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chiefadvisor.sresthakam@svim.edu.in
executiveeditor.sresthakam@svim.edu.in

✉ svim.bbsr@gmail.com
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International Journal on Scientific Research, Engineering, Science, Technology, Humanities and Advanced Knowledge of Management

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It is with immense pride and profound enthusiasm that I welcome you to the International Journal on Scientific Research, Engineering, Science, Technology, Humanities and Advanced Knowledge of Management, professionally recognized as SRESTHAKAM. As the Chairman and Chief Publisher at the Swami Vivekananda Institute of Management, I am honoured to introduce this global platform, which has been meticulously designed to celebrate, elevate, and catalyse academic excellence across all borders. In our rapidly evolving modern landscape, the traditional silos that once separated academic disciplines

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Warm regards

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Er. Ashish Kumar Patra

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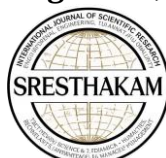


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I look forward to reading your contributions and welcoming you to our growing community of authors. Kindly send your articles to editorinchief.sresthakam@svim.edu.in

Warm regards,

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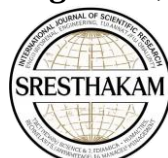
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TABLE OF CONTENTS

Sl No	Name of the Paper	Author name(s)	Page no.
1.	Analysis of Green HRM Practices in Govt. Office Administration in Odisha: Emerging Good governance and Economic Sustainability	Dr. Madhusmita Dash Mr. Shivam Khamari Dr. K. Santhana Lakshmi Prof. (Dr.) Ramesh Chandra Rath	1 – 14
2.	Moonlighting Green HRM Services in Corporate Structure- An Emerging Analysis of Structural Equation Modelling.	Dr. Madhusmita Dash Dr. V. Nagajothi Dr. Rahela Tabassum Prof. (Dr.) Ramesh Chandra Rath	15 – 37
3.	Application of Human Resource Tools for Employee Well-Being and Sustainable Practices on Corporate Sector in India: Emerging Needs & Challenges	Dr. Bijal Shah Dr. K. Santhana Lakshmi Mr. Shivam Khamari Prof. (Dr.) Raj Kumar Singh Prof. (Dr.) Sukanta Kumar Baral	38 – 53
4.	Balancing Power and Profit: How We Make Smart Choices for Blockchain-Based Clean Water Technology	Mr. Shivam Khamari Dr. Jakki Samir Khan Prof. (Dr.) Ramesh Chandra Rath Dr. Rajani Agrawalla	54 – 61
5.	A Sustainable Strategic Planning for Development of Local Tourism Market in Post Pandemic Covid-19	Ms. Monalisa Pattanayak Dr. Rahela Tabassum Mr. Shivam Khamari Prof. Subrat Choudhury	62 – 69
6.	Analysis of Green Business Model on Circular Economy for Economic Sustainability	Prof. (Dr.) Sushil Kumar Mr. Shivam Khamari Dr. Senthil Kumar Ms. Sujata Das	70 – 79
7.	Effect of Cenosphere on Three-Body Abrasive Wear Performance of Woven Hybrid Jute-Glass Epoxy Composites	Dr. Soma Dalbehera Dr. Sarita Nayak Dr. Umarani Adrifa Dr. Y. Vinodhini	80 – 89
8.	Role of Nanotechnology in Breast Cancer Treatment and Management: An Evolving Demands, Health Challenges, And Opportunities for Society at Socioeconomic Levels	Prof. (Dr.) Rashmi Bhardwaj Ms. Monalisa Pattanayak Mr. Shivam Khamari Dr. Rajani Agrawalla Mrs. Sani Rath	90 – 100
9.	An Overview of Organizational Change Management through Talent Pool Creation: Emerging Needs and Challenges.	Mr. Sudarsan Sahoo Dr. Bandana Nayak Mr. Shivam Khamari Dr. Ganesh Prasad Das	101 – 111
10.	Role of Green HRM Practices in Corporate Sector on Economic Sustainability: Emerging Models of Green Practices in 21 st Century.	Ms. Sujata Das Dr. Madhusmita Dash Mr. Shivam Khamari Prof. (Dr.) Ramesh Chandra Rath Prof. Binodini Mahapatra	112 - 129



Analysis of Green HRM Practices in Govt. Office Administration in Odisha: Emerging Good Governance and Economic Sustainability

Dr. Madhusmita Dash ¹, Mr. Shivam Khamari ², Dr. K. Santhana Lakshmi ³, Prof. (Dr.) Ramesh Chandra Rath ⁴

¹Associate Professor, Siksha 'O' Anusandhan (Deemed to be University), Department of Humanities and Social Science, Bhubaneswar, Odisha, India.
Email.id- madhusmitadash@soa.ac.in

²Assistant Professor, Swami Vivekananda Institute of Management, Baniatangi, Khordha
Email Id: shivamkh20@gmail.com ORCID ID: 0009-0009-3618-2954

³Professor and HOD, SRM university, Chennai
Email Id: santhank@srmist.edu.in

⁴Principal at Swami Vivekananda Institute of Management, Bhubaneswar, Odisha
Email Id: drramesh.rrc@gmail.com

ABSTRACT:

At present scenario, the Government of Odisha gives importance of its office administration smoothly in order to execute Green HRM resources and its legal practices in different sectors of Odisha, like energy, water, sanitation, health and hygiene of human resources etc. and execute Green HRM practices for documentation in paper less work in Govt. and Public Sector. Green HRM practices promote resource efficiency through measures like paperless workflows, energy conservation, and waste reduction leading to substantial cost savings for the public exchequer. The main objectives of this research paper is to investigate and analyse the impact of implementing Green Human Resource Management (GHRM) practices within the administrative framework of government offices in Odisha, specifically focusing on their contribution for emerging economic sustainability and the establishment of good environmental practices in various sectors. These sectors involve examining how green HR contributes to cost savings through resource efficiency, reduced waste, optimized energy consumption, and other economic benefits to the stakeholders or creating a good ecological and environmental ambiance for sustaining a good governance. In this regard, the researcher has trying to identify various challenges and opportunities associated with implementing Green HRM practice through various models in the unique context of Odisha government office administration. Again, this paper reveals to justify its purpose recommendations and strategies for effectively leveraging Green HRM practice and various models to achieve both economic development sustainability in the good governance within the state of Odisha.

Primarily, the researcher trying to justify the aforesaid research problem and its real solution at their level best for collection of data in primary method from 500 human resource professionals and employees of different Govt. sectors in Odisha, but some extent the researcher compels to collect some of information through secondary sources. Henceforth, a mixed method of research approaches, techniques etc. which will be used to assess the assigned problem as entitled as above and assume no of hypotheses related to main objectives of the research work, Thus , various Green HRM models taken to examine its validity and authenticity, such as Multi-Group Analysis Models (MGAM), New Models of Green HRM(NMGHRM) which focuses on different aspect of HR functions ,recruitments, performance management, training and development, compensation and reward etc. are incorporating Green practices in order to creating a good culture ,and environment responsibility of the organization for the benefit of the employees. Finally, the researcher expected that from their aforesaid study might have getting the opportunities to adopt Green HRM practices in different Government departments in Odisha. This experimental research would have greater impact in the minds of the employees, stakeholders, management for a better practise on execution of HR policies from time to time in order to achieving organization goals through a conducive environment.

Key words: Green HRM Practices, Multiple-Group Green HRM, Good-Governance of Office Administration, Economic development and sustainability, Strategic Models of Green HRM

1.Introduction

In this section, the researcher aims to execute Green HRM practices in various Govt. offices and organizations for the day-to-day practical, realistic, reliable, implementation of the aforesaid research frame work of Green Practices and expected to seek out various environmental problems in

Odisha and abroad.

Despite the growing global emphasis on environmental sustainability and the potential for Green Human Resource Management (GHRM) practices to contribute to both ecological and economic benefits, there is a limited understanding of the extent to which these practices are implemented within the government office administration



International Journal on Scientific Research, Engineering, Science, Technology, Humanities and Advanced Knowledge of Management (SRESTHAKAM)

in Odisha. This research seeks to address this gap by analysing the current state of GHRM adoption in Odisha's government offices and evaluating its impact on emerging good governance principles (such as transparency, accountability, and stakeholder engagement) and economic sustainability within the state's administrative framework.

The integration of Green Human Resource Management (GHRM) practices holds the potential to significantly influence both good governance and economic sustainability within public sector organizations. However, the specific mechanisms and effectiveness of this interrelation within the unique context of government office administration in Odisha remain largely unexplored. This study aims to analyse the existing GHRM practices in Odisha's government offices, critically examine their contribution to fostering principles of good governance, and assess their impact on achieving long-term economic sustainability within the state's administrative operations.

The adoption of Green Human Resource Management (GHRM) practices in government office administration presents both significant opportunities for advancing good governance and economic sustainability, as well as potential challenges in implementation within the specific bureaucratic and operational context of Odisha. This research endeavours to identify the key GHRM practices currently in place within Odisha's government offices, analyse the challenges and enabling factors influencing their adoption, and evaluate their effectiveness in contributing to enhanced good governance and long-term economic sustainability.

While Green Human Resource Management (GHRM) is increasingly recognized for its potential to drive environmental and economic benefits, its application and impact within the government office administration of Odisha, particularly in relation to emerging good governance and economic sustainability goals, require thorough investigation. This study aims to analyse the existing GHRM practices in Odisha's government offices and assess their contribution to these critical outcomes.

3. Research Objectives:

1. To execute the application of Green HRM practices in different sectors of state Govt. of Odisha and analysis its valuable role and importance in the real practice of Human Resources Management.
2. To motivate employees, staff, employer and all stakeholders to use Green HRM practices in their daily work and life style for reducing the consumption of economic resources at work place and creating an ecological environment for good practices.

3. To examine the Green HRM practices and its effects in the real situation of the Govt. sector through different Green HRM models genuineness and authenticity.

2. Literature Review

This section of literature review have outlines the potential theoretical framework, hypotheses, literature gaps, and contributions for a study, According to Hannan & Freeman, 1977 in their theory Public Sector Organizational Ecology suggests that "Organizational survival and success in the public sector are influenced by environmental pressures and the ability of organizations to adapt to these pressures. In the context of this study, the increasing emphasis on environmental sustainability and resource efficiency by national and international bodies, coupled with citizen expectations, creates pressure on government offices in Odisha to adopt green practices. Green HRM practices can be seen as adaptive mechanisms that enhance the efficiency and legitimacy of government administration in response to these environmental pressures, contributing to economic sustainability and good governance".

According to Hood in 1991 in his theory of New Public Management (NPM) emphasizes "efficiency, effectiveness, and accountability in public sector administration, often drawing inspiration from private sector management practices. Green HRM practices, particularly those focused on resource optimization, waste reduction, and employee engagement in efficiency initiatives, align with the core tenets of NPM by promoting cost-effectiveness and improved service delivery within government offices. Emerging models of Green HRM, leveraging technology for paperless administration and energy management, resonate with the NPM focus on modernization and efficiency".

According to Blau, 1964 in his theory of Social Exchange posits that "positive actions by an organization towards its employees can lead to reciprocal positive behaviours and attitudes from employees. Implementing Green HRM practices that demonstrate the government's commitment to environmental sustainability and employee well-being can foster greater employee engagement, motivation, and a sense of purpose, potentially leading to increased productivity and more responsible resource utilization within government offices. Emerging models that involve employees in green initiatives and recognize their contributions can strengthen this social exchange".

In this research work, we found that there are a few research papers available on Green HRM Practices in Govt. sector administration in India, particularly in Odisha, that's why the researcher highly motivated to do an extensive research on the aforesaid research entitled "Analysis of Green HRM Practices in Govt. Office



Administration in Odisha: Emerging Good governance and Economic Sustainability”. Thus, we focused on the majority of existing literature on Green HRM Practices on the Govt. sector and found that there is a significant gap in understanding its adoption, impact, and unique challenges within the Indian public sector, and even more so within specific state government administrations like Odisha. Scarcity of studies on the economic sustainability aspects in Government context: While some research might touch upon environmental benefits of green practices in government, the specific economic sustainability outcomes (cost savings, resource efficiency gains) linked to Green HRM are under-explored.

In addition to that we observed there are few emerging models in the Govt. sector in Odisha and abroad. Henceforth, an innovative technology-driven Green HRM models are primarily centred on the Govt. sector need to be examine how these emerging models can be adapted and implemented within the specific constraints and opportunities of government office administration in Odisha. Under explored link between Green HRM and Good Governance. The potential of Green HRM practices to contribute to broader good governance principles like transparency, accountability, and citizen of India trust has not been extensively investigated.

Finally, we focused on context based specific challenges and opportunities of Green HRM Practices in Odisha how it executes smoothly in a unique socio-economic, cultural, and administrative context of Odisha which may faces specific challenges and opportunities for implementing Green HRM. These context-specific factors require dedicated research. Measurement issues in Public Sector. Measuring economic sustainability and good governance outcomes in the public sector can be complex. There is a need for developing appropriate metrics to assess the impact of Green HRM in this context. This study aims to contribute to the existing literature by addressing these gaps in Focusing on the Underexplored Context of Odisha Government Administration: This research will provide valuable insights into the adoption and impact of Green HRM within a specific state government in India, contributing to a more nuanced understanding of public sector Green HRM.

The study will specifically investigate how Green HRM practices can contribute to tangible economic benefits within Odisha government offices, such as cost savings through resource efficiency and improved operational effectiveness. The research will explore the potential and challenges of implementing innovative Green HRM models within the Odisha government context. This study will contribute to understanding how Green HRM practices can enhance good governance principles in

public administration in Odisha, such as increased transparency and accountability in resource utilization and a demonstrated commitment to environmental responsibility.

Providing Context-Specific insights and recommendations: By focusing on Odisha, the study will offer practical and contextually relevant recommendations for government policymakers and administrators on effectively implementing Green HRM for economic sustainability and good governance. Developing Relevant Measurement Frameworks: The research may contribute to the development or adaptation of metrics suitable for assessing the economic and good governance outcomes of Green HRM in the public sector context of Odisha. This study has the potential to make a significant contribution to the limited body of knowledge on Green HRM in the public sector, particularly within the context of state government administration in India. By focusing on emerging models and their impact on both economic sustainability and good governance in Odisha, this research can provide valuable insights for theory and practice.

4. Method of Study:

a) Problem Formulation

Primarily when researcher going to justify the objectives of this aforesaid research title there are many problem arises such as:

1)To execute new and advanced model of Green HRM resources and its practices weather effective or not in the Govt. sector of Odisha for executing, maintaining, and managing in the reality.

2)To examine the behavioral aspects of mind of employees, workers and stakeholders on Green HRM practices in real application for creating a natural, ecological and workaholic atmosphere in Public sector.

5. Hypothesis

5.1 Null Hypothesis (H_0)

The Green HRM Practices has no impact and significant on the execution of policy of Govt. Sector particularly in Govt. Offices and public Sector.

This hypothesis refers about the role and importance of the Green HRM practices has tremendous effect for execution and monitor and control of Green HRM policies in official practices.

5.2 Expected Hypothesis (H_e)

This hypothesis refers about the Green HRM practices in Govt. sectors has tremendous impact and significance in administrative ,policy making ,execution and decision



International Journal on Scientific Research, Engineering, Science, Technology, Humanities and Advanced Knowledge of Management (SRESTHAKAM)

making in the real time practice of office management or creating on ecological ambience.

5.3 Alternative Hypothesis (H_a)

This hypothesis refers, how Green HRM practices systematically implemented in Govt. Administration sector of Odisha with followed a scientific tools, techniques, methods and execution of advance model of Green HRM for creating a healthy, hygienic, social, personal life style in scientific and enriched cutoff highly economic expenditure and structure a positive environment for working.

6. Research Design:

The researcher has focused a scientific and advanced research work related to the aforesaid research title and its

Table-1: Refers for Execution of Green HRM and respondents (People) Feed-back related to ten important cities of Odisha

Serial	Name of the city/Head quarters	Total No of Responses (Target)	Execution of Model			Respondents			Total no of Respondents			Total % of +ve Response
			M	F	TG	+ve(M+F+TG)	+ve (M+F+TG)	NR (M+F+TG)	TPR	TNR	TNuR	
1	Bhubanesw	35	15	15	5	13/15	10/15	3/05	26	07	03	74.2
2	Cuttack	35	15	15	5	14/15	10/15	3/05	27	06	02	77.14
3	Puri	35	15	15	5	13/15	12/15	3/05	28	07	00	80.00
4	Baleswar	35	15	15	5	13/15	10/15	3/05	28	05	02	80.00
5	Barhumpu	35	15	15	5	12/15	10/15	3/05	25	03	02	71.42
6	Sambalpur	35	15	15	5	14/15	12/15	3/05	29	03	03	82.85
7	Jharsuguda	35	15	15	5	12/15	13/15	3/05	28	04	01	80.00
8	Balangiri	35	15	15	5	13/15	14/15	2/05	29	03	02	82.85
9	Rourkela	35	15	15	5	13/15	13/15	3/05	29	02	04	82.85
10	Koraput	35	15	15	5	15/15	12/15	3/05	30	04	01	85.71
Total		350	150	150	50	132/150	116/150	29/50	277	41	17	277/3350
Mean		35.5	15.5		5.0	13.2	11.6	2.9	27.7	4.1	1.7	

NB: a) M* –Male, F* Female, TG*: Trans Gender

b)NR*Negative Response NeuTr * Neutral Response

C) TPP* Total percentage of Positive Response

From the data table One , we observed that researcher have taken 10 cities of the state of Odisha and there are 350 People targeted and out of 277 people respond positively, 41 People responded negatively regarding the Green HRM Practices in Govt Sector and collected the information from the habitants of the aforesaid cities and found the mean value is 35.5 and positive Respondents mean value is 27.7 which is a good symptoms for the execution of the aforesaid Policy in the state of odisha . Again, the researcher have extended their research work on the employees of Govt, sector , and taken 10 PSU and Govt, offices of odisha (See data Table :-2)

7. Data Collection:

The researcher has collected the information through the primary sources such as field survey, interview, face to face interaction, email, whatsapp and google form related with the respondents from different offices of public and Govt. Sectors related to Green HRM practices and its impacts and its results in reality, here, the researcher targeted 1000 respondents and expected to accordingly accorded 801 Respondents responses.

International Journal on Scientific Research, Engineering, Science, Technology, Humanities and Advanced Knowledge of Management (SRESTHAKAM)

Table-2: Refers for Execution of Green HRM and respondents (employees) Feed-back related to PSU and Govt. agencies

Sl.No	Name of the Govt .Offices	Total No of Respondent Target	Execution of Model			Respondents Model			Total Number of Response			Total % of Positive Response
			M	F	TG	+Ve (M+TG)	+Ve (F+TG)	N . (M)	TPR	TNR	TNu.F	
1	NALCO	35	15	15	5	14/15	13/15	4/05	27	03	01	77.14
2	OPTCL	35	15	15	5	13/15	12/15	3/05	28	04	03	80.00
3	OMC	35	15	15	5	13/15	12/15	3/05	25	03	04	71.42
4	BSNL	35	15	15	5	15/15	13/15	4/05	28	03	00	80.00
5	BDA	35	15	15	5	12/15	10/15	3/05	25	03	02	71.42
6	CDA	35	15	15	5	14/15	12/15	3/05	29	03	03	82.85
7	Railway	35	15	15	5	13/15	14/15	3/05	30	03	02	85.71
8	Education Dept.	35	15	15	5	13/15	14/15	2/05	29	03	02	82.85
9	Health Dept	35	15	15	5	12/15	13/15	3/05	28	04	03	80.00
10	PWD	35	15	15	5	14/15	14/15	3/05	28	02	02	80.00
Total						133/150	127/15	31/	278/350	31	22	79.43
Mean						13.30	12.7	3.1	27.8	3.1	2.20	

NB: a) M* –Male, F* Female, TG*: Trans Gender (

b)NR*Negative Response NeuTr * Neutral Response (c)

TPP* Total Percentage of Positive response

As per the record of data table two, we observed that researcher have taken 10 PSU and Govt. Offices of the state of Odisha and there are 350 employees targeted and out of 278 employees respond positively, 31 People responded negatively regarding the Green HRM Practices in Govt Sector and collected the information

from the habitants of the aforesaid cities and found the mean value is 35.5 and positive Respondents mean value is 27.8 which is a good symptoms for the execution of the aforesaid Policy in the state of odisha . Again , the researcher have extended their research work on the employees of Govt, sector , and taken 10 Professional Category from Govt, Odisha and found the followings (See data table :3)

Table-3: Refers for Execution of Green HRM and respondents (Various Professions) Feed-back related to PSU and Govt. agencies of Odisha

Sl.No	Execution of Green HRM model by different profession	Target Respondents	Execution of Model			Response Model			Total no of Response			Total Percentage of Positive Response
			M (13)	F (13)	TG (04)	+Ve (M+TG) (13)	+Ve (M+F) (13)	N .R (F+TG) (04)	TPR (All)	TNR (All)	TNuR (All)	
1	Academician	30	13	13	04	11	12	05	23	05	02	76.67
2	Doctor	30	13	13	04	12	14	03	26	03	01	86.67
3	Engineer	30	13	13	04	11	13	03	24	03	03	80.00
4	Lawyer	30	13	13	04	13	12	04	25	04	01	83.33
5	Entrepreneur	30	13	13	04	13	14	01	27	01	02	90.00
6	Promoter	30	13	13	04	12	11	04	21	04	05	70.00
7	Scientist	30	13	13	04	10	14	05	24	05	01	80.00
8	Business M	30	13	13	04	12	12	04	24	04	02	80.00
9	Supply Logistic	30	13	13	04	13	12	04	25	04	01	83.33
10	Mining	30	13	13	04	13	14	03	27	33	03	90.00
Total			130	130	40	120	128	36	246	3.3	21	
Mean Value		300/10=30	13.4	13.4	4.0	12.0	12.8	3.6	24.6		2.1	82.00

International Journal on Scientific Research, Engineering, Science, Technology, Humanities and Advanced Knowledge of Management (SRESTHAKAM)

NB: a) M* –Male, F* Female, TG*: Trans Gender (b)NR*Negative Response NeuTr * Neutral Response (c) TPR* Total Percentage of Positive respondents

According to the record of data table three, we observed that researcher have taken 300 People from 10 professions or category from the state of Odisha and there are 300 employees targeted and out of 246 people respond positively, 36 People responded negatively regarding the Green HRM Practices in Govt Sector of the Odisha and collected the information from the habitants of the aforesaid professions shows positively and found the

8. Result Table:

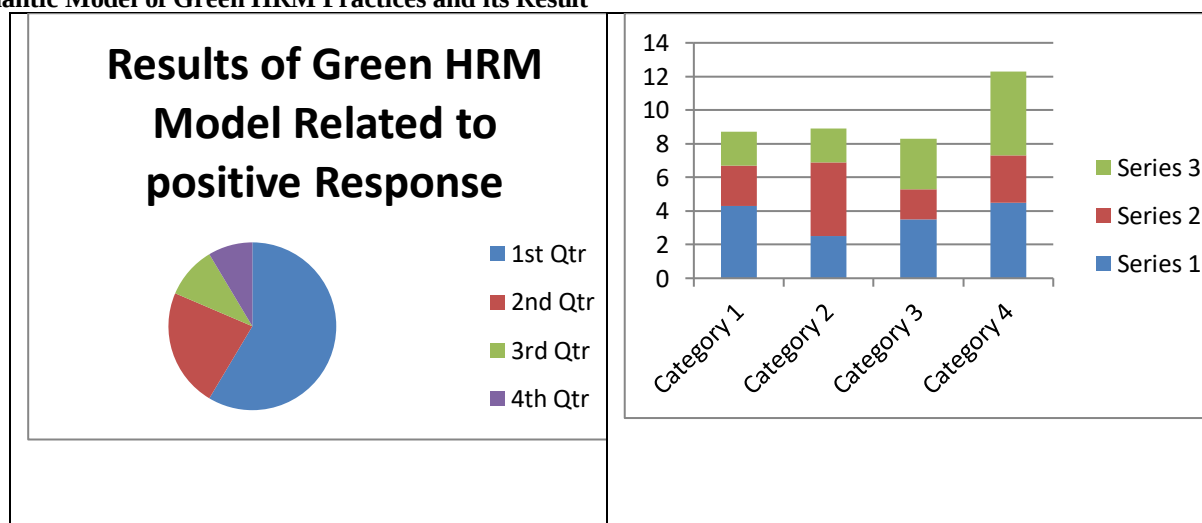
Sl.No	Category	Execution of Model	Respondents Model	Target Respondent	Positive Respondent	Mean Value	Mean Difference (md)	Result
1	Common People	Green HRMP Practices	a)Advanced GHRM b)Environmental Model	350	277	27.7	-01.0%	Positive
2	PSU/Govt Office	Green HRMP Practices	a)Societal model b)Political Model	350	278	27.8	+0.10%	Lightly Positive
3	Govt . Service Employee/ Professions	Green HRMP Practices	a) Economic Model GHRM b)Psychological Model of GHRM	300	246	24.6	-3.2 0	Moderate Positive
Total				1000	801			
Mean Value					80.01			Highly Positive

mean value is 30.0 and positive Respondents mean value is 24.6 which is a good symptoms for the execution of the aforesaid Policy in the state of Odisha . Thus, for final observation of the study, researcher has combined all three tables' data for final analysis related to the taken hypothesis justification.

(See final Result table)

NB: GHRMP* Green Human Resource Model Practice, EoM* Execution of Model, TR *Target Respondent, PR* Positive Respondent MV* Mean value R* Result

Semantic Model of Green HRM Practices and its Result



After a careful observation of the aforesaid result tables types of stake holders. (T1,T2,T3) , the researcher have came to conclusion that the Green HRM model and its practices are very much useful in all sectors because of its positive impact and utility for making a well and conducive working environment for all

9.Green HRM practices at a glance:

Green HRM, or green human resource management, is a developing idea that incorporates environmental sustainability into conventional HR procedures. It seeks to create an environmentally conscious and dedicated workforce that supports an organization's green objectives, ultimately making the business more sustainable and the world healthier. The organization's main objective is to promote eco-friendly practices and lessen its environmental impact in order to promote environmental sustainability. Through the alignment of corporate principles with environmental concern, green human resource management aims to boost employee engagement and happiness while cultivating a feeling of pride and purpose.

Through sustainable resource use, waste reduction, and energy efficiency, putting green principles into practice can result in significant cost savings. Businesses that put sustainability first are frequently seen more positively by investors, consumers, and prospective workers, which improve their reputation and brand image.

Green HRM may boost creativity, draw in top personnel, and give businesses a competitive edge in markets that care about sustainability.

Green HRM Practices:

10. Green Recruitment and Selection:

Employing people who have a dedication to sustainability and who have green expertise. Utilizing paperless hiring procedures (such as video interviews and online applications). Highlighting the company's environmental performance and policies in an effort to draw in eco-aware applicants.

11. Green Training and Development:

Employee education on eco-friendly work practices, waste reduction, energy conservation, and environmental challenges. Educating them about sustainable practices and environmental laws that are pertinent to their positions. skills" in staff members to support the company's environmental goals.

12. Green Performance Management:

Integrating environmental objective and measurements into evaluations of performance. evaluating the contributions made by staff members to sustainability projects (e.g., lowering resource usage, engaging in green teams) encouraging workers to incorporate sustainable practices into their everyday work.

13. Green Rewards and Recognition:

Rewarding and praising staff members for their efforts to ecological sustainability. Providing incentives, prizes, or public acknowledgement for environmentally friendly concepts, waste minimization, or involvement in green initiatives. Putting in place "green compensation" plans that tie environmental success to employee perks.

14 Green Employee Engagement and Relations:

Promoting an environmentally conscious society from the top down. Promoting staff involvement in volunteer programs, green teams, and community service initiatives. Encouraging candid discussion on sustainability objectives and developments. Promoting flexible work schedules (telecommuting) and environmentally friendly modes of transportation (such as public transportation and automobile sharing) in order to lower carbon emissions .

15.Green Workplace Practices:

Adopting paperless office practices (e.g., e-communication, digital documentation).Encouraging energy conservation by, for example, utilizing energy-efficient devices and shutting down lights and laptops. Putting in place strong waste management and recycling initiatives. Establishing eco-friendly office spaces and green building plans. Buying eco-friendly goods and services.

16. Why we need Green HRM Practices in Govt. Sector?

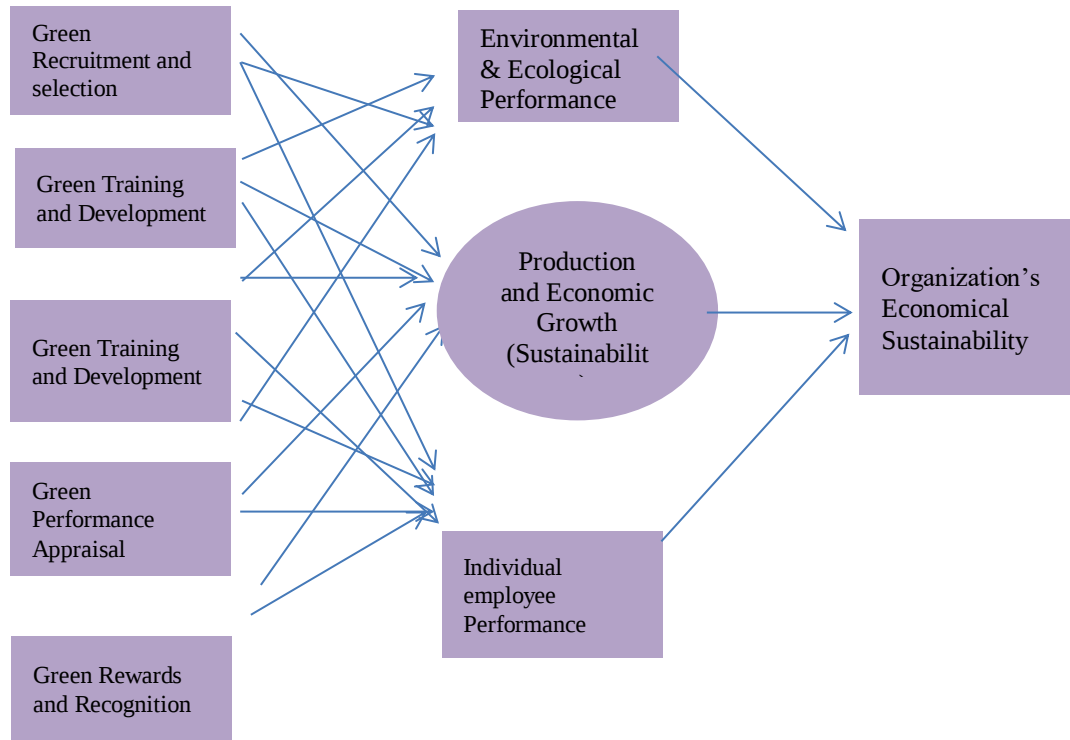
For a variety of reasons, including reputational, social, economic, and environmental advantages, green human resource management (green HRM) methods are becoming more and more important for the government sector. Government institutions must be trusted by the public. Proactively pursuing sustainability can greatly increase public trust and cultivate a favourable perception of the government as an attentive custodian of the environment and its resources. From massive administrative structures to public services, government operations use a lot of resources and produce waste. Green HRM aids in the methodical reduction of waste production, energy use, and carbon footprint in public sector organizations.

Energy-efficient workspaces, paperless administration, better transportation, and waste reduction are examples of green HRM practices that have a direct impact on resource management, electricity bill reduction, and procurement prices. Additional public services may subsequently be funded with these savings. It is frequently necessary to reconsider conventional procedures and embrace creative ideas in order to

embrace green practices. In addition to the environmental advantages, this may result in the modernization of public administration, increasing efficacy and efficiency.

17. Application of advanced Green HRM Model in Different Sectors.

a) Green HRM model and its Techniques



[Model No -1

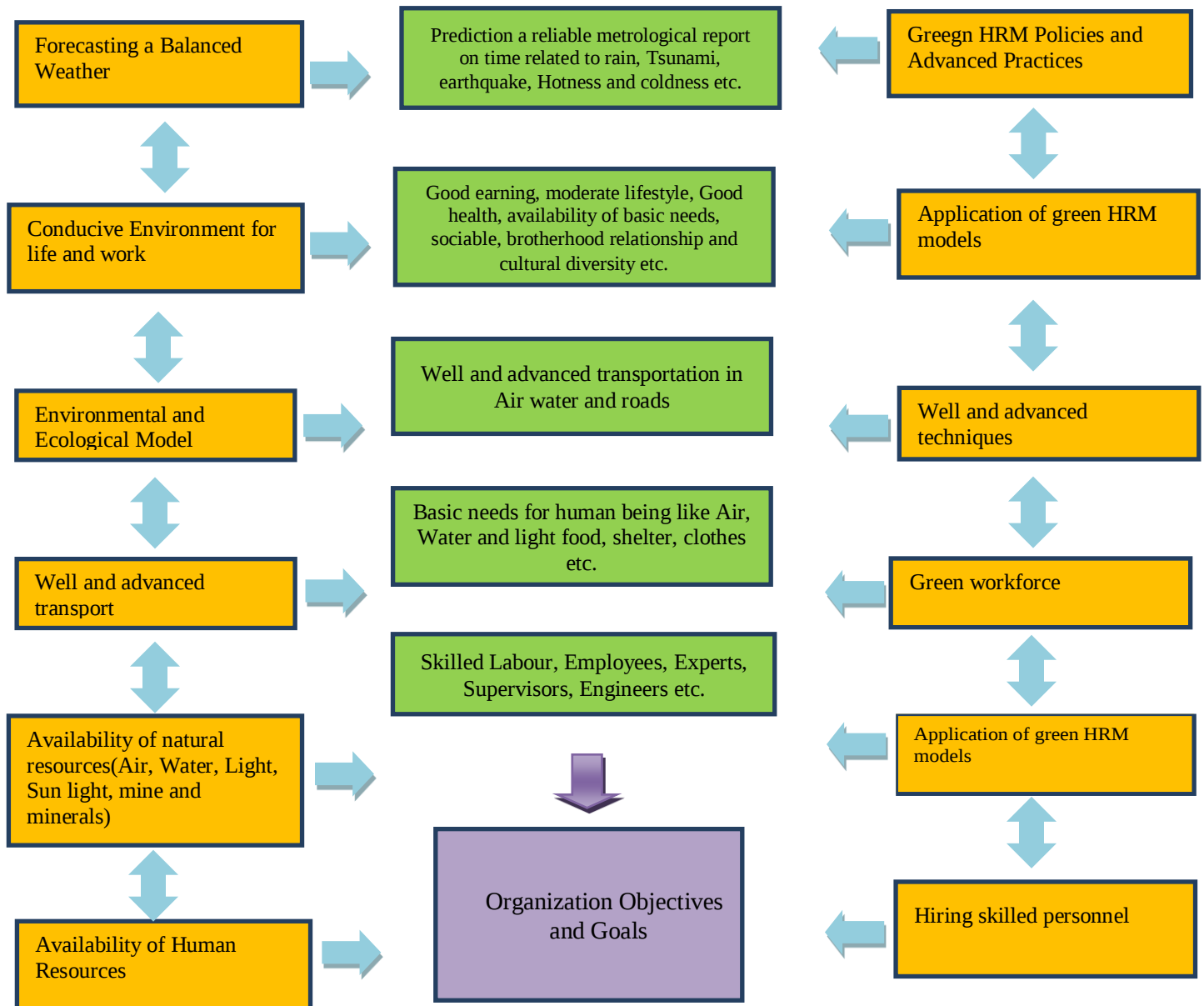
refers about the Green HRM model and its techniques related to application of Green HRM in Govt. Sector in Odisha

Source: Researcher's own Source and design (Patent and copyright-2025 protected)

This Green HRM model design to meet the requirement of economical sustainability in various sectors of Govt. Organization of Odisha where it focuses about good production and its economic growth associate with a conducive ecological environment for employee performance in various factors. Such as Green recruitment and selection ,Green training and development, Green Performance appraisal, Green rewards and recognition which are highly influenced the employees involvement in both production and promotion activities through proper execution of green HRM policies and practices from time to time and it leads economic growth and its sustainability in Different Govt. Organizations of Odisha.

b) Environmental Model/Ecological Model

The ecological model of green human resource management (GHRM), often known as an environmental model incorporates the concepts of environmental sustainability into every facet of HRM procedures. By highlighting the relationship between an organization's environmental performance and human capital, these models seek to produce a "green workforce" that supports sustainable development and ecological balance. From hiring to firing, GHRM is an integrated approach that incorporates environmental considerations into all HR policies and practice.

Ecological Model of Green HRM Practice

International Journal on Scientific Research, Engineering, Science, Technology, Humanities and Advanced Knowledge of Management (SRESTHAKAM)

According to the model, an organization's HR procedures ought to take into account its wider environmental responsibilities since it functions within a bigger ecosystem. The impact that external environmental concerns (such as resource scarcity, stakeholder expectations, regulatory pressures, climate change, and market demands for sustainability) have on organizational behavior and, in turn, GHRM initiatives is highlighted by ecological models. In response to these demands, organizations implement GHRM to strengthen their credibility.

In promoting GHRM adoption and success, the models highlight the significance of internal elements such organizational culture, employee attitudes and awareness, and top management commitment.

A systemic approach is promoted by ecological models, which acknowledge that GHRM activities are interrelated and have a higher overall impact than the sum of their separate components. A thorough GHRM approach affects a number of results, including financial savings, corporate environmental performance, and employee engagement. The models promote GHRM as a strategic approach for sustainable development and long-term organizational resilience, going beyond simple compliance to take a proactive approach to environmental stewardship.

c) Societal Model/Sociological Model

A sociological model, sometimes known as a societal model, of green human resource management (GHRM), studies how institutional frameworks, pressures, norms, and broader social values affect the adoption, efficacy, and implementation of GHRM techniques in businesses. Beyond internal organizational dynamics, it takes into account the variables at the macro level that influence how a business uses its human capital to achieve environmental sustainability.

Businesses are under increasing pressure to operate responsibly as public awareness of pollution, climate change, and resource depletion rises. Organizations are influenced by this push to integrate environmental factors into their HR and other key initiatives. Organizations are directly required to implement green practices by environmental laws, policies, and international agreements (such as carbon emission limits, waste management standards, and green construction codes). Following that, GHRM plays a crucial function in guaranteeing compliance (e.g., incorporating environmental performance into work duties, teaching employees on environmental legislation). More and more job searchers, especially younger ones, are looking for companies that have strong environmental and social values. Employers utilize GHRM to draw in and keep this "green talent." Workers themselves may call for more environmentally friendly procedures at work as a result of social and environmental concerns.

d) Economical Model of Green HRM Practices

The concrete and intangible financial benefits and expenses

related to putting ecologically sustainable HR policies into reality are the main emphasis of an economic model of green human resource management, or GHRM. It seeks to illustrate the "business case" for GHRM by highlighting its benefits to an organization's long-term financial stability, efficiency, and profitability. Return on Investment (ROI), cost-benefit analysis, and competitive advantage are just a few of the standard economics and finance principles that are frequently used in this paradigm. GHRM procedures can result in immediate cost savings by lowering waste, operational inefficiencies, and resource usage. In order to boost revenue and market share, GHRM can improve brand image, draw in eco-aware talent and customers, and even open up new markets. GHRM can lessen financial risks by making sure that environmental laws are followed and by lowering environmental liabilities. Productivity may be increased and processes made more efficient by engaged and environmentally conscious workers. Despite the potential upfront expenses of certain GHRM projects, the model highlights the long-term financial gains and value generation that surpass these expenditures. The Economical Model of GHRM offers a practical viewpoint, emphasizing how incorporating environmental sustainability into HR procedures is not only morally required but also a wise business move that can result in large financial rewards and sustained corporate performance.

e) Behavioral model of Green HRM Practices

The focus of a behavioural model of green human resource management (GHRM) is on how GHRM practices affect employee motivations, attitudes, and, eventually, their pro-environmental actions at work. It explores how employees' psychological reactions convert HR initiatives into real green activities. Employees are seen as essential to accomplishing environmental sustainability objectives in this strategy. The performance of the organizational environment is influenced by their individual actions taken together. GHRM affects behavior in a number of ways, including by influencing attitudes, creating opportunities, motivating people, and influencing perceptions. According to this hypothesis, if workers believe their employer values and treats them fairly, they are more inclined to participate in pro-social activities (such as PEBs). An organization shows its dedication to workers and society by putting GHRM practices into effect. Employees might feel obligated or reciprocated to support the company's green initiatives in exchange. The goal of GHRM, in particular green recruitment and selection, is to draw in candidates whose environmental values coincide with those of the company. Higher levels of commitment, work satisfaction, and desire to participate in PEBs can result from a great person-organization fit.

f) Psychological model

In order to understand how GHRM practices impact employees' pro-environmental attitudes and behaviors, a psychological model of GHRM explores the cognitive and



International Journal on Scientific Research, Engineering, Science, Technology, Humanities and Advanced Knowledge of Management (SRESTHAKAM)

emotional processes involved. Although they are closely connected, the Psychological Model places more emphasis on the internal states, perceptions, attitudes, and emotions that mediate the relationship between GHRM and real environmental performance than the Behavioral Model, which is more focused on the behavioral behaviors. GHRM techniques such as empowerment and involvement help employees feel that they have a personal stake in the organization's environmental performance, which leads to the development of "green psychological ownership." More accountability and proactive green actions may result from this. By looking at the individual-level cognitive and emotional processes that are triggered and influenced by GHRM activities, a psychological model of GHRM explains the "black box" that exists between these practices and environmental effects.

g) Personality trait model of Green HRM practices

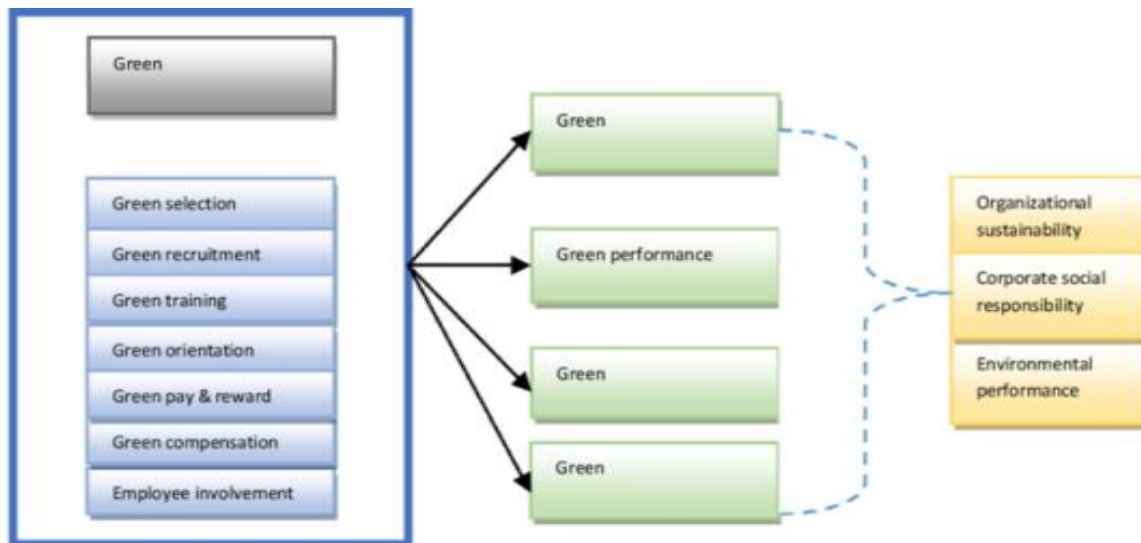
The impact of individual differences in personality traits on employees' reactions to GHRM practices and subsequent pro-environmental activities at work is examined in the Personality Trait Model of Green Human Resource Management (GHRM). According to this hypothesis, people are more or less responsive to green initiatives and more or

less inclined to adopt green practices depending on certain underlying tendencies or stable features. To find candidates with qualities (such as high openness, conscientiousness, agreeableness, and proactive personality) that predict greater responsiveness to green initiatives and a propensity for pro-environmental behavior, organizations can use behavioral interview questions or personality assessments. GHRM may modify green training courses to accommodate various personality types. For instance, people with high levels of openness may flourish in workshops that focus on innovative problem-solving techniques for environmental issues, whereas extremely conscientious people may benefit from thorough procedural instruction on green duties.

h) 5 T model of Green HRM practices

The Government of Odisha, India, has created a governance structure known as the "5T Model" that centers on five fundamental ideas: collaboration, technology, transparency, time, and transformation. Its concepts can be successfully applied to Green Human Resource Management (GHRM) practices in Odisha (and beyond) organizations to promote environmental sustainability, even though it is essentially a public governance model.

