnesses like the common cold. Coronaviruses that are able to transmit from an animal to a human (this process is called zoonosis or zoonotic transmission) (Zoonoses, 2020) via mutation can cause serious illness due to lack of immunity to the new viruses in humans. The three well-known coronaviruses that are able to cause zoonosis are: Severe Acute Respiratory Syndrome Coronavirus (SARS-CoV) (SARS, 2020), Middle East Respiratory Syndrome Coronavirus (MERS-CoV) (MERS-CoV, 2020), and SARS-CoV-2, the virus that caused Coronavirus Disease 2019 (COVID-19) (WHO, 2020).

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A Spatial Domain Technique for Digital Image Authentication and Tamper Recovery

Monalisa Swain & Debabala Swain

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Abstract

Nowadays, digital watermarking techniques are used to protect the integrity and authenticity of digital image and to provide capabilities for self-recovery of tampered locations. In this paper, a blind watermarking technique for image authentication and recovery of tampered area is proposed. Here the watermarking is done in block-wise manner by dividing the original image into non-overlapping blocks of 4*4 sizes. Here watermark data is consisting of authentication data and recovery data. Authentication data for each block is embedded in same block and recovery data is embedded in mapped block. Watermark data is generated using self-embedding techniques. This proposed scheme is checked against different types of attacks and different percentages of content modification of original image. The experimental results represent accurate detection and localization of tamper and high-quality recovery.

Keywords

Blind watermarking **Fragility** **Tamper detection** **Image recovery**

Spatial domain **Mapping block**

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Empowering the Visually Impaired Learners with Text-to-Speech-Based Solution

Debabala Swain & Sony Snigdha Sahoo

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Abstract

Attending classes and completing education is a particularly daunting task for students with visual disability. Their challenges have been further escalated during the prevailing pandemic situation. So, mere transition to a digital platform may not suffice. Educational organizations who are moving to online mode overnight need to have concerns regarding this. Because, although online mode may help in accessing the content at one's own pace, however, the content should be read out aloud and quite slowly and clearly for the students to pick up. An educational app, designed keeping in view the needs of a visually challenged student is thus the need of the hour. This would empower students by freeing them of dependencies. This study is aimed toward highlighting the features and limitations of any such existing apps and laying down the foundation of an app which shall have easy access facility, i.e., text-to-speech for the visually impaired learners. Also, a brief comparison among education-based apps for visually impaired has been summarized.

Keywords

Digital platform **Online education** **Text-to-speech**

Visually impaired learners (VI learners)

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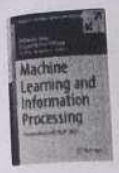

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Copy-Move Forgery Detection Using Scale Invariant Feature Transform

Bandita Das, Debabala Swain, Bunil Kumar Balabantaray, Raimoni Hansda & Vishal Shukla

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Abstract

In the era of digital technology, digital images play an important role in the day to day applications starting from medical diagnosis to court of laws as evidence for the crime investigation. Nowadays it becomes easy to tamper the image with low-cost software tools and hence, only by visual perception one cannot guarantee the authenticity and the integrity of its originality. Copy-move image forgery (CMIF) is one such tampering technique where a region of the image itself is copied and pasted into another region in the same image. This is done either to hide important information or to pass irrelevant data to others. This image forgery (IF) seems to be realistic and hard to detect as the forged region encompasses similar structural characteristics as the original one. This report represents a key-point based method to detect CMIF using Scale Invariant Feature Transform (SIFT). The experimental results and analysis of this method are discussed in detail on online available datasets. This method can detect the CMIF, even the image is distorted by intermediate attacks such as scale, rotation, and some post-processing attacks like image blurring, noise adding, contrast adjustment, color reduction, brightness changes, JPEG compression, etc. This method is also able to detect multiple CMIF.

Keywords

Image forgery **Copy-Move image forgery** **SIFT**

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Transforming the Lives of Socially Dependent to Self-dependent Using IoT

Debabala Swain & Sony Snigdha Sahoo

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Abstract

Internet of Things (IoT) explores the new sensor-based wearable devices and technologies that can be used in day-to-day life. It has opened up a wide range of new dimensions in elderly care, disability care and patient care through real-time monitoring and life supports. This new paradigm has reformed the lifestyle of the socially dependent individuals for the better. It has helped set high standards in the healthcare domain by enabling smart and high technology devices. It has bestowed a self-dependent life to the differently-abled and elderly individuals. Another appealing aspect about IoT is such devices are being made cost-effective in terms of their development so that large number of users look up to these devices for daily usage and whole mankind takes maximum benefit out of the technology. IoT, indeed has got a lot to serve to the society on various aspects, only if mankind is ready to accept it wholeheartedly. This paper briefly summarizes the role of IoT in healthcare and life support and highlights its novel utilities for betterment of socially dependents. Features of some of the IoT solutions have also been discussed thoroughly for instantiating the care that can be imparted by these devices in transforming the socially dependent lives to self-dependent ones. Also, a feature comparison has been provided to stress on the fact that IoT devices can indeed be upgraded at a fast pace which is not to be abdicated but rather be availed for the greater good.

Keywords

IoT Disability care Elderly care Smart devices

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The book " Sustainable Development and Environment" is completely customized for the Development Economists, Development Scientists, Professors, Researchers and Students in the Universities and Colleges of India and Abroad. It is also useful for the candidates for various competitive examinations in India. The book can provide direction to new researchers for conducting their research work in Development Economics and Environment.

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CONTENTS

Preface v

List of Contributors xi

1. **Issue of Conditional Green Convergence A Case Study of Selected OECD Countries** 1
Maniklal Adhikary & Abhishek Dutta

2. **Major Determinants of Agricultural Productivity in India: A Regression Analysis** 16
Laxmipriya Behera & Kalpana Sahoo

3. **Mitigation and Adaptation: A Study of Solutions to Climate Change Issues** 25
Dr. Bandana Pathak

4. **Impact of Rapid Urbanization on Sustainable Development** 41
Bishnupriya Dash

5. **Linkages between Agricultural Growth and Economic Development in India: A Regression Approach** 56
Bhagyalaxmi Behera & Kalpana Sahoo

6. **Foreign Direct Investment and its Impact on Indian Economy: An Econometric Approach and Sustainable Development** 65
Swagatika Mohanty & Prof. (Dr). Jagannath Lenka

7. **Monitoring Urban Wetland Changes and Wetland Ecosystem Services of Bhubaneswar City, Odisha** 72
Ms. Prashna Priyadarshini & Dr. Ashis Chandra Pathy

2

Major Determinants of Agricultural Productivity in India: A Regression Analysis

Laxmipriya Behera & Kalpana Sahoo

Introduction

Agriculture remains an important determinant of the economic, cultural and political landscape in India (Reddy, 2012). Currently both industry and service sector have been contributing more towards economic growth of India, still the importance of agriculture towards its developmental process cannot be ignored. Agriculture is the main source of livelihood for 2.5 billion people, including 1.3 billion smallholders and landless workers. The share of agricultural expenditure in total government spending, in developing countries have been gradually declining since the 1980s. Bilateral and multilateral assistance to agriculture also declined starting in the mid-1980s. It is only in recent years that the World Bank and other aid agencies have increased their lending and boosted their investments towards increasing agricultural productivity (Dethier, 2011). Here the question arises will these efforts of international financial institutions be effective to raise the productivity in agriculture sector ? At present, the growth of agricultural productivity has shown a declined trend in most of the developing countries. The yields of agricultural products are lower than the population growth rate. Given that expanding the cultivated area is not a possibility to meet future needs, in order to feed the growing population, the only solution is increasing agricultural productivity.

Whether it is possible to increase agricultural productivity —which would give a major boost to economic growth and substantially reduce poverty and inequality present in many developing and under developed economies like India depend on many factors. Before examining the major determinants of agricultural productivity in India, it is essential to know the importance and major contribution of agricultural sector on Indian economy.

Economic history tells us that all the developed countries have experienced a shift from agriculture to industry and then to the service sector as the mainstay of the

Role of Language, Literature, and Culture in Nation Building

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CHAPTER SEVEN

Sunset and Sunrise at Kanchenjunga: Reading Kiran Desai's *Inheritance of Loss* from Postmodern Lenses

Madhusmita Pati

Abstract

Kiran Desai's novel *Inheritance of Loss* depicts the complexities of identity issues in multi-racial and multi-lingual India emerging from the consequences of colonialism and ensuing modernist and postmodernist narratives of nation building, their conflicts and dilemmas. The paper uses Jean-François Lyotard as the central interlocutor with his postulations on post-modernism. Kant and Wittgenstein offer the leitmotif for Lyotard's narratives and his works which in turn helps us produce critical interpretations of the losses that the characters inherit in the novel. Desai narrates the conflicts and predicaments which echo the realities of the identity of the State and the Society of Kalimpong as it ensnarls the Indian Nation-State at large. This chapter will examine the experiences thus are narrated through the losses of the diverse characters, evoking human impasses and dilemmas cutting across and forging new identities, boundaries and hopes.

Indian Agriculture Reforms and Rural Development

DR. GOPAL JI SINGH
DR. MANAS BEHERA
DR. SAJOY P.B.
DR PYARE LAL

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clusive Development and Good governance have already occupied the centre-stage of Policy discourses today. The present book studies the functioning of the Panchayati Raj System in the context of good governance and inclusive development. The empirical research that the book undertakes neither romanticises nor rejects the PRIs. It analyses the power equations, struggles and various forms of marginalisation and deprivation in the rural areas. The economically exploited and the socially deprived have a stake in the democratic space created by the PRIs. The silent revolution brought about by the PRIs challenges the unequal power structure and relations in many ways. The project of Inclusive Development and of Good Governance is simply not possible without meaningful and effective participation of the marginalised in the democratic process through the PRIs. The Ruling class and their allies in rural areas are active in preventing the marginalised from occupying the democratic spaces in real terms. The study of this dynamics of rural areas is crucial to developing policies in favour of the marginalised. The Neo-liberal paradigm of development, with its centralising character, defeats inclusive development through democratic decentralisation. What this book sets out to advocate is deepening of democracy in rural areas.

Dr. Manas Behera is actively engaged in Research and Teaching for more than two decades. He is presently working as Head of the Department of Political Science in R.D.Women's University, Bhubaneswar, Odisha. He has presented papers in more than hundred national and international seminars. He has published more than fifty articles in peer reviewed Journals of repute. He has chapters in edited volumes to his credit. He is active in academic bodies and delivers lectures as resource person. His areas of specialisation are Governance, Decentralisation, Inclusive Development, Tribal Studies, Civil Society, Marxism, Ambedkerite thought, Critical Theory, Odisha politics, etc. He has co-authored books on different issues of relevance. He has also administrative experiences in academic field. He has completed his graduation from B.J.B. College, Bhubaneswar and Post-Graduation from Utkal University, Bhubaneswar.

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DR. MANAS BEHERA

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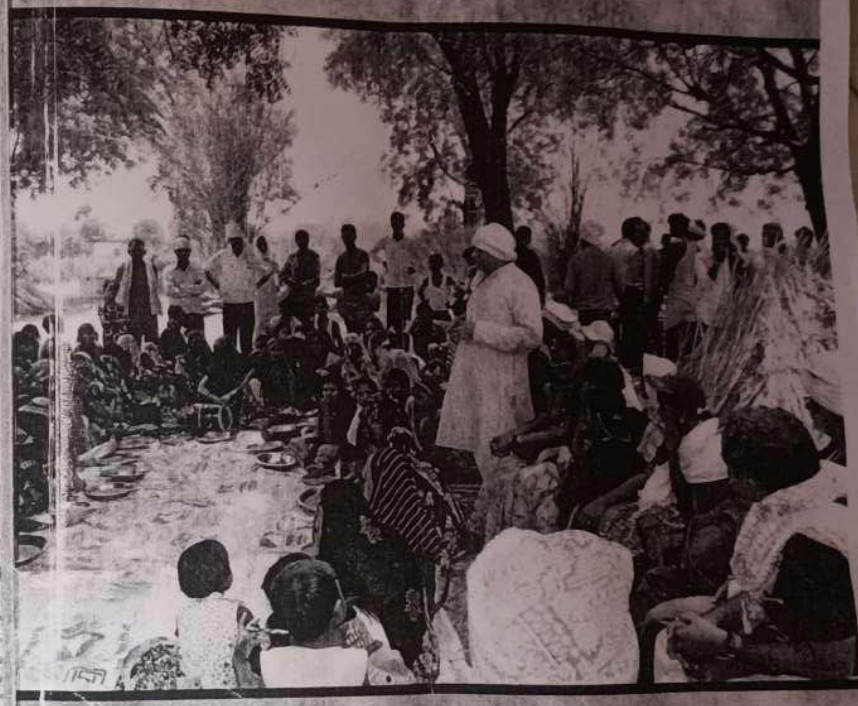

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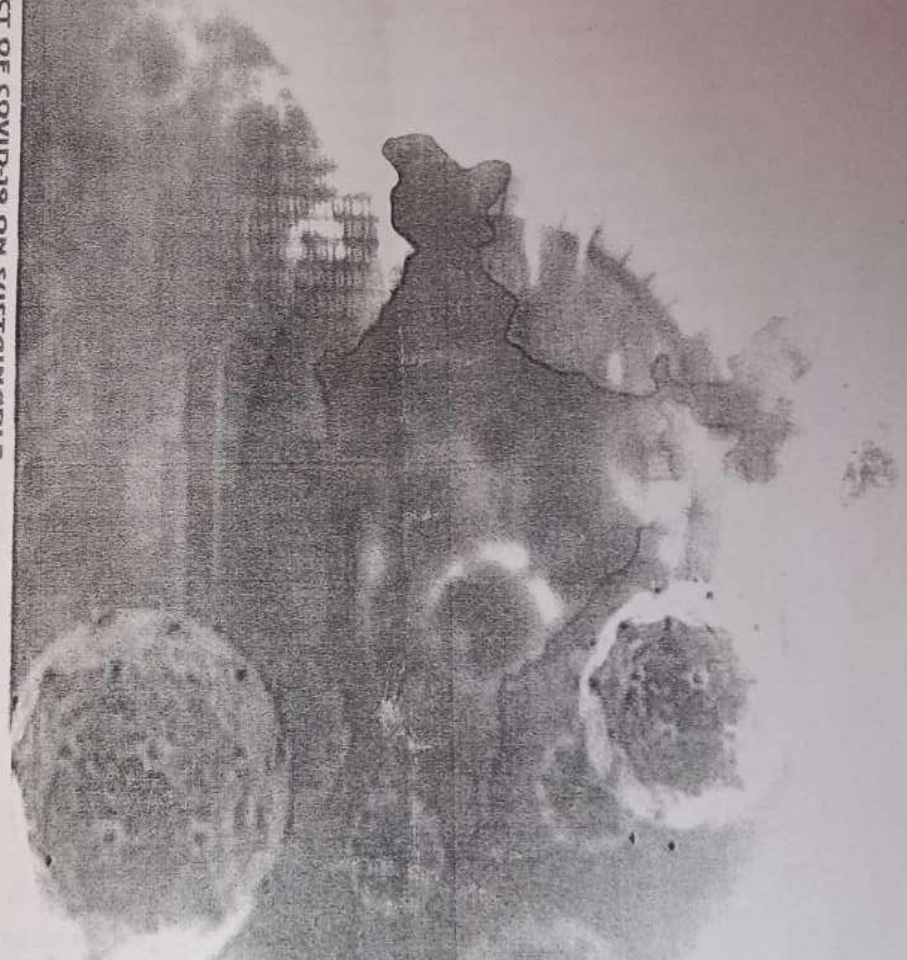
EFFECT OF COVID-19 ON SUSTAINABLE DEVELOPMENT IN INDIA • Dr. Gopal Ji Singh

EFFECT OF COVID-19 ON SUSTAINABLE DEVELOPMENT IN INDIA



Dr. Gopal Ji Singh

COVID-19, Inclusive Democracy and Neo-liberalism in India

—Dr. Manas Behera

Head of the Department of Pol.Sc

R. D. Women"s University, Bhubaneswar, Odisha

Abstract

COVID-19 has decisively influenced human life beyond imagination. The Global Order has failed to contain and manage it and protect the human lives, particularly of the vulnerable. The developed capitalist nations despite their economic strength and higher technology could not overcome the dangers of the pandemic. All big and powerful nations of the world could not come together to protect humanity in this time of unprecedented crisis. They failed to cross their ideological boundaries erected by them. The dominant discourses in the fight against the pandemic was not global, it was national. Where is Globalisation in its true sense? The WHO became an arena of fight among the nations. The Health Systems of the most developed nations of the world simply caught unprepared during the pandemic and could not become ready to fight it. In last four or five decades the well-built public health systems under the Welfare States were gradually replaced by the private players. This paper tries to analyse the failures of the present global order from the perspective of the political economy of neo-liberal globalisation. It has tried to present the cracks in the global order as reflections of the global economy. The neo-liberal capitalist control of the public health systems is the major reason behind the failures of the states in controlling the pandemic. The Pandemic has offered opportunities before people to rethink globalisation for the survival of humanity and for sustainable development. The present global system and its functioning on the principles of neo-liberal globalisation are seriously handicapped to deal with planetary crises like pandemic or climate change. This question have been analysed in this paper along with its impact on democracy with a special reference to India. The current literature on the theme is limited and this paper is an attempt to contribute to that field.

Key words: COVID-19, Pandemic, Neo-liberal Globalisation, Democracy

1.1 Introduction

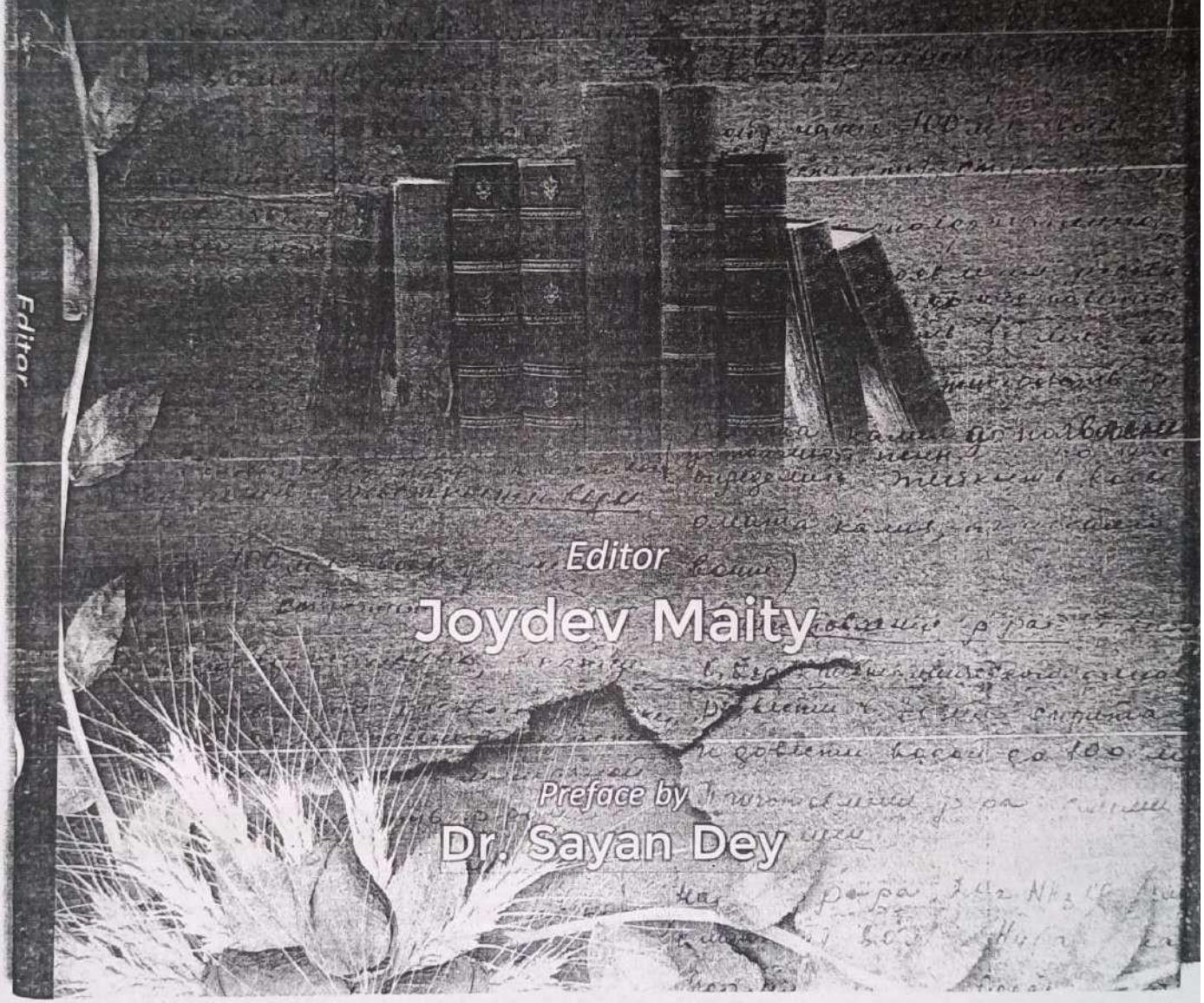
Humanity today faces unprecedented crisis in the form of the pandemic COVID-19 along with brutal poverty, monstrous inequality and environmental degradation having the potential to destroy life on earth. The corona virus pandemic has spread in more than 210 countries and disrupted social and economic life across the globe. It has changed our working, playing, interacting and learning style: our way of life. Lockdown is imposed on more than 3.5 billion people around the world. Doctors and professionals are busy day and night all over the globe to identify the effective treatment. Diplomats and Economists are engaged in finding measures to overcome the economic crisis caused by COVID-19. There is the need of collective work, of Collective Conscience. But unfortunately this is missing in our times. Class Interests coated in National Interest is dominating the discourses of COVID-19 management and inter-state relationships. The situation created out of the present pandemic has put question marks on the capabilities of the Neo-liberal state pursuing neo-liberal policies to face this situation. The gradual dismantling of the public health system through decreased funding and through encouragement to the private players stands thoroughly exposed now. The privatisation of the health sector has commoditised a basic right that is health. The private sector has not come forward on its own to fight the pandemic and help the common people. It cannot, as its logic of existence as a commodity will not allow it. Neither the state has been able to rein it in, in the service of the society. This has created challenges for the Indian State. If India has to serve its people, particularly the marginalised, then it has to reject neo-liberal policies of privatisation of basic services like health. There is least possibility of such a reversal by the present government as it is controlled by the neo-liberal capitalist forces.