Figure :4 Refers about the 5 T Model of Green HRM

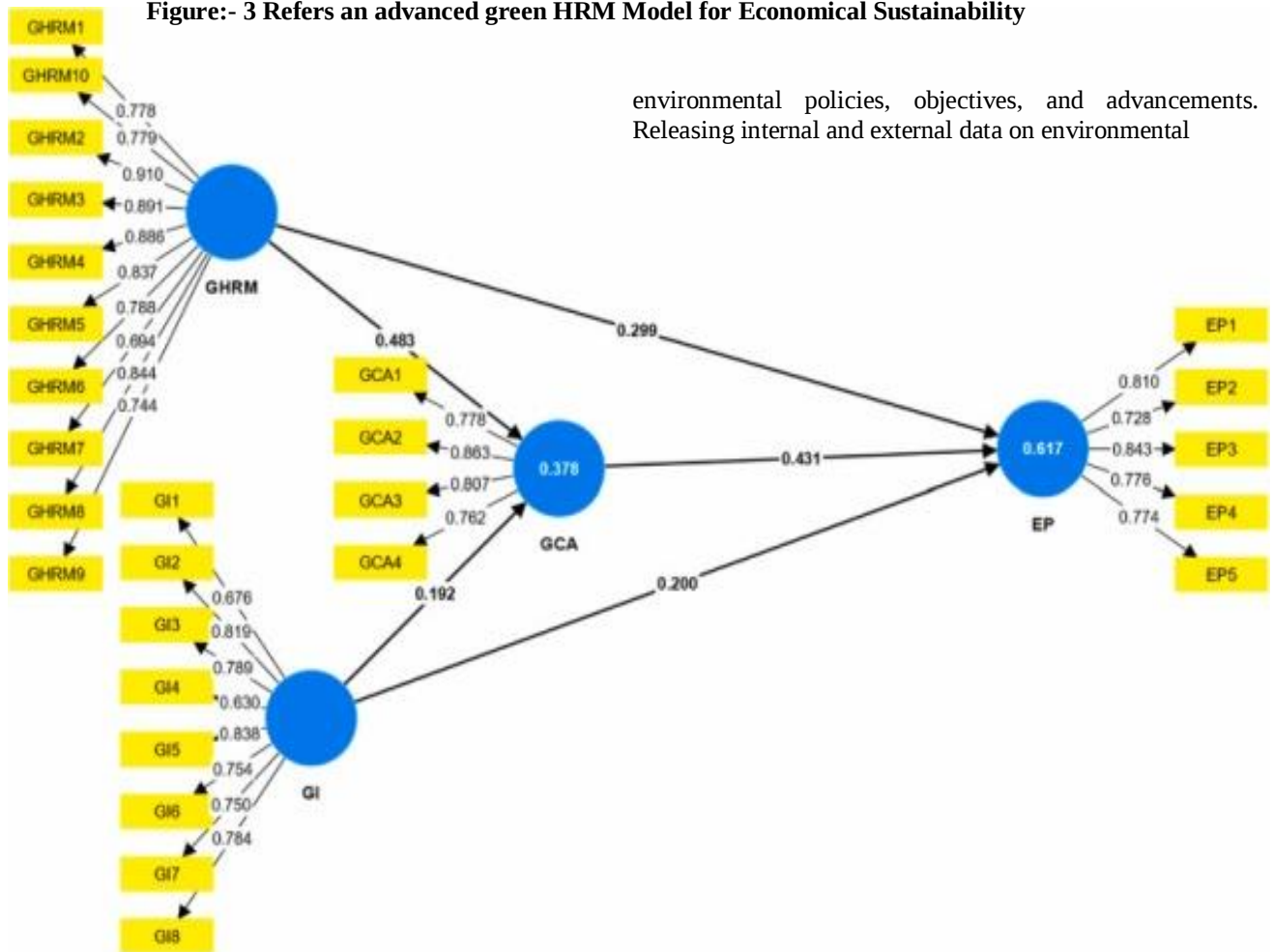


i) Teamwork for Green Goals: Application of GHRM: This "T" highlights cooperation and synergy. According to GHRM, it entails creating an environment where all workers, regardless of department or level, collaborate to achieve environmental sustainability. Assembling groups of people from various departments (hr, operations, marketing, R&D, etc.) to find and carry out environmental projects. encouraging staff members to take part in energy-saving initiatives, waste-reduction programs, environmental audits, and green innovation

challenges. making it very evident that environmental performance is not only the duty of a particular "green department," but rather a shared responsibility. Assuring smooth collaboration between HR and upper management to support green projects.

j) Technology (Using Digital Resources to Promote Green HRM): The use of GHRM involves the use of contemporary technology to improve environmental management and awareness, decrease resource consumption, and streamline HR procedures.

Figure:- 3 Refers an advanced green HRM Model for Economical Sustainability



environmental policies, objectives, and advancements. Releasing internal and external data on environmental

Advance Green HRM Practices include putting in place digital platforms for hiring (online applications, virtual interviews), managing performance (e-appraisals), training (e-learning modules on sustainability), and communicating with employees (HR portals, intranets). reducing business travel by utilizing technology for video conversations and teleconferences, as well as encouraging ride-sharing applications or infrastructure for electric vehicle charging combining environmental management systems (EMS) and human resources (HR) data to monitor and set goals for employee-related environmental consequences, such as energy usage per employee. tracking staff members' efforts to sustainability and gamifying green issues through applications or online platforms.

18. Transparency (An open approach for the Environmental performance)

Making sure that GHRM programs and an organization's environmental performance are transparent and accountable. letting every employee know openly about the company's

metrics on a regular basis, including the contributions of employees to sustainability (e.g., energy savings, trash reduction figures).

Opening lines of communication so that workers can voice their opinions, voice problems, and recommend changes to environmental procedures without worrying about retaliation. Establishing appropriate evaluation standards for employees' environmental performance and doing it in a transparent manner.

19. Time (Efficient Implementation of Green Projects):

Application of GHRM: putting a focus on the timely and effective implementation of environmental projects and GHRM strategies. Establishing precise due dates for environmental projects (such as finishing green training modules or putting in place a new recycling scheme).

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Employees' green contributions should be promptly acknowledged and rewarded in order to sustain motivation and promote desired behaviors. Rapidly responding to recommendations or worries raised by staff members regarding environmental issues .introducing new personnel to the company's green culture as soon as possible by effectively incorporating environmental consciousness into the on boarding process.

a) Imitation/unfastened -style model of Green HRM Practices

The "Imitation/unfastened-style version" of green HRM practices suggests that agencies adopt green HR projects by either mimicking the successful practices of other groups or by developing their own, unique strategies tailored to their particular context and values. This version permits flexibility in implementation, even it enhancing the environmental sustainability at present.

b) Other Types of Green HRM Model:

As per the summit of World Green Summit in 2020 have classified four types of sustainable HRM have been classified: **1) Socially Responsible HRM, 2) Green HRM, 3) Triple Bottom Line HRM, and 4) Common Good HRM.** **Type 1** concerns socially responsible HRM activities, such as diversity management, training, development, as well as health and safety, and work-life balance. These models also executed for making environmental sustainability.

20. Hypothesis Testing:

After careful observation to the all the data table and final result table the following findings comes to picture that the expected hypothesis has justified because all models of Green HRM practices in Govt. sectors has tremendous impact and significance in administrative, policy making ,execution and decision making in the real time practice of office management or creating on ecological ambience due to its highly positive role in all conditions and sectors of Govt. .offices in Odisha .Therefore , the researcher have recommend the Null Hypothesis (Ho) to reject and the expected hypothesis (He) has accepted.

21. Research findings:

From the extensive study of the aforesaid research Paper, the following findings have comes to the floor for future research and its execution such as :

- a) Green HRM model and its Practices has a tremendous impact for creating an ecological and conducive environment for work,
- b) Green HRM and Advanced model not only creates a better class working environment but also it enhancing a best behavioral and psychological relationship in between employees of Govt. office's of Odisha.
- c) It helps to increase the economic development of the all stake holders and keeps it is sustainability.

- d) It provides a good practice for all stake holders by which an ecological working ambience will be created.

Conclusion:

In conclusion, the aforesaid discussions are proving that enforcing an inexperienced HRM version in the authorities quarter can enhance employee engagement, enhance aid utilization, and make contributions to sustainability desires. When demanding situations exist, consisting of constrained budgets and a lack of awareness, the advantages of a greener approach to HRM outweigh the limitations. Inclusive of:

- a. IT improved worker Engagement and delight Green HRM practices, when aligned with worker values, can foster an experience of cause and belonging, main to better engagement and job satisfaction.
- b. Progressed resource utilization of inexperienced practices like power performance and waste discount can lead to cost savings and operational performance.
- c. It enhances the Environmental overall performance of green HRM tasks, contributes to a reduction in the organisation's environmental footprint, and helps the achievement of sustainability desires.
- d. Innovation and competitive benefit, wherein a subculture of environmental duty fostered through green HRM can lead to revolutionary answers and a competitive advantage.
- e. Finally, it focuses on diverse desires for control, ai,d and education for successful implementation, which calls for strong management help, good enough schooling for employees, and clean documentation of green practices.

Bibliography

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(DOI), Ordering. The article maintaining proper format and order of IEEE Template guidelines i.e. Title- 14 pt, Abstract: 11 pt, Heading: 12pt, Body: 10Pt

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“Moonlighting Green HRM Services in Corporate Structure- An Emerging Analysis of Structural Equation Modeling”**Dr. Madhusmita Dash¹ Dr. V. Nagajothi² Dr. Rahela Tabassum³ Prof. (Dr.) Ramesh Chandra Rath⁴**¹ Associate Professor, HSS Department, ITER, SOA University, Bhubaneswar, India
madhusmitadash@soa.ac.in² Director of Management, J. Jayalalithaa Fisheries University, Tamil Nadu
nagajothi@tnfu.ac.in³ Professor in MBA Amjad Ali Khan College of Business Administration, Hyderabad
dr.rahelatabassum@gmail.com⁴ Principal at Swami Vivekananda Institute of Management, Baniatangi Khordha, Affiliated to BPUT, Rourkela and Approved by AICTE, Govt. of India, New Delhi
drramesh.rrc@gmail.com**Abstract**

Moonlighting employees hold multiple jobs at the same time. Due to the increased financial burdens associated with raising children, buying a house, and many other reasons, Employees tend to move onto a second job due to insufficient income or hours from their primary job; married workers are more likely to work multiple jobs. It is also understood that in most cases, unskilled workers will moonlight due to insufficient wages and among professional employees specifically IT services, they tend to moonlight due to their expertise in a specific domain and prefer to do more than one job to gain income out of their area of expertise. In this research work, a convenience sampling had used for testing the response of the respondents on a 5 point Likert scale starting from range 1 -5 (One-to five-point) such as one refers Strongly Agree to five Strongly dis- agree. we have developed a questionnaire, that included a combination of query types, such as open-ended, long-form, or short-ended questions where in respondents can provide us the data without any difficulty. Convenience sampling has been adopted for collecting the data from Smart city, Bhubaneswar and Greater Hyderabad, is also an IT hub in the state of Odisha and Telangana, India. A total of 591 completed questionnaires were returned, yielding a response from the 630 questionnaires distributed. Statistical analyses were conducted using SPSS 23.0. The study analyzed the relationship between dependent and independent variables using structural equation modeling (SEM).

Keywords: Moon Lighting Green HRM Services (MLGHRM) Moonlighting Behavior (MB), Employees of IT services (EoITS), Expertise in Earning

1. Introduction

Moonlighting behaviour has become increasingly prevalent among employees in various industries, including the Information Technology (IT) sector. The IT sector, in particular, presents unique challenges and opportunities for individuals who engage in moonlighting activities. There are many motives of moonlighting behaviour among especially in services sector (IT services) employees. It is also to be understood about what are primary motivations that employees in this sector are showing interest in moonlighting and the drawbacks of the primary job also one of the important reason among others apart from varied reasons and it is also learned that most of the employees look for good work life balance, greater employee experience and wellbeing. Moonlighting also likely to result in conflicts of interest and decreased productivity. Many people began working from home after the pandemic for a variety of reasons, including better utilization of skills, financial benefits, and professional and personal growth.

2. Problem statement

Green HRM practices in IT services industry undergone massive changes post Covid-19 and one of such is moonlighting. Most of the employees are unaware or rather in a state of confusion regarding the concept of moonlighting as such the focus is on moonlighting of employees and impact on their primary work. This study would provide insights into the theme and identify the appropriate factors influencing moonlighting Green HRM practices and behavior of employees at various corporate sector specifically in IT services.

3. Review of Literature

Moonlighting Green HRM is a practice intends to employees of different Corporate Sector or working secondary jobs has become a common trend in IT services sector as a result of remote work and personal requirements. Dickey, H., Watson, V., Zangelidis, A. [1] 'To "moonlight" is to work at many



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different things at once. Employees often take up side gigs in order to supplement their income, obtain expertise in a new industry, pursue a passion, or fill a need for their own well-being that they may not be able to find in their primary position. Wisniewski, R., Kleine, P. [2] Male employees are more likely to engage in moonlighting,

According to a study of a sample of school teachers. Banerjee, S. [3] It has been found that men and women approach moonlighting very differently. Depending on the nature of their primary professions, more and more workers in business organizations are partaking in such activities, which aid workers in developing new abilities. Betts [4] divides them up into monetary strategies and character-based strategies. Moonlighting is primarily seen as a revenue source from an economic perspective. Dispositional theories argue that extra work is more likely than the need for it. The idea of deprivation was the first dispositional framework. The economic and social status of moonlighters is stigmatized. Aspiration theory is the second dispositional framework. People who work a second job are seen as exceptional because they have loftier goals and more determination. Paxson, C. H., and N. Sicherman [5] that people who work two jobs spend an extra 11 to 12 hours per week doing so, compared to people who just work one (usually, the second job takes up about 13 to 14 hours per week). Even if the average number of hours worked has decreased marginally for those with multiple jobs in the United States and the European Union as a result of the current economic slump, more than a quarter of all working hours in the EU and the United States are spent at a second job. Smith et al., [6,7] Working several jobs may raise the likelihood of being hurt for a number of reasons. For one, it might be difficult to get adequate rest when you're trying to keep up with all your obligations. Basner et al. [8] using information from the American Time Use Survey (ATUS), researchers discovered that those who worked many jobs had to put in more hours at each job and get less sleep than those who worked just one to make the same amount of money. Asarma, J. S. V. G. [9]

The likelihood that an employee may quit an organization is influenced by a number of factors, including their level of devotion to the company and their career advancement opportunities inside it. Without proper A Study of Organizational Commitment and Moonlighting Practices of SME 537 motivation, the employees of SMEs progressively lose interest in their work and their performance suffers. Staff in this situation have a hard time making ends meet without access to robust human resources programs, and as a result, they resort to increasingly inefficient methods of obtaining basic necessities. Sabron & Hassim [10] concluded that public sector employees had high rates of moonlighting engagement. They examined the employee's perception on moonlighting practices in for Malaysian public sector hospitals. The study was conducted to determine the environment, personal and behavioural factors that are

related to the employees practicing moonlighting.

The findings obtained that personal factor and environment factor had a positive and significant relationship towards employee's engagement in moonlighting and concluded that it is complex to implement moonlighting in an organization for employers and it is also time consuming. The results also state that environment factor and personal factor influences employee more to be engaged in moonlighting and recommended that government should offer part time basis admin job also so employees can learn new things. Lilja [11] is the first to explicitly explore both motives for moonlighting and to implement the resulting different functions, correcting for the simultaneity bias committed when one includes hours worked on the primary job as a determinant. Public Pain and Private Gain: An Analysis of Moonlighting by Public Health Professionals, the study found that public health professionals frequently hold different roles to gain position and monetary benefits. The reasons such as additional source of income, moonlighting allows employee to make more, which shrinkages the pressure on the employer to increase the wages. Therefore it decreases the financial burden on the organization, broad exposure and opportunity to work in different roles and projects, opportunity to grow skill set, widened professional network, having enough money to weather financial turbulence like layoffs, to progress the living standard, to fight with monotony, to follow passion, moonlighting for Startup. Most employees moonlight in their free time after their first job to supplement their income Ara and Akbar [12] explained the effect of moonlighting practices on job satisfaction of public universities teachers in Pakistan. They identified four factors that are skill diversity, blocked promotion, job autonomy, and additional income responsible for moonlighting among university teachers. They explicated that there is a substantial impact of moonlighting on job satisfaction. Kaukab Ara and Aisha Akbar. [13] , in this Study the author has examined that moonlighting have an impact on satisfaction of job where it comes from pay scale; appraisal/promotions, skills, all are tested in this study. The study concludes that because of lack of pay scale, skills, promotions, appraisal which lead to reduced level of satisfaction in job. Shweta [14] studied the different aspects of moonlighting of employees. She analyzed various issues related to moonlighting and explained the need to understand why employees moonlight. According to Byrne, Gabriel Montes-Rojas Sarmistha Pal [15] Public Pain and Private Gain: An Analysis of Moonlighting by Public Health Professionals, the study found that public health professionals frequently hold different roles to gain position and monetary benefits. The reasons such as additional source of income, moonlighting allows employee to make more, which shrinkages the pressure on the employer to increase the wages.

Therefore it decreases the financial burden on the organization, broad exposure and opportunity to work in



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different roles and projects, opportunity to grow skill set, widened professional network, having enough money to weather financial turbulence like layoffs, to progress the living standard, to fight with monotony, to follow passion, moonlighting for Startup. Most employees moonlight in their free time after their first job to supplement their income. Ashwini et al.,[19] it is also understood that many individuals may be unable to make ends meet with their full-time job alone and may turn to a second job to supplement their income Rispel et al., [20], moreover some individuals may commit to career advancement to gain additional skills or experience that can help them advance their primary career George and George[21], and in today's economy, many people face job insecurity, moonlighting can provide an additional source of income, and a safety net in the case of job loss and lack of job security may be one of the reasons for employee intentions toward moonlighting Kisumano and Wa-Mbaleka, [22], flexibility is another reason for moonlighting, as some individuals who have job flexibility may moonlight for additional income Kimmel,[23] moonlighting can also create conflicts of interest, mainly if the second job is in a similar area to the primary job. Additionally, it can also lead to time management and work-life balance issues (Baldwin Jr. and Daugherty [24]) moonlighting can be a valuable opportunity for individuals to gain additional skills and income, but it is crucial to consider the potential implications and manage time and responsibilities effectively Sussman[25]. Research reported that the relationship between employee job satisfaction and moonlighting intentions, with organizational commitment serving as a mediator. While job satisfaction has a very strong positive impact on organizational commitment, job satisfaction also has a mediating effect on the relationship between job satisfaction and intentions to moonlight. Seema et al. [26]

4. Objectives of the study

- To understand the conceptual framework of moonlighting
- To identify the factors of primary employment that causes employee moonlighting

5. Research Methodology:

In this research work , there are some methods has been used in order to justify the problem and taken some initiative studies of various factors of basic employment that causes moonlighting behavior of employees in IT services in Hyderabad.

6. Hypothesis

- H_0 : This hypothesis refer, there here is no such significant effect of factors affecting employees' moonlighting behavior related to Green HRM Practice in different offices of Govt.of Odisha

- H_1 : This hypothesis refers there is no such significant effect of the factors affecting Green HRM Practices on employees' related to their moonlighting behavior

This study is based on both analytical and descriptive research design with an intention of understanding the employee moonlighting and assessing their perception towards employed workers on the moonlighting.

The sample: - a snowball sampling technique will be used to collect data from the target respondents who are working in small companies in Hyderabad of Telangana State.

- Sample size:** - Out of 600 respondents administered the questionnaires 9 respondents have not given a complete responses questionnaire, some of them have given with some errors as such the complete filled in questionnaires 591 respondents who are employees working in IT services Population of moonlight employees is unknown.
- Sources of data:**
 - The primary data has been collected through a sample survey method by administering a well-structured questionnaire to the employees working in small companies in Hyderabad
 - The questionnaire has been reviewed by professionals and updated to reflect their feedback. The Cronbach Alpha reliability coefficient for the same was determined to be.83. The tools employed in primary research have a reliability of.70 or higher, as stated by Nunnally (1978, p. 245).
 - The secondary data has been collected from following sources such as books, journals, trade journals, publications, syndicated services, newspapers, online sources, articles, manuals etc.

6. Presentation of data for Analysis and Interpretation:

6.1 Opinion Survey Model of Respondent's (Demographic)

Tab-1Age (in years)

Age range in years	Frequency	Percentage
30-35 Years	87	15
36-40 Years	96	16
41-45 Years	90	15
46-50 Years	72	12
51-55 Years	72	12
55 Years/Above	78	13
Total	591	100%

Source: primary data



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Analysis: Primarily based on the statistics in Tab-1, we understand that of the 591 respondents, sixteen% are between the ages of 30 and 35, 15% are among the a long time of 36 and forty, 15% are among the a while of 41 (forty one) and (45) forty five, 12% are between the a long time of 46 and 50, 12% are between the a long time of 51 (Fifty One) and 55 (Fifty Five), and the remaining 13 % (thirteen) are 55 (fifty five) and older.

Tab-2 Gender

Gender	Frequency	Percentage
Male	356	60
Female	235	40
Total	591	100%

Source: Primary Data

Analysis: Related to this result table it has been observed that out of 591 respondents 60 percent respondents are male respondents and remaining 40 percent respondents are Female respondents of the study sample.

Tab-3 Qualification

Educational qualification	Frequency	Percentage
SSC	97	16
Inter	118	20
UG	178	30
PG	78	13
Diploma	102	17
Ph.D.	18	3
Total	591	100%

Source: Primary Data

Analysis: From the Tab-3 it is depicted that Out of 591 respondents 17 percent have studied their SSC, 20 percent respondents have studied Intermediate, 30 percent respondents have done under-graduation, 13 percent respondents have studied PG course, 17 percent respondents have studied Diploma course and remaining 3 percent respondents have done their Ph.Ds.

Tab-4 Marital status

Marital status	Frequency	Percentage
Married	378	64
Single	213	36
Total	591	100%

Source: Primary Data

Analysis: From the Tab-4 it is depicted that Out of 591 respondents 64 percent respondents are married and remaining 36 percent respondents are not married.

Tab-5 Nature of employment

Nature of employment	Frequency	Percentage
IT Job	248	42
Education	129	22
Business	123	21
Medicine	91	15
Total	591	100%

Source: Primary Data

Analysis: From the Tab-5 it is depicted that Out of 591 respondents 42 percent are working in IT companies, 22 percent respondents are working in educational institutes, 21 percent respondents are in business studies, and remaining 15 percent respondents are in medical field of the survey sample

6.3 Component Evaluation:

KMO information

- Awesome: .90s
- Meritorious: .80s
- Middling: .70s
- Mediocre: .60s
- Miserable: .50s
- Unacceptable: <.50

6.4 Bartlett's check of Sphericity

Examine the hypothesis that the correlation matrix is an identification matrix.

- Diagonals are ones
- Off-diagonals are zeros

In this example, a tremendous end result indicates that the matrix isn't an identification matrix; that is, the variables are associated enough to run an EFA that is meaningful.)

The Kaiser-Meyer-Olkin Measurement of Sampling Adequacy		.896
Bartlett's Examination of Sphericity	Approx. Chi Square	1258 0.523
	df	435
	Sig.	.000

Table -6 KMO and Bartlett's Examination (Test)

When anything has a high degree of communality, it corresponds with everything else. Greater community levels are preferable. Some variables may have trouble influencing any factors if their social characteristics are low (between 0.0 and 0.4). Check for "Extraction" column numbers below that seem insufficient. After reviewing the pattern matrix, candidates with low values should be considered for deletion.

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Tab-7 Communalities

	Initial	Extraction
AI1	.421	.435
AI2	.669	.773
AI3	.567	.617
AI4	.554	.600
AI5	.585	.625
SE1	.621	.646
SE2	.690	.715
SE3	.757	.815
SE4	.737	.779
SE5	.717	.752
BLS1	.672	.632
BLS2	.771	.773
BLS3	.823	.862
BLS4	.847	.890
BLS5	.667	.669
WN1	.545	.551
WN2	.718	.769
WN3	.687	.727

WN4	.730	.805
WN5	.582	.600
PA1	.565	.614
PA2	.553	.601
PA3	.530	.595
PA4	.510	.556
PA5	.387	.353
EM1	.547	.522
EM2	.690	.733
EM3	.744	.840
EM4	.564	.543
EM5	.628	.610

Extraction Method: Maximum Likelihood.

Total, 6 factors were extracted, and 66.68% of the independent variables could explain the dependent variables)

Tab-8 Total Variance Explained

Factor	Initial Eigenvalues			Squared Loadings Extraction Sums			A Rotation Sum of Squared Loadings
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	
1	7.971	26.572	26.572	7.312	24.372	24.372	5.259
2	4.181	13.938	40.510	3.862	12.872	37.244	4.129
3	2.954	9.845	50.355	2.725	9.084	46.328	4.716
4	2.602	8.672	59.027	2.355	7.849	54.177	4.705
5	2.343	7.810	66.837	2.153	7.178	61.355	3.927
6	1.893	6.309	73.146	1.597	5.324	66.680	4.727
7	.756	2.521	75.667				
8	.590	1.967	77.634				
9	.529	1.763	79.397				
10	.494	1.646	81.043				
11	.477	1.590	82.633				
12	.440	1.466	84.099				
13	.433	1.443	85.541				
14	.391	1.303	86.845				
15	.366	1.218	88.063				
16	.349	1.164	89.227				
17	.333	1.111	90.338				
18	.321	1.069	91.408				
19	.308	1.028	92.436				
20	.288	.960	93.396				
21	.272	.908	94.303				
22	.262	.874	95.177				
23	.231	.769	95.945				

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24	.220	.732	96.678				
25	.204	.679	97.357				
26	.194	.648	98.005				
27	.184	.614	98.620				
28	.162	.540	99.160				
29	.154	.513	99.672				
30	.098	.328	100.000				

NB: a) the Extraction Method : Maximum Likelihood Extraction

b) When factors are correlated, sums of squared loadings can't be added to obtain the total variance of the test .

Tab-9 Goodness-of-fit Test

Chi-Square	df	Sig.
633.112	270	.000

Inside the above state of affairs, "thing shape" manner the relationships between the variables beneath investigation in the EFA. we can have a look at that variables cluster into elements by means of examining the sample matrix underneath; these variables "load" onto the corresponding elements. The instance underneath suggests an immaculate aspect shape with excessive loadings inside elements, and no big move-loadings across factors (i.e., a number one loading should be at least 0.200 instances larger than a secondary loading). This indicates convergent and discriminate validity.

Tab-10 Pattern Matrix^a

	1	2	3	4	5	6
AI1					.637	
AI2					.894	
AI3					.787	
AI4					.757	
AI5					.793	
SE1		.788				
SE2		.848				
SE3		.900				
SE4		.885				
SE5		.869				
BLS1	.782					
BLS2	.850					
BLS3	.940					
BLS4	.960					
BLS5	.809					

WN1			.702			
WN2			.881			
WN3			.854			
WN4			.912			
WN5			.766			
PA1						.801
PA2						.780
PA3						.774
PA4						.717
PA5						.548
EM1				.626		
EM2				.869		
EM3				.949		
EM4				.737		
EM5				.754		

NB: i)The Extraction Method refers maximum Likelihood

ii)The Rotation Method refers Promax, with Kaiser Normalization Method

a. The Rotation Converged in to 6 iterations:

(As a second choice, you may test out the component correlation matrix, as depicted underneath. issue correlations need to be kept below zero 7. If the correlation between the two variables is better than 0.7, then nearly half of the variance might be shared ($0.7 * 0.7 = 49\%$).

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Table-11 Refers factors Correlated Matrix

Factor	1	2	3	4	5	6
1	1.000	.124	.331	.386	.159	.391
2	.124	1.000	.082	.070	.286	.148
3	.331	.082	1.000	.266	.247	.381
4	.386	.070	.266	1.000	.182	.439
5	.159	.286	.247	.182	1.000	.229
6	.391	.148	.381	.439	.229	1.000

NB: i) The Extraction Method focuses Maximum Likelihood
 ii) The rotation Method refers Promax. With Kaiser Normalization

8. CFA Model

To confirm the factor structure of your dataset, you can use confirmatory factor analysis (CFA), which follows exploratory factor analysis. The exploratory factor analysis (EFA) looks at the factor structure whereas the confirmatory factor analysis (CFA) verifies the factor structure that was derived in the EFA.

8.1 The Confirmatory Factor Analysis (CFA) :

The basic purpose of a Confirmatory Factor Analysis (CFA) is to evaluate the suggested measurement model's construct validity (Hair et al., 2014). The CFA's assessment of construct validity included looking at both convergent and discriminate validity.

a) Convergent Validity:

Table 4 displays the study's measuring model. Individual item reliabilities, convergent validity, and discriminate validity are the three elements on which Hulland's (1999) evaluation of the measurement model rests. Items with the loadings below 0.50 are not suggested for inclusion in the study (Hair et al., 2014; Hulland, 1999) for calculating item reliabilities, which are dependent on item loadings. The term "convergent validity" is used to describe the degree to which one measure of a latent concept relates with different measures of the equal construct (Hair et al., 2014).

b) Discriminate Validity:

When the extracted AVE is higher than its correlations with all the different constructs, the discriminating validity has been established (Fornell & Larcker, 1981). that is executed using evaluating the square root of the AVE to the correlations of the alternative constructs

According to Duarte and Raposo (2010), the discriminant validity construct stands out from the crowd. Discriminant validity is shown by the fact that the square roots of all AVEs (diagonal cells) are greater than the correlations between constructs.

9. Testing of the Hypothesis of the Structural Model

Hypothesized associations between constructs or latent variables form the basis of the structural model. Variance of the endogenous buildings and significance of all path estimates are used to determine the quality of the theoretical model. (Chin, 2010).

The output of the structural model in SPSS: The Structural Model Hypothesis: Tested Results Path t-value and p- value Relationship Results Four DV Path H1 AI---> EM This lends support to Hypothesis.

10. The Structural Model

The next step is to evaluate a structural model if a good fit has been found for the measurements. The purpose of the structural model is to identify which factors have an effect on each other. Thus, the structural model's objective is to put to the test the underlying premise, which is provided in three causal channels to establish connections between the variables. According to these findings, H1 is an important

hypothesis. As a result, this theory is plausible. Since this is the case, a strong correlation in the anticipated path has been established. The positive value of the regression coefficient indicating a positive relationship between AI and EM suggests that AI aids in the development of EM.

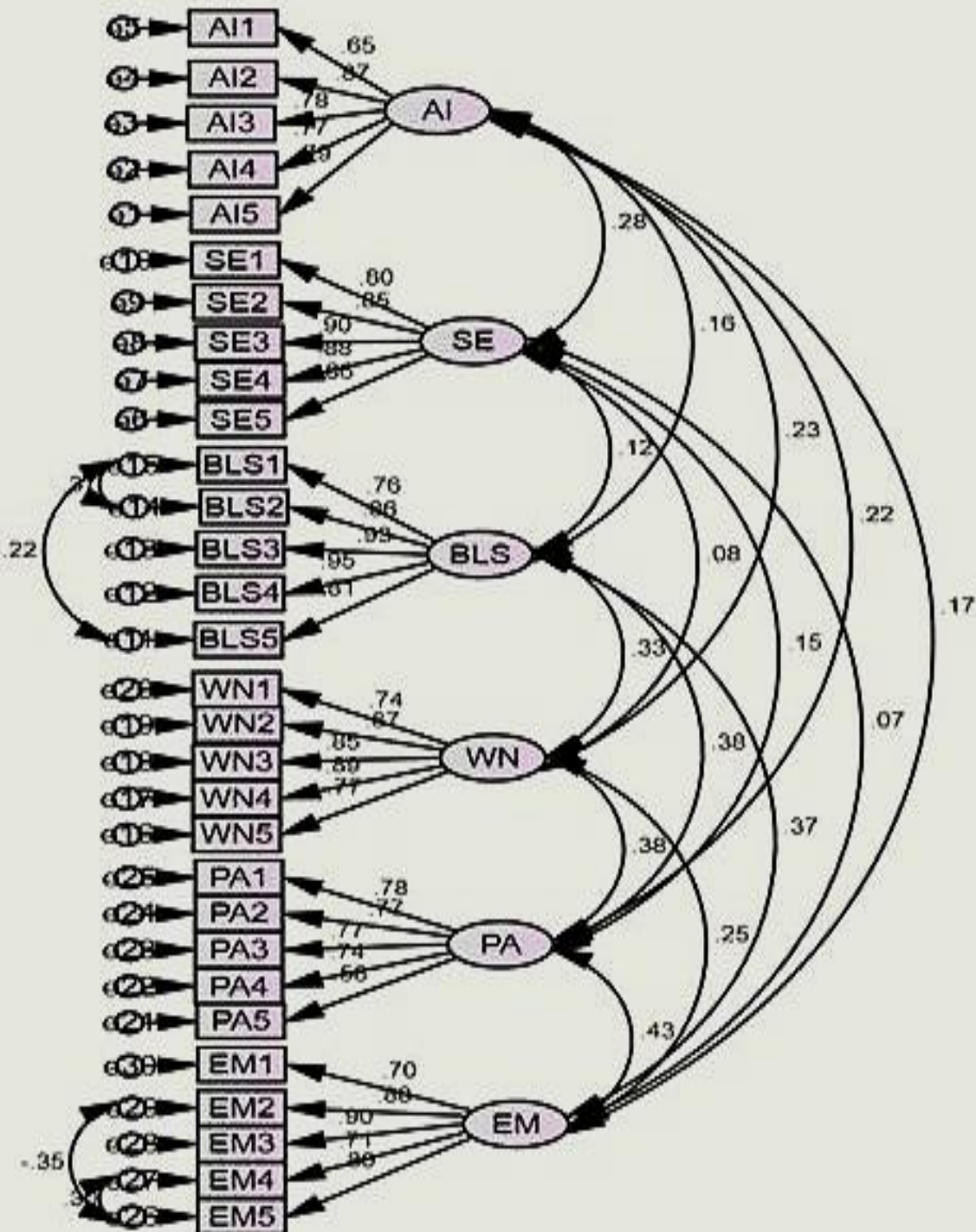


Fig-1 Structural Model

AI: Additional Income

SE: Skill Enhancement

BLS: Better Life Style

WN: Wide Network

PA: Passion

EM: Employee Moonlighting

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NB: Notes for Default Model :

Tab-12 Refers about the computation of Degree of Freedom related to Default Model

The Number of Distinct Sample Moments (NDSM):	
The Number of Distinct Parameters to be Evaluated (NDPE)	
Degrees of Freedom (df) (465 – 79):	

Findings (Default Model)

Minimum had achieved Chi-square Chi-Square =658.596

Degree of Freedom (df) = 386 and Probability level =0.000

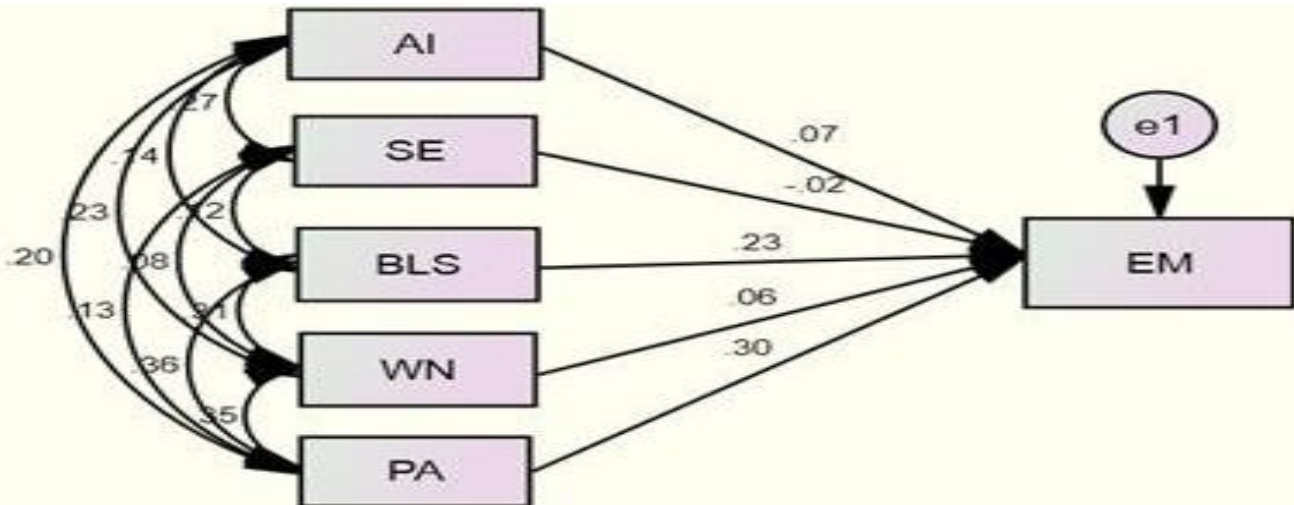


Figure-2 refers the Final SEM Model

Tab-13 Refers about Regression Weights: (Group number 1 - Default model)

Employee Moonlighting(EM)	Estimate	S.E.	C.R.	P Label
Additional Income (AI)	.060	.033	1.849	.035
Skill Enhancement (SE)	-.018	.029	-.610	.021
Better Life Style (BLS)	.224	.039	5.753	***
Wide Network (WN)	.049	.032	1.527	.127
Passion (P)	.357	.047	7.554	***

Estimates (Organization number 1 - Default version), Scalar Estimates (Organization No 1 - Default version), Most probability Estimates

- H₁:** Additional Income has significant impact on employee moonlighting job (@ 5% Level of Significance (.035) Accepted))
H₂: Skill Enhancement has significant impact on employee moonlighting job (@ 5% Level of Significance (.021) Accepted))
H₃: Better Life Style has significant impact on employee moonlighting job (@ 1% Level of Significance (.000) Accepted))
H₄: Wide network has significant impact on employee moonlighting job (@ 5 % Level of Significance (.127) Rejected))
H₅: Passion has significant impact on employee moonlighting job (@ 1% Level of Significance (.000) Accepted)).

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			Estimate	S.E.	C.R.	P	Label
AI(Additional Income)5	<---	AI					
AI(Additional Income)4	<---	AI		.048			
AI(Additional Income)3	<---	AI		.046			
AI(Additional Income)2	<---	AI		.046			
AI(Additional Income)1	<---	AI		.045			
SE(Skill Enhancement)5	<---	SE					
SE(Skill Enhancement)4	<---	SE		.037			
SE(Skill Enhancement)3	<---	SE		.033			
SE(Skill Enhancement)2	<---	SE		.041			
SE(Skill Enhancement)1	<---	SE		.041			
BLS(Better Life Style)5	<---	BLS					
BLS(Better Life Style) 4	<---	BLS		.040			
BLS(Better Life Style) 3	<---	BLS		.041			
BLS(Better Life Style) 2	<---	BLS		.042			
BLS(Better Life Style)1	<---	BLS		.040			
WN(Wide network) 5	<---	WN					
WN(Wide network) 4	<---	WN		.044			
WN(Wide network) 3	<---	WN		.048			
WN(Wide network) 2	<---	WN		.049			
WN(Wide network) 1	<---	WN		.051			
PA(Passion)5	<---	PA					
PA(Passion)4	<---	PA		.087			
PA(Passion)3	<---	PA		.076			
PA(Passion)2	<---	PA		.085			
PA(Passion)1	<---	PA		.082			
EM (Employee	<---	EM					

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Tab-14 Regression Weights: (Group number 1 - Default model)

			Estimate	S.E.			Label
AI(Additional Income)5	<---	AI					
AI(Additional Income)4	<---	AI		.048			
AI(Additional Income)3	<---	AI		.046			
AI(Additional Income)2	<---	AI		.046			
AI(Additional Income)1	<---	AI		.045			
SE(Skill Enhancement)5	<---	SE					
SE(Skill Enhancement)4	<---	SE		.037			
SE(Skill Enhancement)3	<---	SE		.033			
SE(Skill Enhancement)2	<---	SE		.041			
SE(Skill Enhancement)1	<---	SE		.041			
BLS(Better Life Style)5	<---	BLS					
BLS(Better Life Style) 4	<---	BLS		.040			
BLS(Better Life Style) 3	<---	BLS		.041			
BLS(Better Life Style) 2	<---	BLS		.042			
BLS(Better Life Style)1	<---	BLS		.040			
WN(Wide network) 5	<---	WN					
WN(Wide network) 4	<---	WN		.044			
WN(Wide network) 3	<---	WN		.048			
WN(Wide network) 2	<---	WN		.049			
WN(Wide network) 1	<---	WN		.051			
PA(Passion)5	<---	PA					
PA(Passion)4	<---	PA		.087			
PA(Passion)3	<---	PA		.076			
PA(Passion)2	<---	PA		.085			
PA(Passion)1	<---	PA		.082			
EM (Employee	<---	EM					

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EM(Employee Moonlighting) 4	<---	EM		.045		
EM(Employee Moonlighting) 3	<---	EM		.051		
EM(Employee Moonlighting) 2	<---	EM		.055		
EM(Employee Moonlighting) 1	<---	EM		.053		

11. Interpretation

AI (Additional Income)The indicators AI1 to AI5 are significantly influenced by the latent variable AI, with estimates ranging from 0.735 (AI1) to 1.049 (AI2).

- The consistent pattern of high C.R. values suggests that self-efficacy is a robust predictor of these indicators.

BLS (Better Life Style)

- The estimates for BLS indicators range from 0.937 (BLS1) to 1.164 (BLS3), all showing significant relationships.
- BLS4 and BLS3 have notably high loadings, reinforcing their importance in measuring behavioral learning strategies.

WN (Wide network)

Table -15 Refers about the standardized Regression Weights : Group No:01 Related to Default Model)

		Estimate
AI(Additional Income)5	<---	.792
AI(Additional Income)4	<---	.770
AI(Additional Income)3	<---	.784
AI(Additional Income)2	<---	.874
AI(Additional Income)1	<---	.652
SE(Skill Enhancement)5	<---	.865
SE(Skill Enhancement)4	<---	.882
SE(Skill Enhancement)3	<---	.903
SE(Skill Enhancement)2	<---	.845
SE (Skill Enhancement)1	<---	.802
BLS(Better Life Style)5	<---	.807
		Estimate
BLS(Better Life Style)4	<---	.951
BLS(Better Life Style)3	<---	.931
BLS(Better Life Style)2	<---	.862
BLS(Better Life Style)1	<---	.760
WN(Wide network) 5	<---	.770
WN(Wide network) 4	<---	.891
WN(Wide network) 3	<---	.852
WN(Wide network) 2	<---	.871
WN(Wide network) 1	<---	.742
PA(Passion)5	<---	.582

- The WN indicators exhibit strong relationships as well, with estimates ranging from 0.962 (WN1) to 1.134 (WN2).
 - Each indicator shows significant contributions to the wellness construct. PA (Passion)
 - The PA indicators have relatively high loadings ranging from 1.041 (PA3) to 1.169 (PA4).
 - All indicators are significantly related to positive affect, indicating that these measures effectively capture this construct.
- EM (Employee Moonlighting)
- Emotional management indicators show a range of loadings from 0.924 (EM1) to 1.175 (EM3).
- The significant C.R.s indicates that these measures are valid and reliable in assessing emotional management capabilities.

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PA(Passion)4	<---	.744
PA(Passion)3	<---	.767
PA(Passion)2	<---	.774
PA(Passion)1	<---	.784
EM(Employee Moonlighting) 5	<---	.795
EM(Employee Moonlighting) 4	<---	.711
EM(Employee Moonlighting) 3	<---	.898
EM(Employee Moonlighting) 2	<---	.884
EM(Employee Moonlighting) 1	<---	.698

The standardized regression weights presented in your output reflect the strength of the relationships between latent variables (AI, SE, BLS, WN, PA, EM) and their corresponding observed indicators. Standardized weights allow for easier comparison across different constructs since it draws and they are scaled and its mean is zero and the standard deviation is 01. Here's a detailed interpretation of the results:

12. Overview of Components

Each estimate indicates the degree to which a one standard deviation change in the latent variable is associated with a change in the observed indicator, also measured in standard deviations. Higher values indicate stronger relationships.

Group Interpretations

a)AI (Additional Income)

AI1 to AI5

The standardized weights for AI indicators range from 0.652 (AI1) to 0.874 (AI2).

AI2 has the highest weight (0.874), suggesting it is the most strongly related to additional income.

AI1 has the lowest weight (0.652), indicating it is less strongly associated with the latent variable but still significant.

b)SE (Skill Enhancement)

SE1 to SE5

The weights for skill enhancement indicators range from 0.802 (SE1) to 0.903 (SE3).

The highest loading is for SE3 (0.903), indicating it is a critical measure of skill enhancement.

All indicators show strong associations, reflecting that skill enhancement is effectively captured by these measures.

c) BLS (Better Lifestyle)

BLS1 to BLS5

In this section, the standardized weight ranges from 0.760

(BLS1) to 0.951 (BLS4).

BLS4 has the highest weight (0.951), suggesting it is particularly influential in representing better lifestyle outcomes.

The lower weight for BLS1 (0.760) still indicates a meaningful relationship but is comparatively weaker. WN (Wide Network)

WN1 to WN5

The weights range from 0.742 (WN1) to 0.891 (WN4).

The highest loading is for WN4 (0.891), indicating its strong association with having a wide network. All indicators show significant relationships, highlighting the importance of networking.

d) PA (Passion)

PA1 to PA5

The standardized weights ranges from 0.582 (PA5) to 0.784 (PA1).

While all indicators are significant, the weight for PA5 (0.582) suggests it may be less strongly associated compared to others, indicating potential areas for further exploration or improvement.

e) EM (Employee Moonlighting)

EM1 to EM5

The weights range from 0.698 (EM1) to 0.898 (EM3).

The highest loading is for EM3 (0.898), indicating it plays a crucial role in understanding employee moonlighting behaviors.

All indicators are significantly related, suggesting that they collectively provide a robust measure of this construct.

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Tab-16 Covariance: (Group No :-1) Refers Default Model)

			Estimate	S.E.	C.R.	P	Label
Additional Income (	<-->	SE	.160	.027	5.929	***	
Additional Income (	<-->	BLS	.067	.019	3.450	***	
Additional Income (	<-->	WN	.124	.025	4.933	***	
Additional Income (	<-->	PA	.074	.017	4.444	***	
Additional Income (	<-->	EM	.073	.020	3.675	***	

Skill Enhancement (	<-->	BLS	.052	.019	2.718	.007	
Skill Enhancement S	<-->	WN	.041	.024	1.701	.089	
Skill Enhancement S	<-->	PA	.050	.016	3.133	.002	
Skill Enhancement S	<-->	EM	.030	.019	1.562	.118	
(Better Life Style)BLS	<-->	WN	.133	.019	6.818	***	
(Better Life Style)BLS	<-->	PA	.098	.014	7.057	***	
(Better Life Style)BLS	<-->	EM	.122	.016	7.615	***	
Wide network)(WN)	<-->	PA	.121	.018	6.889	***	
Wide network (W	<-->	EM	.102	.019	5.375	***	
Passion(PA)	<-->	EM	.109	.015	7.458	***	
e14	<-->	e15	.061	.008	7.720	***	
e26	<-->	e27	.070	.014	5.173	***	
e11	<-->	e15	.042	.008	5.166	***	
e26	<-->	e29	-.052	.009	-5.771	***	

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13. Result Analysis:

The covariance estimates provided in your output indicate the relationships between various latent variables (Additional Income, Skill Enhancement, Better Lifestyle, Wide Network, Passion, and Employee Moonlighting) and their interdependencies. Covariance measures how two variables alternate collectively; a high quality value shows that as one variable increases, the alternative tends to boom as well, at the same time as a poor value indicates an inverse relationship.

This is the estimated covariance between the pairs of variables.

- S.E. (Standard Error): This reflects the variability of the estimate; smaller values indicate more precise estimates.
- C.R. (Critical Ratio): This is the ratio of the estimate to its standard error. Values greater than 1.96 typically indicate statistical significance.
- P (p-value): Indicates the significance of the covariance estimate. A p-value marked with "****" denotes strong evidence against the null hypothesis (usually $p < 0.001$).