1.2 The Pandemic and the World Order

The WHO declared the outbreak of the Coronavirus disease as Pandemic on March 11, 2020, after seventy one days of its outbreak. It named the disease as 'COVID-19" on 11th February, 2020. 'CO" stands for Corona, 'VI" for virus, 'D" for disease and '19" for 2019. The consequences of the pandemic for the entire humanity are beyond human comprehension in the beginning. As the things are unfolding it has exposed the inherent weaknesses of the present world order. 'It is the globalised world"s most localised emergency. An epidemic has become a pandemic faster in a globalised world, as we have experienced now.

Colonial and Postcolonial LITERATURE

Discourses, Disruptions and Intersections



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Colonial and Postcolonial Literature

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Postcolonial Hangover: Obsession of Fair Skin in Bollywood Songs

Manisha Mishra

Introduction

The term 'colourism' was perhaps first used by Alice Walker in her book *The Color Purple* in the year in 1982. Often colorism and racism are confused. Colourism is the discrimination based on the colour of the skin, whereas racism is the bias based on the virtue of race. Colourism can be seen as a subset of racism. The term might have been used in America, but it is no stranger to India. Sadly, we have all grown up with colorism around us. Shockingly, it begins in most of our homes. From the time that children are born in most Indian homes, the first thing that friends and relatives gauge is their complexion. Surprisingly, even parents start comparing complexions between siblings. Colourism is one hangover that the British left behind in India, even after 71 years of their departure.

Colourism is not limited to India. It was happening and is still happening all over the world. But the scope of my paper limits me to talk about the scenario of India and more specifically Indian films, pointed at Bollywood.

Growing up with Colourism in India

Colourism in India does not stop after children are born. It continues right through teenage years to adolescence. In a subtle and sometimes not-so-subtle way, fair-skinned children are often unfairly favoured by teachers at school, and even preferred more in the Indian marriage market. 'Haldi' is a ritual followed before every Hindu marriage. Turmeric is applied on the bride and the groom to make them 'fair' and beautiful. Indian culture propagates colorism. Let me give you an example from my own state. In an Odia arranged marriage scenario, queries like: "Pila ti safa dekhibaku ta?" ["Is the candidate fair?"] is an oft-quoted one. It is almost implied that next to a properly matched horoscope, skin colour is the only virtue that can make a marriage perfect and prosperous! Dark-skinned girls have to be literally sold off by using heavy dowry in the marriage market; else they are sadly rejected.

From the time immemorial, readers from worldwide have a natural affinity for colonial and postcolonial literature. One can never forget major literary works of these fields like Chinua Achebe's *Things Fall Apart*, Ngugi wa Thiongo's *Decolonising the Mind* or Edward Said's *Orientalism*, and the list of such works can never be completed. The fact is that the brutality of colonialism still haunts the people of colonized countries, and the scars of colonialism is still there. This is one of the main reasons behind the popularity of colonial and postcolonial literature. On the other hand, for writers, such literary works often act as a medium to express their anger, resentment and disgust against the colonizers, and the process itself. This book, *Colonial and Postcolonial Literature: Discourses, Disruptions and Intersections*, as collected scholarly articles, illuminates almost every possible themes of colonial and postcolonial literature. Thus, the themes and issues of identity, race, hybridity, postcolonial feminism, postcolonial hangover, migration, cultural affinity, caste, power relationship, loss of native culture etc. have been interpreted by the scholars here. With the exploration of both texts and contexts, this book will surely encourage the readers to ponder more on such literature throughout the world.

Colonial and Postcolonial LITERATURE

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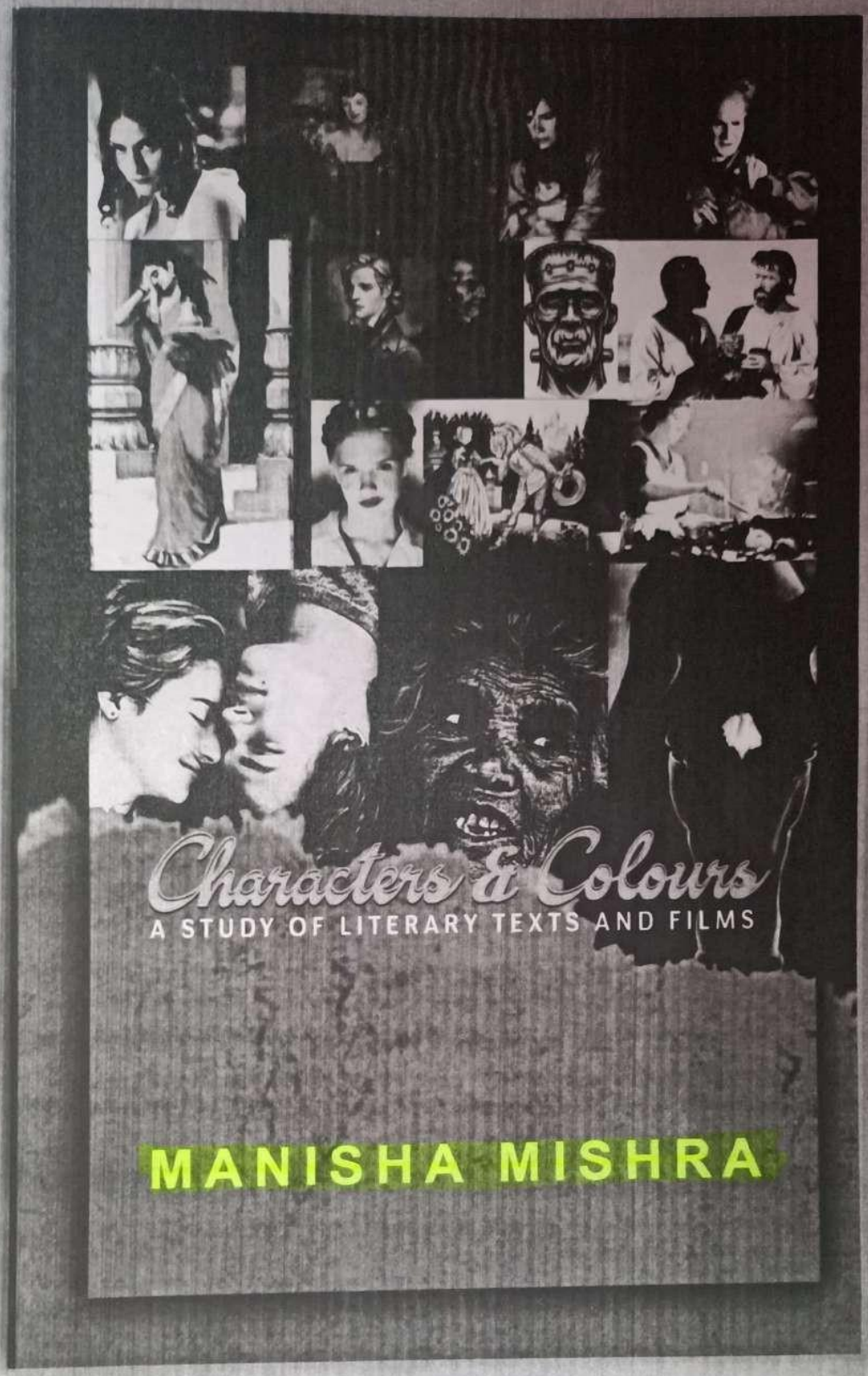

Manisha Mishra

Building on a rather innocuous foundation, Manisha Mishra goes on to produce in Characters and Colours a bravura performance, interleaving the text and its celluloid edition, be it on the big screen or the small. The book thus looks well set to bridge a longstanding disciplinary divide and to usher us towards the multi-modal classroom of the future.