Group Interpretations **Additional Income (AI)**

Covariances:

- AI <--> SE: 0.160 ($p < 0.001$) - A significant positive relationship indicates that higher additional income is associated with higher skill enhancement.
- AI <--> BLS: 0.067 ($p < 0.001$) - A positive but weaker relationship suggests a moderate association between additional income and better lifestyle.
- AI <--> WN: 0.124 ($p < 0.001$) - Indicates that increased additional income correlates positively with having a wider network.
- AI <--> PA: 0.074 ($p < 0.001$) - Suggests a positive association with passion, albeit weaker than other covariances.
- AI <--> EM: 0.073 ($p < 0.001$) - Indicates a modest positive relationship with employee moonlighting.

Skill Enhancement (SE)

- SE <--> BLS: 0.052 ($p = 0.007$) - A statistically significant positive relationship indicates that skill enhancement is positively associated with better lifestyle choices.
- SE <--> WN: 0.041 ($p = 0.089$) - While this shows a positive trend, it is not statistically significant at conventional levels, suggesting further investigation may be needed.
- SE <--> PA: 0.050 ($p = 0.002$) - A significant positive association indicates that skill enhancement is linked to increased passion.
- SE <--> EM: 0.030 ($p = 0.118$) - This

relationship is not statistically significant, suggesting a weaker or less reliable connection.

Better Lifestyle (BLS)

- BLS <--> WN: 0.133 ($p < 0.001$) - A strong positive relationship indicating that better lifestyle choices are associated with having a wider network.
- BLS <--> PA: 0.098 ($p < 0.001$) - Suggests a strong association between better lifestyle and passion.
- BLS <--> EM: 0.122 ($p < 0.001$) - Indicates a significant positive relationship with employee moonlighting.

Wide Network (WN)

- WN <--> PA: 0.121 ($p < 0.001$) - A strong positive association suggests that having a wide network correlates positively with passion.
- WN <--> EM: 0.102 ($p < 0.001$) - Indicates that a wider network is positively associated with employee moonlighting.

Passion (PA)

- PA <--> EM: 0.109 ($p < 0.001$) - A significant positive relationship indicates that higher passion is associated with increased employee moonlighting.

Error Covariances

- The estimates for error terms (e14 <--> e15, e26 <--> e27, etc.) show significant relationships among specific indicators, suggesting that these errors may share some common variance or are influenced by similar factors:

- e14 <--> e15: 0.061 ($p < 0.001$)
- e26 <--> e27: 0.070 ($p < 0.001$)
- e11 <--> e15: 0.042 ($p < 0.001$)
- e26 <--> e29: -0.052 ($p < 0.001$) - This negative covariance suggests an inverse relationship between these two error terms.

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Tab-17 Correlations: (Group number 1 - Default model)

			Estimate
Additional Income (AI)	<-->	SE	.282
Additional Income (AI)	<-->	BLS	.157
Additional Income (AI)	<-->	WN	.234
Additional Income (AI)	<-->	PA	.222
Additional Income (AI)	<-->	EM	.170
Skill Enhancement (SE)	<-->	BLS	.120
Skill Enhancement (SE)	<-->	WN	.076
Skill Enhancement (SE)	<-->	PA	.148
Skill Enhancement (SE)	<-->	EM	.069
(Better Life Style)BLS	<-->	WN	.328
(Better Life Style)BLS	<-->	PA	.385
(Better Life Style)BLS	<-->	EM	.375
Wide network (WN)	<-->	PA	.381
Wide network (WN)	<-->	EM	.253
Passion(PA)	<-->	EM	.426
e14	<-->	e15	.375
e26	<-->	e27	.297
e11	<-->	e15	.217
e26	<-->	e29	-.345

14,.Result Analysis:

The correlation estimates provided in your output reflect the strength and direction of the linear relationships between various latent variables (Additional Income, Skill Enhancement, Better Lifestyle, Wide Network, Passion, and Employee Moonlighting) as well as the relationships among error terms. Correlation coefficients range from -1 to +1, where values towards +1 suggest a strong

Estimate: Each estimate represents the correlation coefficient between pairs of variables. Positive values indicate that as one variable increases, the other tends to increase as well.

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14.1 Additional Income (AI)

- AI <--> SE: 0.282 - A moderate positive correlation indicates that higher additional income is associated with higher skill enhancement.
- AI <--> BLS: 0.157 - A weak positive correlation suggests a modest association between additional income and better lifestyle.
- AI <--> WN: 0.234 - Indicates a moderate positive relationship with a wider network.
- AI <--> PA: 0.222 - Suggests a moderate positive association with passion.
- AI <--> EM: 0.170 - Indicates a weak positive relationship with employee moonlighting.

14.2 Skill Enhancement (SE)

- SE <--> BLS: 0.120 - A weak positive correlation suggests some association between skill enhancement and better lifestyle choices.
- SE <--> WN: 0.076 - Indicates a very weak correlation, suggesting little to no linear relationship.
- SE <--> PA: 0.148 - A weak positive correlation indicates that skill enhancement is somewhat related to passion.
- SE <--> EM: 0.069 - Suggests negligible correlation with employee moonlighting.

14.3 Better Lifestyle (BLS)

- BLS <--> WN: 0.328 - A strong positive correlation indicates that better lifestyle choices are significantly associated with having a wider network.
- BLS <--> PA: 0.385 - Suggests a strong positive relationship between better lifestyle and passion.
-

- BLS <--> EM: 0.375 - Indicates a strong positive association with employee moonlighting.

14.4 Wide Network (WN)

- WN <--> PA: 0.381 - A strong positive correlation suggests that having a wide network is significantly associated with passion.
- WN <--> EM: 0.253 - Indicates a moderate positive relationship with employee moonlighting.

14.5 Passion (PA)

Correlation with EM:

- PA <--> EM: 0.426 - A strong positive correlation indicates that higher levels of passion are significantly associated with increased employee moonlighting.

Error Correlations

- The correlations among error terms (e14 <--> e15, etc.) provide insights into shared variance among specific indicators:
- e14 <--> e15: 0.375 – A strong positive correlation suggests that these two error terms share significant common variance.
- e26 <--> e27: 0.297 – Indicates a moderate positive relationship between these error terms.
- e11 <--> e15: 0.217 – Suggests a weak positive correlation indicating some shared variance.
- e26 <--> e29: -0.345 – This negative correlation indicates an inverse relationship between these two error terms.

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Tab-18 Variances: (Group number 1 - Default model)

	Estima	S.E.	C.R.	P	Label
Additional Income (AI)	.561	.050	11.122	***	
Skill Enhancement (SE)	.574	.044	13.026	***	
(Better Life Style)BLS	.327	.028	11.759	***	
Wide network (WN)	.501	.046	10.849	***	
Passion(PA)	.200	.028	7.279	***	
Employee Moonlighting (EM)	.326	.030	10.986	***	
e1	.333	.024	13.781	***	
e2	.341	.024	14.252	***	
e3	.298	.021	13.956	***	
e4	.190	.018	10.643	***	
e5	.410	.026	15.719	***	
e6	.194	.014	13.729	***	
e7	.196	.015	13.098	***	
e8	.129	.011	12.047	***	
e9	.279	.020	14.286	***	
e10	.330	.022	15.103	***	
e11	.175	.011	15.610	***	
e12	.046	.005	8.701	***	
e13	.068	.006	11.061	***	
e14	.128	.009	14.686	***	
e15	.210	.013	16.085	***	
e16	.344	.023	15.145	***	
e17	.137	.012	11.687	***	
e18	.220	.016	13.423	***	
e19	.204	.016	12.684	***	
e20	.378	.024	15.472	***	
e21	.391	.025	15.844	***	
e22	.220	.016	13.899	***	
e23	.152	.011	13.397	***	
e24	.180	.014	13.220	***	
e25	.163	.013	12.964	***	
e26	.189	.015	12.475	***	
e27	.296	.019	15.366	***	
e28	.108	.011	9.926	***	
e29	.119	.012	10.228	***	
e30	.293	.018	15.896	***	

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The variances provided in your output reflect the amount of variability in each latent variable and observed indicator within the model. Variance estimates are crucial for understanding how much each variable contributes to the overall model and how they relate to one another.

Estimate: This represents the variance for each variable. A higher variance indicates that there is more variability in that variable's scores among the participants.

- S.E. (Standard Error): This reflects the precision of the variance estimate; smaller values indicate more reliable estimates.
- C.R. (Critical Ratio): This is the ratio of the estimate to its standard error. Values greater than 1.96 typically indicate statistical significance.
- P (p-value): Indicates the significance of the variance estimate. A p-value marked with "****" denotes strong evidence against the null hypothesis (usually $p < 0.001$).

Group Interpretations Latent Variables

1. **Additional Income (AI)**
 - Variance Estimate: 0.561 ($p < 0.001$)
 - This indicates a moderate level of variability in additional income among participants, suggesting that factors influencing additional income differ significantly across individuals.
2. **Skill Enhancement (SE)**
 - Variance Estimate: 0.574 ($p < 0.001$)
 - A slightly high variance than AI suggests that skill enhancement experiences also vary considerably among individuals, reflecting diverse opportunities or motivations for skill development.
3. **Better Lifestyle (BLS)**
 - Variance Estimate: 0.327 ($p < 0.001$)
 - This lower variance compared to AI and SE indicates that while there is still variability in lifestyle choices, it is less pronounced, suggesting more uniformity in how individuals perceive or achieve a better lifestyle.
4. **Wide Network (WN)**
 - Variance Estimate: 0.501 ($p < 0.001$)
 - The moderate variance suggests that individuals have different levels of networking capabilities or opportunities, which can influence their social interactions and support systems.
5. **Passion (PA)**
 - Variance Estimate: 0.200 ($p < 0.001$)
 - This relatively low variance indicates that passion levels may be more consistent across participants, possibly reflecting shared interests or values within the sample.
6. **Employee Moonlighting (EM)**
 - Variance Estimate: 0.326 ($p < 0.001$)
 - Similar to BLS, this variance suggests variability in moonlighting behaviors but indicates that many

individuals may share similar patterns regarding secondary employment.

Observed Indicators

The variances for observed indicators (e1 to e30) show varying degrees of variability:

- Indicators such as e5 (0.410), e20 (0.378), and e21 (0.391) have relatively high variances, indicating significant variability in responses among participants for these measures.
- Conversely, indicators like e12 (0.046) and e28 (0.108) show low variances, suggesting that responses are more consistent among participants for these measures.

15. Model Fit Summary

A model that adequately accounts for the correlations between variables in the dataset (here, the factor structure model) is said to fit the data. In the case of poor model fit, there is a large discrepancy between hypothesized correlations and observed correlations, whereas a good fit indicates that we have taken into account the important correlations in the dataset (based on the variables in our model). The correlations in the dataset are inconsistent with the model we suggest, so our model does not "fit" the data.

15.1 Metrics

Goodness of fit can be calculated using a number of different metrics. Below, we've described the reportable metrics, along with the associated thresholds. Both the size of the sample and the number of model variables negatively affect the goodness of fit. The following ranges are meant only as suggestions.

Tab-19 Metrics

16. The Validity and Reliability:

Reliability Composite (CR), common Variance Extracted (AVE), most Shared Variance (MSV), and average Shared Variance (ASV). The video tutorial will show you a way to calculate those values. under are the thresholds for these values:

Reliability

a) $CR > 0.7$

Convergent Validity

b) $AVE > 0.5$

Discriminant Validity

c) $MSV < AVE$

17. The Square Root of AVE higher than Inter –Construct Correlations

If the variables do not correlate well inside their parent factor, then your convergent validity suffers, and the observable variables do not provide a satisfactory explanation for the latent component. In the case of discriminant validity problems, the latent factor is better



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explained by some other variables (from a different factor)
than by its own observed variables, and the variables
within the factor have a lower correlation with those

outside the factor.

Measure	Threshold
Chi-square/df (cmin/df)	< 3 good; < 5 sometimes permissible
p-value for the model	> .05
CFI	> .95 great; > .90 traditional; > .80 sometimes permissible
GFI	> .95
AGFI	> .80
SRMR	< .09
RMSEA	< .05 good; .05 - .10 moderate; > .10 bad
PCLOSE	> .05

Tab-30 Validity and Reliability

	CR	AVE	MSV	MaxR(H)	PA	AI	SE	BLS	WN	EM
PA	0.853	0.539	0.181	0.862	0.734					
AI	0.884	0.605	0.080	0.897	0.222	0.778				
SE	0.934	0.740	0.080	0.938	0.148	0.282	0.860			
BLS	0.937	0.749	0.148	0.957	0.385	0.157	0.120	0.865		
WN	0.915	0.684	0.145	0.925	0.381	0.234	0.076	0.328	0.827	
EM	0.899	0.643	0.181	0.920	0.426	0.170	0.069	0.375	0.253	0.802

18. Result Analysis:

Tab-31 Model fit summary of Structural Equation Model

Indices	Value	Suggested value
Chi-square value	658.596	
P value	0.000	>0.05 (Hair et al., 1998)
GFI	.931	>0.90 (Hu and Bentler, 1999)
AGFI	.916	>0.90 (Hair et al. 2006)
CFI	.978	> 0.90 (Daire et al., 2008)
RMR	.023	< 0.08 (Hair et al. 2006)
RMSEA	.035	< 0.08 (Hair et al. 2006)

It is clear from the data in the table that there is a perfect fit, since the computed P value is 0.000, which is higher than 0.05. In this case, a Goodness of Fit Index (GFI) score of .931 and an Adjusted Goodness of Fit Index (AGFI) value higher than .916 indicate a satisfactory fit. The computed CFI (Comparative match Index) value of .978 indicates a perfect match, as do the RMR (Root Mean Square Residuals) value of .023 and the RMSEA (Root Mean Square Error of Approximation) value of .035, all of which are less than 0.08, further confirming a perfect fit.

Conclusion

1. It is concluded that majority of respondents i.e., 30 percent respondents have done their under-graduation courses followed by intermediate and diploma courses. It indicates that most of the graduates prefer moonlighting.
2. It is concluded that majority of respondents are who are married are moonlighting



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3. Majority of the respondents are in the age group of 36-40 years, followed by other age groups of the study sample who are preferring to moonlighting
4. Majority of respondents are male respondents who are moonlighting due to requirement from family or follow the passion.
5. It is concluded that maximum number of respondents are pursuing IT jobs are willing to moonlighting; it can be because of their potential to explore with their capabilities.
6. Six factors have been extracted through factor analysis where the underlying factors have been put under these six major factors influencing moonlighting.
7. H₁: Additional Income has significant impact on employee moonlighting job (@ 5% Level of Significance (.035) Accepted))
8. H₂: Skill Enhancement has significant impact on employee moonlighting job (@ 5% Level of Significance (.021) Accepted))
9. H₃: Better Life Style has significant impact on employee moonlighting job (@ 1% Level of Significance (.000) Accepted))
10. H₄: Wide network has significant impact on employee moonlighting job (@ 5 % Level of Significance (.127) Rejected))
11. H₅: Passion has significant impact on employee moonlighting job(@ 1% Level of Significance (.000) Accepted.

19. Regression Weights

Observed indicators across the latent variables demonstrate strong and statistically significant relationships, suggesting that they are effective measures of their respective constructs in this model. The high estimates and significant C.R.s indicate that these variables are important predictors in understanding the underlying theoretical framework being assessed.

20. The Standardized Regression Analyses and weights :

The standardized regression weights indicate that all observed indicators across the latent variables demonstrate meaningful and significant relationships with their respective constructs.

Constructs such as Skill Enhancement and Better Lifestyle show particularly strong associations with their indicators, suggesting they are well-defined and effectively measured within this model.

Conversely, while Passion indicators are significant, they may require further refinement or additional measures to enhance their representation in the model.

these findings can inform future research directions or practical applications by identifying which indicators are most influential within each construct and guiding efforts toward enhancing measurement validity and reliability in related studies or interventions.

21. The covariance estimates

The covariance estimates reveal several significant relationships among the latent variables in the model. Additional Income shows strong positive associations with Skill Enhancement and Wide Network, indicating that as individuals increase their income, they also

tend to enhance their skills and expand their networks.

Skill Enhancement has meaningful relationships with Better Lifestyle and Passion, emphasizing its role in promoting overall well-being and engagement.

The Better Lifestyle construct is closely related to both Wide Network and Passion, highlighting its importance in social connections and personal fulfillment.

The relationships among error terms suggest potential underlying factors influencing specific indicators. These insights can inform future research directions or practical applications by identifying key areas of interdependence among constructs and guiding interventions aimed at enhancing these relationships for improved outcomes in related fields such as career development, personal growth, and social networking strategies.

22. The correlation estimates

The correlation estimates reveal several key relationships among the latent variables in model: Additional Income has moderate correlations with Skill Enhancement, Wide Network, and Passion, indicating that as individuals increase their income, they also tend to enhance their skills and expand their networks while becoming more passionate about their pursuits.

Better Lifestyle shows particularly strong correlations with both Passion and Wide Network, suggesting that improvements in lifestyle are closely linked to social connections and personal fulfillment.

The strong correlation between Passion and Employee Moonlighting suggests that individuals who are more passionate about their work or interests are likely to engage in moonlighting activities. These insights



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can inform future research or practical applications by highlighting key areas of interdependence among constructs, guiding interventions aimed at enhancing these relationships for improved outcomes in career development, personal growth, and social networking strategies.

23. The variance estimates

The variance estimates provide valuable insights into how much each latent variable and observed indicator varies within your model:

Higher variances in Additional Income and Skill Enhancement indicate diverse experiences and influences among participants, highlighting areas where interventions could be tailored to individual needs. Lower variances in Better Lifestyle and Passion suggest more uniform perceptions or behaviors in these areas, which may indicate shared societal norms or values.

The variability among observed indicators reflects differing levels of agreement or experience with specific measures, which can inform future research directions or practical applications aimed at enhancing understanding and support in these domains. Overall, these findings can guide interventions by identifying where significant variability exists and where more uniformity may suggest commonalities worth exploring further in both research and practice contexts.

The Default model shows reasonable fit with some discrepancies indicated by its significant chi-square value but acceptable CMIN/DF ratio.

The Saturated model confirms that perfect fit is possible, while the Independence model highlights that ignoring relationships among variables leads to extremely poor fit.

To analyze the relationship between employee performance and employee productivity, Structural Equation Modeling (SEM) was used. Based on the data presented by the conceptual model, we may deduce that the following are true: Chi-square = 658.596, $p = .000$, GFI = .931, AGFI = .916, CFI = .978 and RMSEA = 0.045. Goodness of fit index values indicates that all requirements for a moderately well-fitting model have been satisfied.

Bibliography

In this article, the bibliography refers to a comprehensive source of books, journals, periodicals and different websites consulted and cited by the author but the author not directly copied from the author regarding content, diagrams, facts and findings to the related article.

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Application of Human Resource Tools for Employee Well-Being and Sustainable Practices on Corporate Sector in India: Emerging Needs & Challenges

Dr. Bijal Shah ¹, Dr. K. Santhana Lakshmi ², Mr. Shivam Khamari ³, Prof. (Dr.) Raj Kumar Singh⁴
Prof. (Dr.) Sukanta Kumar Baral ⁵

¹Associate Dean, Parul University, Ahmedabad, Vadodara

Email Id: bijal.shah@paruluniversity.ac.in

²Professor, HOD, SRM University, Chennai

Email Id: santhank@srmist.edu.in

³Assistant Professor, Swami Vivekananda Institute of Management, Baniatangi, Khordha

Email Id: shivamkh20@gmail.com ORCID ID: 0009-0009-3618-2954

⁴Professor and (HOD), Department of Commerce and Dean (Student Welfare) at School of Management Sciences,

Varanasi. Email Id: rksingh@smsvaranasi.com

⁵Professor, Department of Commerce, Indira Gandhi National Tribal University (IGNTU) Amarkantak,

Email Id: sukanta.baral@igntu.ac.in

Abstract:

At present, many organizations are facing employee sustainability and retention for seeking good quality of Product production, which depends upon the Worker-employee-and employer relationship that's why the application of HR tools and its practices are required, and it explores how HR tools can be leveraged to enhance employee well-being and promote sustainable practices within organizations. It examines the role of HR in fostering a positive work environment through initiatives like work-life balance, flexible work arrangements, mental health support, and employee development programs.

This article emphasizes the long-term benefits of these HR practices, including increased employee satisfaction, retention, engagement, and overall productivity, contributing to organizational success and sustainability. The positive outcomes of implementing HR tools for employee well-being include increased employee satisfaction. Improved employee retention, enhanced employee engagement, and increased productivity. Again, it positively impacts organizational performance, innovation skills, and contributes to corporate social responsibility (CSR). Further, this research paper reveals that many HRM models and its practices, like the Ulrich model, HR Value Chain, emerging approaches, Agile, and EX-driven models, etc., are to be executed for real practice and acknowledges the critical role of HR in driving sustainability within the organization through the execution of Strategic planning and development, Research and data analysis, communication and outreach, proper execution of Green HRM policies in different sectors, and monitoring the entire process regularly for real practice

Finally, the researcher expected that the execution of HR Tools and techniques it create a conducive work environment for a healthy work life and enhance employee retention and sustainability in the longer term for every organization. This will be increased the economic development and GDP of the country from time to time.

Key Words:

Employee-Well Being, (EWB), Retention and Sustainability, (RAS) HRM Models and Practices (HRMMAP), Corporate Social Responsibilities (CSR), Strategic Planning and Development (STAD) inexperienced HR practices. Challenges lie in

1. Introduction:

Inside the Indian company sector, Human Resources (HR) techniques are increasingly being implemented to enhance employee well-being and promote sustainable practices. This involves integrating HR techniques with environmental and social considerations, main to an extra holistic and responsible approach to business. Key regions consist of painting-existence balance projects, intellectual health aid, employee improvement programs, and

balancing these initiatives with enterprise needs, ensuring effective implementation, and addressing capacity resistance to change.

2. Literature Review:

This literature evaluation of the research topic entitled "Application of Human Resource Tools for Employee Well-Being and Sustainable Practices



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on Corporate Sector in India: Emerging Needs & Challenges” which explores the utility of Human Resource (HR) tools and practices for enhancing workers well-being and promoting sustainable practices in the corporate zone in India, highlighting emerging desires and demanding situations. There are 1000 respondents targeted for collection of data and expected near about 760 respondents will be anticipated for the positive aspects of the aforesaid research work. The review indicates a developing reputation for the importance of integrating well-being and sustainability into HR techniques to foster a wonderful work environment and improve organizational performance.

3. Objectives of Research:

The researchers have taken the following objectives for justifying the aforesaid research problem, such as:

- a) To study the application of various human resource tools and their effectiveness on employees 'well-being and behavior in different corporate offices in Odisha to make them well productive and perform in their workplace.
- b) To observe the employees' (human) behavior in the workplace and how they adjust themselves in their working environment when they are facing heavy work pressure, stress, deprived of achieving their rights, and needs from their employees.
- c) To study the sustainable HR practices in various sectors of the company and the public sector how effective for shaping a good practice of well-being in work workplace and office in order to create a productive production, motivate employees, and maintain a sustainable brotherhood relationship among employees.
- d) To create the best HR practice and a good relationship between employees and employers by which shapes a conducive working environment for enhancing better quality of production and economic development, and its sustainability, as well as employees ' well-being in their daily life.

4. Method of Study:

In this section, the researcher have taken mixed methods of study both primary and Secondary Method of data collection and target 1000 respondents , most of data has been collected from different employees and employers of corporate sector through questionnaire and face to face interaction with them but while studying their behavioral and social pattern of life, the researcher faced lots of problem for understanding their attitude, nature, behavior, perception etc. so that, secondary method of study taken for collection of various

information related to employee attitude and perception from company websites, published sources, psychological journals etc.

5. Hypothesis:

In this section, researchers have taken the following hypothesis to study the practices of HR Tools, whether effective on the employees of the corporate sector or not, if effective, how much percentage of its effectiveness, and if not effective, why? What are the causes behind it? Let us prove it through the following hypothesis

5.1 Null Hypothesis [Ho]:

There is no effect of HR tools Practices on the employees of the corporate sector to improve their well-being in their personal, social, and professional lives.

5.2 Expected Hypothesis (He):

There is a better effect of HR Tools practices on the employees of the corporate section, if it is systematically and scientifically applied to them, employees are becoming sociable, well-behaved, positive, workaholic, sociable, and maintained a good morality and ethical practice in their daily work life and they becomes well being forever.

5.3 Alternative Hypothesis: (Ha)

There are a number of better possibilities for employee well-being when the application of HR tools practices through a number of HR models in the corporate sector, it leads to economic development of the corporate people and country, which will increase GDP and its sustainability in India.

6. Concept of HR tools and Practices:

As the word HR is concerned, it refers to Human Resource Management (HRM, or on occasion abbreviated to HR) is concerned with all factors of the way humans are employed and managed in different corporations. The term HRM has largely taken over from that of personnel management, which took over from preceding terminology, which includes exertions or welfare control.

7. What are HR Tools and Techniques?

HR tools and techniques are manages all middle HR approaches from new lease requests to employee exists interviews. Based on the requirement, companies can either opt for an easy HR software program that addresses everyday administrative tasks like holiday control, timesheet management, and so on.



8. Practices of HR tools:

Human Resource Management (HRM) is the practice of the subsequent components, such as:

- Recruiting
- Hiring
- Deploying
- Dealing with an Organization's Personnel.

Thus, HRM tools are the nice practices of human resource guidelines in the corporate zone and

government places of work for creating an ecological environment as well as growing a

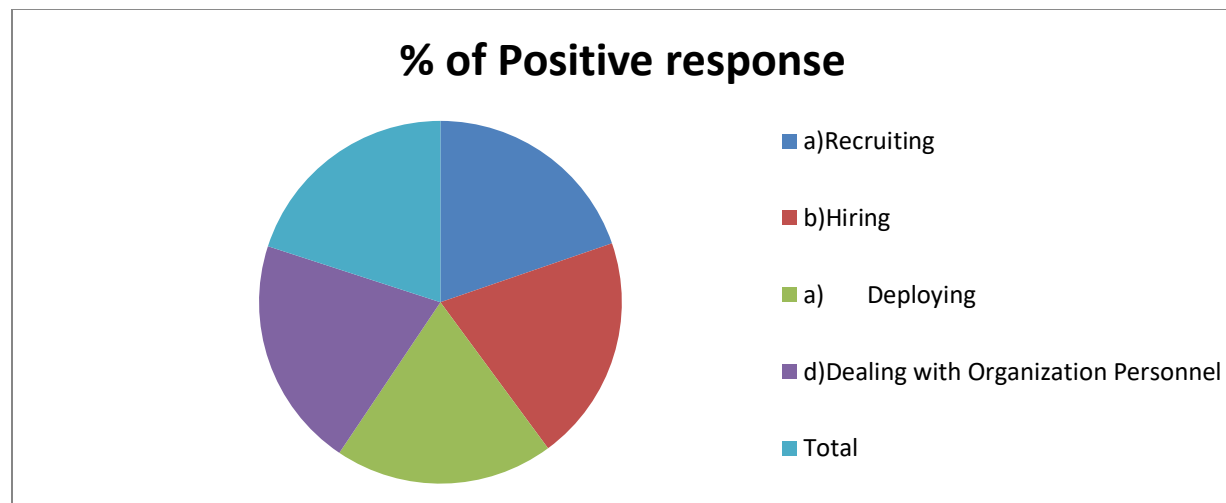
Conducive work culture and surroundings by which employees will be highly well-being and cultured for executing the HR practices in their daily work life, personal and social life style.

Date Table: 1 Practices of Human resource tools in corporate sector

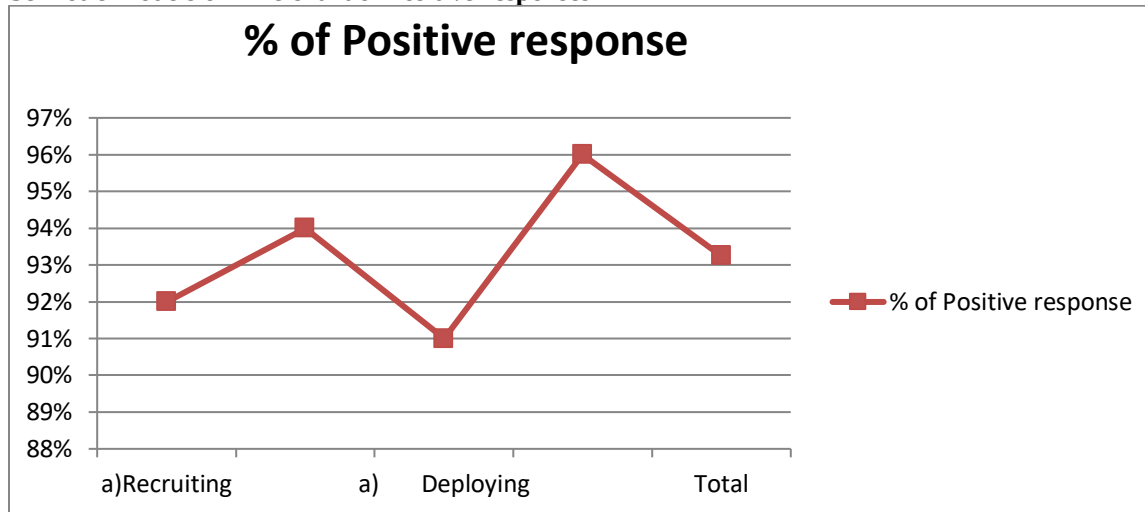
HR Tools	Practice Sector	Number of Employees (M+F+TG) 45+45+10	Support of HR Tools Practice	% of Positive response
a) Recruiting	Corporate sector	100	92	92%
b) Hiring	Govt. & PSU	100	94	94%
c) Deploying	Corporate sector	100	91	91%
d) Dealing with Organization Personnel	Corporate Sector	100	96	96%
Total		400	373	93.25%

Source:
data Collected from Respondents on Direct Questionnaire

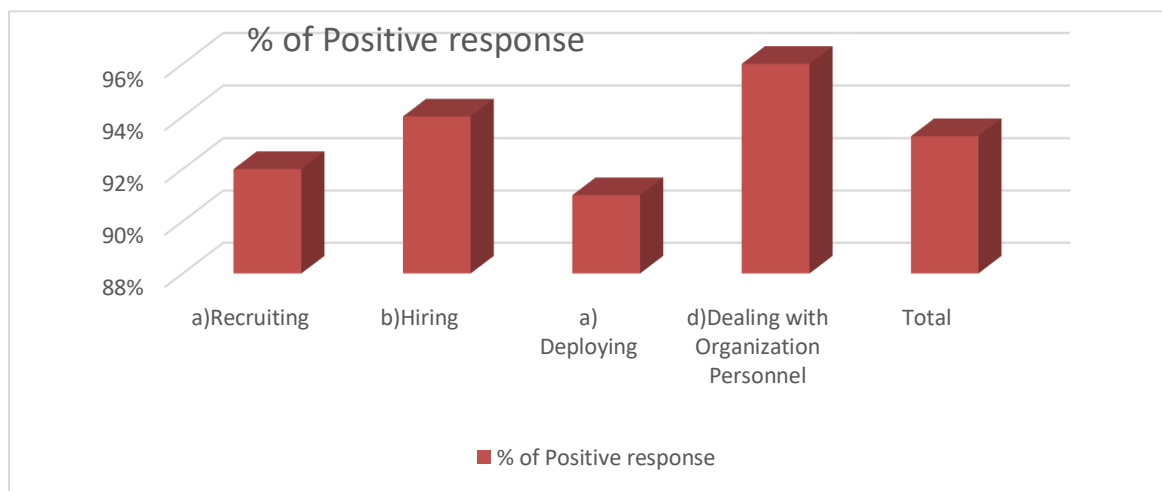
Semiotic models of Pie Chart:



Semiotic Models of Line chart of Positive responses



Semiotic models of barographs of Positive responses



From the data Table :1 it is proves that HR tools practices in corporate sector and PSU sector are accepted because researcher has taken 400 respondents in four segmentation of the HR tools such as a) recruiting b) hiring c) deploying and d) dealing with Organization Personnel and their reposes are 92%,94%,91% and 96% respectably. Thus it is proves that HR tools and practices has a great impact.

9. Models of HR Tools and Practices in Corporate sector:

Various models of HR practices offer different frameworks for managing human capital, each with its own focus and benefits. Some popular models include the Harvard, Ulrich, Warwick, and Fombrun models, each offering a unique perspective on HR's

role within an organization. Additionally, HR operating models like the centralized, decentralized, and federated models, as well as the business partner model, dictate how HR functions are organized and delivered.

10. The Harvard Model of HR Tool Practices:

The Harvard model of Human resource management takes a holistic approach to HR. It considers personnel as treasured assets and focuses on aligning HR in corporate offices in Odisha, which emphasizes customization. It reminds HR groups that there is no one-size-fits-all answer and encourages considerate, strategic decision-making evolved in 1984, the Harvard Framework of HRM is a holistic HR running model that makes a specialty of overcoming troubles related to ancient human beings.

11. Best and Popular Human Resources Models:

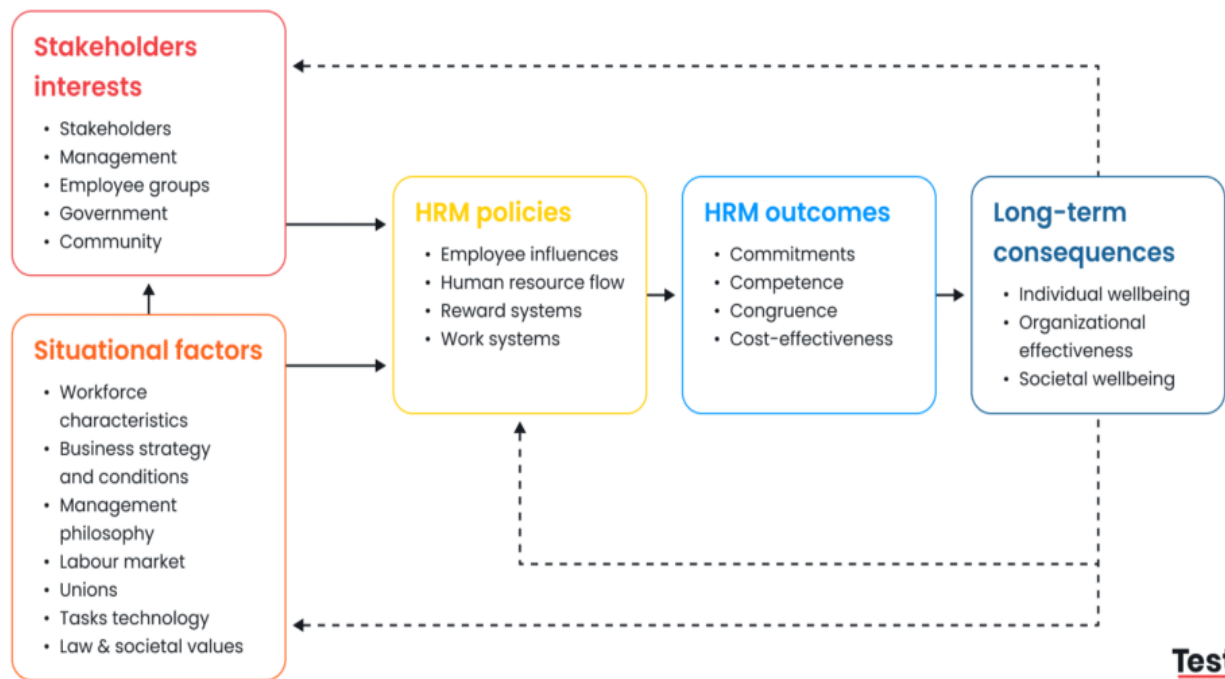
To pressure achievement in human's control, HR professionals want dependent procedures that deal with real-world challenges. The kinds of HR models

mentioned here are realistic frameworks that may be implemented directly to align HR techniques with organizational dreams. Let's discover two widely used fashions—the Harvard model and Ulrich's HR version—and the way they may be used to create meaningful outcomes.

Figure: 2 Refers the Harvard Model of HRM, source from Testlify 2024

An analysis of Key HR Model

The harvard model of HRM



Testlify

12. The Harvard Model of HR Management

The Harvard version specializes in knowledge of the bigger picture of human resource control. It's no longer just about guidelines or techniques; it's about tailoring HR practices day-to-day to fit the corporation's unique circumstances at the same time as balancing the desires of numerous stakeholders, such as employees, management, and external stakeholders.

13. The way it works

The Harvard model is constructed on two key pillars:

13.1 Stakeholder Interest: HR day-to-day balances the priorities of employees, managers, shareholders, and day-to-day. Each group has distinctive expectations from HR practices.

- Situational every day:** every day, like organizational culture, economic conditions, and industry trends, closely influence HR decisions.

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Data Table: 2

Employees Response models of Various HR Models in corporate Sector:

Corporate Sector	HR Models	Nature of survey	No of Respondent	+Ve Respondents			% of + Ve Response	Relationship
			Total = 600	Male (28)	Female (28)	(TG) (04)		
NALCO	The Harvard model.	Practice of HR Tools and Techniques in Corporate sector	60	25	26	03	54/60=90%	Highly Positive
VEDANTA	The Ulrich's HR model		60	24	23	02	49/60=81.67%	Positive
Rourkela Steel Plant (RSP)	The Eight-field Model via Paul Boselie		60	25	27	04	56/60=93.33%	Highly positive
Reliance industries	Front-Back delivery Model		60	27	26	04	57/60= 95.00%	Highly Positive
TATA consultancy Services	The eight additives of the model		60	23	26	03	52/60=86.67%	Moderate positive
Bharati Air Tel	The Seven Models of HR Tools in every day Practice		60	26	24	02	52/60=86.67%	Moderate positive
ADANI Group	HR Transforming Model		60	27	26	03	56/60=93.33%	Highly Positive
Infosys	AI and Automation in HR models		60	21	24	02	47/60=78.33%	Lower positive
State Bank of India	Excessive-overall performance work gadget (HPWS)		60	26	25	03	54/60=90.00%	Highly Positive
Life Insurance Corporation of India	Eight-container HR Model in actual life		60	25	27	04	56/60=93.33%	Highly Positive
Total			600	249	254	30	533/600=88.83%	Highly Positive
Mean Value			60.00	24.9	25.9	3.0	8.83	

Source: Authors Own source of Information

In this above data table-2, there are 10

Corporate sectors are taken for collection of employees respond towards execution of HR tools

collection and Tabulation for result

and practices for Employee Well being and taken ten HR Models. After collection of responses the results are analyzed as per the followings.

Final Result Table for Result Analysis:

No of Companies	No of Models	Total +Respondents	Mean Values	Difference
10	10	Table 1+table 2 = 373+533=906	[Table -1] 37.3	16.0
Total =10	Total =10	Total =903/1000	Table-2 53.3 Total Mean value =90.6	

From the final result table it is proves that both the corporate sector and PSU, Application of HR Tools and practices are highly positive impact and their relation is highly co related because of the obtained mean value is 90.6 and mean difference is 16.0

14. The Outcomes of the Model:

- It focused on employee commitment: developing a loyal and prompted staff.
- Given importance on Competence: making sure personnel have the talents to meet organizational demands.
- Creates Congruence: Aligning employee and organizational dreams.
- It provides cost-effectiveness: coping with HR practices within budget constraints.

15. Making use of the Harvard Model in actual life styles

It permits us to take an example of a mid-sized manufacturing company experiencing excessive worker turnover. Using the Harvard model, HR experts can:

- Pick out key stakeholders, inclusive of employee (who are seeking for higher work-life balance) and bosses (centered on maintaining production timelines).
- Examine situational factors every day, like neighborhood hard work, market situations, or cultural boundaries affecting retention.
- Design strategies to improve employee dedication, for example, introducing flexible shifts or imparting up skilling possibilities tailored to their wishes every day.

The Harvard version emphasizes customization. It reminds HR groups that there's no one-size-fits-all solution and encourages considerate, strategic selection-making that balances all perspectives.

16. Ulrich's HR model

David Ulrich's HR version redefined HR by way of those who specialize in roles in preference to functions. In place of seeing HR as a merely administrative department, this model positions HR experts as imperative every day to the commercial enterprise's success through taking over four distinct role.

The ulrich model



17. The 4 Roles of HRM explained.

1. **Strategic associate:** Align HR practices directly with enterprise targets, making sure HR actively supports agency growth and innovation.

2. **Exchange Agent:** Lead and manipulate trade tasks, assisting personnel and leaders adapt every day shifting organizational wishes.

3. **Administrative expert:** Optimize HR methods day-to-day, ensure smooth operations and compliance.

4 **Worker Champion:** represents personnel's pastimes, advocating for their well-being, engagement, and development.

- Performing as an alternate Agent, HR can manage the prevailing group through training programs to evolve the new organizational shape
- Taking on the executive expert role, HR can streamline payroll and compliance systems daily aid to a geographically dispersed workforce.
- Finally, as a worker Champion, HR can set up and provide daily packages, day-to-day help personnel to manage the transition, and provide experienced support.

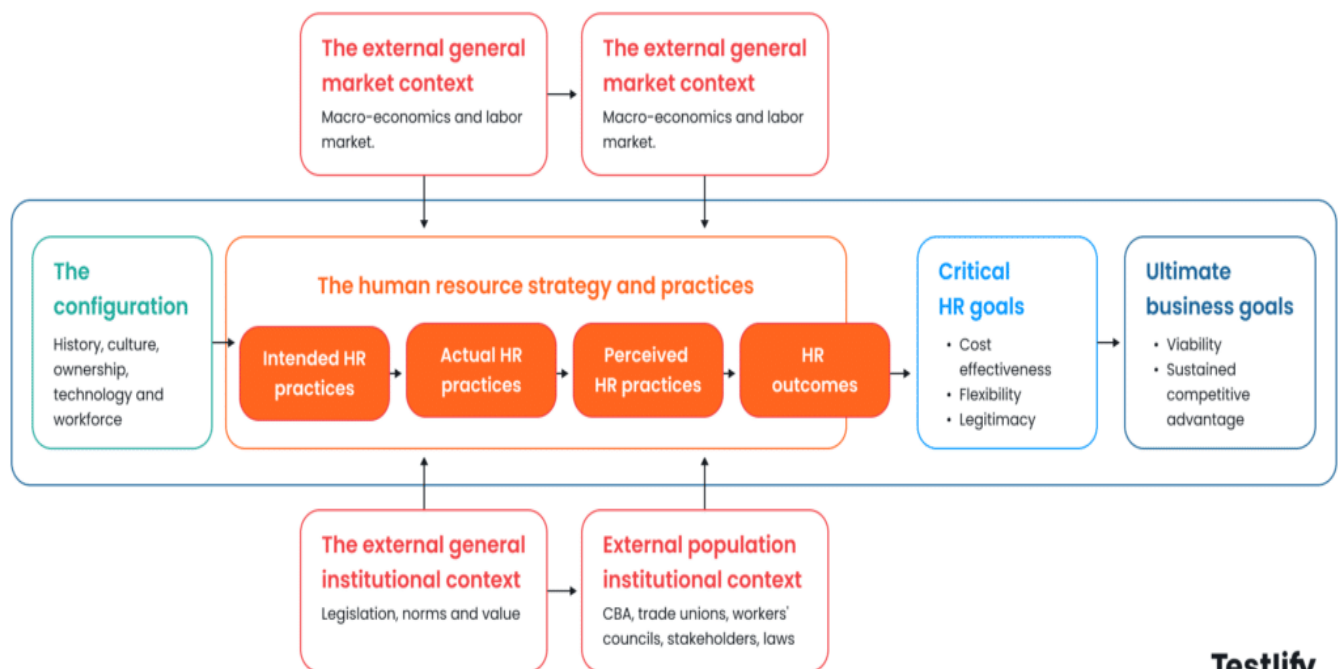
Ulrich's model empowers HR experts every day to put on multiple hats, proving that HR isn't pretty much coping with rules however driving organizational achievement via energetic, strategic involvement.

18. How HR specialists can apply Ulrich's model

To photograph a fast-developing tech startup expanding into new markets. Right here's how the Ulrich model can guide their HR method:

- As a Strategic associate, HR can collaborate with management day-to-day design a day-to-day expertise acquisition approach focused on hiring experts for the new markets.

8 box model by paul boselie



19. The eight-field Model via Paul Boselie:

The 8-container model, evolved by HR expert Paul Boselie, offers a complete way to daily optimize

human resource control. This version emphasizes the interaction between external influences, internal HR practices, and commercial enterprise effects, supporting HR professionals in creating techniques that might be balanced and effective.

20. The eight additives of the model

Figure: 3 Source: Boselie Model of Testlify 2024

1. An external preferred market Context: includes broader economic, prison, and societal factors affecting the agency.
2. An outside population market Context: specializes in enterprise-specific day-to-day, like opposition and hard work market situations.
3. An internal corporation Context: Covers the organization's culture, shape, and internal dynamics.
4. HRM Configuration: refers to the unique HR techniques and practices in the area.
5. Employee Contributions: Assesses the output of employees, including competencies, overall performance, and engagement stages.
6. HR outcomes: Measures the effect of HR practices, including process pleasure, retention, and productivity.
7. Strategic consequences: Evaluates how well HR outcomes align with organizational goals.
8. lengthy-time period effects: looks at sustainability, profitability, and the general fitness of the business enterprise.

22. Daily observe the eight-container version in actual life,

Consider a retail business enterprise suffering from worker turnover in the course of height shopping seasons. With the use of the eight-field model, HR professionals can:

- Look at external elements every day, just like the aggressive hard work marketplace and financial situations affecting retail hiring.

- Align HRM configurations by introducing bendy shift styles or seasonal bonuses to draw skills.
- Degree HR consequences, such as stepped forward retention costs and better process pride.
- Link those upgrades every day strategic results, like increased income during top intervals, and ultimately, everyday lengthy-time period goals, including retaining a robust organization logo in the enterprise.

This model encourages HR professionals day-to-day assume holistically, connecting number of practices with long-term organizational achievement.

23. The Seven Models of HR Tools in every day Practice:

The version is split into two classes:

- a) Use in everyday daily life: strategy, structure, structures.
- b) Use its soft elements every day: Shared Values, abilities, style, staff.

23.1 The way it works

1. **Approach:** make certain HR strategies align with the employer's standard dreams. For instance, if the purpose is every day every day is an innovation leader, HR ought to prioritize hiring innovative skills.

2. **Shape:** check the Organization's hierarchy and reporting traces everyday support its method efficaciously.

3. **Systems:** Refine approaches like recruitment, overall performance control, and payroll day-to-day make ensure performance.

4. **Shared Values:** Foster a place of job subculture that displays the employer's mission and values.