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CONTENTS

Preface v

List of Contributors xi

1. **Issue of Conditional Green Convergence A Case Study of Selected OECD Countries** 1
   Maniklal Adhikary & Abhishek Dutta

2. **Major Determinants of Agricultural Productivity in India: A Regression Analysis** 16
   Laxmipriya Behera & Kalpana Sahoo

3. **Mitigation and Adaptation: A Study of Solutions to Climate Change Issues** 25
   Dr. Bandana Pathak

4. **Impact of Rapid Urbanization on Sustainable Development** 41
   Bishnupriya Dash

5. **Linkages between Agricultural Growth and Economic Development in India: A Regression Approach** 56
   Bhagyalaxmi Behera & Kalpana Sahoo

6. **Foreign Direct Investment and its Impact on Indian Economy: An Econometric Approach and Sustainable Development** 65
   Swagatika Mohanty & Prof. (Dr). Jagannath Lenka

7. **Monitoring Urban Wetland Changes and Wetland Ecosystem Services of Bhubaneswar City, Odisha** 72
   Ms. Prashna Priyadarshini & Dr. Ashis Chandra Pathy

5

Linkages between Agricultural Growth and Economic Development in India: A Regression Approach

Bhagyalaxmi Behera & Kalpana Sahoo

Introduction

Agriculture considers as an important determinant particularly in the initial stages of economic development of a developing country. Until the industrial revolution the majority of the population depended in agriculture for their survival. Historically Indian economy has been considered as an agrarian economy with 3/4th of its population living in villages having agriculture and allied activities as their prime occupation. The majority of the people in India give more priority to agriculture because it provides both food and livelihood to more than half of its population. Adding to this, it also acts as a catalyst for the overall development of the economy via providing employment opportunities to half of its population, generating income, providing raw materials to the industrial sector, adding foreign exchange reserves and ensuring self-reliance on food production and food security (Sahoo & Sethi, 2011).

Agriculture is the main stay and also the most important sector of Indian economy because nearly 50 per cent of India's population depends upon agriculture for their livelihood. Though, it contributes only 18 per cent of India's GDP, still its importance in the country's economic, social, and political structure goes well beyond this indicator. Even after 72 years of Independence, Indian economy is regarded as an agrarian economy. **Sastry et al., (2003)** have tried to examine the linkages among the growth of the different sectors of Indian economy. They have used both input-output model and simultaneous equations framework for the analysis. They have found that despite substantial increase in the share of the service sector in Gross Domestic Product (GDP) over time, the Input-Output test suggested that the agricultural sector plays an important role in determining the overall growth rate of the economy through demand linkages with other sectors of the economy. Some economist argued industry is more

Anomaly detection and optimization using scalable and flexible network data characterization ☆

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ABSTRACT

In the context of information security, cyber-attacks such as malware attacksviruses, etc. caused substantial damage to many organizations. The most common solution to cyber-attack is cryptography algorithm implementation and Intrusion Detection System (IDS). Different cryptography algorithms with varying key length are used to achieve different level of information security. IDS is used to control and alert the cyber-attacks which are much redundant and generates many false alerts in real-life application. The filtering and classification of false alerts involve substantial investment and security analysis. We propose a self-Learning data management approach in terms of data characterization using SeLINA for minimizing false alerts. Two different queues namely: Normal Queue and Suspicious Queues are used for storing information without and with any false alert respectively. The Suspicious Queue then undergoes filtering using feature detection technique. Subsequently, the filtered information with no false alert signals is transferred to the Normal Queue using a supervised hierarchical structure towards minimization of false alerts. Consequently, this technique is helpful to identify malicious attacks easily with no extra time for false alert detection.

1. Introduction

In the recent two decades, the evolution in network performance as well as related service usage has grown at an exponential rate. Not only there is a trend of an increasing number of end users and service providers, but also very large volumes of data in terms of terabytes to petabytes are being transferred each day over the internet. Considering the current COVID-19 pandemic situation [1], almost all activities, starting from corporate to education, are being carried over online medium. Hence the network usage has been significantly increasing at an exponential rate. With this increase in the network usage, the network related attacks are also being increasing accordingly. According to industrial Ethernet book, the global revenue required for protecting against industrial cyber security threats and attacks is being doubled between 2013 and 2019 (approximately 600 million dollars to 1200 million dollars) and in 2020, this growth rate has increased at much faster rate due to active involvement of online medium during this COVID-19 pandemic situation [2].

Cryptography algorithms and Intrusion Detection Systems (IDS) are used to control the security attacks. Cryptography techniques are used for providing security to information with the help of algorithm implementation. Various private and public key cryptography algorithms are adapted by different organizations and researcher for providing different level of security. Private key cryptography uses a single private key which is shared between the sender and receiver in an insecure channel whereas, in case of public key cryptography, a pair of public key and private key is used for encryption and decryption respectively. Public key cryptography is more secure in comparison private key cryptography algorithm [3].

Besides the various cryptography algorithms, there are different IDS techniques which are used to monitor various malicious activities or policy violations. The malicious activities are conveyed either to a manager or centrally collected using a security information and event management (SIEM) system. False intrusion alerts are normally generated due to malicious activities. Hence, false alerts need to be filtered for optimizing the security processes [4].

IDS types ranges from single computer to large network. The most common types are Network Intrusion Detection Systems (NIDS) and Host-based Intrusion Detection System (HIDS). Network traffic analysis is the common example of NIDS whereas, operating system based system monitoring is an example of HIDS. False alert detection is a type of NIDS which is based on the network traffic analysis. Various network

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Effective Online Teaching Learning during COVID-19 Pandemic

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Abstract. The COVID-19 pandemic has resulted in a dramatic change in our day to day life. It affected not only the normal working of many organizations but also the traditional classroom teaching and learning methodologies. Since everyone has to maintain social distancing to follow COVID-19 guidelines, work from home is being preferred as the best alternative as a preventive measure from spreading the pandemic. In its severe impact, schools, colleges, and universities were shut down, pushing nearly 1.2 billion students out of the classroom. As a result, the education system has to suddenly adapt to a distinctive online-based e-learning approach over digital platforms. Research tells that online learning motivated more towards the retention of online resources with less cost in terms of money and time. But, it has also brought many challenges along the way. In this research work, we focus on some of the major challenges such as information security and network bandwidth problem during online teaching. The related security measures being adopted in our research work to secure personal information during any online teaching and learning process. We also focus on some basic learning models for provisioning effective online-based teaching and learning.

Keyword: E-learning, Information Security, Elgamal Cryptography Algorithm, Elgamal Digital Signature, Network failure, Auto-Resolution Adaptation (ARA).

1. Introduction

COVID-19 pandemic is a respiratory based infectious disease caused by SARS-CoV-2 (Severe Acute Respiratory Syndrome Coronavirus-2) virus, first found on 17 November 2019 in Wuhan, Hubei, China, and spread across 188 countries over the globe. The official name was given as COVID-19 (previously named as "2019 novel corona virus") due to the virus which is responsible for the disease [1]. According to CSSE (Centre for Systems Science and Engineering), Johns Hopkins University live report dated 5th September 2020, 26.66 million COVID positive cases are recorded across the globe out of which 17.95 million recovered and 8.76 lakh are deceased and in India out of total 40.24 lakh positive cases, 21.81 lakh are recovered and 69561 are deceased [2].

COVID-19 severely affected all most all sectors starting from the financial market to education. Due to lockdown and shutdown, the financial crisis arises not only in private sectors but also in public sectors. The financial market is primarily controlled in terms of Institutional investments, Banking and Capital Markets, Geo-economics, International Security, Oil and Gas, Media, Entertainment, Culture and Private Investments, Global Governance, Global health, Public finance and social protection,

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Chapter 14
MicroRNA-Mediated Insect Resistance in Field Crops

Bijayalaxmi Mahanty, Suhas Sutar Bharat, Jatindra Nath Mohanty, Rukmini Mishra, and Raj Kumar Joshi

14.1 Introduction

The ever-increasing global population together with changing climatic conditions significantly affects agricultural productivity worldwide. Modern agriculture is tremendously affected by several biotic and abiotic stresses, insect pest being one of the major challenges accounting for up to 25% annual crop yield losses worldwide (Deutsch et al. 2018). Several pest management measures have been utilized by farmers across the world without any tangible success, and important crop plants continue to suffer from yield losses. Moreover, the application of chemical pesticides for controlling insect pests is highly detrimental to both man and its environment. Traditional breeding has significantly contributed to generate high-yielding crop varieties, but the process is time-consuming and cumbersome. Therefore, it is imperative on the part of the plant biologist to formulate new strategies towards development of high-yielding, stress-tolerant crop varieties with existing land and resources to satisfy the current food demand and nutritional security. Genetic

Bijayalaxmi Mahanty and Suhas Sutar Bharat contributed equally with all other contributors.

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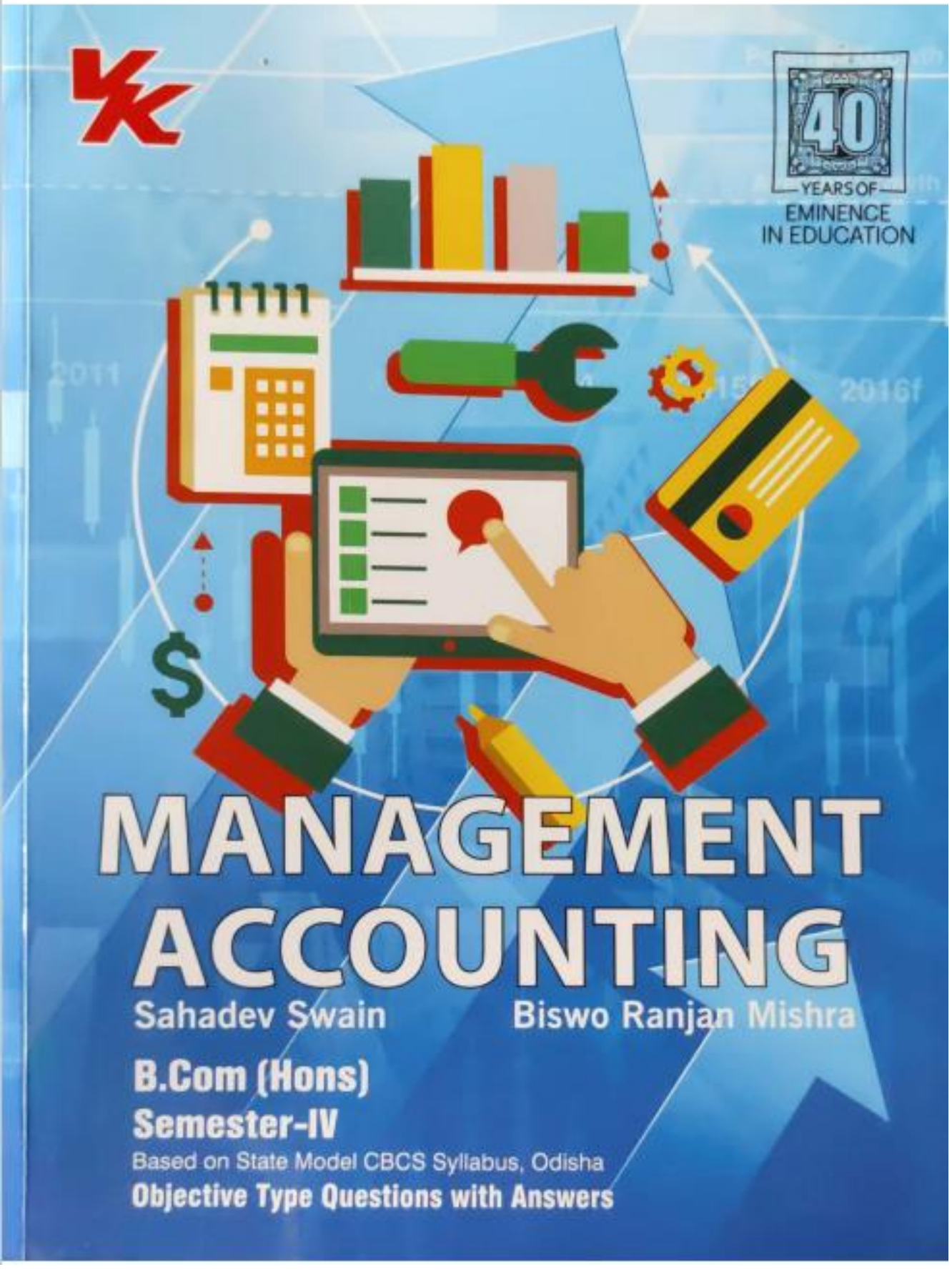

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Semester-IV

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Objective Type Questions with Answers

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CONTENTS

1. MANAGEMENT ACCOUNTING: 1.1–1.22
   - 1.1 Introduction
   - 1.2 Definition of Management Accounting
   - 1.3 Nature of Management Accounting
   - 1.4 Scope of Management Accounting
   - 1.5 Objectives of Management Accounting
   - 1.6 Importance of Management Accounting
   - 1.7 Role of Management Accounting
   - 1.8 Role of Management Accountant
   - 1.9 Distinction between Management Accounting, Financial Accounting & Cost Accounting
   - 1.10 Role of Management Accounting in Modern Business
   - 1.11 Tools and Techniques of Management Accounting
   - 1.12 Limitations of Management Accounting
   - 1.13 Glossary
   - 1.14 Review Questions

2. RATIO ANALYSIS:. 2.1–2.106
   - 2.1 Meaning of Ratio
   - 2.2 Meaning of Ratio Analysis
   - 2.3 Advantages of Ratio Analysis
   - 2.4 Limitations of Ratio Analysis
   - 2.5 Classification of Ratios
   - 2.6 Liquidity Ratios
   - 2.7 Efficiency/Activity/Turnover Ratios
   - 2.8 Solvency Ratios
   - 2.9 Capital Structure/Leverage Ratios
   - 2.10 Profitability Ratios
   - 2.11 Market Based Ratios/Ratio for prospective Investors
   - 2.12 DuPont Analysis
   - 2.13 Preparation of Financial Statements from Ratios
   - 2.14 Ratios at a Glance
   - 2.15 Miscellaneous Examples
   - 2.16 Glossary
   - 2.17 Theoretical Questions
   - 2.18 Practical Questions

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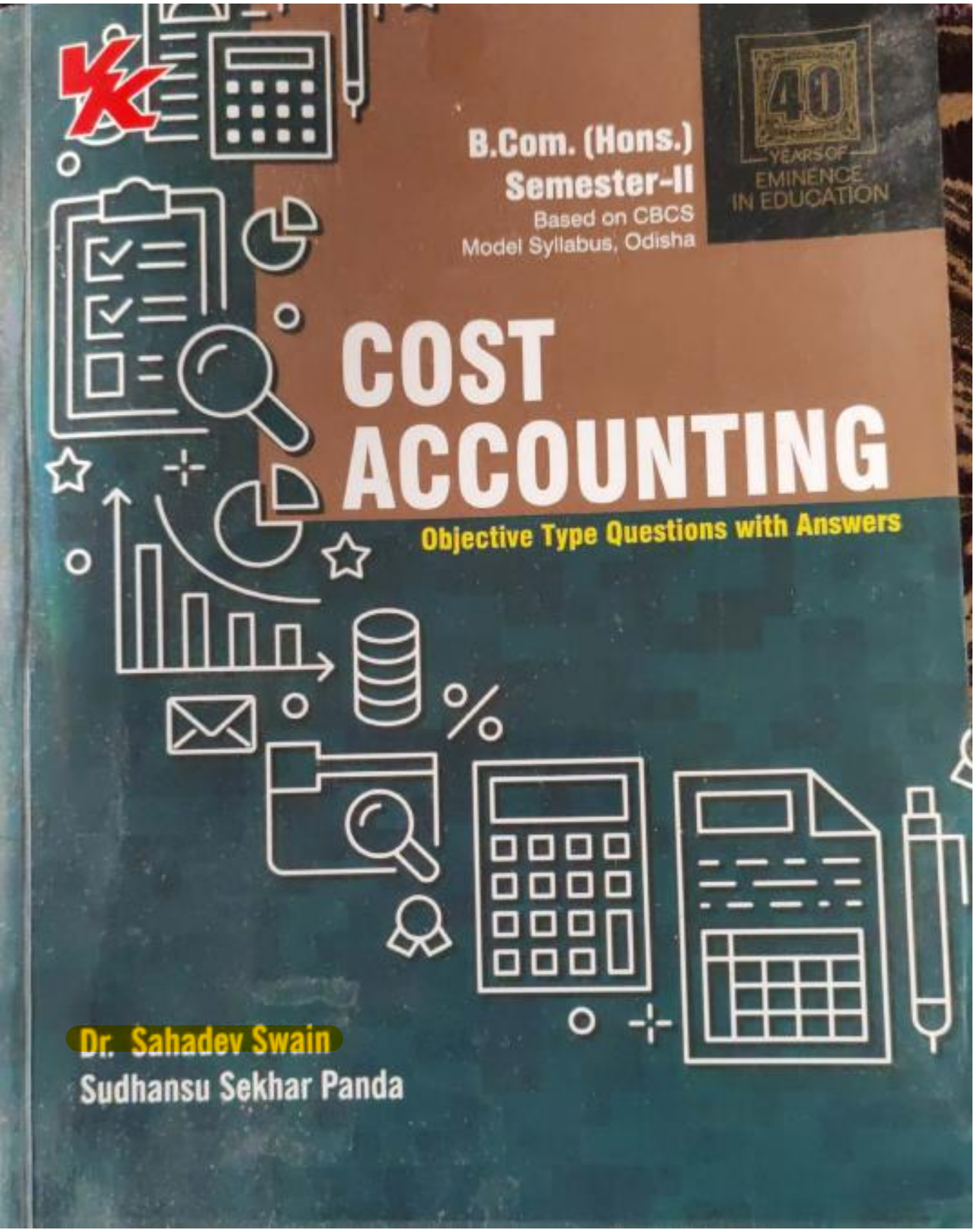
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CONTENTS

SEMESTER–II

1. Nature and Scope of Cost Accounting ..... 1.1 to 1.30
   - Introduction
   - Classification of Accounting
   - Limitation of financial accounting
   - Meaning of Cost, Costing, Cost Accounting and Cost Accountancy
   - Similarities between Cost Accounting and Financial Accounting
   - Difference between Cost Accounting and Financial Accounting
   - Difference between Cost Accounting and Management Accounting
   - Scope of Cost Accounting
   - Objective of Cost Accounting
   - Principles of Cost Accounting
   - Importance of Cost Accounting
   - Limitations of Cost Accounting
   - Objections leveled against Cost Accounting
   - Installation of Cost Accounting System
   - Methods of Costing
   - Techniques of Costing
   - Role of Cost Accountant of an organization
   - Questions

2. Cost: Concept, Elements, Classification and Cost Sheet ..... 2.1 to 2.60
   - Basic Cost Concepts
   - Elements of Cost
   - Classification of Cost
   - Components of Total Cost
   - Items excluded from cost accounts
   - Cost Sheet
   - Production Account
   - Miscellaneous Examples
   - Theoretical Questions
   - Practical Questions

3. Material Control ..... 3.1 to 3.58
   - Introduction
   - Meaning of Material
   - Components of Inventories
   - Meaning of Material Control
   - Objectives of material control
   - Essentials of material control
   - Advantages of material control
   - Techniques of material control
   - Determination of Stock level
   - Economic ordering quantity
   - ABC Analysis
   - VED Analysis
   - Perpetual Inventory System
   - Just-In-Time Inventory System
   - Purchasing of Materials