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5. Capabilities: pick out and broaden key competencies required every day to achieve enterprise objectives.

6. Style: make certain leadership patterns sell collaboration and align with enterprise values.

7. Personnel: awareness on hiring, keeping, and developing the right skills.

The McKinsey 7S model is a conventional framework designed to ensure alignment throughout seven key factors of an organization. Created for commercial enterprise strategy, it's also rather effective whilst implemented in HR control. The 7S framework facilitates HR groups' pressure coherence between approach, shape, and way of life, which might be important for organizational effectiveness.

The Seven elements

The model is divided into two categories:

- Hard elements: method, structure, structures.
- Tender factors: Shared Values, competencies, style, personnel.

How it Works

1. Strategy: Ensure HR techniques align with the corporation's basic desires. As an example, if the aim is to become an innovation chief, HR has to prioritize hiring for creative skills.

2. Shape: examine the corporation's hierarchy and reporting lines to assist its method successfully.

3. Structures: Refine procedures like recruitment, performance management, and payroll to ensure efficiency.

4. Shared Values: Foster a workplace culture that displays the company's venture and values.

5. Abilities: pick out and increase key abilities required to acquire commercial enterprise objectives.

6. Fashion: ensure leadership patterns sell collaboration and align with employer values.

7. Workforce: attention on hiring, retaining, and developing the right expertise.

Making use of the McKinsey 7S model in real-life situations, bear in mind a manufacturing organization transitioning to automation. The HR team can use the McKinsey 7S model to:

- Align their method by hiring experts in automation technologies.
- Adapt the structure with the aid of growing new roles and defining clean reporting traces for tech groups.
- Implement new structures for schooling employees to work alongside automation equipment.
- Strengthen shared values by selling innovation and adaptability as middle concepts.

By addressing every element of the version, HR ensures the business enterprise isn't only most effectively organized for the transition but also thriving in the new operational landscape.

Highly Performance work Schedule (HPWS)

The excessive-performance work gadget (HPWS) is a version that specializes in growing a lifestyle in which employees are empowered, engaged, and tremendously effective. This framework emphasizes the mixing of HR practices to construct an environment where in both individuals and companies thrive.

24. Key capabilities of HPWS

1. Employee Involvement: Encourages employees to take part in decision-making processes, fostering ownership and accountability.

2. Skill improvement: focuses on continuous getting to know through education and development programs to enhance employee capabilities.

3. Performance management: Aligns worker goals with organizational desires, ensuring every person is operating closer to a shared imaginative and prescient.

4. Praise systems: Implement performance-based total rewards to encourage personnel and understand achievements.

5. Painting layout: systems jobs to encourage collaboration and innovation, ensuring that roles are significant and impactful.



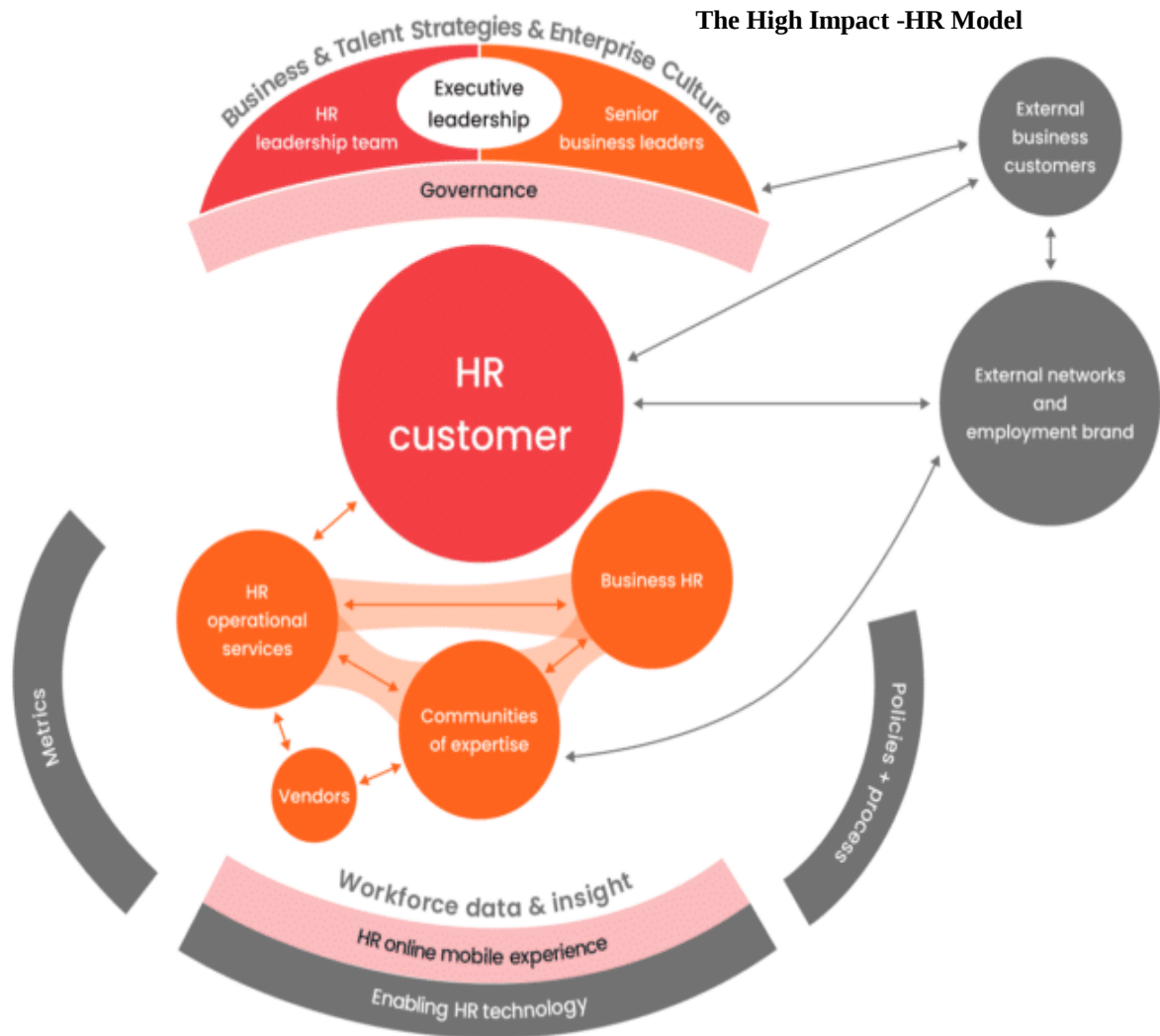


Figure: 3 shows the HR Model of High Impact testing 2024, Source: Testify

25.How to follow HPWS in real existence.

Recall a software agency aiming to boost innovation and employee satisfaction. The HR team can use the HPWS version to:

1. Create a comments-pushed performance control system that ties character contributions to undertaking milestones.
2. Launch up skilling projects to help builders live beforehand to enterprise traits, fostering talent improvement.
3. Offer performance-based total incentives, like bonuses for delivering capabilities in advance of deadlines.
4. Design move-functional teams to encourage expertise-sharing and employee involvement in important decisions.
5. By adopting HPWS, the agency no longer best complements productivity but additionally builds an influential and engaged workforce, driving long-term fulfilment.
6. Human resources fashions are not just theoretical standards; they're sensible gear that HR professionals can use to power performance, alignment, and achievement.

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Every version has specific strengths tailor-made to exceptional challenges:

7. The Harvard version emphasizes balancing stakeholder interests and situational elements, encouraging customized techniques.
8. Ulrich's HR model redefines HR's function, empowering experts to be strategic partners, trade marketers, administrative specialists, and employee champions.
9. The eight-box model presents a comprehensive approach to researching internal and external elements influencing HR practices, ensuring balanced choice-making.
10. The McKinsey 7S model ensures alignment throughout approach, systems, and values, making it ideal for coping with transitions and fostering coherence.
11. The high-overall performance work machine (HPWS) specializes in developing a way of life of engagement, productivity, and continuous development.

By applying information and those HR frameworks, HR specialists can address actual international demanding situations, align staff techniques with organizational goals, and create thriving places of work. Whether you're navigating change, constructing a high-performance tradition, or ensuring strategic alignment, these fashions provide the roadmap to fulfilment.

Take these frameworks, adapt them in your particular organization, and watch as your people management techniques evolve into powerful drivers of enterprise growth.

Selecting the right HR version for your company

Choosing the right HR model isn't pretty much following developments—it's about finding a framework that aligns with your organization's precise wishes and dreams. With so many powerful HR frameworks to choose had, how do you make the right choice? The solution lies in comparing key factors and customizing the model to fit your employer's context. Permit to break it down into actionable steps:

1. Apprehend your organization's length and structure

A small business with a lean team could have distinct HR wishes from a multinational organization with a complex hierarchy.

For startups, a model like HPWS is probably ideal to construct engagement and productivity early. Large agencies may gain from Ulrich's HR version, which

assigns described roles like strategic companion or administrative professional to HR specialists.

27. Examine your enterprise demands

Industry-precise demands dictate HR priorities. For example, tech organizations need agility and innovation, whilst manufacturing may focus greater on efficiency and compliance.

Use the 8-container version to assess outside marketplace factors and inner wishes, making sure your HR strategies mirror the realities of your enterprise.

28. Define clean organizational goals:

HR practices need to without delay support enterprise targets without delay, whether or not it's fast boom, innovation, or staff stabilization.

If your goal is cultural transformation, the McKinsey 7S model can help align strategy, shape, and shared values. For improving talent retention, the Harvard model gives a stakeholder-centered approach.

4. Bear in mind, Organizational tradition

HR fashions are most effective when they resonate with the agency's culture and values. A misaligned framework can create friction in preference for cohesion. Examine how the chosen model complements your existing lifestyle. As an example, HPWS works properly in innovation-pushed corporations, even as the Harvard model suits companies emphasizing collaboration and inclusivity.

29. Customize the Framework:

No model works out of the field for every business enterprise. Tailoring the framework guarantees it addresses your particular demanding situations and leverages your strengths.

Take the principles of your chosen HR model and adapt them. As an example:

- a) Combine Ulrich's HR roles with the cultural alignment attention of the McKinsey 7S version.
- b) Use HPWS in tandem with the eight-container version to combine external marketplace realities with high-overall performance practices.

30. Taking action

When you've evaluated those elements, it's time to put your plan into action:

- 1. Pilot the version:** begin with a branch or group to check how nicely the framework works in your context.
- 2. Gather feedback:** involve personnel and management to discover what's working and what needs adjustment.
- 3. Refine and Scale:** Make important changes primarily based on comments, then roll out the tailor-made version enterprise-wide.



31. Final notion:

Choosing the right HR Model is much less about selecting the “excellent” one and greater approximately finding the one that fits by thinking about your employer’s size, enterprise, desires, and subculture, and with the aid of tailoring the version to your precise desires, you could create an HR method that’s each realistic and transformative. With the proper framework in place, your HR crew can be better prepared to pressure business achievement and foster a thriving workforce.

32. Demanding situations in imposing HR Model

Enforcing HR Model can remodel an enterprise’s human resource practices; however, it’s not without its hurdles. Globally, HR specialists encounter numerous commonplace HR implementation demanding situations, frequently stemming from resistance, aid limitations, or misalignment with organizational goals. Permit discovers those demanding situations and techniques to overcome them effectively.

1. Resistance to Trade :

Personnel and managers often withstand new HR frameworks, especially in the event that they disrupt familiar procedures or demand a shift in conduct. Alternatives can be intimidating, main to pushback or a lack of purchase-in.

That is a frequent assignment across industries, from manufacturing to the era. Personnel fear losing autonomy, at the same time as managers worry approximately improved workloads.

33. Mitigation strategies:

- a) Talk truly: share the cause and benefits of the brand new HR model with all stakeholders.
- b) Involve groups early: engage personnel and executives for the duration of the starting stage to foster ownership and reduce resistance.
- c) Provide schooling: Equip employees with the skills needed to adapt to new strategies.
- d) Lack of Assets:

Imposing an HR version calls for investments in generation, schooling, and skilled personnel. Many corporations, especially smaller ones, war to allocate enough assets.

Aid constraints are commonplace in rising markets or in the course of monetary downturns, where HR budgets are frequently some of the first to be cut.

34. Mitigation strategies:

- a) Start small: Pilot the model with a single group or branch earlier than scaling up.
 - b) Leverage generation: Use value-effective HR software to automate procedures and reduce administrative burdens.
 - c) Seek management guide: gift a clean ROI to leadership to comfortable an extra investment.
 - d) Misalignment with commercial enterprise goals, whilst an HR model isn’t aligned with the organization’s overall goals, it creates disconnects, wasted effort, and constrained impact on organizational fulfillment.
- This assignment is regular in companies with siloed departments, where HR and business leaders function independently.

Mitigation strategies:

- a) Collaborate with leadership: work closely with senior management to align HR strategies with business dreams.
- b) Everyday evaluations: constantly determine the version’s effectiveness and make adjustments to ensure alignment.
- c) Cognizance on Metrics: Use records to illustrate how HR consequences guide enterprise objectives, fostering credibility and alignment.

35. Overly complex Model of HR

Mitigation strategies:

- a) Simplify: Adapt the version to cognizance only of the most relevant elements for your corporation.
- b) Phased Implementation: break the method into potential steps to keep away from overwhelming HR groups.
- c) Use external know-how: recall hiring experts or specialists to streamline implementation.

36. Cultural Misfit

A one-size-fits-all HR model won't align with an enterprise’s particular culture, values, or worker expectations.

That is especially obtrusive in multinational organizations, in which cultural variations can create friction in imposing standardized HR practices.

Mitigation strategies:

- a) Customize: Tailor the model to mirror your business enterprise’s culture and worker needs.
- b) Localize: For worldwide organizations, adapt the version to appreciate nearby and cultural nuances.
- c) Engage employees: searching for input from diverse groups to make certain the framework resonates across the board.

Emerging traits in Human Resources fashion

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As workplaces evolve in response to technology and shifting worker expectations, future HR fashions are becoming extra dynamic and adaptable. The integration of AI, HR analytics, and digital transformation is reshaping conventional procedures, whilst the point of interest on employee experience and inclusivity is driving the development of present-day HR frameworks. Permits explore these trends and the way they're redefining evolving HR techniques.

37. AI and Automation in HR models

a) What's taking place: Artificial intelligence (AI) is revolutionizing how HR approaches are controlled, from recruitment to worker engagement. Chatbots, predictive analytics, and automation equipment are allowing HR teams to save time, lessen mistakes, and make data-driven choices.

b) The way it's reworking HR fashions:

Recruitment models now leverage AI to display resumes and discover top skills quickly.

Performance control frameworks use AI-powered insights to provide personalized feedback and development plans.

AI simplifies administrative obligations, permitting HR specialists to consciousness on strategic initiatives.

38. How it's remodelling HR models:

This model focused on far flung-friendly HR models focus on virtual collaboration, performance tracking, and maintaining engagement across dispersed teams.

Mastering and development frameworks leverage e-mastering structures to make training accessible and scalable.

39. HR Analytics for Data-Driven Choice-Making:

a) What's happening: HR analytics is turning personnel data into actionable insights, assisting agencies in optimizing their people techniques. Predictive analytics identifies tendencies like attrition risks or ability gaps, permitting HR teams to proactively deal with challenges.

b) The way it's transforming HR models:

Staff making plans fashions now integrate real-time records to address staffing desires and optimize resource allocation.

Engagement frameworks use analytics to tune and improve employee pride in measurable methods.

c) Virtual Transformation in HR Frameworks

What's going on: The shift to far-flung and hybrid work environments has accelerated virtual adoption in HR. Cloud-primarily based structures, collaboration

structures, and virtual on boarding gear are actually vital to modern HR frameworks.

40. Focus on employee enjoyment (EX)

a) What's taking place: worker revel in is now a central subject matter in present-day HR frameworks. Groups are designing models that prioritize engagement, wellness, and professional development to draw and retain pinnacle expertise.

b) The way it's reworking HR models:

HR fashions now encompass equipment for non-stop feedback, bendy work options, and well-being packages. Experience-pushed frameworks are built to assist personnel at every point of their lifecycle—from recruitment to retirement.

Five. diversity, fairness, and Inclusion (DEI)

c) What's happening: DEI is now not an upload-on—it's a cornerstone of evolving HR strategies. Agencies are rethinking HR fashions to construct greater equitable offices that remember diversity.

d) How it's transforming HR models:

Recruitment frameworks are being designed to take away bias and boost representation.

- Performance and development models now encompass metrics for fairness and inclusivity the road before hand

41. Key themes and Findings:

Worker well-being:

Present day HR practices increasingly attention on employee well-being, recognizing its impact on activity satisfaction, overall performance, and standard organizational achievement.

2. Sustainable HRM:

Sustainable Human Aid Management (SHRM) integrates environmental and social considerations into HR practices, promoting each worker's well-being and organizational sustainability.

3. HR's function:

HR departments are crucial in using and disseminating sustainable initiatives, fostering a tradition of well-being, and acting as a bridge between management and employees' emotional and intellectual desires.

4. Rising wishes:

Corporations are dealing with increasing demands for intellectual fitness guides, diversity, equity, and inclusion (DEI), and the moral use of generation in well-being control.

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5. Demanding situations:

Implementing powerful well-being initiatives may be difficult, which includes addressing the stigma around mental health, measuring program effectiveness, and ensuring accessibility for all employees.

6. Sustainable Practices:

HRM can make contributions to sustainability via various practices, including promoting strength conservation, waste reduction, and sustainable procurement.

7. In experienced HRM:

In experienced HRM practices, consisting of training employees on sustainability and integrating inexperienced concepts into HR tactics, are gaining traction in India.

8. Impact on overall performance:

SHRM practices, including those associated with worker well-being and sustainability, can improve each worker's performance and the overall organizational performance.

42. Unique HR Tools and Practices:

a) Education and development:

HR can offer schooling packages targeted at sustainability, well-being, and skills development.

b) Performance control:

Integrating sustainability and well-being dreams into performance value determinations can power desired behaviours.

c) Reward and Reputation:

Worthwhile personnel for his or her contributions to sustainability and well-being initiatives can make stronger effective behaviours.

d) Employee Engagement:

Developing a tradition of open communication, empathy, and proactive mental health support can beautify employee engagement.

e) Properly-being takes a look at-in:

Regular check-ins by means of HR experts can determine worker well-being and become aware of areas for aid.

43. Future research directions:

Long-term outcomes of faraway paintings on well-being: Further studies are needed to recognize the lengthy-time period impacts of remote work on employee well-being and the way HR can adapt its strategies.

a) AI-Pushed HR analytics:

Exploring the capability of AI in HR analytics for well-being control, while addressing ethical concerns, is important.

b) Pass-cultural views on properly-being interventions:

In addition, research is needed to understand the cultural nuances of well-being and tailor interventions accordingly.

44. Hypothesis Testing:

After carefully analysis of the aforesaid data table one and two and final result table, the researcher have come to conclusion that the HR tools and Practices are highly correlated to each and every companies and it creates a better relationship of employee well -being in their in all segmentation of their work life and professional life even social life.

Thus, the Null Hypothesis (Ho) not sustain in their statement for justify and expected hypothesis (He) are proved on their relationship with one another of other alternative hypothesis (Ha) with the level of significance of 0, 01 and 0, 05 degree of alpha and the mean difference is 16.0 . Henceforth, the null hypothesis has been rejected and the alternative hypothesis has been accepted.

45. Conclusion:

The literature highlights a developing want for HR to integrate worker properly-being and sustainable practices into its core features within the Indian company region with the aid of adopting a holistic technique and leveraging various HR tools, agencies can foster a high quality work environment, improve worker nicely-being, and make a contribution to a more sustainable future.

Adopting sustainable HR practices is becoming increasingly important for Indian organizations to attract and maintain skills, beautify their logo image, and make contributions to a greater sustainable destiny, even as challenges exist, the advantages of stepped forward worker well-being, a high quality paintings surroundings, and a reduced environmental footprint make it a profitable endeavor by means of embracing innovation, fostering collaboration, and addressing capability resistance, HR can play a pivotal role in using sustainable exchange within the corporate area.

46. Bibliography

In this article, the bibliography refers to a comprehensive source of books, journals, periodicals



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Balancing Power and Profit: How We Make Smart Choices for Blockchain-Based Clean Water Technology

Mr. Shivam Khamari ¹ Dr. Jakki Samir Khan ² Prof. (Dr.) Ramesh Chandra Rath ³
Dr. Rajani Agrawalla ⁴

¹Assistant Professor, Swami Vivekananda institute of Management, Baniatangi, Khordha
Email Id: shivamkh20@gmail.com, ORCID ID: 0009-0009-3618-2954

² Associate Professor, Srusti Academy of Management and Technology (Autonomous), Bhubaneswar, Odisha
Email Id: jakikhan18@gmail.com

³ Professor and Principal, Swami Vivekananda Institute of Management, Baniatangi, Khordha
Email Id: drramesh.rrc@gmail.com

⁴ Assistant Professor, Centurion University of Technology and Management, Bhubaneswar, Odisha, India,
Email: rajaniagrawalla220@gmail.com , ORCID 0009-0005-4746-6953.

Abstract

Cities in developing countries are trying to reuse their wastewater to save the environment. To encourage this, they are using clever financial tools like digital "water credits." Blockchain technology is a great way to keep these digital credits secure and honest. However, there is a catch: some blockchains use massive amounts of electricity, which defeats the purpose of being eco-friendly. **Methods:** This study uses a mix of math models and decision-making tools to find the most efficient blockchain setup. We specifically used a step-by-step evaluation framework to weigh the pros and cons of different blockchain methods. **Results:** We tested our models using the real-world goals of the Odisha 2026 Treated Used Water Policy. We compared three main blockchain types: Proof of Work (PoW), Proof of Time (PoT), and Proof of Authority (PoA). Our findings show that PoA is the clear winner. It drastically cuts down on energy use and processing time while keeping the local city networks safe and secure. **Conclusion:** Our research gives city planners a simple, numbers-based guide for choosing the best blockchain technology. By picking the right system, cities can upgrade their water networks to be both financially smart and truly good for the planet.

Keywords: Wastewater Reuse, Blockchain Technology, Decision-Making, Energy Efficiency, Circular Economy, Smart Water Management.

1. Introduction

To survive and thrive in the future, we must adopt what environmental experts call a "circular economy." In a perfectly circular economy, nothing is ever truly thrown away. Instead, we must carefully collect our dirty wastewater, clean it thoroughly using advanced, modern technology, and use it again and again. This concept is not just a nice, futuristic idea; in many developing and rapidly industrializing areas, it is quickly becoming a strict, unavoidable law. Governments are creating bold, aggressive new policies to force cities and businesses to stop wasting water.

A perfect, real-world example of this is the newly announced Policy on Reuse of Treated Used Water (Tuw) of Urban Odisha, 2026. This ambitious policy was created by the state of Odisha in India to tackle the severe, growing water stress in rapidly expanding cities like Bhubaneswar, Cuttack,

Rourkela, and Sambalpur. Right now, the daily reality is staggering: the state produces about 1,104 million liters of wastewater every single day. However, it currently only has the physical machinery and infrastructure to clean about 190 million liters of that dirty water. The vast majority of the wastewater is simply lost, polluting the local environment. To fix this massive problem, the new 2026 policy demands that absolutely all city wastewater must be collected and treated by the year 2030. Furthermore, the government has set an incredibly ambitious, long-term goal aligned with their "Vision Odisha 2036" master plan: by the year 2036, at least fifty percent of all that treated wastewater must be actively reused by society. This means a massive, historic upgrade in both physical water pipes and digital tracking systems is urgently needed right now.



2. Literature Review:

The Promise and Peril of Digital Tracking:

It is one thing to build massive plants to clean the wastewater; it is an entirely different and much harder challenge to get people to actually use it. Many factory owners, local farmers, and residential apartment managers are hesitant to switch from using natural, cheap fresh water to using treated wastewater. To convince them to change their daily habits, governments must offer strong, undeniable financial rewards. Under the new Odisha policy, the government has brilliantly created the "TUV Tariff Model". This economic model legally guarantees that recycled water will always be sold at a significantly lower price than regular drinking water.

But the policy goes even further by offering direct, tangible financial rewards. Farmers who agree to use treated water for irrigating their crops receive digital "water credits," while factories and residential apartment buildings receive direct cash rebates, viability gap funding (VGF), and significant utility discounts. However, managing these financial rewards for millions of different people and businesses is incredibly difficult. If the government relies on old-fashioned paper records, easily altered spreadsheets, or standard computer databases, the system can be quickly hacked. Records can be altered, and dishonest people might claim financial rewards they did not actually earn.

This is exactly where blockchain technology comes into the picture. Blockchain is essentially an unhackable, permanent, and totally transparent digital notebook. Every single time a drop of water is cleaned and delivered to a factory, a smart sensor sends a secure message to the blockchain. The blockchain securely records the transaction forever and automatically sends the financial reward or water credit directly to the user's account. Because multiple computers constantly check every transaction, no single person or corrupt official can cheat the system.

But there is a major, highly concerning catch. Researchers have recently discovered a severe problem with the most famous and widely used types of blockchain systems, such as the Proof of Work (PoW) system used by the Bitcoin network. These traditional systems require thousands of massive, powerful computers around the world to compete against each other to solve incredibly difficult, ultimately meaningless math puzzles just to record a single transaction. Because all these giant computers are running at maximum power twenty-four hours a day, they burn massive, mind-boggling amounts of

electricity. This creates a frustrating, dangerous paradox. The entire purpose of cleaning and reusing wastewater is to protect the environment and save natural resources. If the digital tracking system we use burns massive amounts of fossil fuel electricity to operate, we completely destroy the environmental benefits we were trying to achieve. We end up wasting precious energy just to save water.

3. Objective of the Study

Our comprehensive study was explicitly created to solve this exact energy-versus-finance problem. We absolutely cannot abandon blockchain technology, because we desperately need its perfect security, transparency, and automation to manage city funds and distribute water credits fairly. But we also cannot accept the massive, budget-destroying electricity bills and severe environmental damage caused by traditional blockchains. Therefore, we built a simple, highly practical, and incredibly logical guide to test and compare different modern blockchain setups.

Our ultimate goal is to find the perfect digital system. We want to identify a blockchain network that keeps a city's money completely safe, processes vast amounts of data in the blink of an eye, and does not drive up the electric bill or harm the planet. By finding this perfect, harmonious balance, we can help rapidly growing cities modernize their public water networks successfully, efficiently, and affordably.

4. Materials and Methods

4.1. System Architecture and Financial Planning

Before we could even begin to pick a digital software system, we first had to draw a clear, comprehensive map of the entire city water network. We needed to deeply understand how the physical, muddy world of water pipes connects to the invisible, digital world of computer servers. Our map includes the starting points where dirty water comes from, such as household toilets, kitchen sinks, and industrial factory drains. The map then follows the water through miles of underground pipes to specialized sewage treatment plants.

In eastern regions of India like Odisha, where land space within crowded cities is very limited, engineers often use specific, highly compact cleaning technologies. One very popular method is the Moving Bed Biofilm Reactor (MBBR). This amazing technology uses thousands of tiny, free-floating plastic wheels inside a massive tank of water. Friendly, waste-eating bacteria grow on these plastic wheels and



naturally consume the organic pollution in the water. Another popular space-saving method is the Sequencing Batch Reactor (SBR), which performs all the cleaning steps in one single, timed tank. Once the water is fully cleaned by these systems, the Odisha 2026 policy dictates that it must be sent back out into the world. It is piped to farmers for crop irrigation, to massive steel factories for cooling towers, to local fire departments for emergency use, and to city workers for washing dusty roads and watering public parks.

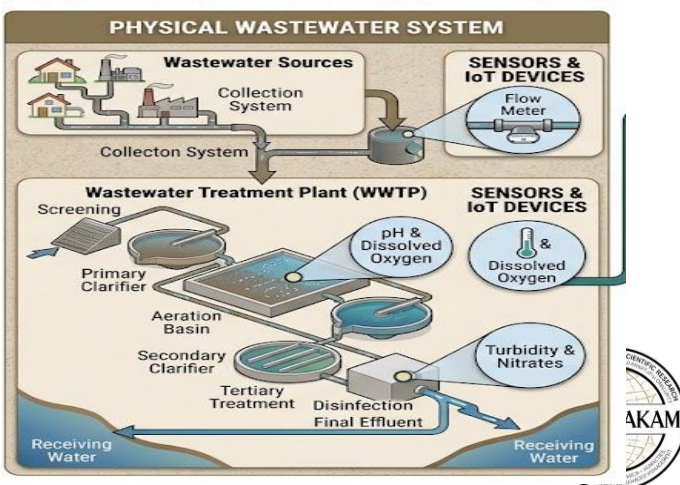
We built a logical framework to keep the total costs of this massive, city-wide operation as low as physically possible. In city planning and engineering, costs are always divided into two main categories. The first is Capital Expenditure, universally known as CAPEX. This is the massive, one-time upfront cost of buying the land, pouring thousands of tons of concrete, laying pipes, and building the water treatment plants. For example, building a medium-to-large plant capable of handling millions of liters of water can easily cost upwards of one crore rupees to build.

The second, and arguably more important category, is Operational Expenditure, or OPEX. This is the daily, monthly, and yearly cost of keeping the plant alive and running. It includes the continuous salaries of the workers, the cost of the special chemicals used to disinfect the water, and most importantly, the massive electricity bills required to run the heavy water pumps and aeration blowers 24 hours a day. A large plant can easily cost over 1.5 Lakhs every single month just in electricity and basic maintenance.

Our primary goal was to ensure that adding a highly advanced digital blockchain network did not cause the city's monthly OPEX to explode out of control. We had to carefully balance the physical, unavoidable costs of cleaning the water with the new digital costs of paying for the blockchain's computer servers and the electricity they consume.

The simple, elegant relationship between the physical water pipes, the smart quality sensors, and the digital blockchain ledger is shown clearly in Figure 1 below.

FIGURE 1: HOW THE PHYSICAL WASTEWATER



WATER SYSTEM CONNECTS TO THE DIGITAL BLOCKCHAIN

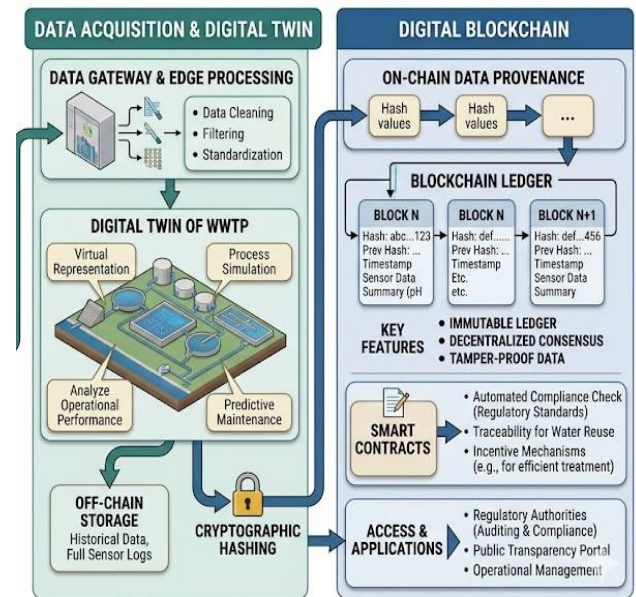


Figure 1: How the Physical Wastewater System Connects to the Digital Blockchain

4.2. Decision-Making Tools Explained

Simply Picking the absolute best blockchain for a city is very much like a family trying to buy a new car. You cannot have everything perfectly in one package. If you want a car that is incredibly fast and powerful (like a luxury sports car), it will probably consume a massive amount of fuel and be incredibly expensive to buy and maintain. If you want a car that is incredibly safe, heavy, and practically indestructible (like an armored tank), it will be very slow and terrible for normal city driving. You have to balance speed, safety, and fuel efficiency based on what your family actually needs for their daily life.

To make a smart, completely unbiased choice for city planners, we used a highly structured, two-part decision-making approach. We removed all the complex equations that normally clutter these studies and focused purely on the core logic of these trusted management tools.

Step 1: Finding Out What Matters Most (The NSFDSS Approach)

The first tool we used is called the Non-Structural Fuzzy Decision Support System, or NSFDSS for short. While the name sounds highly complicated and intimidating, the core idea is wonderfully simple and deeply human. When human beings make choices, we rarely use exact, rigid numbers in our heads. If you ask a city mayor how important network security is, they won't say "it has a mathematical value of 0.84." They will use fuzzy, descriptive words and say "it is

very important" or "it is somewhat important." The NSFDDSS tool takes these "fuzzy," descriptive human words and helps organize them into clear, ranked priorities.

The process works in three simple, logical steps:

- **Breaking it Down:** First, we take the massive, confusing problem of "choosing the right blockchain" and break it down into small, bite-sized pieces. We identified four main pieces that matter to a city: Energy Consumption (how much electricity the system uses), Speed (how fast it records a transaction), Security (how hard it is for hackers to break in), and Decentralization (how many different people around the world control the network).
- **Side-by-Side Comparison:** Next, we compare these pieces side-by-side, two at a time. We ask tough questions like: "When a city has a very tight budget and struggling citizens, is saving electricity more important than having total, global decentralization?"
- **Finding the Big Picture:** Finally, the tool looks at all our comparative answers and combines them to reveal the ultimate priorities. It tells us exactly what features city planners truly care about the most when they are forced to make tough, real-world choices.

Step 2: Ranking the Options (The TOPSIS Approach)

Once we knew exactly what the city cared about, we moved to the second tool, known as TOPSIS (Technique for Order Preference by Similarity to Ideal Solution). Again, the logic behind this tool is brilliantly simple and intuitive.

Imagine you are trying to find the perfect house to buy. The absolute "perfect" house would be incredibly massive, located right in the center of the city, absolutely beautiful, and cost almost nothing. However, we all know this perfect house does not actually exist in the real world. On the flip side, the absolute "worst" house would be tiny, falling apart, located hours away from town, and ridiculously expensive.

The TOPSIS method simply asks us to mathematically imagine both the impossible perfect scenario and the absolute worst-case scenario. Then, we take our real-world choices—in our specific case, the different types of blockchain technologies—and we measure them against these two extremes. We want to find the option that sits as close as humanly possible to the perfect dream, and as far away as possible from the worst nightmare.

We used this logical method to score three very different, prominent blockchain styles:

- **Proof of Work (PoW):** The oldest, most famous style, used by Bitcoin, which relies on millions of computers competing aggressively to solve useless puzzles.
- **Proof of Time (PoT):** A newer style that tries to save energy by forcing computers to literally "go to sleep" and wait random amounts of time before they are allowed to record a transaction.
- **Proof of Authority (PoA):** A highly controlled, efficient style where only a small, hand-picked group of known, trusted officials are allowed to record transactions on the network.

5. Results

5.1. Discovering What Matters Most to Cities

Our first tool, the fuzzy decision system, revealed a stark, harsh reality about managing public utilities in developing nations. When you are managing an overwhelming 1,104 million liters of muddy wastewater every single day, you absolutely cannot afford to run expensive, energy-draining digital experiments.

The results showed that for a city's water department, saving energy is the absolute, undeniable top priority. It accounted for nearly half of the entire decision weight. Why is this so crucial? Because the physical water treatment plants—with their massive MBBR aeration tanks and giant sludge pumps—already consume massive amounts of electricity just to operate. Adding a digital tracking system that also consumes massive amounts of electricity would completely drain the city's remaining funds.

Following closely behind energy is speed, or processing time. The modern water network relies on thousands of smart, internet-connected sensors installed on pipes and factory cooling towers. These sensors send live, critical data every single second. If the digital ledger is slow, the entire system causes a massive traffic jam of data, making it impossible to issue instant water credits or quickly detect dangerous pipe leaks.

Security was ranked third. While it is obviously crucial to keep financial data safe, municipal water credits are strictly meant for local farmers and businesses; they are not the same as high-stakes, global banking transfers. The risk profile is slightly



different. Finally, total network decentralization ranked dead last. City governments are, by their very nature, centralized authorities. They do not need an anonymous, globally open network; they just need a reliable, tightly controlled local tool. You can see this visual breakdown of priorities in Figure 2 below.

FIGURE 2: PRIORITY WEIGHTS FOR CITY BLOCKCHAIN

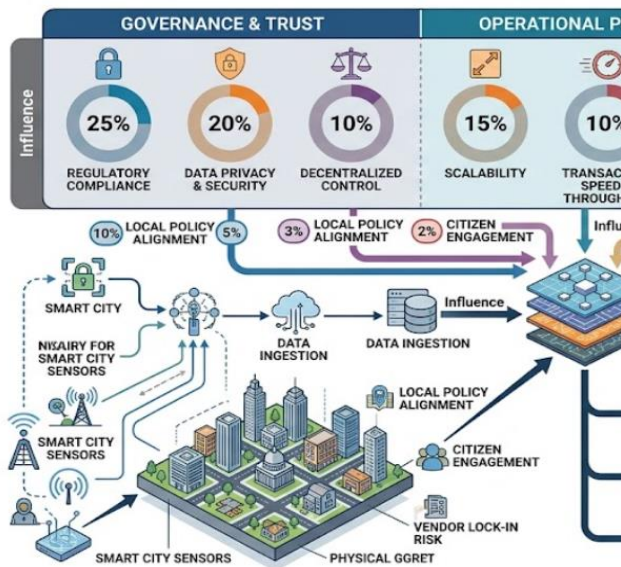


Figure 2: Priority Weights for City Blockchain Choices

5.2. How the Different Blockchains Performed

Armed with these clear, undeniable priorities, we used the TOPSIS ranking method to strictly score the three different blockchain systems. We evaluated how well they could handle the massive, daily tracking needed to fulfill the ambitious Odisha 2026 mandate of reusing fifty percent of the city's treated wastewater.

The results of our comprehensive evaluation are presented in Table 1 below. The closer the "Overall Perfection Score" is to 1.0, the closer that technology is to being the absolute perfect solution for the city.

Blockchain Technology Type	Energy Efficiency Profile	Speed and Processing Time	Security and Trust Style	Overall Perfection Score
Proof of Authority (PoA)	Excellent (Almost zero extra energy)	Very Fast (Processes in under 1 second)	Approved by highly trusted users, no approval needed. Because there is absolutely no massive competition and no waiting around, the system is lightning-fast, processing data in less than a single second. Most importantly, because the computers are not constantly struggling to solve puzzles, the system uses virtually no extra electricity. It is incredibly cheap, blazing fast, and highly secure.	0.99
Proof of Time (PoT)	Okay (Moderate energy)	Unpredictable (Random waiting)	Hardware-based timers	0.54

	use)	delays)
Proof of Work (PoW)	Very Poor (Massive energy waste)	Very Slow (Takes several minutes)

Table 1: Final Ranking of the Three Blockchain Options for Municipal Water Systems

The results paint a very clear, dramatic picture. The famous Proof of Work (PoW) system is a terrible, highly destructive choice for city water systems. Because it requires thousands of computers to burn massive amounts of electricity competing in math puzzles, its energy consumption is completely unacceptable. It would cause OPEX costs to skyrocket. Furthermore, because it purposefully takes several minutes to confirm a single block of data, it is completely useless for a modern city network that needs to monitor live, flowing water sensors every second. It rightfully scored the lowest on our perfect-solution test.

Proof of Time (PoT) performed moderately better, but still fell short. It uses significantly less electricity because it removes the competitive, energy-burning math puzzles. Instead, it forces computers to "go to sleep" for a randomly assigned amount of time. The very first computer to wake up gets the right to record the data. While this saves power, the random waiting times create unpredictable, frustrating delays. Researchers have noted that these waiting times typically range from 0.25 to 0.45 seconds. Sometimes a transaction takes a quarter of a second; sometimes it takes much longer. When a city is trying to monitor dangerous industrial wastewater flows in real-time, unpredictable delays are a major safety hazard. Therefore, PoT is simply not reliable enough for critical infrastructure.

Proof of Authority (PoA) emerged as the absolute, undeniable best choice, scoring incredibly close to our imaginary "perfect" system. PoA boldly throws away the complicated math puzzles and the silly random waiting games. Instead, it relies on a very simple, ancient concept: human reputation and known identity. In a PoA system, only a small group of pre-approved, highly trusted users are legally given the right to approve transactions. Because there is absolutely no massive competition and no waiting around, the system is lightning-fast, reliably processing data in less than a single second. Most importantly, because the computers are not constantly struggling to solve puzzles, the system uses virtually no extra electricity. It is incredibly cheap, blazing fast, and highly secure.

6. Discussion

6.1. What This Means for Real-World Governance

The overwhelming, landslide victory of the Proof of Authority (PoA) system teaches us a profound and very important lesson about deploying high technology in developing regions. For years, technology enthusiasts and cryptocurrency fans have loudly argued that all blockchains must be completely decentralized. This means no single government or person is in charge, and anyone in the world can join the network anonymously. While that concept might be wonderful for global digital currencies, our study firmly proves that total decentralization is actually a massive, expensive disadvantage when managing a local, public utility.

Developing cities do not need a highly complex, globally anonymous network to manage their neighborhood water pipes. They need a system that is blazing fast, highly accountable, and deeply integrated with local, established laws. By giving approval power exclusively to known, trusted local officials—which is exactly how the Proof of Authority system works—cities get a digital network that operates at lightning speed and costs almost nothing to maintain.

This specific technological setup aligns flawlessly with the management structure already outlined in the Odisha Treated Used Water Policy of 2026. The Odisha government has already thoughtfully established a highly organized, multi-tier chain of command to manage this new water era. At the very top sits the State High Powered Committee (SHPC), which makes the major, state-wide pricing rules. Beneath them is the State Level Technical Committee (SLTC) and the District Coordination Committees (DCCs), which actively manage the day-to-day operations in local neighborhoods and aggregate local water demand. In a Proof of Authority blockchain, the "validator nodes" (the actual computers that approve the transactions) would simply be operated by these exact same, trusted government committees. The digital architecture perfectly mirrors the human governance architecture. This makes the system incredibly easy for the government to adopt, deeply understand, and trust.

6.2. The Socio-Economic Impact on Growing Cities

If implemented correctly, matching the right digital technology with the right public policy will completely transform the daily lives and economies of

cities like Bhubaneswar, Cuttack, Rourkela, and Sambalpur.

Currently, during the incredibly hot, unforgiving summer months, these fast-growing urban centers face severe water scarcity. Fresh, clean drinking water is often agonizingly diverted away from homes just to keep massive industrial cooling towers running or to water vast public parks. By successfully implementing a robust, highly efficient wastewater reuse system, the government relieves the massive pressure on natural rivers and underground aquifers. Fresh, pristine drinking water can finally be saved exclusively for human consumption and residential homes, vastly improving the daily quality of life.

Economically, the impact is immense and far-reaching. The policy mandates that treated used water must be priced cheaper than fresh drinking water. This creates a massive, irresistible financial incentive for large factories, steel plants, and power plants located near Rourkela and Angul to switch entirely to recycled water. It significantly lowers their daily operational costs, making the local industries more profitable, resilient, and competitive on a global scale.

Furthermore, the introduction of digital "water credits" for the agricultural sector represents a brilliant leap forward in supporting local, hardworking farmers. Farmers located on the outskirts of the cities can use the treated, nutrient-rich wastewater to irrigate their crops safely. Every time they use this water, the Proof of Authority blockchain instantly records the action and issues a digital credit straight to their account. These credits act as direct, reliable subsidies, drastically lowering the financial burden on the farmers while simultaneously ensuring that the city's massive output of 1,104 million liters of wastewater is put to productive use rather than polluting the local environment. It is a perfect, beautiful circle of economic growth and environmental benefit.

6.3. Comparing Our Findings to Global Trends

When we look closely at global research trends, our findings strongly support a growing, powerful movement in the scientific community. Over the past few years, there has been a massive backlash against older blockchain models because of their horrific environmental impact. Many recent studies from top engineering and management journals have urged industries to abandon Proof of Work entirely when building sustainable infrastructure.

However, some global studies have suggested using highly experimental, complicated alternatives like



Directed Acyclic Graphs or complex staking models. Our study powerfully cuts through the noise and proves that for public city water grids, simpler is vastly superior. A straightforward, reputable Proof of Authority system provides the absolute most practical, rugged, and reliable solution. It connects smoothly with the smart water meters already being installed in modern cities. It can issue financial rewards or levy harsh penalties against polluting factories instantly, without ever getting stuck trying to solve complex mathematical puzzles.

6.4. Study Limits and Future Challenges

While our findings are highly promising and clear, it is absolutely crucial to acknowledge the limitations of our study. Real-world execution is always messier and more complicated than controlled, theoretical planning.

The primary limitation of our proposed digital system is its heavy, unyielding reliance on continuous, stable internet connectivity. The smart sensors located at the treatment plants and the factories must be able to communicate with the central blockchain constantly. In many developing and rural areas on the outskirts of major cities, internet connections can drop out or suffer from severe bandwidth issues. If the sensors go offline, the real-time tracking stops entirely, which could significantly delay the issuance of water credits or dangerously mask a sudden drop in water quality. Future engineers must carefully design robust offline-memory solutions so that sensors can safely store data locally during internet outages and upload it securely once the connection is restored.

Secondly, because the Proof of Authority system relies entirely on a small group of trusted city officials to run the network, it introduces an element of human trust back into a digital system. The public must be absolutely confident that the officials running the computers are completely honest, highly transparent, and free from corruption. To maintain deep public trust, the government will need to establish strict, independent auditing boards that regularly review the blockchain's activity to ensure no official has abused their power or altered records illegally.

Finally, while the blockchain software itself is incredibly cheap to run under the PoA model, the physical hardware required—such as the advanced Internet of Things (IoT) water quality sensors and meters—can be very expensive to purchase, install, and maintain on a massive scale across thousands of factories and farms. The government will need to deliberately allocate sufficient Capital Expenditure (CAPEX) to heavily subsidize the installation of these

physical sensors before the digital network can truly come to life and flourish.

However, a brilliant, well-meaning policy will inevitably fail if it is built on the wrong technological foundation. If a city attempts to manage its new green water credits using an old, energy-hungry blockchain system, the massive electricity costs will completely drain the city's budget and cause severe environmental harm. Our comprehensive, step-by-step research clearly proves that the Proof of Authority (PoA) technology is the absolute smartest, safest, and greenest choice available today.