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ଡ. ସଂଘମିତ୍ରା ଭଂଜ

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ବିପ୍ଳାପନର ଆବର୍ତ୍ତରେ କୋକୁଆ

• ସଂଘମିତ୍ରା ଭଞ୍ଜ

"ଯେକୌଣସି ମହାନ୍ ଲେଖକ ନିଜ ବଳିଷ୍ଠ କଳାକୃତି ଭିତରେ ନିଜର ପ୍ରତ୍ୟୁତ୍ପନ୍ନ ଠିକ୍ ପ୍ରତ୍ୟେକ ଜିନ୍ୟା ପରୋକ୍ଷ ଭାବରେ ତାଙ୍କି ବେଗଥାଏ ଅଥବା ନିଜ ବିଚାର, ବୁଦ୍ଧି, ବିବେକ ଜିନ୍ୟା ନିରୀକ୍ଷଣ ଶକ୍ତିକୁ ଅତିମାତ୍ରାରେ ପ୍ରତିଫାଦିତ କରିଥାଏ । କାରଣ ସେ ଆତ୍ମବିଶ୍ୱାସ ଏବଂ ନୂତନ ପ୍ରୟୋଗ ପାଇଁ ସଂକାଦିତ ।" (୧) ୧୯୮୦ ମସିହା ପରବର୍ତ୍ତୀ ଓଡ଼ିଆ ନାଟ୍ୟରେ ନିରୀକ୍ଷଣାତ୍ମକ ନୂତନ ପ୍ରୟୋଗଧାରୀ ନାଟ୍ୟକାର ହେଉଛନ୍ତି ଡ. ବିଜୟ କୁମାର ଶତପଥୀ । ଚଳନ୍ତି ସମୟର ଜୀବନ-ଜଗତକୁ ସେ ତାଙ୍କ ଅନ୍ତର୍ଦୃଷ୍ଟିରେ ଯେଉଁଭି ରାଜରେ ଅବଲୋକନ କରିଥାଆନ୍ତି, ତାକୁ ନାଟକର ଜାନ୍ତାସ୍ତରେ ମୂର୍ତ୍ତିମନ୍ତ କରି ଗଢ଼ିତୋଳିବାରେ ସେ କୃତବିଦ୍ୟ । ତାଙ୍କର ସୃଷ୍ଟି ଭିତରେ ବିଶ୍ୱକବି ରବୀନ୍ଦ୍ରନାଥଙ୍କ ଗୀତାଞ୍ଜଳିର 'Where tireless striving stretches its arms towards perfection.' ଆହ୍ୱାନ ରହିଛି । ପୃଥିବୀକୁ ଅଖଣ୍ଡ-ଅବିଭାଜ୍ୟ ଦେଖିବାର ବୃତ୍ତା, ମାନବର ନିର୍ଭୀକ-ବିଚାର ସ୍ୱାତନ୍ତ୍ର୍ୟ, ମହାଜତାର ଦାବୀ ସହିତ ଉନ୍ନତ ରାଷ୍ଟ୍ର ନିର୍ମାଣର ଆକାଂକ୍ଷା ନାଟ୍ୟକାର ବିଜୟ ଶତପଥୀଙ୍କ ଆଦର୍ଶବାଦର ଇତାହାର । ସାର୍ବଜନୀନ ସତ୍ୟରେ ସେ ବିଶ୍ୱାସୀ ଓ ପ୍ରଗତିର ଆଶାରେ ସେ ସର୍ବଦା ଅଭିଭୂତ ଥିବା ଜଣେ ସୃତନ୍ତ ପାରମ୍ପତ ସାଧକ ।

ଆଧୁନିକ ଓଡ଼ିଆ ସାହିତ୍ୟରେ ନୂତନ ଆଲୋଜନର ଯଶସ୍ୱୀ ଉତରସାଧକ ରୂପେ ଡ. ଶତପଥୀ ପରମ୍ପରାନୁଗତ ପୁଣି ନୂତନତ୍ୱର ଆବାହକ ମଧ୍ୟ । ତାଙ୍କର ନାଟ୍ୟକୃତିଗୁଡ଼ିକ ସମୟ-ସମାଜ ତଥା ମାନବ ଜୀବନର ସ୍ପନ୍ଦନ-ସାବନାଳ-ଅବିକଳ ଅନୁକୃତି । 'ପଶିଲର ନିସ୍ତାରଂଗ', 'ଜଂପର ଆତ୍ମା', 'ଖୁଧୁତ ସରୀସୃପ', 'ଏଇ ଯେ ସୂର୍ଯ୍ୟ ଉଦି', 'ବିଷାଦ ବୃକ୍ଷର କାହାଣୀ', 'କର୍ଣ୍ଣ', 'ଜାଗାଗାରର କାହାଣୀ', 'ପଳା ପାଇସା ଦେଖି ଜାମ୍ବା', 'କୋକୁଆ' ଇତ୍ୟାଦି ନାଟକ ତାଙ୍କ ସମୁନ୍ନତ-ସଂପ୍ରସାରିତ ଦୃଷ୍ଟି-ଦର୍ଶନର ପ୍ରତିନିଧିତ୍ୱ କରିଛି । 'ଏକ ଉତ୍ସ ସହରର ଇତିବୃତ' 'କର୍ଣ୍ଣ' ଇତ୍ୟାଦି ନାଟକ ଶତପଥୀଙ୍କ ନାଟ୍ୟଚେତନାର ଗୁଣାତ୍ମକ ବିଜୟକୁ ଘୋଷଣା କରିଛି । ସେଉଁଥିପାଇଁ 'ଏଇ ଯେ ସୂର୍ଯ୍ୟ ଉଦି' ନିମନ୍ତେ ୧୯୮୯ ମସିହାରେ ସେ ଓଡ଼ିଶା ସାହିତ୍ୟ ଏକାଡେମୀ ଦ୍ୱାରା ପୁରସ୍କୃତ ହୋଇଛନ୍ତି ।

ଉତର ଆଧୁନିକ ଓଡ଼ିଆ ନାଟକର ଜଣେ ପ୍ରତିନିଧିସ୍ଥାନୀୟ ନାଟ୍ୟକାର ରାଜରେ ନାଟକର ରାଜପଥ ଏବଂ ରୂପପଥ ସୌନ୍ଦର୍ଯ୍ୟ ବୃଦ୍ଧି ପ୍ରତି ଶତପଥୀ ସର୍ବଦା ସଜାଗ । ବିଶେଷତଃ ସାର୍ତ୍ରମାନିକ ସ୍ତିତିରେ ତାଙ୍କ ସୃଷ୍ଟି ଆଜିମୁଖ୍ୟ ପ୍ରତି ସେ ସର୍ବଦା ସଚେତନଶୀଳ । ଜଁପଲ୍ ସାର୍ତ୍ରଙ୍କ ମତରେ – 'ଲେଖା କେବଳ ଲେଖା ନୁହେଁ, ତାହା ଏକ କୃତି ମଟେ । ଦୃଷ୍ଟ ପ୍ରବୃତ୍ତି ବିଶ୍ୱରେ ମନୁଷ୍ୟର ଯେଉଁ ସତତ ସଂଘର୍ଷ ଜାରିଛି, ସେହି ସଂଘର୍ଷରେ ଲେଖା ଯେ ଏକ ଉପଯୋଗୀ ଅସ୍ତ୍ର – ତାହା ଲେଖକଙ୍କର୍ତ୍ତୁ ବୁଝିବା ଆବଶ୍ୟକ ।' ନାଟ୍ୟକାର ବିଜୟ ଶତପଥୀଙ୍କ ପାଇଁ ତାଙ୍କ ସମ୍ପ୍ର ସାଧନା କେବଳ ଗୋଟିଏ ଗୋଟିଏ ଲେଖା ନୁହେଁ ବରଂ ଗୋଟିଏ ଗୋଟିଏ ଉପଯୋଗୀ ଅସ୍ତ୍ର । ସେହି ଅସ୍ତ୍ରଗୁଡ଼ିକୁ ପ୍ରୟୋଗ କରି ନାଟକରେ ସେ ବହୁ ପରୀକ୍ଷା-ନିରୀକ୍ଷା କରିଛନ୍ତି । ବିଶେଷଜ୍ଞ "ପୁଞ୍ଜିପତି ସଂସ୍କୃତ-ସମାଜ ଉପରେ ନିୟନ୍ତ୍ରଣ ବା ପ୍ରଭାବ ବିସ୍ତାର କରିଛି । ଏହି ଧନତାନ୍ତ୍ରିକ ଚେତନା ସମାଜକୁ ନିଜର ସାଥୀଳିଆ ଅଧିକାରରେ ସୁତ୍ର ସୁତ୍ର ଧରି ନିଜ ପାବତଳେ ରାଖି ରଖି ସେମାନଙ୍କ ଉପରେ ଅତ୍ୟାଚାର ଚଳାଇ ଥିବାରୁ ଜନିତ ଯୋଷାକୁ ମୁକ୍ତିଦେବା ତଥା ଏହି ସାମନ୍ତତାନ୍ତ୍ରୀ ସଂସ୍କୃତିର ଧ୍ୱଂସ ସାଧନ କରିବା ହେଉଛି ଉତର – ଆଧୁନିକ ସାହିତ୍ୟର ପ୍ରଧାନ ଲକ୍ଷ୍ୟ ।"(୨) ବିଂଶ ଶତକରେ ଅଧିକାରବାଦ, ବରିତ୍ର-ଶୋଷିତର ମର୍ଯ୍ୟାଦା ପ୍ରସଙ୍ଗ, ଶ୍ରେଣୀ-ସଂଘର୍ଷ ଓ ସାମାଜିକ ଚେତନା, ସାମନ୍ତତନ୍ତ୍ର, ଧାର୍ମିକ – ରାଜନୈତିକ-ଅର୍ଥନୈତିକ ସମସ୍ୟା, ଆତଙ୍କବାଦ, ପରିବେଶ ପ୍ରଦୂଷଣ, ଜଙ୍ଗଲ – ବିଲୋପ, ସର୍ବହରା ଅଦିବାସୀମାନଙ୍କ ଜୀବନ ସଂଗ୍ରାମ ଓ ବାସ୍ତୁଚ୍ୟୁତିର ସମସ୍ୟାମାନ ସାହିତ୍ୟରେ ସ୍ୱାକୃତି ଲାଭ କରିଥିଲା । ଶ୍ରେଣୀ ସଂଘର୍ଷ (class struggle) ଆଧାରରେ ଆଦିବାସୀ ଓ ବଚିତମାନଙ୍କ ସଂପୂର୍ଣ୍ଣ ଜୀବନଚକ୍ର (whole human cycle)କୁ ସାହିତ୍ୟର ଆଲୋଚନାଭୁକ୍ତ କରାଗଲା । ବିଶ୍ୱସ୍ତରୀୟ ମାର୍କ୍ସବାଦୀ ଚିନ୍ତା ଆଧାରରେ ସମାଜବାଦୀ ଧିଜାଧରକୁ ସମନ୍ୱିତ କରି କ୍ରାନ୍ତିର ଅଗିନବ ଦିଗ ଉନ୍ମୋଚନ କରିଥିବା ଚିତ୍ରଜଳାଳଙ୍କ ମଧ୍ୟରେ ଥିଲେ ଲିଓ ଟଲ୍ଷ୍ଟି, ଫ୍ରେଞ୍ଚାଗୋଲ, ଗର୍କୀ, ମାକ୍ସ ସେବୁଟ୍ଟ, ଚାରଲାଙ୍ଗ, ଲୁଡ୍‌ଗାଉସି, ରାଲଫ ଫକ୍ସ, ଅର୍ନେଷ୍ଟ ଫିସର୍ ପ୍ରମୁଖ । ରାଜରେ ମାର୍କ୍ସବାଦର ତିନୋଟି ଧାର୍ଯ୍ୟକୁ ସାହିତ୍ୟରେ ଗୁରୁତ୍ୱପ୍ରଦାନ କରାଯାଇଥିଲା ।