By utilizing Proof of Authority, local governments can take full, confident control of a lightning-fast, highly secure digital ledger that requires virtually zero extra electricity to run. This allows cities to instantly manage water discounts, reliably monitor live environmental data, and issue agricultural credits without wasting precious taxpayer money or contributing to global warming. Moving forward, the next vital step is for researchers, engineers, and city planners to move out of the planning phase and begin aggressively testing this PoA setup in real-world water treatment plants. By building small, physical pilot projects, we can witness firsthand how this brilliant fusion of public policy and green digital technology successfully handles the unpredictable, daily challenges of real city life. When implemented correctly, this approach will absolutely ensure that our pursuit of a green, sustainable environment is powered by equally sustainable, brilliant innovation.

7. Conclusion

Using blockchain to reward people for reusing wastewater is a brilliant way to fight climate change and improve city living. But if a city picks the wrong type of blockchain, the energy costs will be far too high. Our research clearly shows that Proof of Authority (PoA) is the smartest choice. It offers the perfect mix of low energy use, fast processing, and solid security. By using PoA, cities can easily manage water credits and discounts without draining their budgets. In the future, researchers should test this PoA setup in real-world water treatment plants to see exactly how it handles daily, real-life challenges.

8. Bibliography

In this article, the bibliography refers to a comprehensive source of books, journals, periodicals and different websites consulted and cited by the author but the author not directly copied from the author regarding content, diagrams, facts and findings to the related article.



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A Sustainable Strategic Planning for Development of Local Tourism Market in Post Pandemic Covid-19

Ms. Monalisa Pattnayak ¹, Dr. Rahela Tabassum ², Mr. Shivam Khamari ³, Prof. Subrat Choudhury ⁴

¹Assistant Professor, at Department of Basic Science and Humanities, MITS, Raygada

Email Id: monalisa@mits.edu.in

²Professor in MBA Amjad Ali Khan College of Business Administration, Hyderabad

Email Id: rahela.tabassum@gmail.com

³Assistant Professor, Swami Vivekananda Institute of Management, Baniatangi, Khordha

Email Id: shivamkh20@gmail.com ORCID ID: 0009-0009-3618-2954

⁴Professor and Director, Swami Vivekananda Institute of Management, Baniatangi, Khordha

Email Id: subrat.choudhury14@gmail.com

Abstract

At present Scenario, the coronavirus crisis (COVID-19) is having massive impacts on the tourism industry throughout the Globe—many of which will be needs to be reshape the industry's future landscape. What actions should the stakeholders of this industry be taking today from a marketing and communications perspective? It is the truth that, no one knows for sure; we're all figuring this out together. However, a business-as-usual approach is almost certainly wrong because there is nothing "usual" about this new life we're all living and what's happening to the tourism industry right now. In this Study, we focuses about the local Tourism development in the Post Pandemic COVID-19 with a sustainable planning and we hope it will be effective and again we see the new life than the virtual life on the field of Local Tourism Sector.

Key Words: Sustainable Strategic Planning (SSP), New Virtual Life (NVL) Post –Pandemic Covid -19 (PPC-19), Local Tourism Sector (LTS)

1. Introduction:

Today, tourism places are drawing the attention of Global tourist for a happy visit to each and every destination. (Tourist Spot) Tourist are coming from different places of the world , it may eco -tourism, global tourism or local tourism are one of many region that requires proper planning and coordination's for a sustainable economic development in the local region . In this study, we provides the simple structure and the guide lines for a comprehensive tourism planning at a community or Organizational Level for promotion of local tourism in to a great extent.

2. Literature Review:

In this section, the researcher have trying to their level best research contribution for justifying the taken research title "A Sustainable Strategic planning For Development Of Local Tourism Market In Post Pandemic Covid-19" .here, the researcher have taken 300 no of respondents response as related with the aforesaid research work, due to pandemic effect 214 Countries had been affected and near about 9 Cores and more people becomes COVID-19 positive and 17 Lakhs of people were died. It crashed all the life style of human beings in all segmentations. The economic condition and GDP of any country is down ward. Thus, the researcher has done

an extensive study for revive of new virtual life as related with tourism sector and expected tourism sector will be restored post pandemic if a strategic planning will be taken by the state , central govt. local govt. community and society.

3. Research objectives:

The researchers have taken the following objectives in order to conduct their research work such as:

- To know about the COVID-19 effect in tourism industry and world economic.
- To determine a strategic planning for tourism development in post pandemic era
- To execute a strategic planning for a sustainable economic development in tourism sector in locality.
- To develop the tourism infrastructure such as hotel, bus bay, rail, tram, airport, road, communication etc. for enhancing tourism sector in to a great extent.

4. Hypothesis:

H₀: Impact of COVID-19 on the tourism sector downward the economic system of the country in a negative, which is effect of human life survival.



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He: A sustainable and Strategic Planning for development of local tourism is highly necessary for revive of human life after post pandemic COVID-19.

5. What is Tourism?

As the word, 'Tourism' is Conferenced, it is indicates such a beautiful place or places or region which is/are attract and motivate to tourist people towards its Sweet Scenic views, memorable things, opportunities and best possibilities of future life. It has contains all the resources for enhancing the beauty of nature and nurture with a strategic planning and investment.

6. Difference in between strategic planning and Comprehensive planning?

A Strategic planning is a Systematic process of Identifying objectives, defining and evaluating various methods for achieving them. Where as a strategic tourism planning is that planning which consider all the tourism resources, organizations, markets and programmes within a region.

A Comprehensive planning is a process that determines various community goals and future aspirations in terms of community development in a particular Society. A comprehensive plan typically encompasses large geographical areas, a broad range of topics and covers a long- term time horizon.

7. Concept of Sustainable Development

So far as the word sustainable Development is concerned, it is a progress that needs of the Present without any compromising the ability of future to meet their own needs (UNWCED -1987)

8. Resources of sustainable tourism:

As recourses of a sustainable development of tourism Sector in locality is concerned, the following resources should be needed such as:

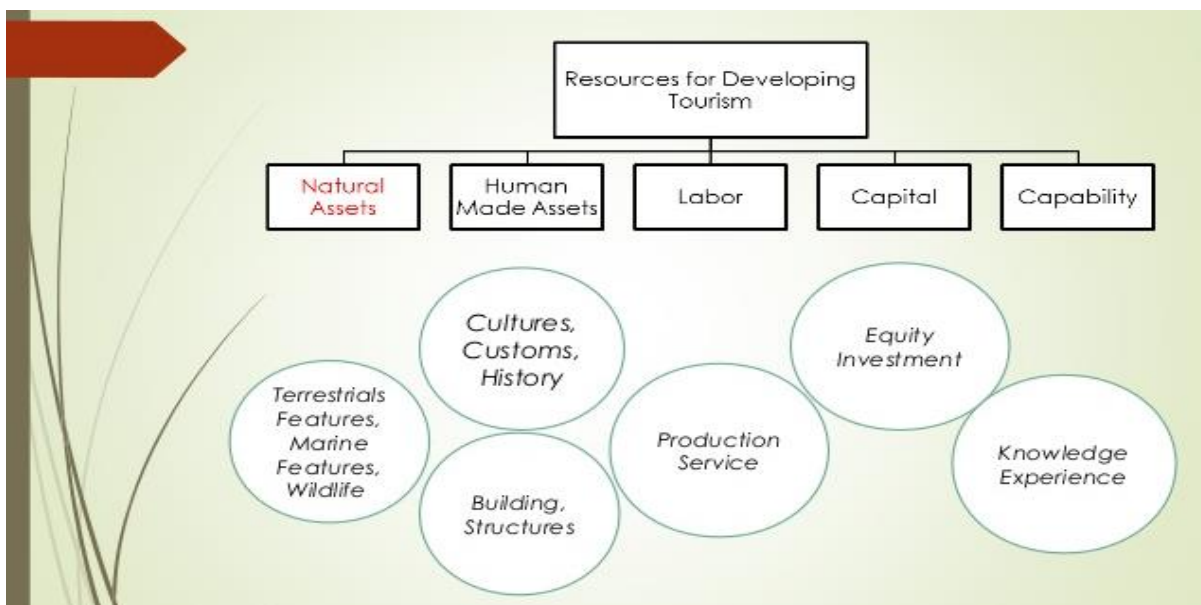
- Investment of Capital
- Use of required Materials
- Knowledge about
- Labour

In the tourism Material include natural and human made asset for a sustainable development

Tourism and Maintainable



Global Talks: An Impact of a Sustainable Strategic Planning for Development of Local Tourism in Post-Pandemic on 24th November 2020



9. Needs and Importance of Sustainable Planning:

For a better tourism development, the following resources have been need with a sustainable planning such as:

- ❖ Scarce of Resources and finite, henceforth, have a sustainable Planning for Tourism
- ❖ Investment of Capital in Proper way of Economic development for the social welfare and tourism activity so that it would returns a higher Volume.
- ❖ Investment of capital in tourism sector which gives not only high scale of investment but also increases economic divarication So that resources allocated properly for local tourism development
- ❖ Personal security and safety of Tourism is needed like : protection of their Life from terrorist, Natural calamity, providing health and sanitation facility, drinking water and Guest House facility also needed thereon.

10. Strategic Planning for Sustainable Tourism Development

There are four basic principles are to be needed for a sustainable tourism development such as:

- ❖ An innovative idea with holistic planning and cross sectorial Planning and strategy making.
- ❖ The importance of Preserving and Preventive essential ecological environment.
- ❖ The need to protect and secure both the human heritage and bio diversity.
- ❖ It would be required for sustainable development and carried out proper productivity where it does not deplete to resources for the long term and future generations.

11.Why Need Strategic Planning for Sustainable Tourism?

At present for a better tourism a sustainable tourism is necessarily required the followings with a best strategic planning such as:

- It needs high quality attractions
- It consists a high Class tourism infrastructure
- It needs community support and tolerance in locality
- Needs Government Assistance in all Levels
- Needs Personal security and Safety of Tourists
- Always would be maintained code of ethics and manners of tourists.



[Figure-2 refers about the Geological park of Tourism]
12.Attributes of Attractions for Tourists

- It is a natural and Scenic Vision
- It consists a high Class tourism infrastructure of modern and ancient
- It may fixed or mobile
- Large or small with potentiality of attractions
- It may Temporary or Permanent
- May be designed some type of human activity
- May be unique

13. Local tourism has promoted by some of key players such as:

Government Sector:

Owns with Provides sufficient funding for development of Tourist place with attractive designs of monuments and sculpturing and operate it properly for public welfare and amusement.

14.Private Sector:

Owns and operates with profit making tourist attractions and facilities

Joint Sector: Owns both state Govt. and central Govt. and operates properly for public welfare

NGO's: owns and operates for profit making with up-to date attractions and facilities



[Figure -3 Refers about the traditional architecture of buildings in UK, Canada, Italy and India etc.]

16. Needs Government Assistance:

For local tourism development generally local people needs Government assistance in the following levels such as:

- National level: Provides adequate funding and initiate tourism Development
- State Level: Provides adequate funding and initiate tourism Development as per requirement of locality.
- Regional Level/local Level: Trying for their level best for infrastructure development but their strategic is broken down to different components assigned to others for implementation

17. Personal Security and Safety of Tourist:

- For a well tourism development generally Tourist people needs Government assistance in the following levels such as:
- Government should endure the personal safety and security of tourist and instant security help whenever they needed there on.
- Local government must be prepared multiple cases of respond immediately in both ordinary and unexpected case (If any happened).



[Figure -4 refers about the local Tourism Development through local music]



[Figure – 5 various product and project models of locality for a sustainable tourism development after pandemic]





[Figure -6 refers about the Models of Geo Tourism for a sustainable development after COVID-1

[Figure -7 indicates about a Project model for tourism development at Monetary Bay Aquarium Monetary]



[Figure -8 indicates about a Project model for tourism development at local handicraft and art]



Set up a Geotourism Stewardship Council

For Set up Geo tourism Stewardship Council it includes:

- Community organizations for.
- Historic preservation
- Urban renewal
- Nature and ecotourism
- Local government

- Traditional performing arts, artisan and crafts
- Tourism and local business expertise
- Farm/restaurant programs
- Tourism promotion
- Beautification/aesthetics
- Other characteristics of the place
- Indigenous and minority groups

A Model for Geotourism Stewardship Councils...



❖ Arizona GSC

❖ Get involved with a project - Geotourism Map Guide, festival, or other program



[Figure -10 refers about the models of Vermont Northeast kingdom Project for a sustainable tourism development after pandemic.

Vermont Northeast Kingdom Project

Vermont's Northeast Kingdom Geotourism Program

- Home
- About the Kingdom
- About Geotourism
- Geotourism MapGuide
- NEK Geotourism News
- NEK Geotourism Alliance
- Resources for Travelers
- Geotourism Globally



Geotourism Program
Geo-tourism n: Tourism that sustains or enhances the geographical character of a place—its environment, culture, aesthetics, heritage, and the well-being of its residents. [Learn more >>](#)




Visit NEK Autumn

Vermont's Northeast Kingdom has long been cherished by visitors and natives alike for its unspoiled beauty and natural treasures. To preserve the natural environment and to promote sustainable destinations, Vermont's Northeast Kingdom is working with

Limitations of Sustainable Tourism Development

For a well and sustainable tourism development the following benefits to be expected by tourist that

- ❖ There is a big mismatch in between Strategic Planning and sustainable development in theory and Practice in the concept of sustainable tourism.

Conclusion:

In conclusion, the above summations are summering that Covid-19 affects the entire tourism sector throughout the globe and tourism sector totally crashed, like hotel, restaurant, air, train, bus, handicraft, national, International even local market also. Therefore, for expecting a sustainable tourism in post pandemic era, the government should have focused on the following segmentation for optimum development like

- a. Sustainable Tourism is a key part for achieving the goals of tourism development in different sector such as local. Regional. National and international level
- b. The futures of the local people are efficient and bright and prosperous, so, Management should be utilizing the available resources properly for today and manage efficiently for tomorrow for new generations.
- c. Sharing the tourist knowledge's and experiences through the digital technology for wide propaganda and publication about the identification of tourist place and resources.

Bibliography

In this article, the bibliography refers to a comprehensive source of books, journals, periodicals and different websites consulted and cited by the author but the author not directly copied from the author regarding content, diagrams, facts and findings to the related article.

Thus, we the authors, solemnly declare that this is our own creativity with maintaining originality. Some extent we may refer previous publications cited it in the literature review section with due permission of previous authors.

Key aspects of Bibliography:

Purpose: This article / research paper supports the academic integrity of the research scholars and professors, and helps to authors for their citations located and develop the motivation of readers for their happiness.

Content: The content of article is maintaining author

- ❖ Local people have no idea regarding to understand the concept of Sustainable tourism therefore, it is far away of its objectives
- ❖ Always seems local conflicts regarding the ownership or authority of local tourism place management.

identification, names, title, publication, Date of Indexing (DOI), Ordering. The article maintaining proper format and order of IEEE Template guidelines i.e. Title- 14 pt, Abstract: 11 pt, Heading: 12pt, Body: 10Pt

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Data Availability Statement: The data, charts, and step-by-step methods used to reach the conclusions in this study are available from the corresponding author upon reasonable request.

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Analysis of Green Business Model on Circular Economy for Economic Sustainability

Prof. (Dr.) Sushil Kumar¹ Mr. Shivam Khamari² Dr. Senthil Kumar³ Ms. Sujata Das⁴

¹ Professor of Food and Agribusiness, Business Sustainability, and Human Resource Management, IIM Lucknow Email.id- sushil@iiml.ac.in

² Assistant Professor, Swami Vivekananda Institute of Management, Baniatangi, Khordha Email Id- shivamkhamari8500@gmail.com ORCID ID: 0009-0009-3618-2954

³ Professor of Management, University of Madras, Chepauk, Chennai, Tamil Nadu Email Id: senthilkumar@unom.ac.in

⁴ Research Scholar, Siksha 'O' Anusandhan (Deemed to be University), Department of Humanities and Social Science, Bhubaneswar, Odisha, India. Email.id- d.sujata79@gmail.com

Abstract:

At the present situation of world economics, green business and circular economics plays an essential function in improving financial sustainability and GDP of any nation, because an inexperienced enterprise and circular economic system have a look at must introduce the shift from the linear "take-make-dispose" version to a regenerative version that minimizes waste and maximizes resource use.

The researcher has aimed her ideas of green business and the circular economy as a reaction to conventional linear monetary models and developing environmental worries. Which highlights how circular economy policies enhancing green business and economic sustainability, which includes lessen, reuse, and recycle, are integrated into green business techniques to reap sustainability and profitability. This technique can result in blessings like waste control, value savings, superior brand popularity, and supply chain resilience, increasing new design of Product manufacturing, improvement of innovation infrastructure, acknowledging and assembly the prevailing financial demanding situations to solve a larger scale of organizational development and commercial enterprise fulfillment.

Therefore, Green business and Circular economy emphasize the transformative potential of green groups and the circular economy in growing sustainable, resilient, and profitable business models that benefit both the environment and society.

Key words: Green Business Model (GBM), Circular Economic Policy (CEP), Integrated Green Business Strategy (GBS), Regenerative Model of Green Business, Linear Model of Green Business (LMGB)

1. Introduction:

Currently, inexperienced business and circular economics play an important position in enhancing financial sustainability and GDP of any nation, due to the fact that green enterprise models and the circular economy draft far away from the linear equations of circular economics tool, closer to a regenerative approach centered on economic sustainability. In this paper, the principal goals of studying how the circular model minimizes waste and aid use through maintaining merchandise and materials in use for as long as possible through techniques like reuse, restore, refurbishment, and recycling. A inexperienced commercial enterprise method integrates this circularity with financial viability, frequently via progressive strategies like product-as-a-service, beneficial useful resource restoration, or sustainable sourcing, at the same time as also considering environmental, social, and governance (ESG) elements.

2. Objectives of the Study:

The objectives have been taken by the researcher in order to study the aforesaid topic entitled:

- To observe the relevance of the take a look at for the evaluation of the inexperienced commercial enterprise model in the circular financial system for financial Sustainability in unique regions and its potential
- To have a look at the effect of inexperienced era software with a focal point on decoupling increase from resource depletion by means of getting rid of waste, circulating products/substances, and regenerating nature.
- To gain the green business via eco-layout, reuse, repair, recycling (the 6 Rs), renewable electricity, and sustainable fashions to cut emissions, hold natural capital, foster innovation, build resilience, and create long-term value for enterprise, humans, and the planet.



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- d) To Design out waste and pollutants from the start, preserving materials in use longer, and moving from linear "take-make-dispose" to restorative structures.
- e) To riding innovation in design, era, and enterprise fashions (like condo/subscription) to create price sustainably.

3.Literature Review:

The literature evaluation section of the studies above title on green business (GB) and the circular financial system (CE) exhibits that CE is a center approach for sustainable development, moving from linear "take-make-dispose" fashions to regenerative structures (reduce, reuse, recycle). Research highlights CE's role in decoupling growth from aid use, riding new business models (like product-as-a-carrier), improving competitiveness, and integrating environmental, monetary, and social dreams. Key topics consist of innovation, policy needs (e.g., inexperienced finance), challenges in implementation (scalability, awareness), and the necessity for cross-regional collaboration.

Again, the researcher has focused on a systematic evaluation of literature related to the following themes for the improvement of green commercial enterprise and circular economy

a) Enterprise model Innovation: This Literature review explores new CE fashions (e.g., sharing, leasing, and product-service structures) that boost profitability and sustainability, moving past mere recycling.

b) Environmental & economic blessings: studies verify CE reduces waste, pollution, and GHG emissions, while improving useful resource performance, company competitiveness, and profitability.

c) Function of Generation & policy: New technology (e.g., in substances, virtual tracking) and supportive rules (e.g., green finance, tax incentives, waste rules) are important enablers.

d) Integration with other ideas: research connects CE with green finance (GF) to bridge investment gaps, bio-financial system, and the broader green economy agenda.

e) Challenges & boundaries: not unusual hurdles encompass scaling round solutions, overcoming high upfront expenses, converting customer conduct, and regulatory boundaries.

4.Problem Formulation:

In this section, the researcher has faced several problems related to the aforesaid topic and needful

research work, such as:

- a) First, the researcher has faced difficulties in collecting various information related to green business and circular economy because all data are purely original, hidden, and important . so that concerned industries and business organizations, employees are reluctant to express their response or feedback freely
- b) A problem formula for an analysis of green business and the circular economic system identifies an opening between the contemporary linear financial model and the preferred sustainable device, specializing in particular demanding situations hindering the extensive adoption of round and green practices

5. Problem Statement:

The modern-day dominant linear economic model of "take-make-use-waste" is environmentally unsustainable, leading to aid depletion, high carbon emissions, and sizable waste generation. at the same time as the principles of inexperienced business (GB) and the circular economic system (CE) offer a promising paradigm shift closer to sustainability, their massive and effective implementation faces enormous practical, monetary, and systemic limitations which have no longer been absolutely addressed or understood .

6. Hypothesis:

The researcher have taken number of hypothesis in order to conduct her research work such as

6.1 Null Hypothesis(H_0) It refers that the Green business models has no effect for increasing the economic rate of business enterprises and its sustainability related to circular economic .

6.2Expected Hypothesis (H_e)

This speculation is the core linking inexperienced commercial enterprise and circular economy (CE) is that integrating CE ideas (lessen, reuse, recycle, regenerate) into business models drives innovation, cuts costs (waste, energy), complements logo cost, and guarantees long-term profitability while decoupling economic growth from aid depletion, growing a sustainable.

6.3Alternative hypothesis: (H_a)

It refers to a regenerative gadget that shifts from "take-make-dispose" to closed-loop feed advent. Inexperienced entrepreneurship acts as the engine, leveraging generation and new fashions (like product-as-a-carrier) to obtain those environmental and financial dreams.



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7. Method of study:

In this section, the researcher has prepared a good questionnaire and taken both the Primary and secondary methods of study for collecting the data from the respondents and targeted five hundred respondents from various sectors such as industry, business organizations, enterprises, as well as small-scale industries, and expected to collect 311 Respondents opinion for recording.

Besides that, the researcher has also taken various models of green business related to the circular economy, such as the European model, Asian Model of Green business, Western Model of Green business, and the circular economy, and compare with themselves for finding a remarkable research gap for analysis.

In this section, the researcher has prepared a good questionnaire and taken both the Primary and secondary method of study for collecting the data from the respondents and targeted five hundred respondents from various sectors such as industry, Business organization, enterprises as well as small scale industries and expected to collect 300 Respondents opinion for recording.

Besides that, the researcher has also taken various models of green business related to circular economic such as European model, Asian Model of Green business, Western Model of green business and Circular Economic Model and compare with themselves for finding a remarkable research gap for analysis.

8. Meaning and Concept of Green Business:

The idea of inexperienced enterprise is a modern and most popular word for drawing the attention of each and every lover of the surroundings and Industrialist, entrepreneur or any ruler of a country in the world. The phrase green commercial enterprise consists of phrases including "green and business", wherein 'inexperienced' means pollution-free and smooth surroundings without any risky particle in the earth for preserving a stunning existence with no danger, while "commercial enterprise: is a business pastime or transaction for buying profit through the career of business. It has a number of salient capabilities, together with number of segmentations such as :

- Linear vs. circular economy: The traditional linear version has a finite give up, even as the circular economic system is a closed-loop system that aims to eliminate waste.
- In an experienced commercial enterprise: An

enterprise that prioritizes both financial profitability and environmental responsibility.

- Round business models (CBMs): particular strategies designed to function within a round economic system, which includes:
- Product-as-a-carrier: supplying products as a provider (e.g., leasing) to encourage the organization to hold and upgrade the product in the course of its existence cycle.
- Aid restoration: Extracting the fee from waste streams.
- Product lifestyles Extension: strategies like upkeep, restoration, and refurbishment to maintain products in use longer.
- Sharing structures: models that enable customers to purchase merchandise, as discussed in this YouTube video.

9. Role and Importance of green Business Models in Circular Economic:

Green business models are crucial for the circular economy by redesigning operations to eliminate waste, keep materials in use (reuse, repair, recycle), and regenerate nature, shifting from linear "take-make-waste" systems to regenerative ones, which reduces costs, boosts innovation, meets regulations, and creates new markets for sustainable products and services. They embed sustainability into core value creation, driving economic growth while protecting the environment and ensuring long-term resilience.

10. Roles of Green Business Models:

The green business model has number of roles upon circular economics such as:

- a) **Eliminating Waste & pollutants:** Designing products for disassembly, modularity, and recyclability from the beginning, is stopping waste in place of handling it.
- b) **Circulating materials:** implementing techniques like product-as-a-carrier, leasing, refurbishment (e.g., Renault's circular factory), and aiding efficiency to maintain merchandise and additives at excessive value.
- c) **Regenerating Nature:** the use of renewable strength, non-poisonous materials, and fostering natural systems, moving beyond just "doing less damage" to developing positive environmental impact.
- d) **Using Innovation:** Fostering new technology, materials, and offerings (like reverse logistics, restore hubs) that assist circular loops and create new sales



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streams.

11. Function of Green Business Model:

a) Product-as-a-carrier (PaaS): Promoting the characteristic of a product (e.g., mild, mobility) instead of the product itself, incentivizing sturdiness and take-lower back.

b) Eco-design: Designing merchandise with their entire lifecycle in mind, the use of recycled content material and clean-to-repair components.

c) Closed-Loop structures: Reintegrating used

substances again into production, like the use of recycled plastics or reconditioned batteries.

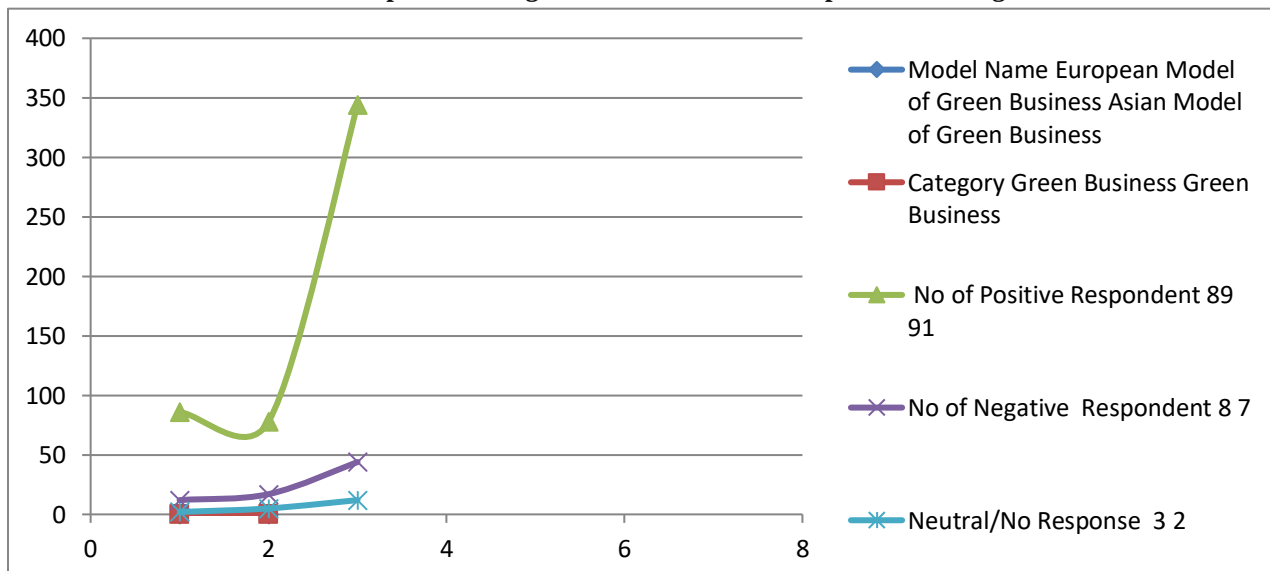
Data Table: I

The data table: I stated about the 300/500 respondents given their valuable response from various sectors [i.e Corporate Industry, Business firm, MSME, SME, and other business organizations] related to effect of Green business upon circular economic and its sustainability . Their feed-back recoded in data table. (Please see Data Table: 1)

Response Model:

S.L No	Companies	Category	Positive Response			Negative Response			No Response	Mean Value of Positive Response
01	Reliance Industries	Large Scale Industries	25	23	02	07	13	01	29	50/100
2	Steel & Mines Industries	Large scale Industries	25	25	01	10	12	00	27	51/100
03	Corporate Industries	MSME	28	22	00	16	19	00	15	50/100
04	Food and Beverages	SME	29	21	00	14	18	00	18	50/100
05	Hotel and Restaurants	MSME	34	14	02	18	24	00	08	50/100
06	Production Manufacturing & Industries	Large scale	36	23	01	15	17	00	08	60/100
07			177	128	06	80	103	01	105	311/600=51.83%

Semiotic Models of Positive respondents of green Business in Bar Graph /Scatter diagram

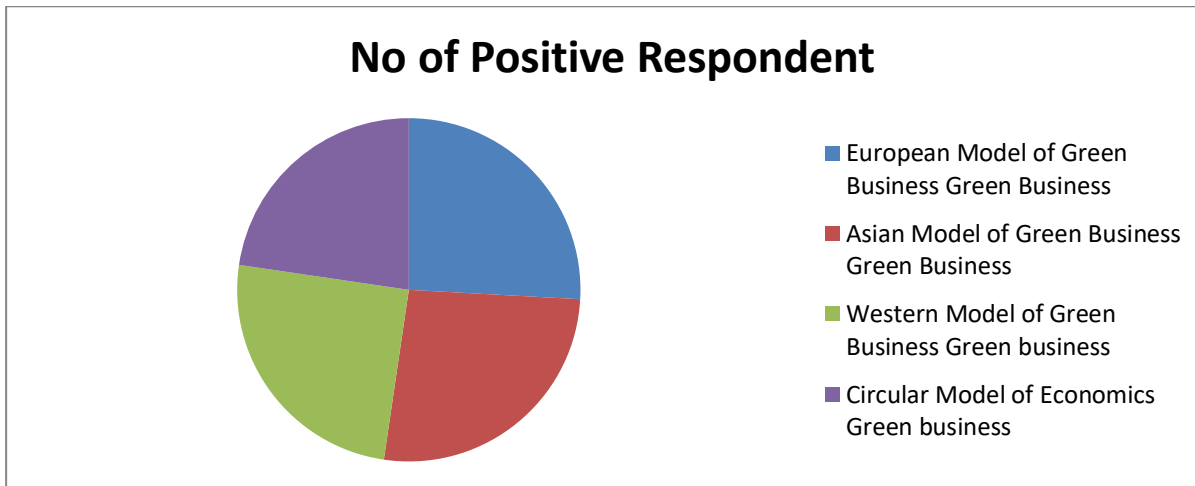


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S.L No	Model Name	Category	No of Positive Respondent	No of Negative Respondent	Neutral/No Response	% Of Positive Response
01	European Model of Green Business	Green Business	89	08	03	89%
02	Asian Model of Green Business	Green Business	91	07	02	91%
03	Western Model of Green Business	Green business	86	12	02	86%
04	Circular Model of Economics	Green business	78	17	05	78%
Total			344	44	12	344/400=86%

Respondents of Various models of Green

Economic in Pie Chart and Bar Diagram

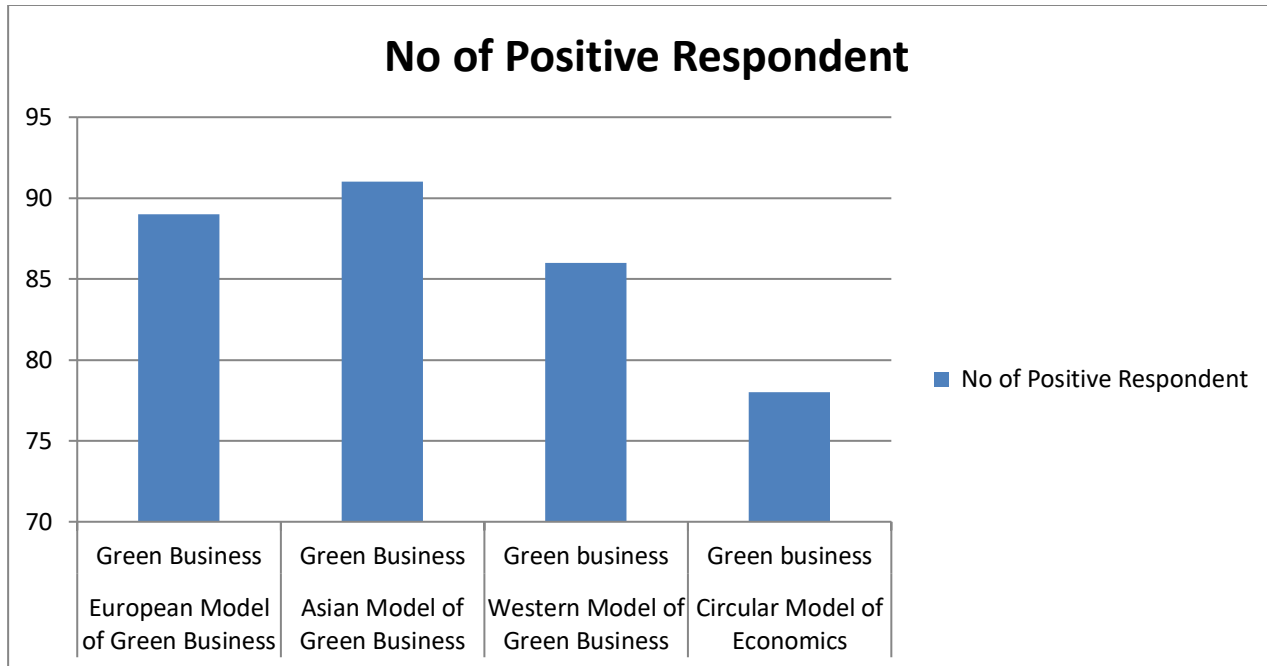


The aforesaid data table proves that the Green business model has a greater importance for enhancing the development cycle of the circular economy and its sustainability.

In this regard, the Asian Model of Green Business is

more effective than the other three models of Green Business, because of green Technology and AI based Production process implemented more, as well as the Asia Continent is more population, so there are ample customers interested to purchase carbon free product in their day-to-day lives and requirements

Reponse Models of Green Business on Bargraph



12. Advantages and Challenges:

Advantages: groups adopting spherical principles can advantage blessings like lower economic and financial savings, a more potent brand reputation, and long-term profitability.

a) Economic: lower raw cloth costs, new market possibilities, improved efficiency, and resilient supply chains.

b) Environmental: reduced emissions, lower resource depletion, much less pollution.

c) Social: improved logo reputation, alignment with purchaser values, capacity for higher operating conditions

- ❖ **Challenges:** not unusual, annoying situations encompass scaling up, gaining patron popularity, and securing good enough financing

13. Integration and future Direction:

- ❖ **Integration:** Circular economic system standards are a key motive force of sustainability and can be included into e-commercial enterprise models to improve ESG performance.
- ❖ **Destiny studies:** extra research is needed to construct theoretical frameworks and recognize a way to scale these fashions correctly across exceptional sectors.
- ❖ **Holistic Approach:** Many researchers emphasize the

need for a multidisciplinary technique to cope with the complex hyperlinks between waste, environmental impact, and financial systems.

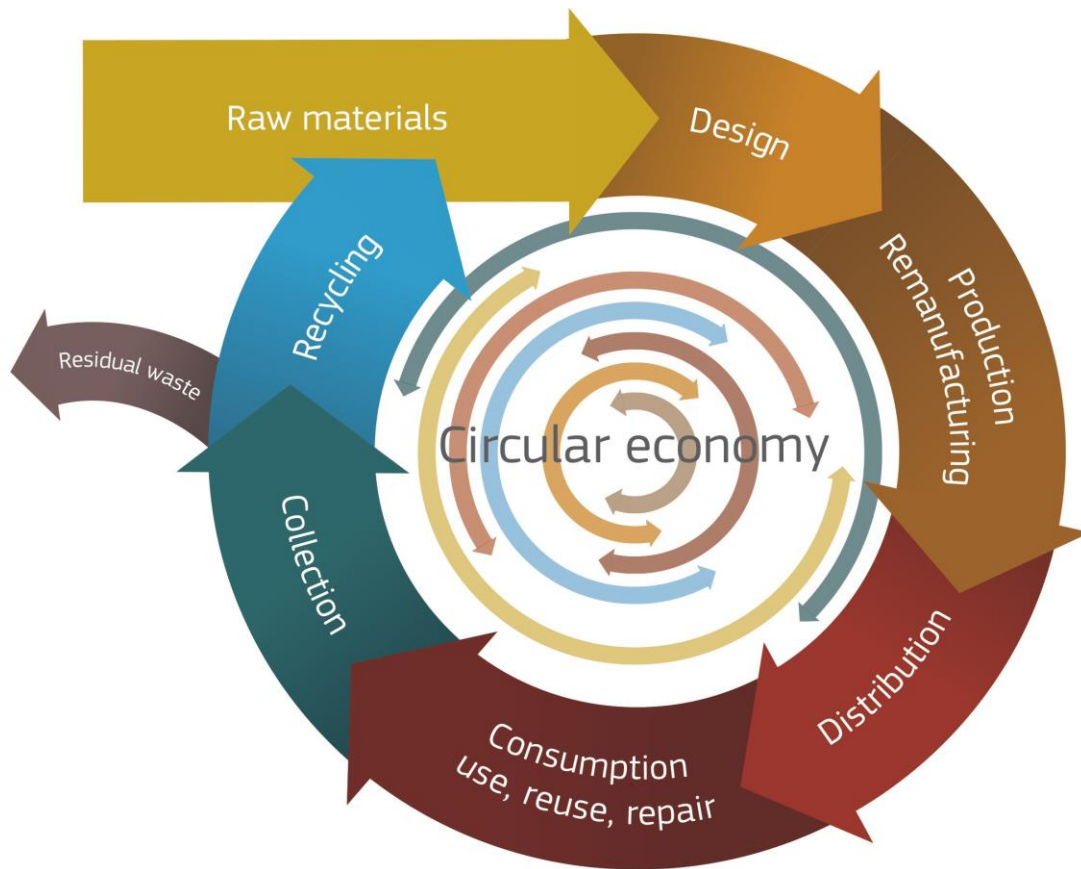
- ❖ **Future Integration:** Circular economy principles are a key driver of sustainability and can be integrated into e-business models to improve ESG performance.
- ❖ Protecting the environment and preserving our competitiveness should move hand-in-hand: each are about a sustainable

14. Concept of Circular Economy

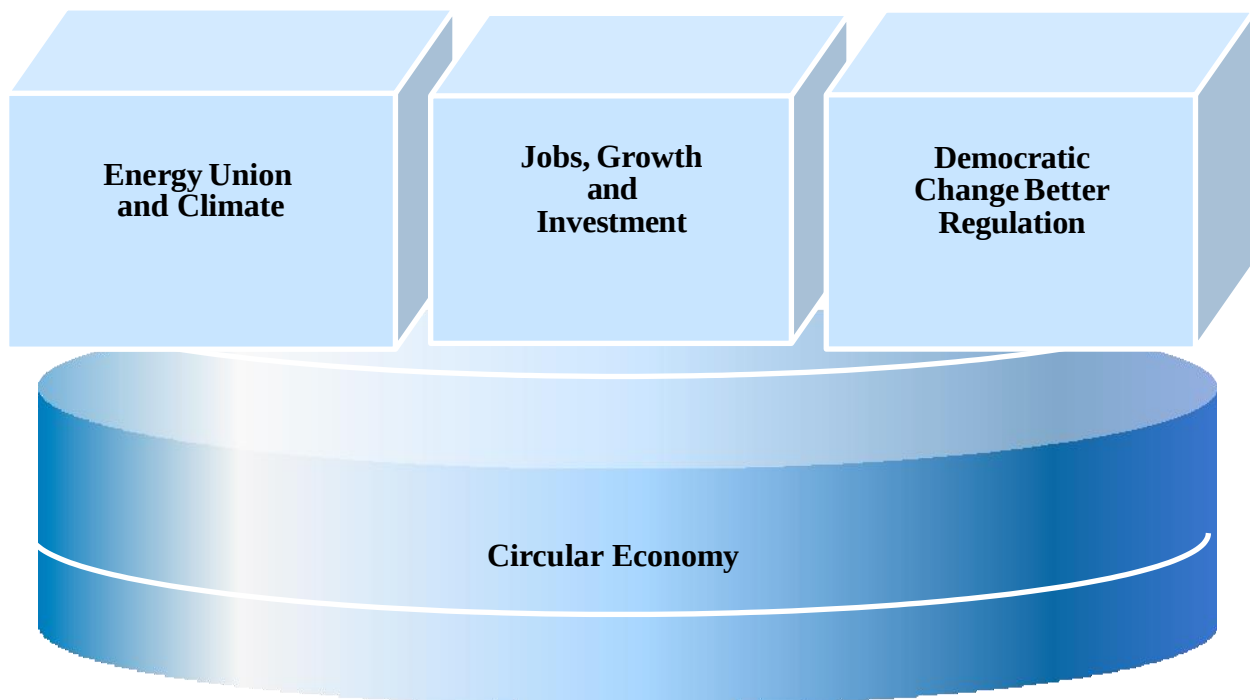
The circular economics is a cyclical financial system is involved; it's far a procedure of economic flow in the course of the yr associated with a business activity of an organization, commercial enterprise firm, or industry, which includes:

- a)** Preserving the price of merchandise, substances, and sources in the economic system for as long as feasible even as minimizing waste generation.
- b)** To reinforce our financial system and competitiveness with new business opportunities and innovative services and products.
- c)** To develop the monetary growth and improvement, social and environmental profits

Models of Circular Economic for Green Product and Materials:



Models of Green Business and Circular Economic for Protecting the Environment



5 Main Areas of Action



Protecting the environment and maintaining our competitiveness have to go hand-in-hand: both are about a sustainable future.

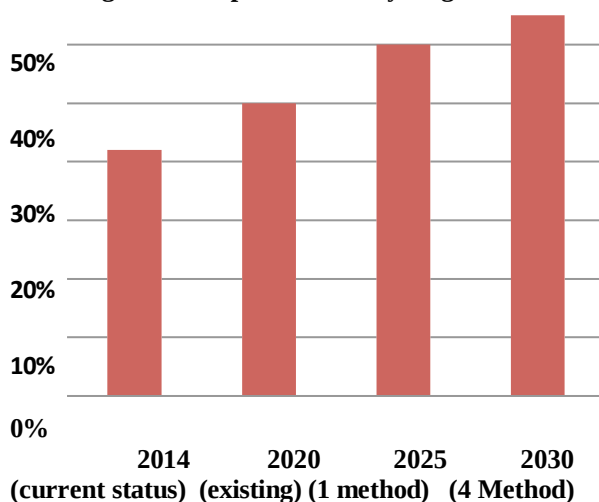
15. Objectives

- ❖ To Reuse and restore of merchandise to avoid waste.
- ❖ To empower clients with dependable information at the environmental impact of merchandise.

16. Chief Key movements:

- a) To Increase guidelines to encourage reuse of sports (e.g., waste proposal)
- b) To work and make sure availability of spare components (Eco-design?)
- c) The higher in put into effect guarantees and action on false green claims
- d) To Emphasize CE standards in green Public Procurement.
- e) To be an independent trying out programmed to evaluate viable planned obsolescence.
- f) To focus higher labeling: European Eco-label, Environmental Footprint.

New targets municipal- waste recycling



17. Definitions:

- a) Municipal waste (OECD/Euro stat-based)
- b) Backfilling, creation and demolition waste (constructing on COM selection 2011/753/European)
- c) Meals waste
- d) Coaching for Reuse

18. Calculation guidelines

- a) An unmarried method
- b) major rule: enter to the final recycling
- c) Derogation: output of sorting operation if losses are < 10% and a monitoring system is in place.

18.1 New calculation policies to cover:

- a) Output of known re-use centers and merchandise prepared for reuse by way of deposit-refund schemes
- b) Steel recycling from power recovery

18.2 Prevention

- ❖ To cognizance on food waste, textiles, WEEE, and furniture
- ❖ Measures to promote the usage of recyclable, long-lasting, aid-efficient merchandise
- ❖ Goal to be set on the national level on disposed/incinerated waste (max kg/inhabitant)

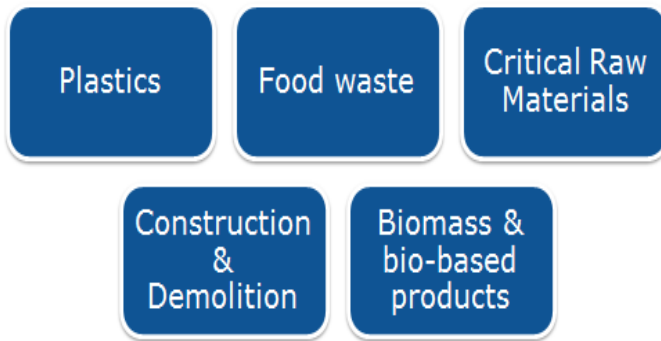
18.3 Producer responsibility

- a) For minimal requirements to be reputable by means of MS while growing and making use of EPR, together with:
 - a) Definition of the jobs and duties of the actors
 - b) Defining measurable objectives and a reporting method
 - c) Information, transparency, talk
 - d) Focus on full price coverage

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- e) To consciousness on tracking via MS
- f) To link the product's real end-of-life cost and expenses to be paid through producers

Priority Sectors



19. Hypothesis Testing:

From the above data table the obtained result mean value of green Business is very high in both the models and it has a great impact in the circular economic development and its sustainability. Thus, it is highly significant and reject the Null hypothesis (Ho) and accepted the expected hypothesis (He) due to its relevant effect and justification.

20. Research Findings:

From the above discussions, we acquired the associated findings, along with the fine effects of adopting circular financial system ideas on commercial enterprise overall performance (e.g., cost savings, new revenue streams) and environmental consequences (e.g., decreased waste).

Demanding situations: in short, point out the obstacles to adoption, which include regulatory hurdles, the need for patron schooling, and financing issues.

21. Conclusion

In sum, the above summations summarize that green commercial enterprise and circular Economics emphasize the transformative ability of green organizations and the circular economy in growing sustainable, resilient, and worthwhile enterprise models that gain each the environment and society.

Finally, we observe that, it has a great essence. Inexperienced enterprise models are the engine that makes the circular economic system a tangible, worthwhile, and sustainable reality by fundamentally

converting how organizations create value.

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Data Availability Statement: The data, charts, and step-by-step methods used to reach the conclusions in this study are available from the corresponding author upon reasonable request.

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**Effect of Cenosphere on Three-Body Abrasive Wear Performance of Woven Hybrid
Jute-Glass Epoxy Composites****Dr. Soma Dalbehera¹, Dr. Sarita Nayak², Dr. Umarani Adrifa³, Dr. Y. Vinodhini⁴**¹*Department of Mechanical Engineering, Skill Development & Technical Education, Govt. of Odisha,
India, Email Id: somadalbehera@gcekalahandi.ac.in*²*Principal, Suddhananda College of Management and Computer Studies
Email Id: saritanayak73@gmail.com*³*Professor, Tunisia University, Tunisia
Email Id: umarani.adrifa@uvt.tn*⁴*Professor, and HOD, MBA Amjad Ali Khan College of Business Administration, Hyderabad
Email Id: adithyasiddhartha13@gmail.com***Abstract**

In the present study the three-body abrasive wear behavior of particulate filled woven hybrid jute-glass (GJJG) epoxy composites have been reported. The hybrid epoxy composites were fabricated and filled with (5-20) wt. % of cenosphere filler with a step of 5wt. %. In the present investigation, angular silica sand particles of size in the range (200-250) μm were used as dry abrasive. Abrasive wear tests were conducted on a dry sand rubber wheel abrasion tester (ASTM G65) under different loads (5-20)N at contact pressures of 1.89, 3.78, 5.68 and 7.6 N/cm^2 and abrading distances (143-2292m). Cenosphere is a hollow microsphere produced during phase transformation and thermo chemical reaction of combustion of coal in thermal power plant. The filler addition has shown significant influence on three-body abrasive wear response of glass-jute hybrid epoxy composites at various loads. Abrasion resistance of unfilled and filled glass-jute epoxy composites strongly depends on the experimental test parameters such as applied load, sliding speed and abrasive particle size. The results indicate that the wear volume increases and specific wear rate decreases with addition of cenosphere content with improved abrasion resistance. Advanced optical microscopy was used to study the worn surface morphology to understand the mechanism involved in the removal of material. Microscopic studies of abraded surfaces support the involved mechanisms and indicate that distribution of cenosphere particles on the composite surface increases the abrasion resistance of the developed composites.

Keywords: Three-body abrasive wear; Hybrid jute-glass composite Cenosphere; Surface morphology.**Introduction**

Polymer composites recently have replaced many of the conventional materials in various engineering applications. This is owing to the advantages of polymers over traditional materials such as ease of processing, productivity, cost reduction etc. Research is underway worldwide to develop newer composites with varied combinations of fibers and fillers so as to make them useable under different operational conditions. In most of these applications, the properties of polymers are modified using fillers and fibers to suit the high strength/high modulus requirements. A notable advance in the polymer industry has been the use of fiber and particulate fillers as reinforcement in polymer matrix. As far as the fibers are concerned growth in natural fiber plastic composite are increasing day by day. Because natural fibers are advantageously used as a result of their low density and increasing environmental stress/pressure. Natural fibers composites found applications where load bearing capacity and dimensional stability under moist and high thermal conditions are of second order importance. In spite of several advantages the mechanical properties of natural fiber composites are much lower than those of synthetic fiber composites. As pointed out by Sabeel

Ahmed¹ natural fibre alone in polymer matrix is inadequate in satisfactorily tackling all the technical needs of a fibre reinforced composite. They have the opinion that if it is combined with a synthetic fiber in the same matrix the properties advantage of both the fibers can be taken care of this results in a hybrid composite.

In an earlier study the authors² have worked with mechanical properties of woven jute glass hybrid epoxy composites. In their work they tried to find out the optimum layering sequence of jute and glass fiber which will give both maximum tensile and flexural strength. The results indicated that two glass layers at extreme position with two jute layers at middle of stacking sequence (GJJG) gives maximum strength to the hybrid composite.

On the other hand particulate fillers are of considerable interest, not only from an economic point of view, but as modifiers especially the physical properties of the polymer. It is well documented in the literature that majority fillers have a positive influence on mechanical properties. Hard particulate fillers consisting of ceramic or metal particles and fiber fillers made of glass are being used these days to dramatically improve the wear resistance, even up to three orders of magnitude. Various kinds of polymers and polymer matrix composites

reinforced with metal particles have a wide range of industrial applications, such as heaters, electrodes, composites with thermal durability at high temperature etc. These engineering composites are desired due to their low density, high corrosion resistance, ease of fabrication and low cost. Similarly, ceramic filled polymer composites have been the subject of extensive research in last two decades. The inclusion of inorganic fillers into polymers for commercial applications is primarily aimed at the cost reduction and stiffness improvement.

Polymer composites are being used in numerous application area. One important area is tribo applications such as bearings, gears etc. where it is quite difficult to apply lubricants. Leaving behind adhesive wear these composites have also excellent in other areas such as abrasion, fretting, reciprocating and erosion.³ Abrasive wear occurs in different applications such as pipe line carrying sand slurries in petroleum refining, pumps handling industrial fluids, chute lines abraded by coke in minerals and coal handling equipments.⁴

Cenosphere is a ceramic rich industrial waste produced during burning of coal in thermal power plants. This is also known as aluminosilicate hollow microsphere. Figure 1(a) shows the micrographs of the distribution of cenosphere particulate as reinforcement in the composites and Figure 1(b) shows the EDX analysis of cenosphere particles. As indicated in EDX analysis the particles are mainly composed of mixtures of oxides such as SiO_2 , Al_2O_3 and Fe_2O_3 . Various trace elements such as K, Ca and Au are also present. It is a unique class of filler suitable for polymer matrix because of its fine dispersion, homogeneity, inertness, low water absorption and chemical stability. Research is going on to find out the various ways to utilize this by-product to prevent any environmental problem as well as effectively use them to produce new usable materials. In continuation to this work here the authors have added cenosphere as particulate filler material to the GJJG composite. Different weight percentages (5, 10, 15 and 20%) of cenospheres were added to the composite. It is observed that though the literature [5-7] is rich with studies on tribological behaviour of cenosphere filled polymer composites, no attempt has been made till date on three-body abrasion test to find out the effect of cenosphere filled hybrid jute-glass reinforced epoxy composite.

Keeping this in view, in the present work the effect of cenosphere on the three-body abrasion wear behaviour of jute-glass hybrid composites have been found out experimentally. Woven fabric reinforced composites are gaining popularity because of their balanced properties in the material plane as well as their ease of handling during fabrication.

Here the orientation of jute has been kept as $(45^\circ-45^\circ)$ and that of glass as $(0^\circ-90^\circ)$ while making the hybrid composite. Wear mechanisms involved in the material removal process were studied with the aid of advanced

optical microscopy.



Fig. 1(a) Cenosphere filler **Fig. 1(b)** EDX analysis of cenosphere particle

2. Experimental Details

2.1 Materials

The following materials are used for laminate preparation, testing and to investigate the abrasion characteristics: jute fiber (woven), E-glass fiber, cenosphere (Grade of CS300), epoxies resin (LY-556), and hardener (HY-951).

2.2 Composite fabrication

Hybrid laminates of woven jute and glass mat for stacking sequence (GJJG) were prepared by usual hand lay-up technique. Four groups of laminate composite samples were made with varying weight percentage of cenosphere (5%, 10%, 15% and 20%). The layout of fiber for glass was kept at $(0^\circ-90^\circ)$ and for jute it was changed to $(45^\circ-45^\circ)$ orientation instead of $(0^\circ-90^\circ)$ orientation. A wooden mold of dimension $(150 \times 60 \times 5)$ mm was used for manufacturing the composite slab. For easy removal of the composite teflon sheet and silicon spray are used which prevent adhesion between mold wall and composite sample. The epoxy (LY 556) and hardener (HY 951) were mixed in a ratio of 10:1 to which cenosphere were added and mixed properly by gentle stirring. Pre-impregnated jute and glass fiber were kept in the mold with the proper sequence. The load was applied from the top surface of composites and the molds were allowed to cure for 72hrs at room temperature. After 72hrs the samples were taken out of the mold and cut to required shape and size. The abrasion test samples of size $(75 \text{ mm} \times 25 \text{ mm} \times 5 \text{ mm})$ were prepared from the laminates using a diamond tipped cutter. The composites with their designation, the volume fraction of fiber and thicknesses calculated are presented in Table 1.

Table 1 Laminate stacking sequence

Symbol	Stacking sequence	Cenosphere Wt. (%)	Total fiber		Thickness (mm)
			Volume fraction %	Weight fraction %	
S1	GJJG	5	16.4	29.3	5
S2	GJJG	10	18.2	32.6	5
S3	GJJG	15	20.8	37.1	5
S4	GJJG	20	23.3	41.4	5

2.3 Three-body abrasion test

The three-body abrasive wear tests were conducted using a dry sand/rubber wheel abrasion tester by ASTM G-65 standard as shown in figure 2.



Fig. 2. Dry sand/rubber wheel abrasive test rig

Angular silica sand of size (150-250) μm with sharp edges was used as abrasive. The samples were cleaned with acetone in ultrasonic cleaner and then dried. The initial weight was measured using an electronic balance having a least count of $1 \times 10^{-3}\text{g}$. The samples were then mounted on the specimen holder and pressed against the chlorobutyl rubber wheel using a lever arm with a specified force while controlled flow of abrasive particles abrades the surface. The chlorobutyl rubber wheel of thickness 12.7 mm rimmed on a 228 mm diameter wheel. The wheel was rotated at a speed ranging from 200 to 1000rpm at an approximate sliding velocity of 0.83 to 4.16 m/s. Static force of 5, 10, 15 and 20 N were applied on specimen using dead load on the load arm. The pivot axis of the lever arm lies in-plane, tangential to the rubber wheel surface and normal to the horizontal diameter along which the load was applied and moisture free silica abrasive particles were passed between the specimen and the rubber wheel. The specimen holder was designed to ensure that wear scar location remains the same, even after

removal and replacement of samples. The abrasive feeding system consists of a hopper that allows silica sand to fall under gravity through the nozzle onto a rubber wheel. The rubber wheel was rotated by a motor through timer belt and the speed of the motor determined the discharge rate of silica sand. The experimental conditions are summarized in Table 2.

Table 2. Test conditions.

Test variables	Test parameters
Load	5 N, 10 N, 15 N, 20N
Rotational speed of rubber wheel	(200 $\pm$ 5) rev/min (V = 2.4 m/s)
Diameter of rubber whe	228.6mm
Abrasive particles	Silica sand, angular
Abrasive size	(150–250) μm
Sand Flow rate	(250 $\pm$ 50)g/min
Size of the specimen	(75 $\times$ 25 $\times$ 5)mm ³

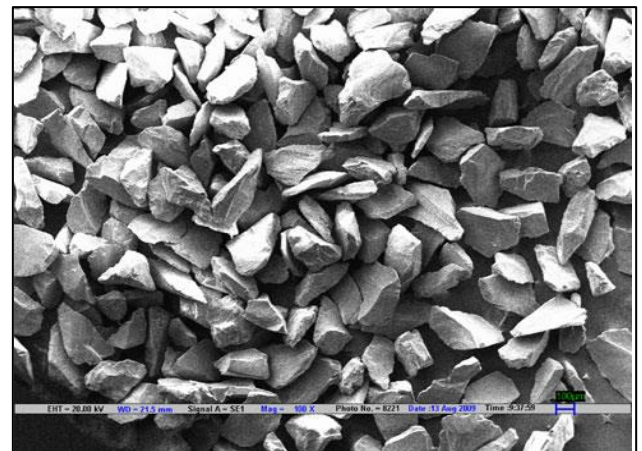


Fig. 3. SEM of Silica sand

The scanning electron micrograph of silica sand used is shown in fig.3 which displays the morphology of the

abrasive particles. All tests were performed in a dry environment at laboratory room temperature. Each abrasion test lasted for 5 minutes. After completion of each test the specimen was removed from the holder, cleaned in acetone and weight loss measurements were recorded. This procedure was repeated until the abrasive wear rate attains a steady-state value. Wear volume were computed from the weight loss measurements. The same test procedure and conditions were maintained and new samples were taken for every set of applied load, sliding speeds and abrasive particle sizes.

Wear volume (ΔV), wear rate (W_r) and specific wear rate (K_0) were calculated from the following equations.

$$\Delta V = \frac{\Delta m}{\rho} (\text{mm}^3) \quad (1)$$

$$w_r = \frac{\Delta V}{M_a} \left(\frac{\text{m}^3}{\text{g}} \right) \quad (2)$$

$$K_0 = \frac{\Delta V}{Ld} \left(\frac{\text{m}^3}{\text{Nm}} \right) \quad (3)$$

Where Δm is the mass loss (gm), ρ the density of the test material (gm/cc), M_a the mass of the abrasive (gm), ΔV the volume loss (mm^3), L is the load (N) and d the sliding distance (m). Typical wear scars of the abraded specimens are shown in Fig. 4.



Fig. 4. Typical appearance of wear scar of the specimens at different loads

According Zum Gahr [8], the rate of material removal in three-body abrasion can be one order of magnitude lower than that of two-body abrasion. This is due to the loose abrasive particles abrade the solid surfaces for only about 10% of the time between which they are situated while they spend about 90% of the time in rolling. Figure 5 shows the schematic representation of different zones on the wear scar under three-body abrasive wear test condition.

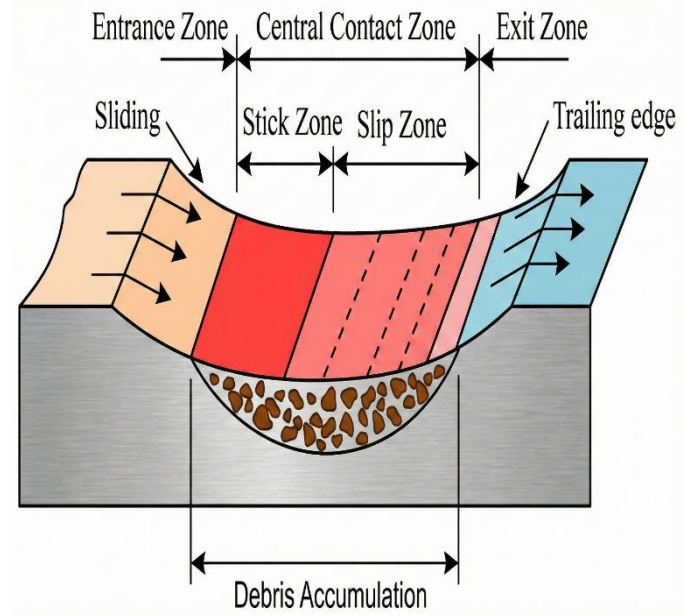


Fig. 5. Schematic representation of different zone on the wear scar

The wear scar has three different zones: an entrance zone where abrasive first come into contact with specimen, central zone in which particle may roll as well as slide and an exit area where abrasive particles leave the specimen. The entrance and exit areas subjected to multiple indentations by angular abrasive particles, whereas in central zone the angular particles have a rolling component to their motion across the specimen surface and it creates repeated contact on the loading surfaces. These may lead to localized fatigue damage and removal of the material surface.

3 Results and Discussions

3.1 Effect of cenosphere on abrasive wear behaviour of glass-jute epoxy composites

The experimental results of the three-body abrasion wear test for different weight percentage of cenosphere filled hybrid glass-jute (GJJG) epoxy composite at various loads and sliding distances were found out. The variation of abrasive wear volume, wear rate and specific wear rate of cenosphere filled hybrid glass-jute (GJJG) epoxy composites at different applied loads (5-20N varied in steps of 5N at contact pressures of 1.89, 3.78, 5.68 and 7.6 N/cm^2 respectively) for various developed abrasive specimens are shown in figures 6-8. It is observed from the graphs that for all the hybrid composites used in this study there is a near linear wear volume loss with respect to applied load. The highest wear rate is found to be for hybrid glass-jute (GJJG) composite without cenosphere particle with a value of $0.77 \text{ mm}^3/\text{g}$ at 20N and the lowest

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for 20wt.% of cenosphere filled GJJG composite of value $0.21\text{mm}^3/\text{g}$ at the same load. It is also observed that the wear rate of 5wt.% cenosphere filled hybrid composite is more than that of 20wt. percentage filled hybrid composites. This is due to the higher matrix-filler interaction and better adhesion between the fiber, matrix and filler in the developed composites [9].

Figures 9-11 show the variation of abrasive wear volume, wear rate and specific wear rate of cenosphere filled hybrid glass-jute (GJJG) epoxy composites as a function of sliding distances for different composites. For all the composites tested, it is observed that the specific wear rate decreases with increase in filler content. At all loading conditions, the highest specific wear rate is for 5wt.% of cenosphere filled glass-jute (GJJG) composite with a value of $3.853 \times 10^{-11} \text{m}^3/(\text{N m})$ and the lowest value of $2.22 \times 10^{-11} \text{m}^3/(\text{N m})$ for 20wt.% of cenosphere filled composites for abrading distance of 2292m. The specific wear rate strongly depends on the applied load and abrading distance for all the developed composites. The phenomenon of decrease in specific wear rate is due to the fabric nature and the presence of glass fiber at outer surface of composites. This is also attributed to the fact that at lower abrading distance low modulus matrix was exposed and at higher abrading distance high modulus fiber was exposed to abrasion [10].

This can further be explained by the fact that when the abrasive particles get entrapped between the rubber wheel and the composite samples, due to high stress of the hard abrasive particles, ploughing action takes place on the sample surface leading to removal of more matrix material. The lowest wear rate is due to the presence of higher cenosphere wt. percentage on the surface of the developed composite that act as an effective barrier to prevent the large-scale deformation of the epoxy matrix. The higher filler loading into hybrid glass-jute composites is thought to create a hard surface and this results in reduced wear loss in developed composites. Severe damage to the fiber and epoxy matrix is the primary reason for the higher wear rate using silica as abrasive in most of abrasion wear. This is because abrasive particles can be embedded on the softer surface and groove the harder one. More debris and micro cracks in the matrix were obvious due to deformation of the softened matrix under high contact pressure.

Chand N. and Naik A.M. *et al.* [11] observed that glass fibres provide better resistance against abrasive wear, which is reflected from the present study and high weight fraction of glass fibres in the composites show less wear loss as compared to composites containing less glass fibres. In the present work also, similar observations were found which are in agreement with the findings reported in the literatures [11,12].

3.2 Worn surface morphology of abraded surfaces

In order to understand the details of abrasion wear mechanisms of cenosphere filled hybrid glass-jute (GJJG) epoxy composites of specific fibre orientations, advanced optical micrographs of worn surfaces at various loads are shown in figures 12-13.

Figures 12(a) and (b) shows the micrographic study of abraded hybrid glass-jute (GJJG) epoxy composite. Damage is caused to the specimen surface by sliding the abrasive particles. It is also observed that cracks are developed along the matrix surface due to application of loads. Small grooves are also found on surface.

From figure 13(a) it is observed that at higher load (20N) and low cenosphere content (5wt.%) the fibres are exposed from glass-jute composites while abraded along the surface. From figure 13(b) it is found that when cenosphere amount increases to 20wt.% at the same load, there is less damage to the composite and matrix surface indicating improved resistance against abrasion. Matrix debonding and expose of fiber at the interface is not visible. This might have happened due to higher weight percent (20wt.%) cenosphere particles which are distributed evenly on the specimen surface. Hard cenosphere particles abrading time is more than the glass fiber, hence are not exposed so easily.

4 Conclusions

From abrasive wear studies of cenosphere filled woven hybrid glass-jute (GJJG) epoxy composites, the following conclusions are drawn.

1. Abrasion resistance of unfilled and filled glass-jute epoxy composites strongly depends on the experimental test parameters such as applied load, sliding speed and abrasive particle size.
2. Cenosphere filled hybrid glass-jute (GJJG) epoxy composites showed high abrasion resistance than unfilled composites.
3. The abrasive wear volume increases with increase in filler content. Inclusion of cenosphere in developed composites is found to be beneficial for resisting abrasion wear of glass fiber.
4. Microscopic studies of worn surfaces support the involved mechanisms and indicate that distribution of cenosphere particles on the composite surface increases the abrading resistance of the developed composites.
5. research, authorship, and/or publication of this article.

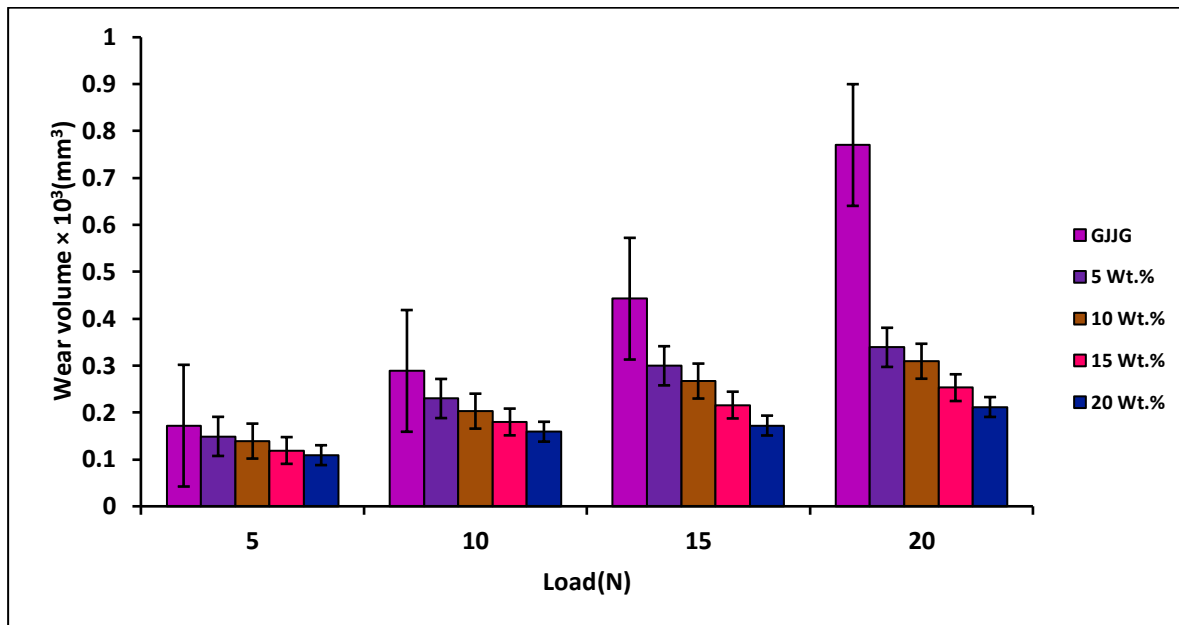


Figure 6: Variation of wear volume with respect to loads (N) for different cenosphere weight percentage of abraded hybrid glass-jute (GJJG) epoxy composites

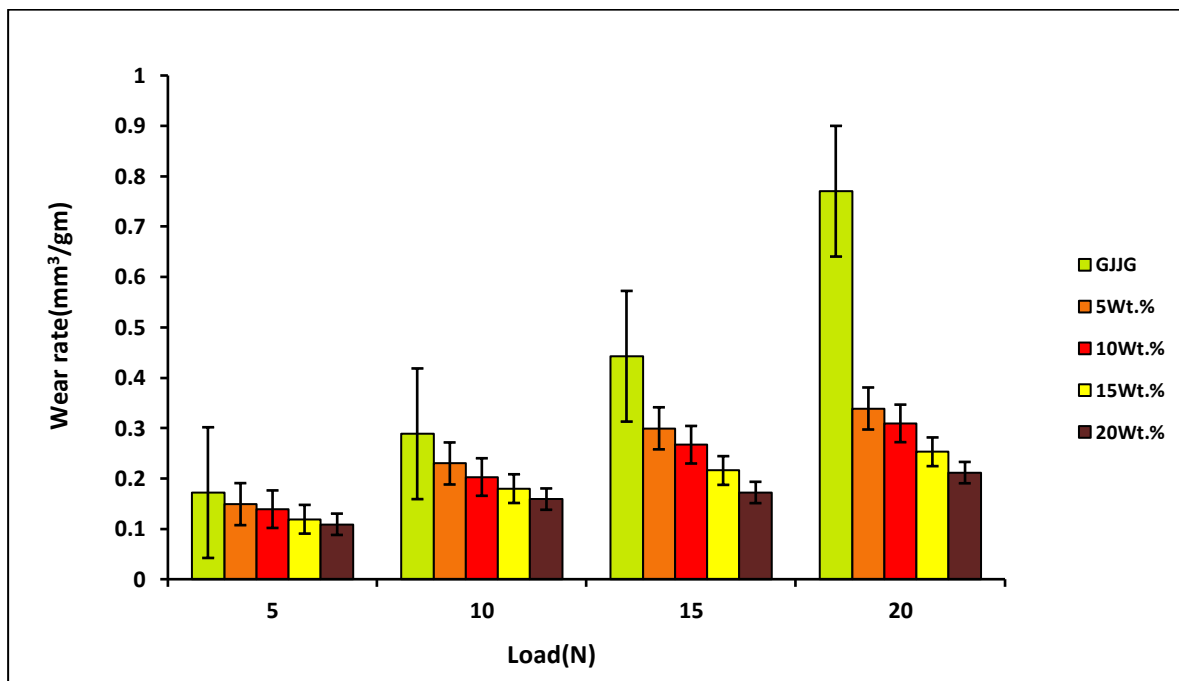


Figure 7: Variation of wear rate with respect to loads (N) for different cenosphere wt. percentage of abraded hybrid glass-jute (GJJG) epoxy composite

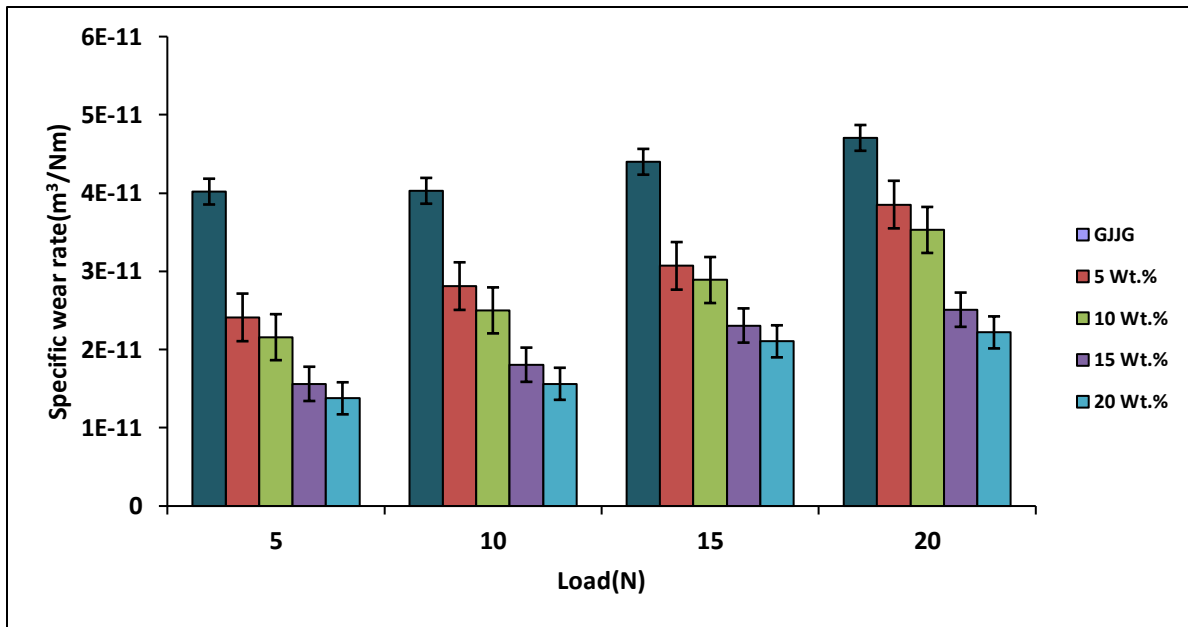


Figure 8: Variation of specific wear rate with respect to loads (N) for different cenosphere weight percentage of abraded hybrid glass-jute (GJJG) epoxy composites

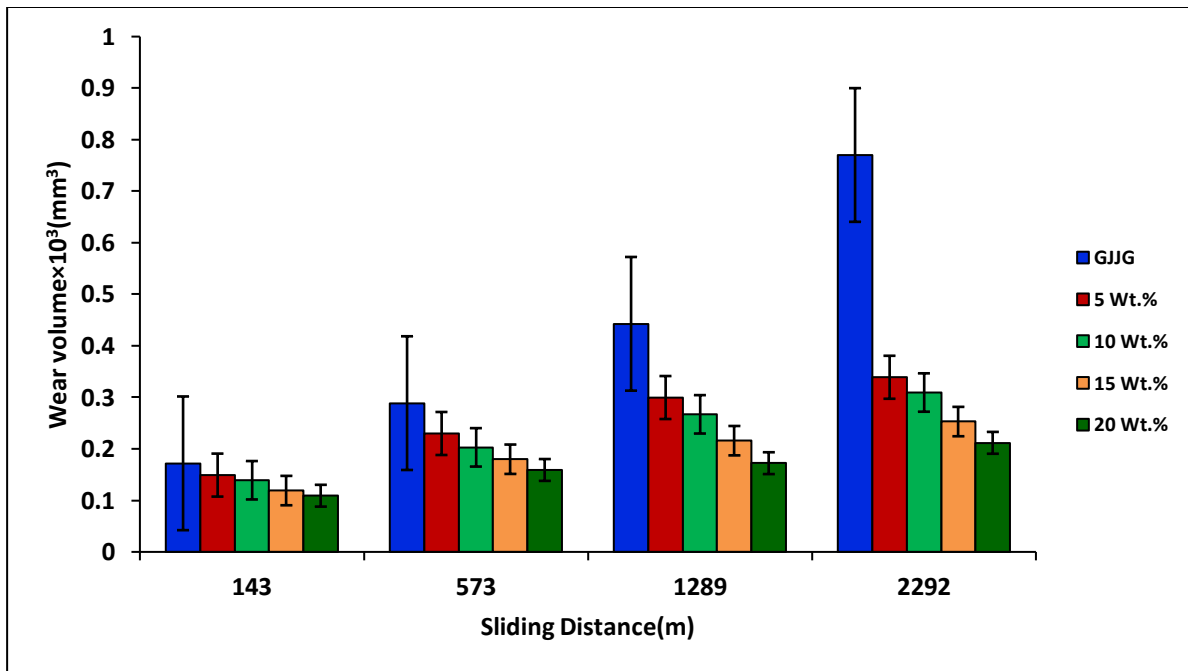


Figure 9: Variation of wear volume with respect to sliding distances (m) for different cenosphere wt. percentage of abraded hybrid glass-jute (GJJG) epoxy composites

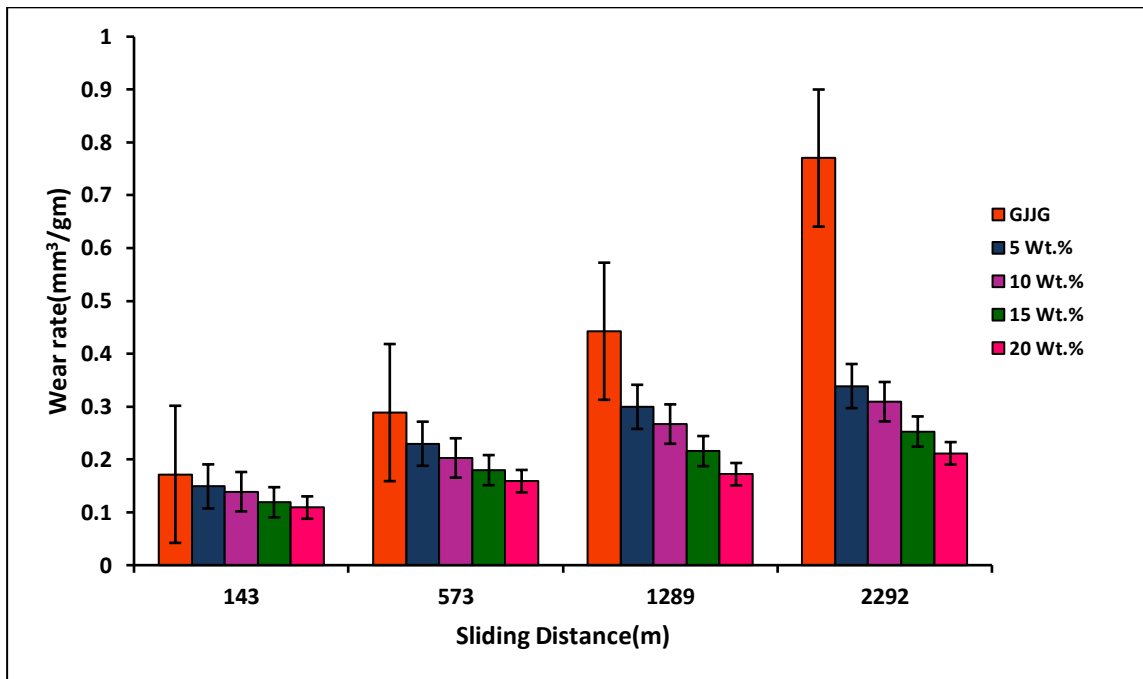


Figure 10: Variation of wear rate with respect to sliding distances (m) for different cenosphere wt. percentage of abraded hybrid glass-jute (GJJG) epoxy composite

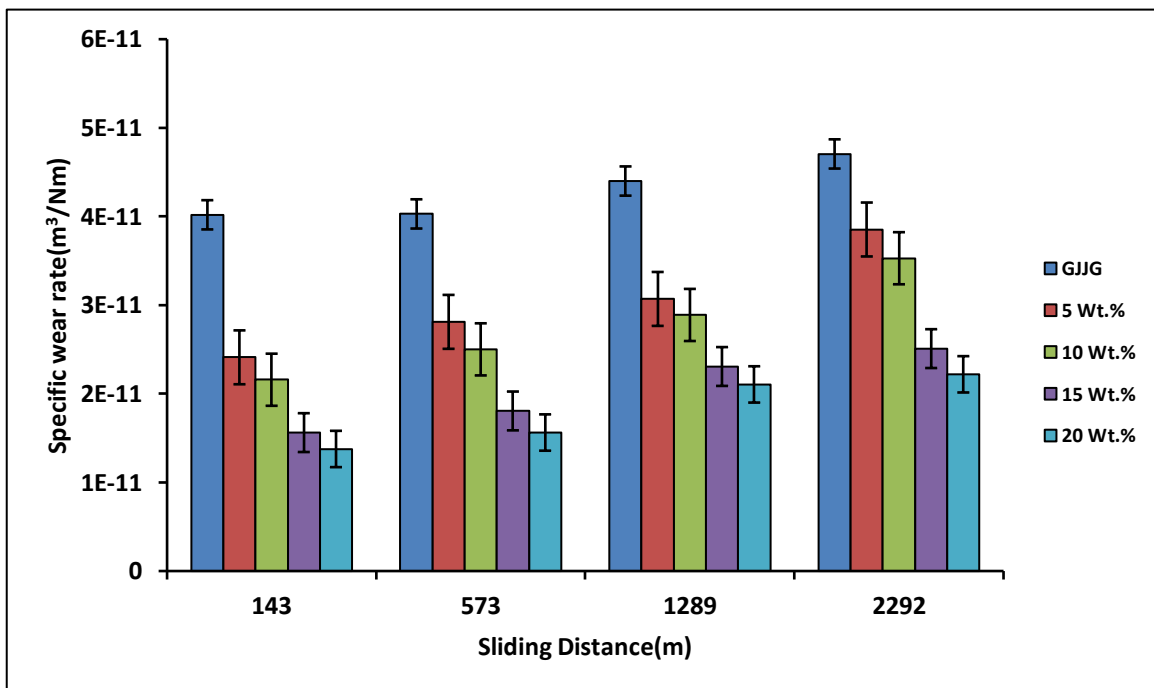


Figure 11: Variation of specific wear rate with respect to sliding distances (m) for different cenosphere wt. percentage of abraded hybrid glass-jute (GJJG) epoxy composites

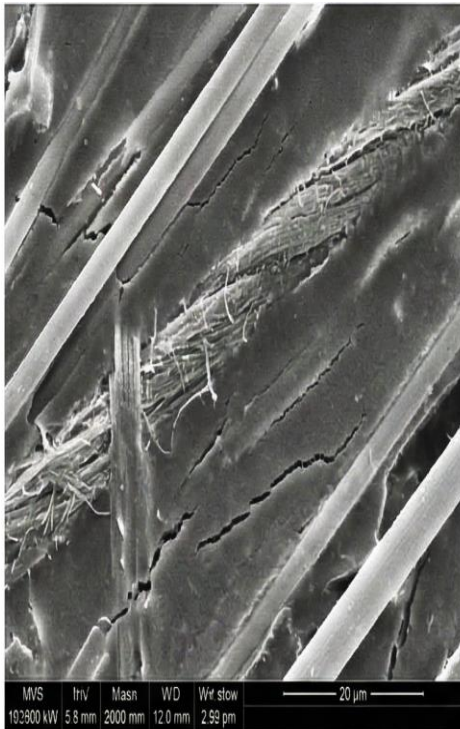


Fig. 12(a) Micrograph of hybrid GJJG composite at load 10N

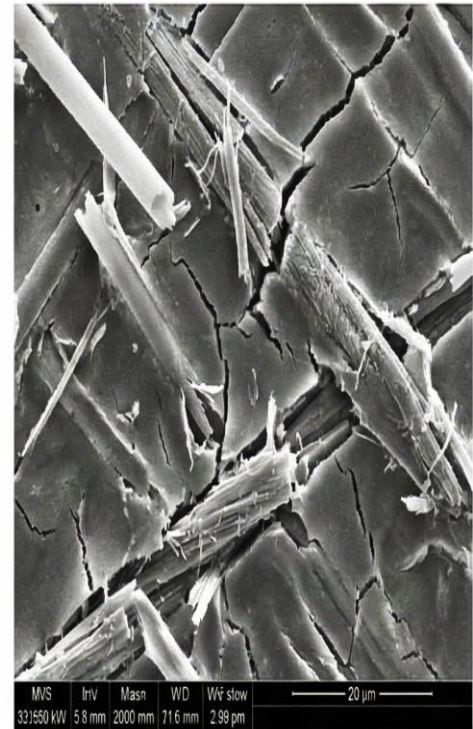


Fig. 12(b) Micrograph of hybrid glass-jute (GJJG) composite at load 20N

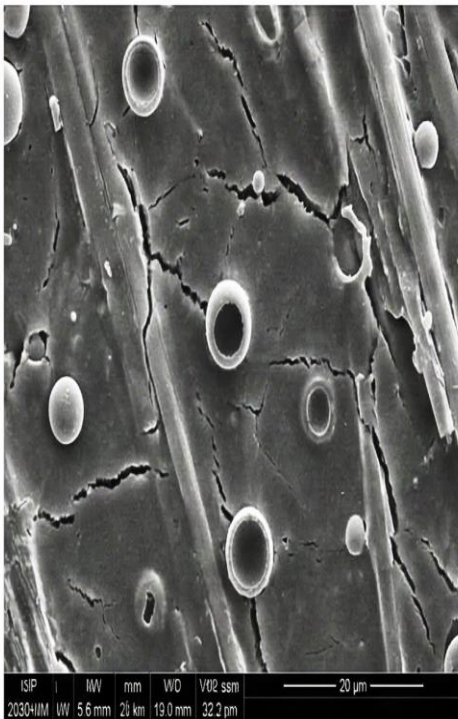


Fig. 13(a) Micrograph of 5wt.% cenosphere filled GJJG composite at load 20N

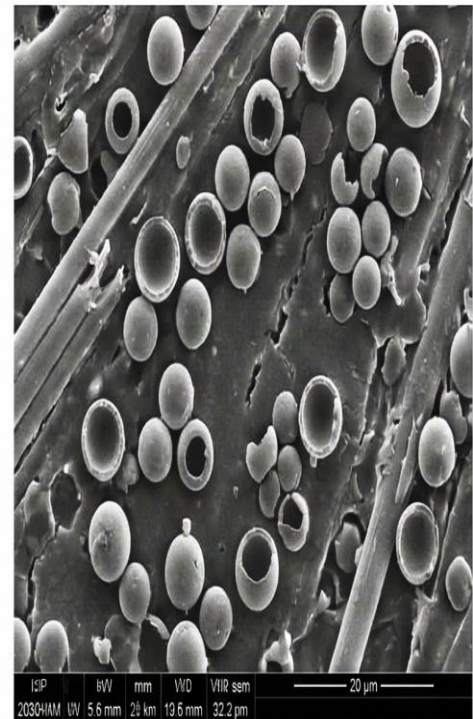


Fig. 13(b) Micrograph of 20 wt.% cenosphere filled GJJG composite at load 20N

Bibliography

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Content: The content of article is maintaining author identification, names, title, publication, Date of Indexing (DOI), Ordering. The article maintaining proper format and order of IEEE Template guidelines i.e. Title- 14 pt, Abstract: 11 pt, Heading: 12pt, Body: 10Pt

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Role of Nanotechnology in Breast Cancer Treatment and Management: An Evolving Demands, Health Challenges, And Opportunities for Society at Socioeconomic Levels**Prof. (Dr.) Rashmi Bhardwaj¹, Ms. Monalisa Pattanayak², Mr. Shivam Khamari³, Dr. Rajani Agrawalla⁴
Mrs. Sani Rath⁴**¹Professor and Dean, Research, Guru Gobind Singh's Indraprastha, University, Dwaraka, New DelhiEmail Id: rashmib@ipu.ac.in²Assistant Professor, at Department of Basic Science and Humanities, MITS, Raygada,Email Id: monalisa@mits.edu.in³ Assistant Professor, Swami Vivekananda Institute of Management, Baniatangi, KhordhaEmail Id: shivamkh20@gmail.com⁴ Assistant Professor, Centurion University of Technology and Management, Bhubaneswar, Odisha, India,Email: rajaniagrawalla220@gmail.com, ORCID 0009-0005-4746-6953.⁵ Assistant Professor & IQAC, Swami Vivekananda Institute of Management, Baniatangi, KhordhaEmail Id: sanirath594@gmail.com ORCID ID: 0009-0009-3618-2954**Abstract**

Breast cancer is one of the predominant malevolent diseases worldwide in females. Still, conventional drug dosage is far less than the optimal ratio, as demonstrated through the high mortality rate of women with this cancer—one of the prospective future therapy to alleviate the effects of breast cancer nanomedicine. Nanomedicine drugs, i.e., Doxil® and Abraxane®, are commonly used for adjuvant therapy that is currently providing a promising clinical result. However, such drugs were initially supposed for anticancer treatment and not expressly for breast cancer treatment. In recent years, various new and successful nano-therapeutic methods and instruments have been invented with a more in-depth insight into molecular biology related to this cancer. The present study will first provide an outline of breast cancer's existing treatment, the revised status of Nano medicine's therapeutic use. Then it addresses the latest significant trends in the advancement of nanomedicine. That includes passive and active breast cancer cell targeting, stem cell targeting of breast-cancer, tumor microenvironment-based nano-therapy, and drug-resistant mono-therapy mixture. We will come across; antitumor gene effect, anti-metastasis effect, and drug tolerance reverse effect of making more advances in cancer specificity. Researchers will come through; antitumor gene effect, anti-metastasis effect, and drug tolerance reverse effect of making more advances in cancer specificity. This article also addresses nanotechnology's uses for the treatment of tuberculosis, the therapeutic use of nanotechnology in functional dentistry, ophthalmology, anesthesia, visualization, tissue engineering, antibiotic resistance, and immune reaction. At even earlier levels, nano pharmaceuticals can be used to classify diseases.

Key words: Nano medicine, drug therapy, breast cancer, targeted delivery, drug resistance, microenvironment**1. Introduction**

The twentieth century was revolutionized by nanotechnology and applications in the field of drugs and pharmaceuticals. The analysis of incredibly tiny structures is carried out using nanotechnology [1]. A comparatively recent discipline of science and technology is nano medicine [2]. The "Nano" belongs to the Greek term meaning "dwarf.", and the Greek word "nano" implies scale, which is used for very small or micro.

Nanotechnology is the science of incredibly tiny structures ranging 0.1-100 nm in dimension; however, it is often inherent to that materials, due to their limited scale, can possess distinct properties, such as electrical conductance, chemical reactivity, magnetism, optical effects, and physical resistance, from larger particles. Thus, it can be used for many

applications and develop different forms of nanomaterial's and Nano devices [3, 4]. Use A4 paper size (210 x 297 mm) and adjust the margins to those shown in Table 1. The final printed area will be 172 x 252 mm.

2. Literature Review:

In this section, we the researcher have taken nineteen references of previous publications (Journal and Books, Magazines etc.) of various authors and carefully studies of their experiments and findings as related with the aforesaid research title "Nanotechnology in breast cancer treatment and management: an evolving demands, health challenges, and opportunities for society at



International Journal on Scientific Research, Engineering, Science, Technology, Humanities and Advanced Knowledge of Management (SRESTHAKAM)

socioeconomic levels". In connection, with, we the researcher has trying to justified our experiment and research in difference from them .according to I.S. Glück, F. de Snoo, et al Breast Cancer Research and Treatment. 2013; 139, 759–767, [1]more focused on Chemo Therapeutic Treatment rather than Operation, but we the researcher used Nano-Particle and technology for breast cancer Operation.

Similarly, we also took consideration of careful observation the previous findings of author from Reference [2]. [3], [4],[5]and [6] , where they advocates for use of Nano medicines along with execution of Image therapy and successful therapeutic procedures for treatment of breast cancer which is more success they expected 02% but we the researcher expected more % of curable of breast cancer treatment than previous recommendations by various doctors as reference from [7-15] . According to I. Capek et al.; Polymer decorated gold nanoparticles in Nano medicine conjugates. Advances in Colloid and Interface Science.2017; 249, 386–399, [7], in breast cancer treatment polymer decorated gold

Nanoparticles are so useful for prevention and treatment of Breast cancer in Stage II and III .According to Ruiz A., et al.; surgical resection versus systemic therapy for breast cancer liver metastases: Results of a European case-matched comparison. Eur. J. Cancer. 2018; 95:1–10 and other [15-19], it is easy to understand about the surgical resection versus systematic Therapy for breast cancer liver treatment is so useful and having a better result of breast cancer recovery patients.

However, we the researcher have motivated to do our research work on the basis of obtained knowledge from published sources of previous authors suggestions and recommendations and trying to our level best for proving that , use of Nanotechnology in breast cancer treatment and management is expected to be more fruitful than other mode of therapy treatment.