୧. ଶ୍ରମିକ-ଚାଷୀଙ୍କ ସଂଘର୍ଷକୁ ଅଲୋଚନା କରିବା ।

୨. ସ୍ୱତନ୍ତ୍ରତା ସଂଗ୍ରାମରେ ବରିତ୍ର ଜନସାଧାରଣଙ୍କୁ ସାମିଲ୍ କରିବା ।

୩. ସାମାଜିକ ରାସ୍ତରଣର ପ୍ରକ୍ରିୟାକୁ ବ୍ୟାପକ ଏବଂ ତୀବ୍ର କରିବା ।

ମାର୍କ୍ସବାଦର ଏହି ଲକ୍ଷ୍ୟ ଅଦୌ ସାଧାରଣ ନଥିଲା । ଏହାକୁ ବୁଝାନ୍ତି କରିବାରେ ସାହିତ୍ୟର ମାଧ୍ୟମ ଥିଲା ପୁରୁଷ । ୧୯୪୨ ମସିହାଠାରୁ ୧୯୫୫ ମସିହା ପର୍ଯ୍ୟନ୍ତ

ଆଧୁନିକ ଓଡ଼ିଆ ଉପନ୍ୟାସର ବିକାଶ ଓ ସ୍ଥିତି
(୧୯୮୦-୨୦୨୦)

ଡକ୍ଟର ସଂଘମିତ୍ରା ଲଙ୍କ

ମର୍ଯ୍ୟାଦାସମ୍ପନ୍ନ ସୁଦୀର୍ଘ-ଜାଜନିକ ଗଦ୍ୟ-ମହାକାବ୍ୟ ରୂପେ ଉପନ୍ୟାସକୁ 'Reading Public'ର ମାନ୍ୟତା ମିଳେ । ଏକଦା ମହାକାବ୍ୟର ଭୂମିକା ଯାହା ଥିଲା, ଆଧୁନିକ କାଳରେ ଉପନ୍ୟାସର ଭୂମିକା ସେହିଭଳି ରହିଛି । ଯେହେତୁ ଏଥିରେ ପ୍ରେମ ଏବଂ ଭାବପ୍ରବଣତାର ପରିପ୍ରକାଶ ମହତ୍ତ୍ୱପୂର୍ଣ୍ଣ ଥାଏ, ଏହାକୁ ନାରୀଧର୍ମ କଳା (Feminine Art) ଭାବରେ ମଧ୍ୟ ଗ୍ରହଣ କରାଯାଏ । କିନ୍ତୁ ଏଥିରେ ପୌରୁଷର ଲକ୍ଷଣକୁ ମଧ୍ୟ ଅଗ୍ରାହ୍ୟ କରାଯାଇ ନ ପାରେ । ମାର୍କିନ୍ ଯୁକ୍ତରାଷ୍ଟ୍ରର ଜ୍ୟାକ୍ କେରୁଆଜ୍‌ଙ୍କ ମତରେ– "ଉପନ୍ୟାସର ଉପଜୀବ୍ୟ ହେଉଛି ରାସ୍ତାଘାଟ ଚଳମାନ ଜୀବନ । ଉପନ୍ୟାସ ରଚନା ଲାଗି କୌଣସି କଥାବସ୍ତୁ ଖୋଜିବା ଲୋଡ଼ା ନାହିଁ । ଗତବର୍ଷ ଜାନୁଆରୀଠାରୁ ଜୁଲାଇ ମାସ ପର୍ଯ୍ୟନ୍ତ ନିଜେ କ'ଣ କ'ଣ କରିଛି, ତାହା ସଚେତ ଲେଖିଦେଲେ ହିଁ ହେଲା ଉପନ୍ୟାସ । ଏହା ଅବଶ୍ୟ ଏକ ଅତିକଥନ । ତଥାପି ଜଗତର ଯାବତୀୟ ବିଷୟକୁ ସାମ୍ପ୍ରତିକ ଉପନ୍ୟାସ ଯେ ଜୁକ୍ଷିଗତ କରିପାରେ, ସେଇ ସୂଚନା ଏଥିରୁ ମିଳୁଛି । ଏହି ବିଚିତ୍ର ବହୁମୁଖୀ ମଣିଷ ଜୀବନର ଉଭା ଯେତେ ପୋତା ସେତେ । ଉଭା ଦିଗ ସଙ୍ଗେ ସଙ୍ଗେ ଜୀବନର ପୋତା ଦିଗଟି ମଧ୍ୟ ଏବେ ଉପନ୍ୟାସରେ ତମାଲାଇ ଭାବରେ ରୂପାୟିତ ହୋଇପାରିଛି ।"[୧] ଜୀବନ ସହିତ ନିବିଡ଼ ସମ୍ପୃକ୍ତିରୁ ଉପନ୍ୟାସର ସୃଷ୍ଟି । ହିନ୍ଦୀ ସାହିତ୍ୟର କବିସମ୍ରାଟ ପ୍ରେମଚାନ୍ଦଙ୍କ ମତରେ – 'ମୈଁ ଉପନ୍ୟାସ୍ କୋ ମାନବ୍ ଚରିତ୍ର କା ଚିତ୍ର ମାତ୍ର ସମଝ୍‌ତା ହୁଁ । ମାନବ୍ ଚରିତ୍ର ପର୍ ପ୍ରକାଶ ଡାଲ୍‌ନା ଔର ଉସ୍‌କେ ଉତ୍ଥାନ କୋ ଖୋଲ୍‌ନା ହିଁ ଉପନ୍ୟାସ୍ କା ମୂଳତତ୍ତ୍ୱ ହୈ ।' 'An Introduction to the study of literature' ପୁସ୍ତକରେ ପାଶ୍ଚାତ୍ୟ ଆଲୋଚକ ଉଇଲିୟମ୍ ହେନେରୀ ହଡ୍‌ସନ୍ ଉପନ୍ୟାସର ସଂଜ୍ଞା ସମ୍ପର୍କରେ କହିଛନ୍ତି – 'Like the Drama, the novel is con-

cerned directly with life.' ସେହିପରି 'The Progress of Romance' ରେ C. Ravee କହନ୍ତି– 'The novel is a picture of real life and manners and of the times in which it is writter x x x the novel gives familiar realtion of such thing as pass everyday before our eyes.' ହେନେରୀ ଜେମ୍‌ସଙ୍କ ମତରେ– 'A novel is a personal, a direct impression of life.' ରିଚାର୍ଡ଼ କଟନ୍‌ଙ୍କ ମତରେ– 'It is a study of contemporary soceity with an impalied social interest.'

ପାଶ୍ଚାତ୍ୟ ଉପନ୍ୟାସ ସାହିତ୍ୟର କଳାଗତ ରୂପରେଖ ପରିବର୍ତ୍ତିତ ହୋଇଛି । ଏଜାଦଶ ଶତାବ୍ଦୀର ଡାପାନୀ ଗେଞ୍ଜି କାହାଣୀ, ଚତୁର୍ଦ୍ଦଶ ଶତାବ୍ଦୀର ଇଟାଲୀୟ ନଭେଲା, ମଧ୍ୟଯୁଗୀୟ 'ରୋମାନ୍ସ', ଅଷ୍ଟାଦଶ ଶତାବ୍ଦୀର 'Novel' ପୁଣି ଆଜି 'ଆଣ୍ଟିନଭେଲ୍' ଭାବରେ ପରିଚିତି ଲାଭ କରିଛି । ଯୁରୋପୀୟ ସାହିତ୍ୟର ଉତ୍ତ୍ୱଳ ବୈଦିକ ବିନ୍ଦୁ ଭାବରେ ହୋମରଙ୍କ 'ଅଡ଼େସି', ଭାରତୀୟ ସାହିତ୍ୟର 'ରାମାୟଣ' ଏବଂ 'ମହାଭାରତ'କୁ ପ୍ରାଧାନ୍ୟ ପ୍ରଦାନ କରାଯାଏ । ଏତଦ୍‌ଭିନ୍ନ ଭାରତୀୟ ସଂସ୍କୃତ କଥା ସରିତ, ବେତାଳ ପଞ୍ଚବିଂଶତି, ଦଶକୁମାର ଚରିତ, କାଦମ୍ବରୀ, ବୌଦ୍ଧ ସାହିତ୍ୟର ଜାତକ ଗଳ୍ପ, ଓଡ଼ିଆରେ ସାରଳା ମହାଭାରତ, ବଳରାମଙ୍କ ବାଣି-ରାମାୟଣ, ଗୁହ୍ୟସୂଧାନିଧି ଇତ୍ୟାଦି ଦେଇ କଥାରୂପ ଗତିଶାଳ ହୋଇଥିଲା । ସଂସ୍କୃତ ପୁରାଣରେ 'ଦେବତ୍ୱ' (Godification) ଯୋଗୁଁ ପୁରାଣ ଚରିତ୍ର ଅତିଶ୍ୱସନୀୟ ମନେହେଲେ ଏବଂ ଦୂରେଇଗଲେ ମଧ୍ୟ । ତେଣୁ ସମାଜନିଷ୍ଠ ଜୀବନ ଓ ସାମାଜିକ ଚରିତ୍ରଙ୍କୁ କଥା ରୂପ ପ୍ରମୁଖ ଆଧାର ଭାବରେ ଗ୍ରହଣ କରାଗଲା । ସଂସ୍କାରବୋଧର ମାନସିକତାରୁ ସମସ୍ୟା ଉତ୍ଥାପନର ବାସ୍ତବତା ଏବଂ ପରେ ବାର୍ତ୍ତମାନିକ ସ୍ଥିତି ତଥା ସ୍ୱରୂପ ଉଦ୍‌ଘାଟନ ହିଁ ଉପନ୍ୟାସର ଆଭିମୁଖ୍ୟ ପାଲଟିଗଲା ।