1959	R. Feynman developed the thought process
1974	For the first time, Taniguchi introduced the term nanotechnology.
1981	IBM Scanning and Tunneling of Microscope
1985	"Bucky Ball"
1986	A book on "nanotechnology Engines of Creation" published by K. Eric Drexler, Atomic Force Microscope
1989	IBM logo developed with the binding of individual atoms.
1991	S. Iijima first time came to know about Carbon Nanotube.
1999	1st Nanomedicine book by R. Freitas "Nanomedicine" published
2000	For the first time, the National Nanotechnology Initiative was launched
2001	Development of the theory of nanometer-scale, electronic devices, and synthesis and characterization of carbon nanotubes and nanowires. Feynman Prize in Nanotechnology was also awarded this year first time.
2002	Nanotechnology Feynman Prize was given for utilizing DNA to function the self-assembly of structures.
2003	Feynman Prize given to the model of structure of molecular electronics of various materials. That integrated individual-molecule biological motors.
2004	The initial conference on nanotechnology policy held. The first center of Nano mechanical systems established; Feynman Prize given to design the stable protein structures and for making novel enzyme using different function.
2005-2010	3D Nano systems such as; robotics, 3D networking, and nano products change their form when its application prepared.
2011	The new era of molecular nanotechnology begins.

3. History of Nano-technology :

The research in nanotechnology dating back from 1958 and different phases of development is outlined in Table 1 below n [5]. The nano-scale and nanostructures nano-scale position where the most familiar objects' features are defined just ahead of the atom's size. Items with nano-scales having a minimum of one dimension (height, weight, depth) measuring 1-999nm. The brief description of the role of nanotechnology in pharmaceuticals, as illustrated in the diagram (Figure 1), is divided into two specific forms of Nano tools: Nanotechnology is explored in-depth in various areas such as health, medicine, electronics, electricity, and the atmosphere. Nanoparticle uses in drug delivery, cancer, protein, and peptide delivery are explained. In cancer therapy, applications of different Nano systems such as carbon Nanotube, dendrites, Solid lipid nanoparticles, Nano crystal, Nanowire, Nano shells, Liposomes, etc., are given [6,7]. In treating degenerative neuron diseases like Parkinson's, and Alzheimer's. Nanotechnologies advancement help [8; 9].

Table 1. Scientific Development of Nano Technology

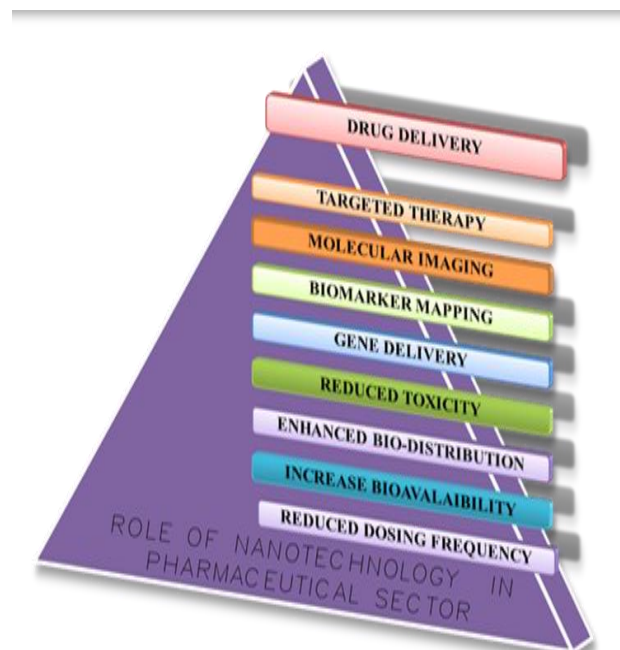


Fig.1. Role of Nanotechnology in Pharmaceutical Sector

The treatment of specific atoms, molecules, or substances into systems for developing products and devices with unique properties is nanotechnology. It includes top-down work, i.e., minimizing large objects' scale to the smallest shape, e.g. photonics, top-down or bottom-up applications nano-electronics nano-engineering, which involves

converting individual atoms, molecules in nanostructures, and even stronger approaches in biology chemistry.

4. Research Objectives

Researchers have taken the following Objectives to rest and examine the use of Nano Technology in breast Cancer treatment and its effect, such as:

- ❖ To use Nanotechnology while anatomy of Breast Tissue
- ❖ To use Nanotechnology based on particles and medical instruments in order to examine the symptoms of Breast cancer.
- ❖ To examine the sign and symptoms of Breast cancer and its causes
- ❖ To study various risk factors of Breast Cancer through Nano Technology mode of Operation.
- ❖ To study and examine various symptoms of Breast Cancer and its Grading, Stages, and treatment through the application of Nano Technology
- ❖ To test and examine various Nano-medicines, how useful and effective pre and post-stage Breast cancer treatment.

5. Hypotheses:

The researchers have done their research work using research methodology to prove the related research problem taken by the previous Researcher. But here, we have taken two hypotheses to examine the effect of the use of nanotechnology in breast cancer operation such as:

Ho: Null hypothesis has taken by researchers for justifying whether the use of nanotechnology Particle in breast cancer operation is effective or not?

Here, the Null hypothesis refers that Breast Cancer treatment is not curable by using (Use of Nano Technology /particle of weapons /things) nano-technology mode of Operation. At the same time, doctors operate on breast cancer in various cancer hospitals throughout the world.

H1: Alternative hypothesis: The use of Nanotechnology/particle in breast cancer cell treatment is more effective and curable while patient will be operated by doctors in various cancer hospitals in the world.

6. Hypothesis Testing

In this section, the researchers have taken 200 women cancer patients, 200 Doctors, 200 Nurses, and 200 Lab, Technician's response from 200 cancer hospital the world; based on their answers; the Researcher has tasted the hypothesis on this way of the respondent data table that From this data table, the Researcher has concluded that in stage -1, 45.12 Patients have been cured using

nanotechnology particles are highly appreciative.
Thus, we can reject or exclude the null hypothesis

by accepting an alternative view at the levels of
alpha 0, 01 level and 0.05 Level.

Table 2.Refers to the response data as related to breast cancer treatment

Respondent s	No.of curable Stage-1	No of Not curable Stage-4	Use of Nanoparticle/ Technology	Mean value
Patients	104	96	200	52.00 (Stage-1)
Doctors	92	108	200	
Nurses	86	114	200	
Lab. Reports	79	121	200	
Total	361	439	800	45.1 2

Figure 2. Refers to the Bar graph of respondent's related to breast cancer treatment

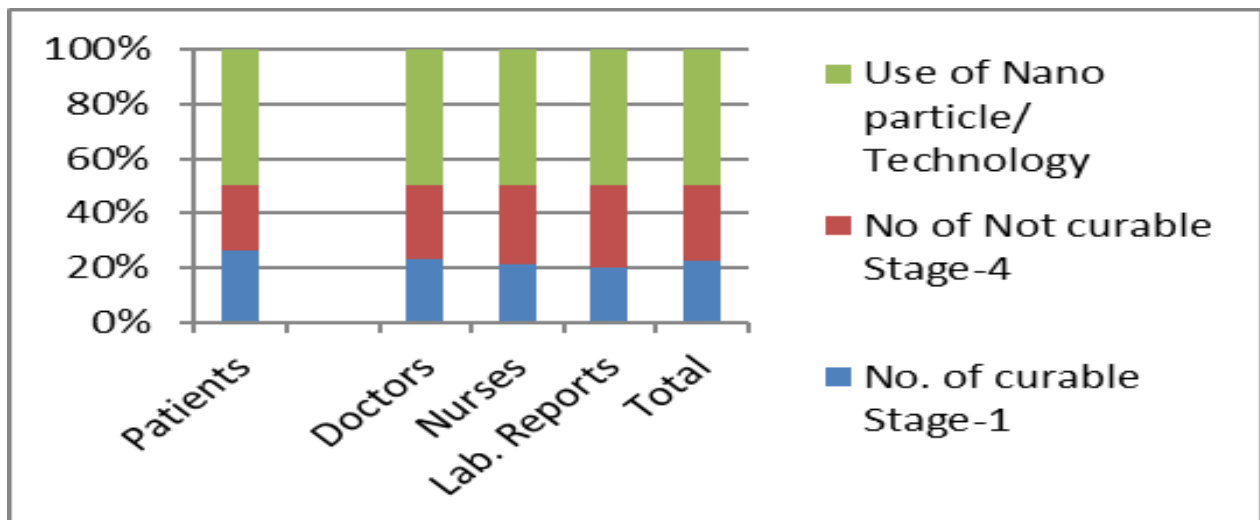
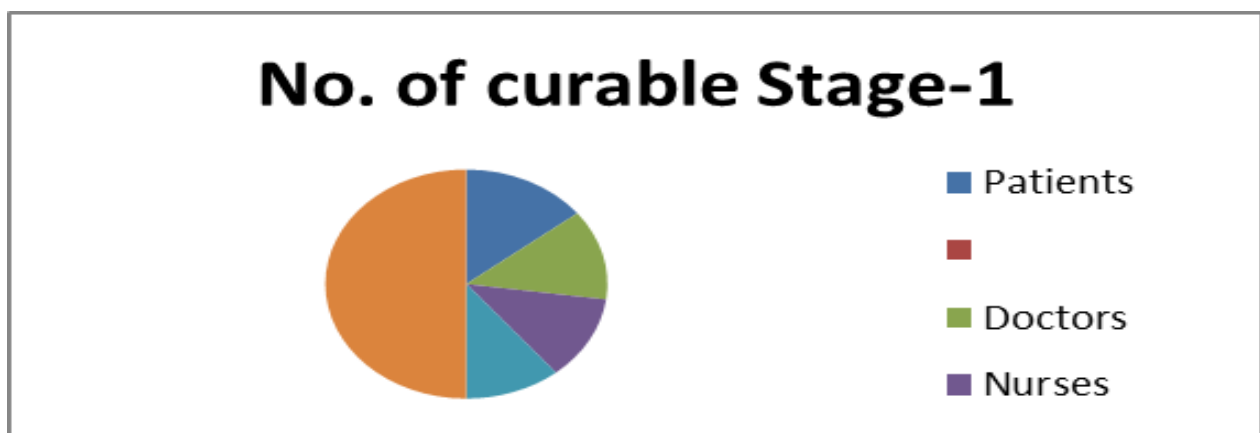


Fig. 3. Refers to the Semiotic Models of respondents in Pie chart



7. Breast Cancer

Breast cancer is one of the types of cancer disease in the breast of women when the breast tissues have become abnormal. In other words, when tissue mass is irregular, and its development dominates and uncoordinated to that of normal tissues and continues the same way after the cessation of stimulus that evoked the variations in the breast part. In other words, we can say Breast cancer is that cancer that originates in the breast tissue [10].

Over the past few years, breast cancer has risen as one of the most damaging cancer, producing millions of new cases per year. Not only is breast cancer restricted to women, but it also accounted for 0.8-1% of male patients [10], and nanotechnology-based-therapeutic approaches increasingly acceptable to improve therapeutic efficacy and reduce unwanted effects associated with corporate anticancer payload in breast cancer [11].

8. Structure of Breast Cancer

Generally, Breast cancer occurs when various Peculiar symptoms are visible in the structure of the Breast, such as:

- a) Breast cancer is one cancer originating from the breast tissues which grown peculiarly.
- b) Changes in tissue and look like an excessive amount of tissue structure; the expansion exceeds which is uncoordinated to other tissues. It continues similarly after the termination of spurs that aroused the change.
- c) It is one of the types of cancer specifically originates in the breast tissue of women.
- d) Breast Cancer occurs when changes in the sweat gland in Peculiarly such as and it lies in the deep in between pectoral Fascla.
- e) Changes in shape and boundaries feeling pain in Breast and tingling in Upper portion of nipple and feeling pain, sometime it may be a pulse, etc. (please see the Structure of Breast in figure 4 for details) [12,13].

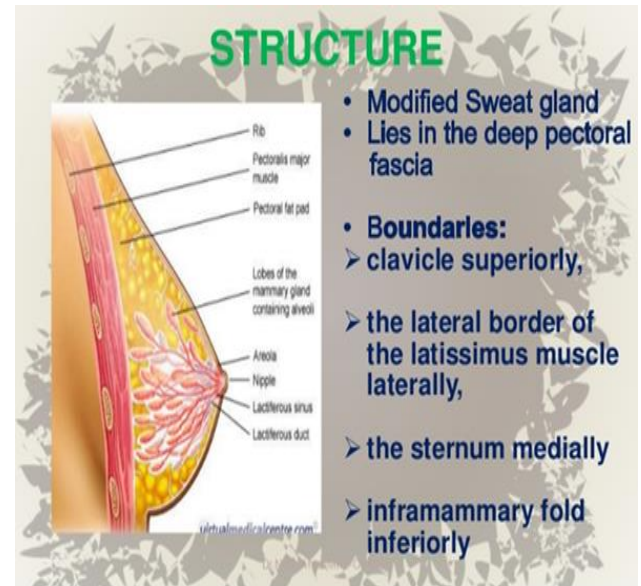


Fig. 4. Shows to the structure of women Breast leads to cancer

9. Types of Breast Cancer

Two most frequent types: “Ductal carcinoma” in situ, invasive ductal carcinoma, is recurrent cancers, and ‘metastatic breast cancer’ is among the forms of breast cancer [14, 15, and 16].

Metastatic Breast Cancer

It is one type of Breast Cancer that occurs in the anomalies of tissue cells. Metastatic breast cancer is often known as breast cancer in Stage 4. At this stage, the disease has spread to various body sections. The lungs, kidneys, bones, or cortex are typically included in this [16].

9.1 Metastatic Breast Cancer:

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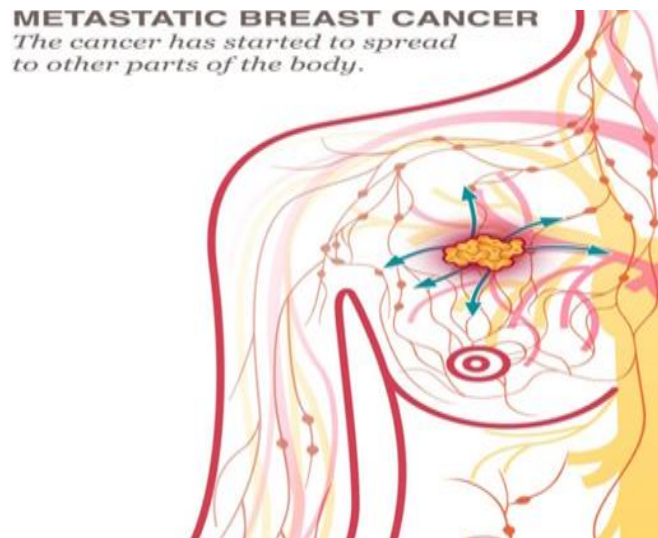


Fig. 5. Refers to metastatic Breast cancer

9.1.1 How does cancer spread or metastasize?

The expansion of breast cancer normally appears through one or more of the following steps:

9.1.2 Cancer cells invade nearby healthy cells.

When healthy cells are taken over and replaced by uncharacteristic cells.

9.1.3 Cancer cells penetrate into the circulatory or lymph system.

Cancer cells travel through the walls of nearby lymph vessels or blood vessels.

9.1.4 Migration through circulation

Cancer cells carries through lymph system and the bloodstream to other parts of the body.

9.1.5 Cancer cells lodge in capillaries

Cancer infected cells become static when stiff at a considerable distance into the capillaries. The divides and drift into the other nearby tissue.

9.1.6 New small tumors grow

Cancer cells form small tumors at the new location [15] (called micro metastases.)

- Non-invasive: ductal carcinoma in-situ lobar carcinoma in-situ [16]

Invasive: Invasive ductal carcinoma Invasive lobar carcinoma

- Inflammatory breast cancer
- Phyllodes tumour

9.1.7 Symptoms of Metastatic Breast Cancer (MBC)

The symptoms may not be same in every patient, it relies upon how much the breast cancer has spread and what type of tissue the new cancer growth has invaded. All symptoms should be reported to your physician.

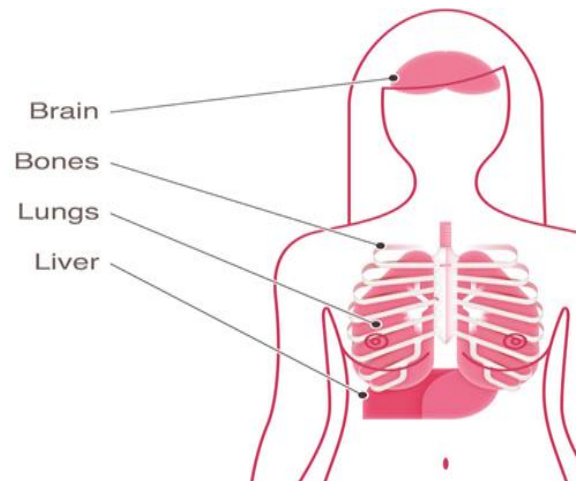


Fig. 6. Refers to the symptoms of metastasis: it also differs liable to the location where cancer has spread

Following are common symptoms that may not be uniform to every patient but frequently recognized in the patient of breast cancer metastasis.

a) Metastasis in the bone may cause [17]

- Severe, and progressive pain
- Constant swelling in the Breast
- Soft bones, likely to be fractured or broken easily.

b) Metastasis to brain may cause

- Patient having feeling pain and persistent, progressively worsening headache or pressure to the head
- Seems vision disturbances and eyesight become poor day to day
- Feeling Seizures, vomiting, and nausea
- Behavioural and personality changes
- Feeling excessive headache and pain at the head and breast region

c) Metastasis to the liver may cause[19]

- The patient Suffers Jaundice frequently
- Itchy skin or rash on the breast reason
- Abnormally high enzymes in the liver
- Abdominal pain, appetite loss, nausea, and vomiting

d) Metastasis to the lungs may cause [20]

- Chronic cough and difficulty to get a smooth breath
- Abnormal chest X-ray
- Feeling Chest pain Regularly

Other nonspecific systemic symptoms of metastatic breast cancer are; fatigue, loss of weight, or less appetite. Along with this disease, such symptoms can also be caused due to medication and depression.

9.2 Ductal Carcinoma In Situ (DCIS) [16, 21]

It is a non-aggressive breast cancer in which irregular cells formed in the tunnels of milk duct. Peculiar cells do not disperse through the underlying breast tissue outside the ducts. Ductal carcinoma in situ is the breast cancer of initial stages, which is easily treatable. Although it may expand through the underlying breast tissue if left unchecked or undetected.

9.2.1 What does “in situ” mean?

The initial stage of breast cancer is referred to as “carcinoma in situ.” Carcinoma means “cancer,” and in situ means “in the original place [21]”.

9.2.2 Signs and Symptoms [21, 22]

Breast cancer has the following symptoms when a patient has reported to a doctor such as:

- Lumps occur in Breast
- Changes breast size and shape day by day
- Patients breast skin dimpling and feeling pain
- Breast nipple inversion and spontaneous changes in its colour either shadow blackish or a little bit red
- The patient’s Breast changes her texture and skin from time to time
- Plus/Liquid occurs in the Breast, and she has feeling excessive pain

10. Complications associated with Conventional Therapies

While there are various options available, many of them have serious side effects. Tamoxifen, a hormone treatment, is related to severe side effects and risks, including a 2.4-fold elevated risk of endometrial cancer in women over 50 [23] and a 1.9-fold increased risk thromboembolic complications (Fisher et al., 2005). Even though targeted treatments have proven to have a substantial beneficial impact in several clinical trials [24], they are associated with severe side effects. Trastuzumab, alone or in conjunction with chemotherapy, has been linked to severe cardiac problems such as ventricular dysfunction and congestive heart failure, as well as common flu-like symptoms (Slamon et al., 2001).

11. Use of Novel Nanotechnology in Breast Cancer Treatment or Management

Nanotechnology is being used in many of the formulation mentioned above approaches, and it is having a positive impact on nearly every industry, including healthcare. Although nanotechnology in medicine appears to be a new trend, the basic nanotechnology approaches for medical applications have been around for decades.

Nanotechnology has been proposed to minimize dose quantity and frequency while retaining a similar pharmacological profile and fewer side effects. This may be attributed to nano-carriers' ability to deliver inside confined tissue. Carbon nanotubes, micelles, dendrimers, metallic nanoparticles (NPs), nano-crystals, quantum dots, polymeric NPs, and lipid-based nano-carriers such as liposomes, nano-some SLN, and NLC are only a few examples of nano-systems. The benefit of nano-systems is their compact scale, enabling them to push through biological barriers like the blood-brain barrier (BBB) [25, 26].

11.1 Liposome

In 1965, the first lipid vesicles, later known as liposomes, were described; in 1976, the first sustained-release polymer system of biomolecules was described; in 1994, the first long-circulating stealth polymeric nanoparticles were described; in 1998, the first quantum dot bio-conjugate was told; and in 2001, the first nanowire nano-sensor was described. It has become increasingly clear in recent years that developing new drugs is insufficient to ensure advancement in drug therapy [27]. Exciting in vitro results were frequently followed by disappointing in vivo results due to insufficient drug concentrations due to poor absorption, rapid metabolism and elimination, poor water solubility, and high plasma levels fluctuation due to unpredictable bioavailability after oral administration.

The development of appropriate drug carrier systems is a promising strategy for overcoming these issues henceforth liposomal anthracyclines have proven to be effective and safe when combined with trastuzumab both in advanced and early breast cancer. Of particular interest is the use of the combination of liposomal anthracyclines plus trastuzumab in patients with early and HER2-overexpressing breast cancer, as this is probably the subgroup that would benefit most from a treatment with anthracyclines.

11.2 Dendrimer

Dendrimers are promising drug delivery devices that can solve the shortcomings of currently approved anticancer medications [29]. They can overcome drug resistance, decrease drug toxicity, and increase drug solubility and bioavailability [30]. Anticancer medicines have been loaded into micelles and dendrimers, resulting in selective drug delivery, sustained drug release, improved cellular uptake, decreased adverse side effects, and enhanced anticancer action in-vitro and in- vivo. Dendrimers are typically used to accomplish successful drug targeting to tumor tissues by covalently binding unique targeting moieties such as folic acid, antibody, sugar epidermal growth factor, and biotin [31]

Chemotherapeutic agents and theranostic applications of chemotherapy have been successfully administered using these nano-carriers [32].

Poly-lysine, PPI, phosphorus, and carbosilanedendrimers are other forms of dendrimers used in biomedical applications, especially in oncology. Polylysine (PLL) is an amphiphilic dendrimer with a branched structure

made up of Penta-functional central molecules made up of positively charged essential amino acids, including lysine -amino-alanine [33]. PLL is a fascinating new class of molecules because of their small size and natural components, which allow them to be internalized more readily than synthetic molecules.

11.3 Micelles

Micelles are colloidal particles with a size around 5–100 nm which are currently under investigation as carriers for hydrophobic drugs in anticancer therapy and have excellent tumor-targeted delivery properties, making them a feasible drug delivery mechanism with high translational potential[34] NC-6300, NK911, and NC-6004 are micelle products engineered to deliver epirubicin, doxorubicin, and cisplatin, respectively [35]. The antitumor efficacy of NC-6300 was shown in phase I clinical trial in 2013 with a substantial reduction in cardiac toxicity, suggesting that the formulation is safe and tolerable [36]. SP1049C comprises a non-ionic Pluronic block copolymer mixture (1:8 w/w ratio) of Pluronic L61 and F127. Doxorubicin is mechanically encapsulated in the hydrophobic centre of the micelles by noncovalent bonds [37]. SP1049C was shown to be more effective than doxorubicin against several tumor cell lines in vitro [38]. Compared to free doxorubicin in preclinical in vivo studies, SP1049C showed superior antitumor activity, efficacy, and an increased AUC in tumor tissue in multiple animal tumor models doxorubicin-resistant tumors [39]. SP1049C and free doxorubicin had identical AUC and Cmax in the liver, kidney, breast, lung, and plasma.

11.4 Carbon nanotubes

Carbon nanotubes are cylinders made up of one or more coaxial graphite layers with a diameter in the nanometer range that serve as instructive examples of nanomaterial' Janus-like properties[40]. Based on their structure, they can be divided into two groups: single-walled carbon nanotubes with a single cylindrical carbon wall and multi walled carbon nanotubes with multiple walls cylinders. They can offer a promising approach to gene and drug delivery for cancer therapy due to their unique electronic, thermal, and structural characteristics [41]. Because of their thermal conductivity and optical properties, carbon nanotubes are the right candidate for killing cancer cells via local hyperthermia.

11.5 Nanoparticles

Nanoparticles are particulate dispersions or stable particles of sizes varying between 10 to 1000 nanometres [42]. A nanoparticle matrix is used to dissolve, entrap, encapsulate, or bind the drug. Nanoparticles, Nano spheres, and Nano capsules may be made based on the process of preparation. Nano capsules are matrix structures in which the drug is mechanically and evenly distributed. At the same time, Nano spheres are matrix systems where the drug is confined to a space surrounded by a unique polymer membrane [43].

11.6 Polymeric nanoparticles

Polymeric nanoparticles are submicron-sized structures made up of several biodegradable (e.g., albumin, chitosan, and alginate) and non-biodegradable (e.g., albumin, chitosan, and alginate) polymers [44]. Regulated pharmaceuticals delivery through parenteral, oral, pulmonary, nasal, and topical routes is the most active field of research utilizing polymeric nanoparticles. Therapeutic agents may be encapsulated, covalently bound, or adsorbed to Nano carriers in this manner [45]. These strategies can quickly solve drug solubility problems, which is significant since a substantial percentage of potential drug candidates discovered by high-throughput screening programs are water-insoluble [46]. On the other hand, polymeric nanoparticles are distinguished from drug Nano suspensions, which are sub-micron colloidal dispersions of pure drug particles stabilized by surfactants. Polymeric nanoparticles may also be

tailored to individual cells and sites in the body due to their small size and the ability to functionalize their surface with polymers and suitable ligands. As a result, polymeric nanoparticles could solve drug stability problems and reduce drug-induced side effects [47]

11.7 Solid lipid nanoparticles

Solid lipid nanoparticles are a quickly expanding area in nanotechnology with various possible drug delivery applications, clinical medicine, science, and several other sites [48]. Lipid nanoparticles present the possibility of discovering new therapeutics due to their unusual size-dependent properties. The ability to integrate drugs into Nano carriers introduces a modern drug delivery prototype that can be used for secondary and tertiary drug targeting [49]. As a result, solid lipid nanoparticles hold a lot of promise for achieving the objective of controlled and site-specific drug distribution, and they've gotten a lot of attention from scientists [49]. Drugs that are poorly soluble and hydrophobic are encapsulated in stable lipid nanoparticles, bioavailability, and cellular absorption problems [50].

12 Commercialization/ Marketed Cancer Nanomedicine/ Clinical Trials

These are several of the commercialized and phase III formulations in Breast Cancer which mentioned in Table No. 3 given below:

Table 3. Few Marketed Cancer nanomedicine delivery systems in the treatment or management of Breast Cancer

Product Name/Company	Nanomedicine Type	Therapeutic Agent	Reference
Myocet™/Teva UK	Liposome	Doxirubicin	51,52
LEP-ETU	Liposome	Paclitaxel	53, 54
Doxil, Caelyx	Liposome	Doxirubicin	55
Thermo Dox™/Celsion	Liposome	Doxirubicin	56
EndoTAG-1/MediGene	Liposome	Paclitaxel	57,58
NKTR102 (PEG)/Nektar	Polymeric conjugates	Irinotecan	59,60
Genexol-PM™/Samyang Biopharmaceuticals	Polymeric micelles	Paclitaxel	61,62
NK105/Nano-Carrier™	Polymeric micelles	Paclitaxel	63

13. Applications of Nanotechnology in Healthcare

Different diseases such as diabetes, aids, Parkinson's disease, Alzheimer's disease, cardiovascular conditions, and multiple sclerosis, and other forms of severe inflammatory or contagious diseases (e.g., HIV), also constitute a vast number of significant and complex diseases that pose major suffering to humans [64,65,66].

Nano medicine is one of the applications of nanotechnology that can be operated in the area of medicine. Nano materials and Nano electronics biosensors are used for Nano medicine. In the coming days, molecular nanotechnology will emerge from Nano medicine.

The use of Nano science in the medical sector has many expected advantages and is theoretically beneficial for all human races. [67]

Early identification and avoidance, better evaluation, proper care, and follow-up of diseases are feasible with Nano medicine aid. Some Nano scale particles are used as tags and labels; it is possible to do biologically quickly; as the processing is becoming more efficient and versatile. With the advent of Nano devices, including gold nanoparticles, gene sequencing became more successful.

These gold nanoparticles may be used to identify genetic sequences in a sample while marked with small fragments of DNA [68]. Damaged tissue may be replicated or restored with the assistance of nanotechnology. In the tissue implant engineering that could revolutionize the organ transplantation and reproductive implants, such so-called reproduced stirred cells are used [69].

With the assistance of carbon nanotubes, advanced biosensors along with novel properties can be created. For astrobiology, such biosensors can bring in practical use that can shed light on researching life's roots [70].

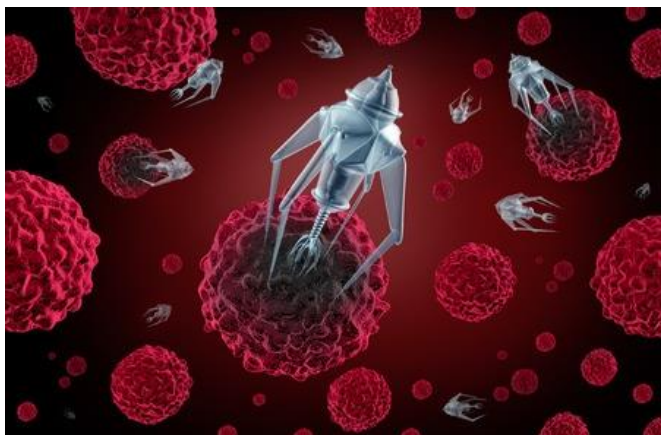


Fig.7. Refers to the application of Nano materials and tools for the treatment of breast Cancer

Sensors for cancer diagnostics are now being developed using this technology. Although CNT is inert, a probe molecule may be functionalized at the tip. As an experimental platform, their analysis utilizes AFM [71, 72].

Test molecule to act as an established leukaemia cell signature.

ii. Present flow would be to an IC chip via a CNT electrode due to hybridization.

iii. Prototype catheter production of biosensors. An exception has been nanotechnology

Conclusion

In conclusion, from the above discussions, we may conclude that current nanotechnology for breast cancer treatment is an excellent way of treatment with a more preventive and secure operation mode, which has a more impactful and better result than other modes of treatment of breast cancer. For example, Conventional chemotherapy reveals Considerable shortcomings in delivering proper treatment in metastatic breast cancer control. While Nano-formulated a thracyclines and paclitaxel have been dramatically enhanced, effective diagnosis and adequate treatment of metastatic disease remain a key problem. The aggressive targeting of malignant cells emerges in this sense as a potential technique for an effective response to the ranostics in Metastatic Breast cancer. In terms of physiological obstacles, unique ligands and antitumor medicines coupled on nanoparticles' surface have shown successful contact with the cancer cells and increased drug distribution to the tumor sites. It is anticipated that successful targeting nano strategies can decrease toxicity and chemo resistance and increase anticancer function. Additional tests are required before this new class of nano drugs is incorporated into clinical purposes. Somehow, cooperation among nanotechnologists and physicians has produced a notable success, and a therapeutic revolution for breast cancer management should be highly supported. As we discussed in this review, a significant amount of analysis has been done, and there is an abundance of proof available. We believe that nanotechnology is an emerging area for the treatment of cancers since they are nontoxic, biocompatible, and biodegradable, with minimal to no immunogenicity. Since nanostructure, they've been studied extensively as a Nano carrier for tumour-targeted drug delivery. These Nano carriers have a greater therapeutic effect due to passive drug delivery. Since lipids contain reactive functional groups, they

make it easier to conjugate proteins and other targeting agents for tumour-targeted drug delivery. Hence focus on more research and more technology-based learning; we can develop such Nano medicines to reduce the severe side-effect and associated with the survivors at the socioeconomic level.

Bibliography

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Content: The content of article is maintaining author identification, names, title, publication, Date of Indexing (DOI), Ordering. The article maintaining proper format and order of IEEE Template guidelines i.e. Title- 14 pt, Abstract: 11 pt, Heading: 12pt, Body: 10Pt

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An Overview of Organizational Change Management through Talent Pool Creation: Emerging Needs and Challenges

Mr. Sudarsan Sahoo ¹, Dr. Bandana Nayak ², Mr. Shivam Khamari ³, Dr. Ganesh Prasad Das ⁴

¹Research scholar, Institute of Business and Computer Studies (IBCS), Siksha 'O' Anusandhan Deemed to be University, Bhubaneswar, Odisha

Email ID: sudarsan@gmail.com

²Associate Professor Rourkela Symbiosis Institute of Business Management, Bengaluru, Symbiosis International Deemed to be University

Email Id: drbandananayak@gmail.com

³ Assistant Professor, Swami Vivekananda Institute of Management, Baniatangi, Khordha

Email Id: shivamkh20@gmail.com ORCID ID: 0009-0009-3618-2954

⁴ Professor, Institute of Business and Computer Studies, Siksha 'O' Anusandhan Deemed to be University, Bhubaneswar

Email Id: ganesh.das@yahoo.com

Abstract:

Nowadays every successful company around the world are communicating the need for change for encouraging employees to focus on success by fixing problems, but achieving the organizational goal through a right step for change in performance is uncommon. Henceforth, companies are focusing on building an adequate infrastructure of permanent talent pool so that the organizations can get the best resources without any time lag in order to test the importance of talent pool creation for managing organizational change. By which, ordinal data were collected and subsequently ordinal logistic regression method was adopted to test the hypothesis. In this invited research paper, there were 393 respondents who participated and their responses were used for testing of a hypothesis as related with the aforesaid research problem for finding its right solution.

Keywords: Ordinal Logistic Regression (OLR), Ordinal Data (OD), Change Management (CM), Talent Pool (TP), Proportional Odds Model (POM).

Introduction:

It is an iconic to witness, the day-to-day changing scenarios of the world. It comes up with the basic transformation in many different ways. In business, the same principle is applied. Today the organizations those are realizing the possibilities to bring in the organizational transformations, success cannot be achieved as a standardized single process, they need to rely on constant and incessant change which could be relied on by the HR strategist, after the detailed understanding of the organizational culture. The multinational corporate to retain their business base they invest in many ways to improve their sales and provide better service to their clients without forgetting their customers and their customers' needs underlie their organization's existence. Change management cannot be an Adhoc performance but is a crucial skill for leaders and managers. It should be a structured process of managing people, processes, and technology in response to the changing environment, to align business strategies with external changes and keep competitive in their counterparts.

To meet recent changes the executives are today asked to understand and monitor how their organizations are designed and in what way they can be managed with a greater efficient way. The present survey results highlight several important strategies that organizations use to transform themselves successfully. Setting clear and high aspirations for change is the most significant. Another most important tactics to remain engaged with the changing business environment is to engage the entire organization in a change effort through a wide variety of means in a first instance they try to make visible the CEO who is an important part in bringing the change in the entire organizational case. But again the successful companies adopt other methods to keep their people involved, communication and accountability methods are some amongst them. The change management is practiced by prominent companies, because these successful companies are far likelier to communicate the need for change positively, encouraging employees to build on success rather than focusing exclusively on fixing problems.

In connection with, Pruis (2011) has an



opinion that “the talent management is a most sought after topic that has attracted everyone’s attention in recent times in the present economic slowdown there is the greater demand for talents, it is highly difficult to attract, deploy, retain and develop, them. In 2010 Morgan and Jardin in one of their studies have found out today most of the companies have started using talent management in a more practical to deal with their employees with right knowledge, abilities, skills, behaviors, and relationships to attain their strategic business objectives.

In today’s complex business environment most of the organizations are using talent management system without having concurrent information of what they do need to do exactly in the talent system. Therefore, it is apparent to understand the issue of talent pool creation and retention in the context of India, which certainly proves to be the driving force for the use of talent management in future.

The talent management has become the hottest topic of discussion for management consultants, academics and practitioners in these days. Seeing a group of McKinsey consultants in the late 1990s invented the phrase “The War for Talent” to address the issue of growing talent shortage.

1. Planning a transformation

Although the change in various multinational corporations is frequently talked about as if it’s all essential to keeping pace with the changing time, the present research highlights the great intensity of talent management so that the varieties of goals that organizations are capable to perform that could be achieved through the transformation. Every organization with the motive to transform need to set a clear and significant goal is the first step for organizational change management. And the results do show that executives who believe that their organizations transformed themselves successfully are much likelier than others to say that their goals were both clearly defined and truly transformational. The present research finds out the importance of talent pool creation to transform their organization.

2. Literature Review

In this section the researchers have adopted the specific research guidelines and methodology as the previous researcher had taken for its authentication and justified for their proposed research work. In this paper, the taken research title “An Overview of Organizational Change Management through Talent

Pool Creation: Emerging Needs and Challenges” is an excellent and recent topic which are needed by any organization to meet the needs and challenges of the day-to-day administration of Management. Thus, many researchers have provided the various definition of the term talent from different perspectives.

As Tansely (2011)[1] wrote in his article, there is not a universal definition of “talent” in all the languages. Meaning of talent depends on the language that is shared in the organization. Many corporations do not even know what talent means, let alone manage it (The Economist, 2006) [2].

According to Iles et al. (2010a) and Capelli (2008), talent management and HRM present a correlated theoretical base with dissimilar analysis. They presented three points of view regarding the definition of talent management as follows:

(i) Talent management is not fundamentally different from HRM: It includes all the HRM activities and therefore it can be said that talent management is a rebranding term of HRM, which has changed from the traditional term to a new concept. This new label of HRM has focused on how to manage talents strategically.

(ii) Talent management includes human resource management with a specific emphasis: talent management uses the same instruments as human resource management and organizational development, but talent management emphasizes on talented people, accordingly, the focal point is “talent pool”, both internal and external of the organization.

(iii) Talent management concentrates on proficiency development through managing the progression of talents within the corporation. Their focus is on talent flows instead of the talent pool. The theory has originated from operational and logical theories whereas Talent management programs are created to provide talent pools for supplying certain job categories and focus on the development of specific individuals who are qualified to create success in the organization based on the difference in between Change management and talent pool Management.

1. Difference in between Change Management and Talent Pool Management: [Table:1]

Basic Difference	Change Management	Talent pool Management
i) Based on process	a) It is a process/procedure of Management System of administration	a) Talent management is a basic Process to manage the ability, competency and power of employees within an Organization
ii) Based on commitment	b) It is a system Commitment given by the management to their employees when they recruit or hire them regarding their salary, bonus, benefits, welfare etc.	b) It is an Organization's commitment to recruit, hire, retain and developed the most talented and superior employees from the job market.
iii) Based on data base	c) It is based on the information or data about the employee's previous experience, knowledge and skill which has related with his/her work performance.	c) It is a data base of potential job of an employee that have potential to meet an organization's immediate and long term needs in order to build a talent pool.

2. Key Components of Talent Management:

There are seven Components of Talent Management such as:

- Strategic employees planning and developing organizational goals with an adequate plan
- Talent Acquisition and Retention
- Performance Management
- Learning and Motivating
- Compensation
- Career Development
- Successful Planning

3. Why Organization needs Change Management?

At present scenario many organizations are facing lots of problem in its process of production and operation because of the development of new methods and technologies which are effective and affect the production process as well as administration system, that's why each organization wanted to do or implement new things in order to get better performance and something is changing in performance of production or work performance “**Change management**”.

Kotter has pointed out that willingness is the basic factor in change management because management wanted to change the system or administration then it is easy to change or from the employee side, if they wanted to change in their work style and willingness to work then it creates a conducive

work environment by which change is possible. According to Kotter (1996), there is the 8-step model for change in work Performance such as:

- Establishing a sense of urgency
- Creating a guiding coalition
- Developing a vision and strategy
- Communicating the change vision
- Empowering employees for broad-based action
- Generating short term wins
- Consolidating gains and producing more change
- Anchoring new approaches in the culture.

Kanter et al (1992) argue that the first step to implementing change is building coalitions of stakeholders, including employees and sponsors, such as local authorities whose support is essential. Retention is a voluntary move by an organization to create an environment which engages employees for long term (Chaminade, 2007). The main purpose of retention is to prevent the loss of competent employees from the organization as this could have an adverse effect on productivity and service delivery. However, retention of high performing employees has become more challenging for managers as this category of employees frequently move from one job to another as they are being attracted by more than one organization at a time.

The Organization is always invested in the form of training and development of those workers from whom they expect to return and give output on its investment. On leadership and employee retention, Eisenberger and associates (1990) suggested that employee's perception regarding an organization is strongly influenced by their relationship with the supervisor.



Aladwani (2001) postulates that the tools of management of change are leadership, communication, training, planning, and incentive systems, which can all act as levers and can move great obstacles with a minimum of effort when applied correctly. Organizational change can occur at different levels which require different change strategies and techniques (Goodstein & Burke, 1991). Lashunda (2010) gives three levels:

i) Changing the individuals who work in the organization

ii) Changing organizational structures and systems
Directly changing the organizational companies are seeing change management play an important role during the implementation of new technology.

Many people fear that as technology develops, it will take over the workplace. This often causes resistance to change in firms looking to implement new technology. By helping employees better understand change, you create a workplace that is more open-minded and open to change. Change management can help ease this tension and create a smooth process.

Change management is a formal way of communicating with employees. It tells them why change is happening, what it will look like for them, and how it will ultimately benefit them in the end. Keeping employees informed from the start helps smooth the transition and shorten the time. Also, if employees are more open to change, they will be more engaged in the process of making it happen. When employees are more engaged, the transition can happen more quickly and ultimately save your organization time and resources. A systematic approach to organizational change management (OCM) is beneficial when change requires people throughout an organization to learn new behaviors and skills. By formally setting expectations, employing tools to improve communication and proactively seeking ways to reduce misinformation, stakeholders are more likely to buy into a change initially and remain committed to the change throughout any discomfort associated with it.

1. Research Question:

The prominent question arises that is it always believed that the organizational change management (OCM) is possible only when there is the significant adherence to continuance in talent pool creation and the retention of the talent pool that are performing their task with reasonable effectiveness. There are some of the questions that have the major share in deciding organizational change function. The last century was slow in adapting to the global business scenario change, but in the 21st century, the experience shows there is a vast change in business atmosphere with the strong influx of globalization. Following are the research questions based on which the present research is conducted;

RQ1- Is there any need to bring change in organizational functioning to bring newness in the organizational functioning?

RQ2- Is it essential to keep the talent pool intact for bringing organizational change?

RQ3- Is talent retention an essential for managing organizational change?

2. Aim and Objectives of Research:

The research questions that arise in the previous section give rise to the following research objectives that are to be tested in the following sections;

A. To execute the policy of talent Pool Creation in management for expecting an ample opportunity of the employee hired based on their skill and talent.

B. To test the importance of the creation of a talent pool in the management of organizational change.

C. To test the essentiality of talent retention for managing the organizational change.

3. Hypotheses:

The researcher had tried their level best to justify the authenticity of the taken hypothesis.

Where they have taken two hypotheses such as H_0 (Null hypothesis) and Alternative Hypothesis (H_1)

Thus, the taken hypothesis that is needed to be tested under a limited geographical area;

H_0 : Talent pool creation is not important for organizational change management.

H_1 : Talent pool creation is important for organizational change management.

	Survey Group	Area / Place	
1	HR Professionals working in corporates	Bhubaneswar & Cuttack	29
2	HR Professionals working in corporates	Visakhapatnam, Vijayawada & Guntur	48
3	Research Scholars	Bhubaneswar, Cuttack, Visakhapatnam, Vijayawada & Guntur	233
4	Academician	Bhubaneswar, Cuttack, Visakhapatnam, Vijayawada & Guntur	83
	Total Sample Size		393

3. Research Methodology:

1.1]Method of Study:

In this research paper, the researcher has followed the research methodology as the previous researcher were adopted, we take both primary and secondary mode of data collection, firstly, the primary source of data is considered for testing the hypotheses. The data are obtained from the information received from the respondents who participated in the data collection process. The nature of the research prohibits the adoption of secondary data. The primary method of data is used for the collection of responses received from the company were turnover. The company whose turnover was more than 100 million in Indian currency for 2017-18 financial years was considered for inclusion in the survey list. Apart from the professionals working in the sample companies, other two groups were taken for data collection i.e. Research Scholars and the Academicians who deal with HR related subjects.

Following table-1 shows the fragmentation of sample groups for the present research.

In this research paper, two hypotheses were considered for testing, and for this, in each case, there is one independent variable and only one dependent variable. In the case of the first people involved in the survey. The geographical limitation leads to use of Odisha and Andhra Pradesh for the sample survey. In this research, the small and medium scale enterprises were given priority, but the basic criteria for the selection of a hypothesis, the dependent variable is the importance of organizational change management and the independent variable is the creation of the talent pool.

used and the data to be gathered are categorical in	100%
nature for this reason in this case the ordinal scale	80%
is used is like; Very Important (1), Fairly Important	60%
(2), Neutral (3), fairly not important (4) not at all	40%
Important (5)	20%

1.2 Semitic Models of Pie Chart of Respondents: (Table- 1)

Table- 2: Response on Level of importance for talent pool creation and the following table-2 shows the method in which information is gathered :

Mode of talent pool creation	Level of Importance					Total Response
	1	2	3	4	5	
Aggressive	18	19	15	14	26	92
Moderate and Consistent	18	15	12	9	14	68
Moderate and Inconsistence	24	21	6	11	2	64
Slow and Consistent	15	21	27	17	21	101
Slow and Inconsistence	14	17	6	12	19	68
Total	89	93	66	63	82	393

Very Important (1), Fairly Important (2), Neutral (3), Fairly Not Important (4) And

The outcome variable is ordered In case of an ordinal logistic regression model and has more than two levels. In this article, the ordinal outcome variable is Level of importance for talent pool creation, which is coded as 1, 2, 3, 4 and 5 (Very Important=1, Fairly Important=2, Neutral=3, Fairly Not Important = 4 And Not At All Important=5 and is categorized based on a continuous variable, mode of talent pool creation. the mode of talent creation is categorized based on Aggressive strategy, Moderate and Consistent strategy, Moderate and In consistence strategy, Slow and Consistent

Not At All Important (5)

strategy, and Slow and In consistence strategy.

The distribution of mode of talent pool creation is highly positively skewed. The violation of the assumption of normality makes the use of Multiple Regression inappropriate. Therefore, ordinal logistic regression is the most appropriate model for analyzing the ordinal outcome variable in this case. The ordinal logistic regression model can be expressed as a latent variable model (Agresti, 2002; Greene, 2003; Long, 1997, Long & Freese, 2006; Powers & Xie, 2000; Wooldridge & Jeffrey, 2001).