ସାହିତ୍ୟରେ ଉପନ୍ୟାସର ଆବିର୍ଭାବ ପ୍ରାୟ ୨୦୦ ବର୍ଷ ତଳର କଥା । ଇଂରେଜୀ ସାହିତ୍ୟରେ ଉପନ୍ୟାସର ଆରମ୍ଭ ହୋଇଥିଲେ ହେଁ ଉନବିଂଶ ଶତାବ୍ଦୀର ପ୍ରଥମ ପାଦରେ ସ୍କଟ୍‌ଙ୍କ ଅଲ୍ୟୁଦୟ ପର୍ଯ୍ୟନ୍ତ ଉପନ୍ୟାସର ଶୁଦ୍ଧ-ସମୁନ୍ନତ ରୂପ ଆତ୍ମପ୍ରକାଶ ଲାଭ କରିପାରି ନ ଥିଲା । ଯୁଗୀୟ ଅସନ୍ତୋଷ, ବିବିଧ ଚାପ, ତଥା ପରିବର୍ତ୍ତନଶୀଳ ସ୍ୱରୂପ ଆଧାରରେ ସମୟର ନିଚ୍ଛକପଣକୁ ଉପନ୍ୟାସ ଅନ୍ତର୍ଗର୍ଭିତ କରି ଅଭିବ୍ୟକ୍ତ ହୋଇଛି । ପ୍ରତ୍ୟେକ ଯୁଗରେ ବିଭିନ୍ନ ସଂସ୍କାର, ପରିସ୍ଥିତି, ପୃଥକ୍ ଚିନ୍ତନ, ବିବିଧ ନିୟମ ଉପଲବ୍ଧ ହୋଇଥାଏ । ତେଣୁ ଚିନ୍ତା-ଚେତନାଗତ ଭିନ୍ନତା ଅତ୍ୟନ୍ତ ସ୍ୱଭାବସିଦ୍ଧ । ପୃଥିବୀ ଉପନ୍ୟାସର ଇତିହାସରେ ଉନବିଂଶ ଶତାବ୍ଦୀ ତଥା ଆବ୍ୟ ବିଂଶ ଶତାବ୍ଦୀ ଯଥାର୍ଥତଃ ଏକ ସ୍ୱର୍ଣ୍ଣଯୁଗ ଥିଲା ।

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16

NATIONAL EDUCATION POLICY 2020 AND REVISITING MOTHER TONGUE IN THE CURRICULUM OF ODISHA

Dr. Sasmita Kar

Introduction

Language plays a very important role in the all round development of a child. It shapes the child's world, gives him/her means of expressing himself/herself, contributes to his/her emotional growth and academic as well as other aspects of life. Experts have found when a child is born he starts learning in his home language. It is not just in our country, in countries like France and Germany and even Nobel laureates have admitted that their knowledge of science or any other subject has been better when they studied it in their language."

Primary education in a child's first language or mother tongue is crucial to early learning and considered as most effective strategy for developing strong academic foundations and a base for acquiring proficiency in other language. The National Education Policy 2020 has recommended early schooling in a child's mother tongue and states that it can improve learning, increase student participation, reduce the number of dropoutsand grade repetition. Approved by the Union Cabinet on July 29, 2020, it says that "the medium of instruction until at least class 5, but preferably till class 8 and beyond, will be the home language, mother tongue, local language and regional language." All efforts will be made early on to ensure that any gaps that exist between

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25

BIG DATA SCIENCE AND OMICS TECHNOLOGY

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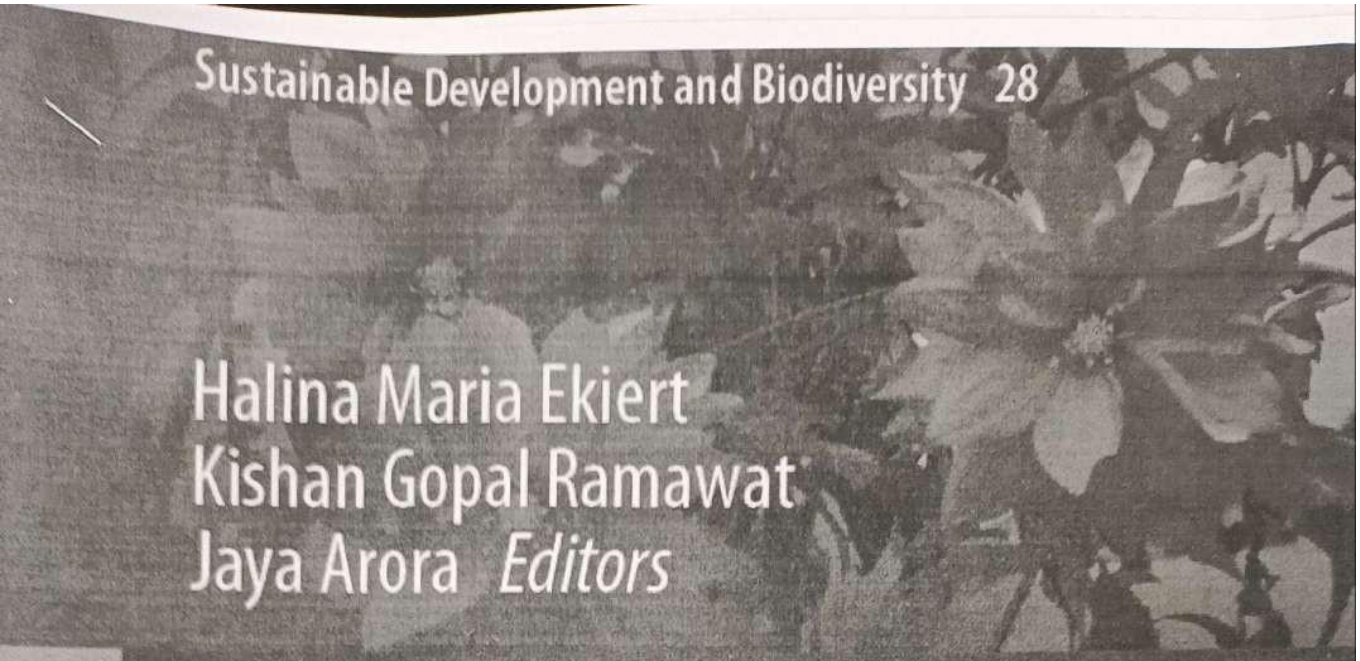
I. Abstract
II. Big Data
III. Omics Science
IV. Genomics
V. Proteomics
VI. Metabolomics
VII. Integration of Omics Technology with Big Data
VIII. Data Science for storage, handling and processing
IX. Sources of Big Data in Omics Science
X. Our Approaches

I. ABSTRACT

Big Data refers to the tools, processes and procedures allowing an organization to create, manipulate, and manage very large data sets and storage facilities and aims to assist in capturing, storing, searching, sharing, and analyzing voluminous and heterogeneous data. Current usage of the term big data refers to the use of predictive analytics, user behaviour analytics, and such other advanced data analytics methods that extract value from data, and seldom to a particular size of data set. The advents of high-throughput technologies like Next Generation

Sustainable Development and Biodiversity 28



Halina Maria Ekiert
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Back to top ↑

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Back to top ↑

Chapter 15
Cultivation and Utilization of *Pandanus odorifer* for Industrial Application

Noohi Nasim, I. Sriram Sandeep, Sanghamitra Nayak, and Sujata Mohanty

Abstract *Pandanus odorifer* (Forssk.) Kuntze (Kewda) is an industrially important aromatic plant currently having huge demand for the unique fragrance possessed by its essential oil. Phenyl ethyl methyl ether is the major component which imparts this exquisite odour to the kewda male flower essential oil. This distinctive aroma instigates its extensive usage in the cosmetic, pharmaceuticals and flavour and fragrance industries. Almost every part of the plant (flower, stem, root, leaves) possess numerous pharmacological and ethnic utilities. The plant propagation using elite genetic material is therefore imperative to produce improved quality kewda plants to meet the global need. The accelerated demand of kewda perfumes has resulted in a hike in the price of kewda oil. Hence, the farmers require its large-scale cultivation mainly in the coastal and sub-coastal regions. The present chapter focuses on the botanical, phytochemical, pharmacological, agronomical and biotechnological aspects of *Pandanus odorifer*. This comprehensive information will conclusively allow better utilization of this industrially important plant for various industrial uses and improve the socio-economic growth of low-income coastal villagers.

Keywords *Pandanus odorifer* · Essential oil · Perfume · Chemotype · Genotype · Pharmacology · Aromatic plant · Flavour and fragrance industry

15.1 Introduction

Since ancient times plants have been an exorbitant source of natural products and have been widely used to treat various health-related disorders; natural products include numerous pharmaceutical compounds, colouring agents, dyes, and aromatic essential oils. The essential oils are the secondary metabolites stored in the glandular trichomes or cavities and provide a defence system to the plant against herbivores (Glas et al. 2012). Several aromatic plants have been identified and explored for their therapeutic essential oils which are used extensively in the flavor and fragrance

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Manisha Mishra

MANISHA MISHRA

SHOBHA TO CHANDNI

In your long tresses
In your large doe-like eyes
And lustrous lashes
He immersed himself, Chandni
He found his moon
In your face
On cloudy nights
But things were different then
I wish to be his new moon now, Chandni.

I was once a moon
In someone's exquisite sky
Lit by twinkling stars
But little did I realise
The eclipse chased me
On close grounds
And could reach me so swiftly
Before I waxed completely.

Love is no crime, dear Chandni
But not after marriage
Can any wife bear
To have her affections
Betrayed by a man for his lover
He is no longer yours, for sure.

In a ritual before the fire
Taking seven rounds
Tying the sacred '*mangalsutra*'
He has proclaimed me as his
Before the entire universe.
Was it an illusion?

Manisha Mishra

RHEA TO MAYA

I loved him as I could
With all my heart
All my mind in it, Maya!
His soul in an eternal quest
For a different madness
That only tuned into you.

You robbed me
Of a husband
You robbed my child
Of a father
I should probably begin hating you
But love has no rhyme or reason
Perhaps that's why
I loved him
Once upon a time.

I begin to wonder
About the delicate strings
Of my quivering heart
That started beating for him
Was it merely a hallucination
Not pure love
That he finally found in you?