Assuming a latent variable, Y^* exists, $Y^* = x\beta + \epsilon$, can be defined where x is a row vector ($1 \times k$) containing no constant, β is a column vector ($k \times 1$)

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of structural coefficients, and ε is a random error with standard normal distribution: $\varepsilon \sim N(0, 1)$. Let Y^* be divided by some cut points (thresholds): $\alpha_1, \alpha_2, \alpha_3 \dots \alpha_j$, and $\alpha_1 < \alpha_2 < \alpha_3 \dots < \alpha_j$. Considering the observed Level of importance for talent pool

$$Y = 3 \left\{ \begin{array}{l} 1. \text{ If } Y^* \leq \alpha_1 \\ \text{if } \alpha_2 < Y^* \leq \alpha_3 \\ \text{if } \alpha_3 < Y^* \leq \alpha_4 \end{array} \right\}$$

Thus the probability of Level of importance for talent pool creation can be computed as follows;

$$P(y = 1) = P(y^* \leq \alpha_1) = P(x\beta + \varepsilon \leq \alpha_1) = F(\alpha_1 - x\beta);$$

$$P(y = 2) = P(\alpha_1 < y^* \leq \alpha_2) = F(\alpha_2 - x\beta) - F(\alpha_1 - x\beta);$$

$$P(y = 3) = P(\alpha_2 < y^* \leq \alpha_3) = F(\alpha_3 - x\beta) - F(\alpha_2 - x\beta);$$

$$P(y = 4) = P(\alpha_3 < y^* \leq \alpha_4) = F(\alpha_4 - x\beta) - F(\alpha_3 - x\beta);$$

$$P(y = 5) = P(\alpha_4 < y^* \leq \infty) = 1 - F(\alpha_4 - x\beta);$$

$$P(Y \leq j) = F(\alpha_j - x\beta), \text{ where } j = 1, 2, \dots, J-1.$$

creation is the ordinal outcome, y , ranging from 1 to 5, where Very Important=1, Fairly Important=2, Neutral=3, Fairly Not Important = 4 and Not At All Important=5, define:

$$2. \text{ If } \alpha_1 < Y^* \leq \alpha_2 \\ \text{if } \alpha_4 < Y^* \leq \infty$$

and negative log-log. Just as Stata, the ordinal logit model is also based on the latent continuous outcome variable for SPSS PLUM, (Liu, Xing, 2009) it takes the same form as follows:

$$\begin{aligned} & \text{logit} [\pi(Y \leq j | x_1, x_2, \dots, x_p)] \\ &= \ln \left(\frac{\pi(Y \leq j | x_1, x_2, \dots, x_p)}{\pi(Y > j | x_1, x_2, \dots, x_p)} \right) \\ &= \alpha_j + (-\beta_1 X_1 - \beta_2 X_2 - \dots - \beta_p X_p), \end{aligned}$$

Table -3: Case Processing Summary

		N	Marginal Percentage
Importance	Very Important	83	21.1%
	Fairly Important	85	21.6%
	Neutral	40	10.2%
	Fairly Not Important	96	24.4%
	Not At all Important	89	22.6%
Mode of Talent Pool Creation	Aggressive	87	22.1%
	Moderate and consistent	76	19.3%
	Moderate and inconsistent	93	23.7%
	Slow and consistent	65	16.5%
	Slow and inconsistent	72	18.3%
	Valid	393	100.0%
	Missing	0	
		393	

The cumulative probabilities can also be computed using the form:

(1) SPSS PLUM (Polychromous Universal Model) is an extension of the generalized linear model for ordinal response data. It can provide five types of link functions including logit, probit, complementary log-log, cauchit

In this research, I took the help of 393 respondents, divided into three response categories

i.e. HR Professionals working in corporates, Research Scholars and academicians and asked to rate the importance of talent pool under five-point Likert scales. In this research paper, the proportional odds model or parallel-



International Journal on Scientific Research, Engineering, Science, Technology, Humanities and Advanced Knowledge of Management (SRESTHAKAM)

lines model was used.

The model that is considered to be the baseline for the interpretation of data is as follows; In this research I took the help of 393 respondents, divided into three response categories i.e. HR Professionals working in corporates, Research Scholars and academicians and asked to rate the importance of talent pool under five point likert scales.

In this research paper proportional odds model or parallel-lines model was used. The model that is considered to be the baseline for the interpretation of data is as follows;

$$P(Y_i > j) = \frac{\exp(\alpha_j + X_i \beta_j)}{1 + \{\exp(\alpha_j + X_i \beta_j)\}}$$

where $j = 1, 2, \dots, M - 1$

In the above formula for the parallel-lines model the β 's values are the same for all values of j but not the α 's values are the same for all values of j .

The proportional odds model is also known as the ordered logit model and this can be explained and tested with the help of SPSS. In this research paper, the SPSS-17 was used to test the ordinal data collected from the 393 respondents and it is discussed in the following 1.9 data Analysis section.

1. Data Analysis:

In this section, the researcher has presented the collection data to examine its validity and the taken table-3 summary of the data collected is given with a marginal percentage. TPC that

refers to talent pool creation, is based on five categories that includes Aggressive, Moderate and consistent, Moderate and inconsistent, Slow and consistent and Slow and inconsistent this counts 89, 93, 66, 63 and 82 responses were collected and their marginal percentages are

22.6%, 23.7%, 16.8%, 16.0%, and 20.9%

respectively. The level of Importance of talent pool creation was segregated under five different heads were Very Important (1), Fairly Important (2), Neutral (3), Fairly Not Important

(4) and Not At all Important (5) and the values for these are 92, 68, 64, 101 and 68 respectively The following table-4 shows the Model fitting information. Before starting to look at the effects of each explanatory variable in the model, there is a need to determine whether the model improves our ability to predict the outcome or not.

It is to compare the final model against the baseline to see whether it has significantly improved the fit to the data. The Model fitting Information table-3 gives the -2 log-likelihood values for the baseline and the final model, and SPSS performed a chi-square to test the difference between the -2LL for the two models. The significant chi-square statistical value indicates that the final model gives a significant improvement over the baseline intercept-only model where the significant p-value is less than .0005 ($p < .0005$). Hence it is to conclude that the model adopted gives better predictions than that of the predetermined model.

Table.4: Model Fitting Information

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Intercept Only	123.614			
Final	101.765	21.849	4	.000

Link function: Logit.

From the following table-5 the results for the present analysis suggest the present model fits well as the calculated 'p' value is more than .0005 (i.e. $p > .0005$). Hence it is to conclude that the present model fits adequately. Hence based on the observed data it is to reject the null hypothesis.

Table- 5: Goodness-of-Fit

	Chi-Square	Df	Sig.
Pearson	20.011	12	.067
Deviance	20.301	12	.062



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From the following table-6 the threshold variable represents the response variable in the ordered logistic regression. The threshold estimate for [importance = 1] is the cutoff value between very important and fairly important. Similarly the threshold estimates for importance = 2] is the cutoff value between fairly important and neutral, the threshold estimate for importance = 3] is the cutoff value between neutral and fairly not important, the threshold estimate for [importance = 4] is the cutoff value between fairly not important and not at all important. In-case of importance-2 the estimated cut-point on the latent variable is used to differentiate. Since the p-values less than alpha level they are statistically significant; otherwise are shown as not. The thresholds that are shown at the top of the parameter estimates output, and they indicate where the latent variable is cut to make the four groups that is observed on the data collected for this research.

The threshold coefficients have represented the intercepts, specifically the point in terms of a logit where the status of the importance level which could be predicted into the four category.

- a) $\text{Ln}(\theta_1) = -1.506 + .234X_1$
- b) $\text{Ln}(\theta_3) = .332 - .2$
- c) $\text{Ln}(\theta_2) = -.378 + .221X_2$
- d) $\text{Ln}(\theta_4) = 1.150 + .229X$

In these coefficients, the negative sign indicates that those variables have negative effects on the level of importance. The estimates that are labeled location are the coefficients for the predictor variables. Here the relationship exists between the mode of talent creation and the level of its importance for the organizational change management. From the observed significance levels in the table-6, it can be concluded that the explanatory variable i.e. mode of talent pool creation has an effect on the level of importance in the management of organizational change.

The estimates that are labeled as the location is of great importance as they are the coefficient of the predictor variables. The Wald statistics is the square of the ratio of the coefficient to its standard error.

The importance of Wald statistics in the column with heading sig (< 0.05) indicates the importance of the predictor variables in the model and reject the null hypothesis $H_0: \beta_i = 0$. Here in the table-6, the value of Wald statistics shows that the corresponding variable is significant.

Table- 6: Parameter Estimates of Ordinal Logistic Regression

		Estimate	Std. Error	Wald	df	Sig.	Lower Bound	Upper Bound
Threshold	[Importance = 1]	-1.506	.234	41.365	1	.000	-1.966	-1.047
	[Importance = 2]	-.378	.221	2.929	1	.087	-.811	.055
	[Importance = 3]	.332	.221	2.262	1	.133	-.101	.764
	[Importance = 4]	1.150	.229	25.115	1	.000	.700	1.599
Location	[mode of TPC=1]	.064	.283	.051	1	.821	-.491	.619
	[mode of TPC=2]	-.352	.304	1.340	1	.247	-.948	.244
	[mode of TPC=3]	-1.117	.316	12.520	1	.000	-1.736	-.498
	[mode of TPC=4]	.015	.278	.003	1	.956	-.529	.559
	[mode of TPC=5]	0 ^a	.000	.000	0	.000	.000	.000

Link function: Log it.

a. This parameter is set to zero because it is redundant.

The following table-7 i.e. test of parallel lines is of greater importance in establishing the hypothesis. The table-7 helps in creating the parallel line test for general model with chi square test value 20.301 and the p-value is .062 which is

greater than at 5% level of significance. Thus, it is to reject the null hypothesis. Therefore there is not enough evidence to reject the null hypothesis for general model. Thus the proportional odds assumption appears to have held for general model.

**Table -7: Test of Parallel
Lines**

Model	-2 Log Likelihood	Chi-Square	Df	Sig.
Null Hypothesis	101.765			
General	81.464	20.301	12	.062

[The Null hypothesis states that the location parameters (Slope Co-efficient) are the same across response categories]

In this section, the researcher has to try to justify the authenticity of the taken hypothesis through the hypothesis testing from the above table-7, it is to conclude that there is not enough evidence to reject the null hypothesis for the general model. Thus the proportional odds assumption appears to have held for the general model.

3. Limitations & scope of the study:

This research has following limitations that need to be eradicated so that these can be utilized in the large spectrum of the studies:

a) This is limited to the geographical boundary

Conclusion:

Since this research is applied under a limited sphere i.e. in case of small and medium scale Organizations

a) It cannot be utilized for large corporate houses.

In conclusion, from the above discussion of analysis section, it is clear that talent pool creation is not at all essential for organizational change management, apart from the talent pool creation another independent factor that could have an impact on organizational change management. This research is successfully managed to explain the importance of talent management. In this research, the attempt is made to test the importance of talent pool creation for bringing the change in organizational management. Proportional odds model

2. Testing of Hypothesis:

hence it cannot be generalized for other geographical areas.

b) The time and financial constraint to collect the data was another limitation that pulls the research to be used in other areas of study.

The adoption of the proportional odds model reveals that the null hypothesis is to be accepted

i.e. Talent pool creation is not important for organizational change management. Hence it is to reject the alternate hypothesis which says that Talent pool creation is important for organizational change management

b) Since only one variable was used to test in relation to the organizational change management, other aspects of it remained absent. Thus in the future, the research can be carried out in other areas too.

made it clear that talent pool creation is not important for organizational change management. Since in this research talent pool creation is only taken as the independent variable and it is believed that this is an essential facet of this research. Thus, further research can be carried out on talent retention and its impact on organizational change management. Apart from this, another research is possible to test the correlation between talent pool creation and talent retention In this section, the researcher have trying to justify the authenticity of the taken hypothesis through the hypothesis testing ,From the above table-7 it is to conclude that there is not enough evidence to reject the



null hypothesis for general model. Thus the proportional odds assumption appears to have held for general model.

Bibliography

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**Role of Green HRM Practices in Corporate Sector on Economic Sustainability:
Emerging Models of Green Practices in 21st Century****Ms. Sujata Das^{*1}, Dr. Madhusmita Dash², Mr. Shivam Khamari³
Prof. (Dr.) Ramesh Chandra Rath⁴, Prof. Binodini Mahapatra⁵**^{1*} *Research Scholar, Siksha 'O' Anusandhan (Deemed to be University), Department of Humanities and Social Science, Bhubaneswar, Odisha, India.**Email.id- d.sujata79@gmail.com*² *Associate Professor, Siksha 'O' Anusandhan (Deemed to be University), Department of Humanities and Social Science, Bhubaneswar, Odisha, India.**Email.id- madhusmitadash@soa.ac.in*³ *Assistant Professor, Swami Vivekananda Institute of Management, Baniatangi, Khordha**Email Id: shivamkh20@gmail.com ORCID ID: 0009-0009-3618-2954*⁴ *Principal, Swami Vivekananda Institute of Management (SVIM), Bhubaneswar, Odisha, India.**Email Id: dramesh.rrc@gmail.com*⁵ *Research Scholar, School of Management Science, Biju Patnaik, University, Rourkela, Odisha.**Email Id: mahapatrabinodini23@gmail.com***Abstract:**

At present scenario, to address the changing dynamics of the business environment, particularly the execution of Green HRM in the twenty-first century, the notion of Green HRM practices and its economical sustainability plays an important role in every sector of corporate and human life. So the researcher have eagerly interested to study its role and application, the real practice of the corporate world which combines HRM Practices and economical sustainability in the form of real execution of various laws ,principles and corporate policy for rapid development in different field. Thus this submitted article focuses new paradigm of corporate standard in the present scenario of the world and it needs thoroughly examined. In this collection the researcher have prepared a good questionnaire and asked 700 respondent of Bhubaneswar based different corporate sector of Odisha. In order to examine the authenticity as well as practical importance of Green HRM execution in various companies of IT Sector and Production and Operation Sector of the corporate world in 21st century. In this research work, we use various models of green practices and statistical methods such as Partial Least Square Statistical Model (PLSSEM), Green HRM Practices Model (GHRMPM) & Multi -Group Analysis Model (MGAM) etc. in order to use to access the appropriate study in between different corporate industries. The appropriate study we found that how the Green HRM practices will be influenced in the future business strategy and the article justified by predicting, evaluating and judging its critical value, applicability related to companies future business goals and its economical sustainability in 21st Century. Therefore this paper has given a warrantee with sufficient essence for implementation of different research tools and techniques in order to examine the novel green HRM practices and its unique framework design by the researcher for predicating its emerging studies of the present business landscape and economical values for creating a conducive ecological ambiance to work.

Keywords: Green HRM Practices, Corporate Sector economic sustainability, Emerging Models of Green HRM practices.

1. Introduction

Now-a-days, each nation's governments in world-wide are implementing strict environmental regulations, including carbon emission targets, waste management protocols, pollution control measures, Resource Conservation , execution of Laws etc. The Governments often use financial incentives (e.g., tax breaks, subsidies) to encourage Sustainable Practices and Penalties (MSPP) (e.g., fines, legal action) for non-compliance. Global agreements on climate change and biodiversity loss create pressure on national governments to implement policies that drive corporate sustainability.

In the corporate sector, Human Resource

Management (HRM) plays a pivotal and multifaceted role that extends far beyond traditional administrative functions. It acts as a strategic partner in achieving organizational goals and ensuring long-term success. Here's a breakdown of the key roles of HRM.

The main objective of this paper is to explore innovative and contemporary approaches to integrating sustainability into various HR functions in the 21st century. This could include the use of technology, new strategic frameworks, or unique employee engagement initiatives by presenting and examining contemporary instances of how this integration is being accomplished in the business sector, the article essentially aims to close the gap between financial performance (economic



**International Journal on Scientific Research, Engineering, Science, Technology, Humanities and Advanced
Knowledge of Management (SRESTHAKAM)**

sustainability) and environmental responsibility (driven by Green HRM). It seeks to go beyond abstract debates and offer specific explanations of the “how” of Green HRM's contribution to a corporate sector that is more economically sustainable in the 21st century.

The future of Green HRM is inextricably linked to economic sustainability in the corporate sector. By strategically integrating environmental considerations into HR practices, organizations can achieve significant economic benefits through increased efficiency, enhanced reputation, improved employee engagement, fostering innovation, and mitigating risks. As environmental pressures and stakeholder expectations continue to rise, Green HRM will transition from a niche concept to a mainstream imperative for long-term economic viability and success.

2. Literature Review

In this section of literature review outlines the theoretical framework of understanding of the study and development of a suitable and examinable hypothesis for observing the relationship in between green HRM Practices and an economic and sustainability in the corporate sector in different districts and cities in Odisha for considering emerging models in the 21st century in the world.

From this theoretical framework, drawing on Research Based Views (RBV) of various respondents and Stakeholders from different corporate sectors, around 385 (385/700) respondents from different cities of Odisha gives positive feedback relate to aforesaid research entitled Role of Green HRM Practices in Corporate Sector on Economic Sustainability: Emerging Models of Green Practices in 21st Century”. Which provides a robust foundation stone of research work for examining the role of Green HRM practices, particularly emerging models in the 21st century, in driving economic sustainability within corporate organizations of different cities of Odisha such as capital city Bhubaneswar, Smart city Rourkela, Industry city Sambalpur Jharsuguda, and Silver city Cuttack, Berhampur etc.

In this regard, the researcher has proposed three hypotheses for justifying the assigned paper .and it will be empirically tested to understand the nature and strength of these relationships between the variables, theoretical models for contributing valuable insights to the young researchers and readers from academic, Industry, literature and practical application in the corporate sector.

3. Meaning and concept of Green HRM

Many scholars define Green HRM as the set of HR practices aimed at reducing an organization's

environmental impact and promoting sustainability. This encompasses a wide range of activities, from green recruitment and training to eco-friendly performance management and employee engagement in environmental initiatives. (Jackson, Renwick, Jabbour, & Muller- Camen, 2011)[9]. The role of employees is central to Green HRM. The literature highlights how HR practices can influence employee attitudes, behaviours, and skills to support environmental sustainability within the organization. This includes maintaining environmental awareness, promoting environmentally friendly behaviour, and strengthening employees to contribute to environmentally friendly practices (Ramus, 2001; Daily, Bishop, Steiner & Stewart, 2007). The essential aspects of definition emphasize the overall objectives of the HR strategy of environmental issues and strategic integration into organizational goals. Green HRM is not only to implement isolated green initiatives, but also to be included at the core of post-sustainability HR practices. (Egri & Pinfield, 1996; Govindarajulu & Daily, 2004) [2.6] Related to employee recruitment and selection processes in the company sector.

4. Green HRM Practices:

Currently, GRM Practices executed in various corporate sectors in all over the world lke:

a) Green Recruitment and Selection

Attracting and hiring individuals with pro-environmental values and skills can lead to a workforce more inclined to identify and implement sustainable practices, contributing to resource efficiency, waste reduction, and a positive environmental image, ultimately enhancing economic sustainability. Emerging models focusing on digital and value-based green recruitment can broaden the pool of environmentally conscious talent, (Renwick, Redman, & Maguire, 2013) [12].

b) Green Employee Involvement

Empowering employees to participate in sustainability initiatives, generate green ideas, and contribute to environmental problem solving can lead to innovative solutions, improved efficiency, and a stronger sense of ownership, positively impacting economic sustainability. Emerging models leverage digital platforms and collaborative tools to facilitate widespread employee involvement in green initiatives, (Robertson & Barling, 2013) [13]

5. Emerging Models and Frameworks

Emerging models, characterized by the integration of technology, data analytics, a focus on employee values, and innovative engagement strategies, are expected to enhance the effectiveness and impact of traditional Green HRM practices on economic sustainability by reaching a wider audience, fostering deeper engagement, and driving more impactful green



**International Journal on Scientific Research, Engineering, Science, Technology, Humanities and Advanced
Knowledge of Management (SRESTHAKAM)**

behaviours.

According to Egri & Pinfield, 1996; Jackson et al., 2011 in their model of Strategic Green HRM (SGHRM) emphasizes the alignment of Green HRM practices with the overall environmental strategy and goals of the organization. It views Green HRM not as a set of isolated initiatives but as an integral part of achieving a sustainable competitive advantage [2,8]

According to Appelbaum et al., 2000 in their framework of Ability-Motivation-Opportunity (AMO) suggests that "Employee performance is a function of their abilities (skills and knowledge), motivation (willingness to perform), and opportunities (supportive work environment). Green HRM practices can influence all three components in the context of economic sustainability,[1].

According to Jeffrey Pfeffer in 1994 in his model High- Performance Green Work Systems (HPGWS) integrates green practices into high-performance work systems to enhance both environmental and organizational outcomes through employee involvement, teamwork, and empowerment focused on sustainability goals,[11].

According to John Elkington in 1994 in their approach of The Triple Bottom Line (TBL) suggests that HRM practices should contribute to the "three Ps": People (social equity), Planet (environmental stewardship), and Profit (economic viability), thus embedding sustainability into all HR functions,[3].

According to Barney in 1991 in his theory Resource-Based View (RBV) , suggested that "A firm's

competitive advantage stems from its unique internal resources and employees capabilities in various resource allocation and management which not includes just external an external factors but also it include the internal human resources. These resources are varying from situation to situation according to adopt in the environment and this variable will be evaluated when its required will be Valuable, Rare, Inimitable and Non-substitutable (VRIN) that can be leveraged to achieve sustained superior performance.

In this context of the study, environmentally conscious and skilled human capital, fostered through Green HRM practices, can be considered a Valuable and Potentially Inimitable Resource (VPIR). Emerging models of Green HRM, focusing on attracting, developing, and retaining employees committed to sustainability, can contribute to building this unique resource, leading to innovation, efficiency gains, and ultimately, economic sustainability in various corporate sectors of Odisha.

According to Freeman in 1984 in his theory of Stakeholder suggests that "Organizations should consider the interests of all stakeholders, including employees, customers, investors, communities, and

the environment. Green HRM practices directly address the environmental concerns of various stakeholders. By demonstrating a commitment to sustainability through HR practices, organizations can enhance their reputation, build stronger stakeholder relationships, and gain legitimacy, which can positively impact economic performance. Emerging models of Green HRM often involve engaging employees in sustainability initiatives, aligning their values with organizational goals, and attracting stakeholders who prioritize environmental responsibility" [5].

Based on the literature review outlined previously several research gaps can be identified in the existing research paper taken by the present research scholar. Thus, the assigned research work has explored the link between General and Green HRM practices in different corporate sector in Odisha where organizational outcomes including some aspects of economic and financial allocation for Green HRM administration, designing, planning to create Green and ecological environment in the organisation setup but there is a relative scarcity of studies are visible specifically examining the economic sustainability implications of new and emerging models of Green HRM practices prevalent in the 21st century in the present world.

The impact of Green HRM practices on economic sustainability may vary across different industries and organizational contexts. Existing literature may lack sufficient industry-specific studies focusing on the effectiveness of emerging green models in diverse sectors (e.g., manufacturing vs. service, large corporations vs. SMEs). The unique challenges and opportunities within the Indian context, with its specific regulatory landscape and socio-economic conditions.

Quantifying the direct and indirect economic benefits of specific Green HRM practices can be complex. Existing studies may rely on broader financial indicators, and there is a need for more nuanced metrics that directly link green HR initiatives to specific economic outcomes (e.g., ROI of green training programs, cost savings from employee-driven sustainability initiatives).

This research paper aims to investigate various Green HRM practices how taken by corporate industries in order to contribute to the existing literature review by addressing the following identified corporate gaps.

The study will specifically investigate the economic sustainability implications of contemporary and innovative Green HRM practices that are gaining traction in the 21st century, providing insights into their unique contributions. The research will delve into specific emerging green practices within different HRM functions (e.g., AI in green recruitment, digital platforms for green training, technology-enabled green performance monitoring,



International Journal on Scientific Research, Engineering, Science, Technology, Humanities and Advanced Knowledge of Management (SRESTHAKAM)

gamified employee engagement in sustainability) to understand their individual and combined economic impacts. The study will analyse how the interaction and integration of different emerging Green HRM practices contribute to economic

sustainability, moving beyond the examination of isolated practices. Depending on the scope and data availability, the study may aim to provide context-specific insights, potentially focusing on the Indian corporate sector and its unique challenges and opportunities in leveraging emerging Green HRM for economic sustainability. This would contribute to a more nuanced understanding relevant to the local context (as per the current time and location awareness).

The study will strive to identify and utilize relevant metrics to quantify the economic benefits (cost savings, revenue generation, efficiency gains, etc.) associated with the adoption of emerging Green HRM models.

The research may explore how organizational culture and leadership styles influence the successful implementation and economic impact of emerging Green HRM practices. By identifying the economic benefits of specific emerging Green HRM models, the study will offer practical recommendations for corporate organizations seeking to enhance both their environmental performance and economic sustainability in the 21st century.

7. Research Objectives:

In this section researcher have taken a no of research objectives related to research topic in order to justify them in anticipation of the taken research hypothesis and variables in contrast to Green HRM practices in various corporate sector in Odisha

There are five research objectives have been taken as follows:

1. To execute Green HRM practices in a different corporate sector of Odisha in order to examine and observe its practical uses and positive effect in the employee behavioural practice performance through various Green HRM Models and variables.
2. To motivate the employees of various corporate sector in Odisha in order to create an ecological environment by adopting the green HRM practices for the long-run environmental sustainability.
3. To make new and innovative Green HRM models for the real practice in corporate sector in order to improving economic development and its sustainability in the real world.
4. To justify the implementation of Green HRM models and its effects in the minds of the corporate employees in order to accept its role and importance

in application of digital technology and Artificial Intelligence.

8. Problem Formulation: In this Paper, the researcher faces many problems related to green HRM Practices how executed in different corporate sectors, and why Green HRM Practices we do adopt in various corporate sector but also it needs to practice in all sectors of human being's life for the real practice and needs for solving the problems of environmental. Economic, social and many ecological problems of the present society and definitely increase the economic development and sustainability of all segmentations of corporate life style.

9. Hypothesis:

In this section, the researcher has taken no of objectives for conducting a systematic and scientific research work related to the aforesaid research title and trying to justify on their level best. Hence forth we have taken the following hypothesis for examining various variables, models& equations from time to time whenever it will be needed. Such as:

9.1 Expected Hypothesis:

- a) [H1]: This hypothesis refers about the process of Green Recruitment and Selection Practices (GRSP) which has a significant role and positive effect on the economic sustainability in various corporate sectors.
- b) [H2]: This expected hypothesis refers that, Green Training and Development Practices (GTDP) have a significant positive effect on the economic sustainability of corporate sector
- c) [H3]: This expected hypothesis refers that, Green Performance Management Practices (GPMP) have a significant and positive effect on the economic sustainability of various corporate organizations.

9.2 Alternative Hypothesis: - (Ha)

- a) Ha1:-This alternative hypothesis refers about the Green Compensation and Benefits Practices (GCBP) how influence employee's behaviour, engagement in different work activities of GHRM practices in their organization and expected a significant and positive effect on the economic sustainability of various corporate organizations.
- b) Ha2:-This alternative hypothesis discusses how Green Employee Involvement Practices (GEIP) are implemented in the actual work assignments that are assigned to them and why it is anticipated that they will play a significant role and positively impact the financial sustainability of various corporate organizations.
- c) Ha3:-According to this alternative hypothesis, the positive correlation between overall green HRM



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Knowledge of Management (SRESTHAKAM)**

practices and economic sustainability will be considerably strengthened if an emerging model of green HRM practices is adopted in the twenty-first century.

10. Variables:

In this section, the researcher has taken no of variables for justifying the aforesaid hypothesis. The variables are namely :-

10.1 Independent Variable:

This variable refers about the execution of Green HRM in Corporate Sector has influenced to other variables or conditions such as Paperless work in administration, HR policy execution, and employee sustain etc. but other extremes may not influence Green HRM in administrative matter.

10.2 Dependent Variable:

This variable refers the authenticity of Green HRM practices in Corporate Sector depends upon no constraints such as, Support of higher-level management to upper, middle, lower and ground level management for execution properly the Green HRM rules and regulations and its benefits which expected a positive impact for creating conducive environment in the premises of the concerned organization for industry.

10.3 Alternative variable:

Changing the government's HR policies and other related factors, like allocating funds (budget) for well-developed Green HRM practices in various departments and organizations as a best practice, are crucial factors that impact the efficacy of Green HRM practices.

10.4 Control variable:

This variable refers, if the top level management, such as (Chairman, Board of Directors, CEO's etc.) with proper coordination Government and local bodies of administration then it will be highly effective in organization and it will be control by the top level management. In order to accomplish both environmental and business objectives, firms can successfully incorporate environmental sustainability into their human resource practices, according to the most recent research on Green HRM (GHRM) models. Recent models emphasize the importance of linking GHRM to organizational performance, employee well-being, and environmental responsibility. These models also explore the mediating and moderating roles of factors like environmental awareness, psychological climate, and organizational culture in the relationship between GHRM and employee behaviour.

11. Concept of Green HRM:

Regarding the idea of Green HRM, it is a good practice of Human Resource Management (GHRM) in many corporate sectors, where all employees are participating and embracing creative and sustainable ecological green practices to raise public awareness and create an eco- friendly workplace in their daily lives. Such as followed good and innovative practice, not to produce more garbage, harmful products from the industries and recycling it for use. Besides, those do practice to use required energy in the process production and administration, produce green products and promote it.

i) Fombrun Model: The Fombrun Model focuses on selection, evaluation, development, and incentives, 4 HRM responsibilities that affect organizational effectiveness.

ii) Harvard Model: This fundamental HRM model strongly emphasizes matching HR tactics with outside variables and company strategy. It emphasizes the essential role of hiring, overall performance opinions, incentives, and schooling.

iii) Guest Model: This model emphasizes an extra complete technique to HRM, taking into consideration elements consisting of worker family members, communication structures, and organizational structure.

iv) Warwick Model: The Warwick model locations a sturdy emphasis on the function that organizational development and people management play in reaching corporate objectives. It attracts attention to how HRM contributes to a productive place of work.

The management play in reaching corporate objectives. It draws attention to how HRM contributes to a productive workplace.

In corporate sector the aforesaid Green HRM Practices, has muted with number of similar amnd expected models of practices and the following performances has been found after the mutation with each other in the real practice at the corporate sector.

12. Mutation of Green HRM:

For a better green practice in corporate sector, the researcher have taken the following models with various approach and after mutation the following results has been found in the table :I of mutation model.

13. Models of Green HRM:

This GHRM Models refers about the process of



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recruitment and selection of individual employees
how adopted to the GHRM practices in corporate
sector related their attitude, behaviour towards the
policies of GHRM while executed in corporate

S.L No	Models Name	Types of Approach	Nature of work and Activity (After Mutation)	Performance	Ranks
1	Fombrun Model	Inter- Personal Approach	a) Employee Selection b) Appraisal System c) Employee Motivation and development d) Achievement of Organizational goal.	Positive	04
2	Harvard Model	HR Strategic Approach	a) Recruitment & Selection b) Performance c) Monitoring d) Rewards /Perks d) Training	Highly Positive	02
3	Guest Model	Holistic Approach	a) Planning & Designing b) Communication System c) Employee Relation d) Employee Sustainability	Moderate Positive	03
4	Warwick Model	Economic and Instrumental Approach	a) Achieving Business Goal b) Creating a Conducive c) Working Environment d) Recognition b)	Extreme Positive	01

sector (See figure :1)

As the role of GHRM models are concerned, these are plays a vital role for increasing, exploring how practices like green recruitment, training, and performance management impact organizational environmental performance, such as reduced carbon footprint and resource efficiency.

15.1 Employee Engagement and Well-being:

Research highlights the importance of creating a positive work environment that encourages employee involvement in green initiatives, leading to increased job satisfaction and green job performance.

a) Organizational Sustainability:

GHRM is seen as a key driver of overall organizational sustainability, encompassing economic, social, and environmental aspects.

16. Emphasis on Employee-Centered Approaches:

a) The Green Knowledge Sharing practice:

Models acknowledge the importance of fostering a culture of green knowledge sharing, where employees are empowered to contribute their ideas and expertise to improve environmental practices.

b) The Employee Involvement and Empowerment:

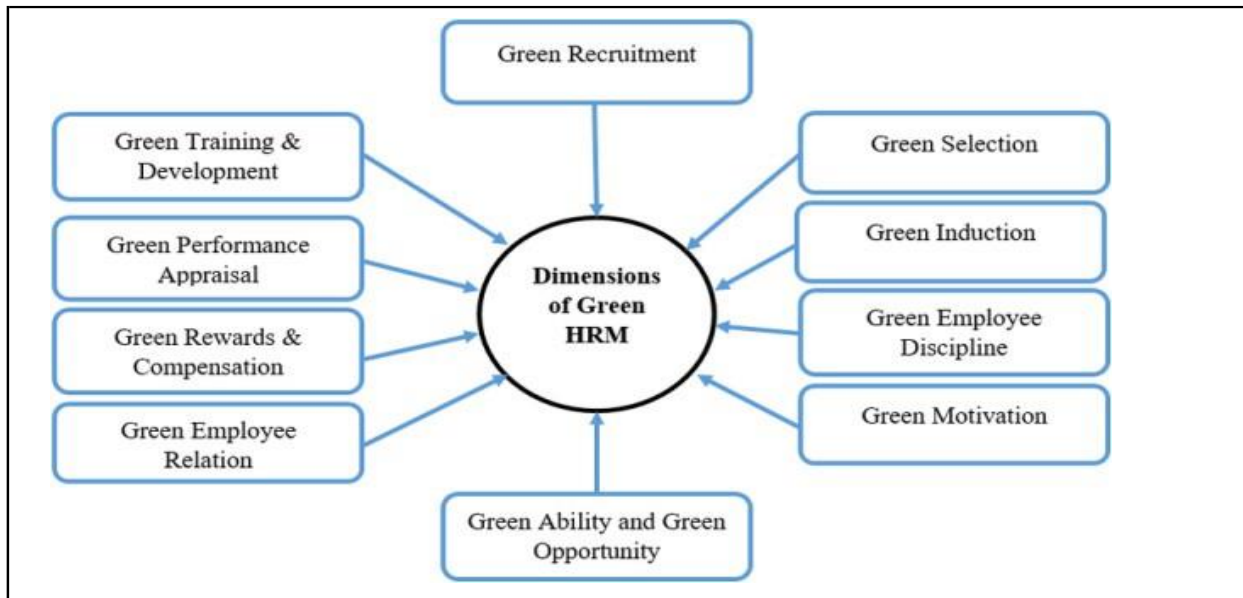
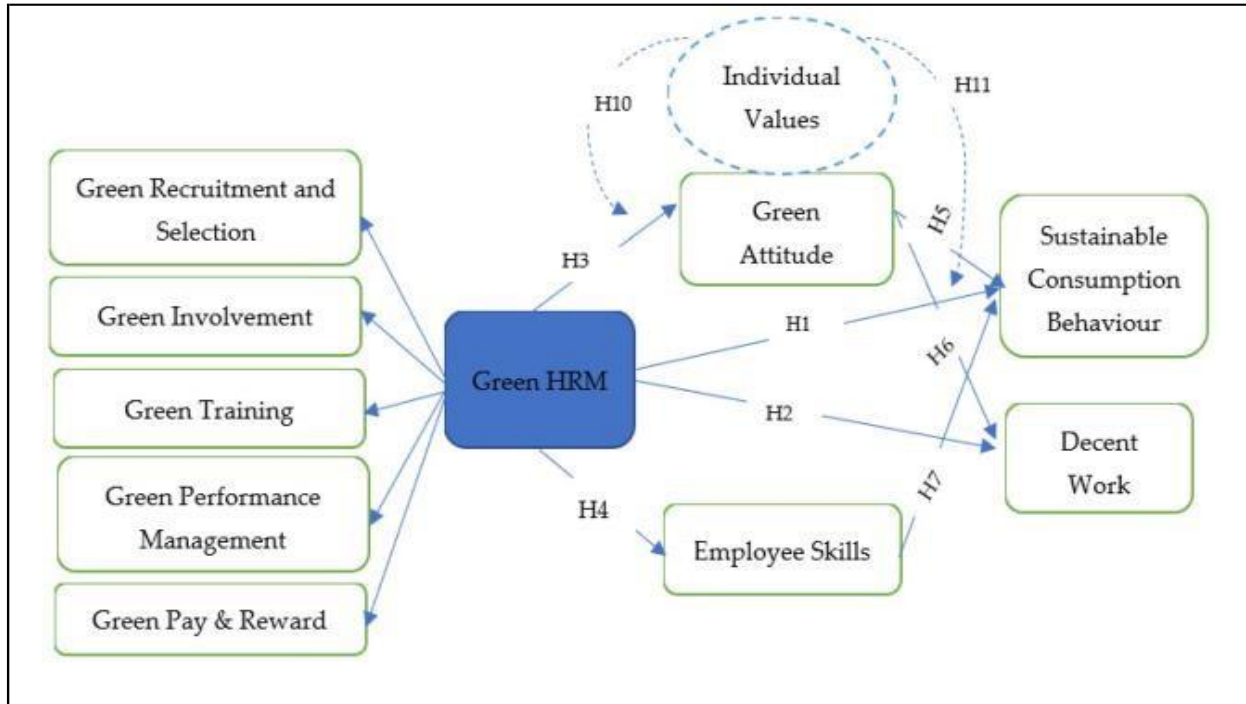
Encouraging employee participation in green initiatives, providing training on environmental issues, and empowering employees to make decisions that support sustainability is crucial.

c) The Psychological Climate:

Creating a positive pro-environmental psychological climate within the organization, where employees feel supported and encouraged to behave in environmentally responsible ways, is a key element.



17. Integration of Traditional HR Practices with Green Principles:



14. Why Green Model?

a) Green Recruitment and Selection:

Organizations are increasingly focusing on recruiting and selecting employees who are environmentally conscious and possess the skills and knowledge needed to contribute to sustainability.

b) Green Training and Development:

Providing training programs that raise employee awareness of environmental issues and equip them with the knowledge and skills to implement green practices is essential.

Since the OECD Secretariat created the GREEN model to evaluate the economic impact of reducing CO₂ emissions using a variety of economic tools, GHRM is currently required for the corporate world. There are two sections to execute Green HRM Practices and Green HRM sustainability for creating an eco-free environment.

15. Role of GHRM Models in Corporate Practice Green Performance:

Green Performance Management:

Integrating environmental performance goals into performance evaluations and providing incentives for employees who demonstrate pro-environmental behaviors can motivate sustainable practices.

16. Emerging Trends of GHRM:

a) Artificial Intelligence and Automation in HR:

The use of AI and automation in HR processes can help streamline green HRM practices and make them more efficient.

b) Focus on Specific Industries:

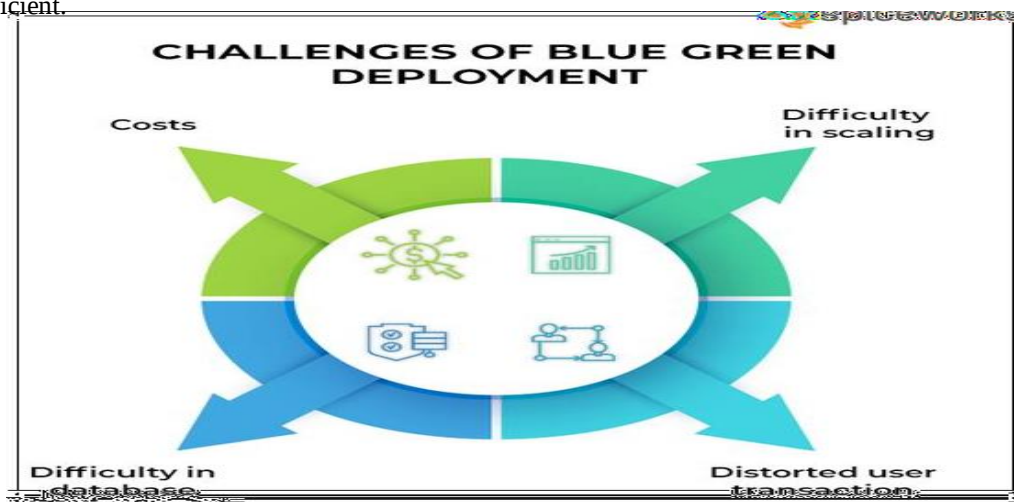
Research is exploring the application of GHRM in specific industries, such as manufacturing and construction, to address their unique environmental challenges.

c) Global Sustainability Standards:

Many GHRM models are aligning with global sustainability standards, such as the United Nations Sustainable Development Goals (SDGs), to ensure that HR practices contribute to broader environmental goals. In conclusion, the latest models of Green HRM emphasize the importance of integrating environmental sustainability into all aspects of HR, focusing on employee engagement, knowledge sharing, and organizational performance. These models are evolving to reflect the growing recognition of the critical role that HR plays in achieving both environmental and business success.

17. The Blue-Green HRM Model:

In a code release approach known as “blue-green deployment,” two distinct but identical environments coexist at the same time, and traffic is progressively transferred between them so that an updated environment is put into production and the older environment is decommissioned over an ongoing cycle. (See the figure -4 BGHRM)



[Figure:- 4 refers a diagrammatic represents of Blue Green Model in Corporate Practices in 21st century in world)

a) Green Recruitment and Selection

Attracting and hiring individuals with pro-environmental values and skills can lead to a workforce more inclined to identify and implement sustainable practices, contributing to resource efficiency, waste reduction, and a positive environmental image, ultimately enhancing

b) Green Performance Management

Integrating environmental performance metrics into employee evaluations and reward systems can incentivize behaviours that contribute to environmental conservation and cost savings. Emerging models are incorporating broader

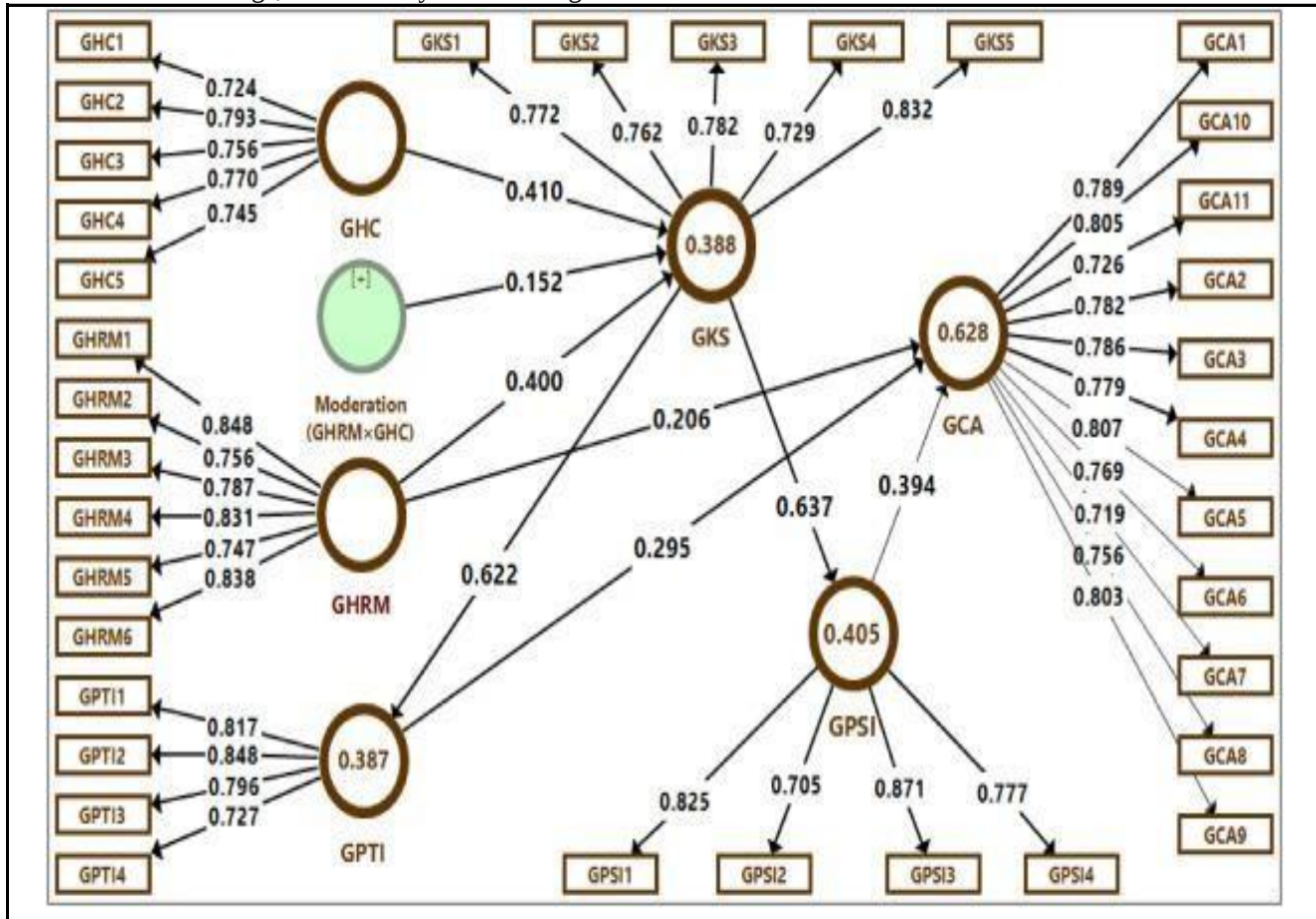


Figure -3 refers Green HRM Mediation Model and its Practices in Sustainability Goals. The model reviews, aligning individual and organizational environmental objectives with economic outcomes. Based on the theoretical framework, the following hypotheses are proposed:

economic sustainability. Emerging models focusing on digital and value-based green recruitment can broaden the pool of environmentally conscious talent.

c) Green Training and Development:

Equipping employees with the knowledge and skills to implement sustainable practices across various organizational functions can lead to tangible economic benefits through improved resource management, reduced environmental risks, and the development of green innovations. Emerging models utilizing online platforms and experiential learning can effectively disseminate green knowledge and skills. Based on the theoretical framework, the following hypotheses are proposed:

d) Green Compensation and Benefits

Offering incentives for environmentally friendly behaviours (e.g., commuting alternatives, energy-saving initiatives) and providing benefits that support sustainable lifestyles can enhance employee engagement in green initiatives and contribute to cost reduction and a positive organizational image. Emerging models are exploring innovative green benefits packages to attract and retain environmentally conscious talent. Based on the theoretical framework, the following hypotheses are proposed:

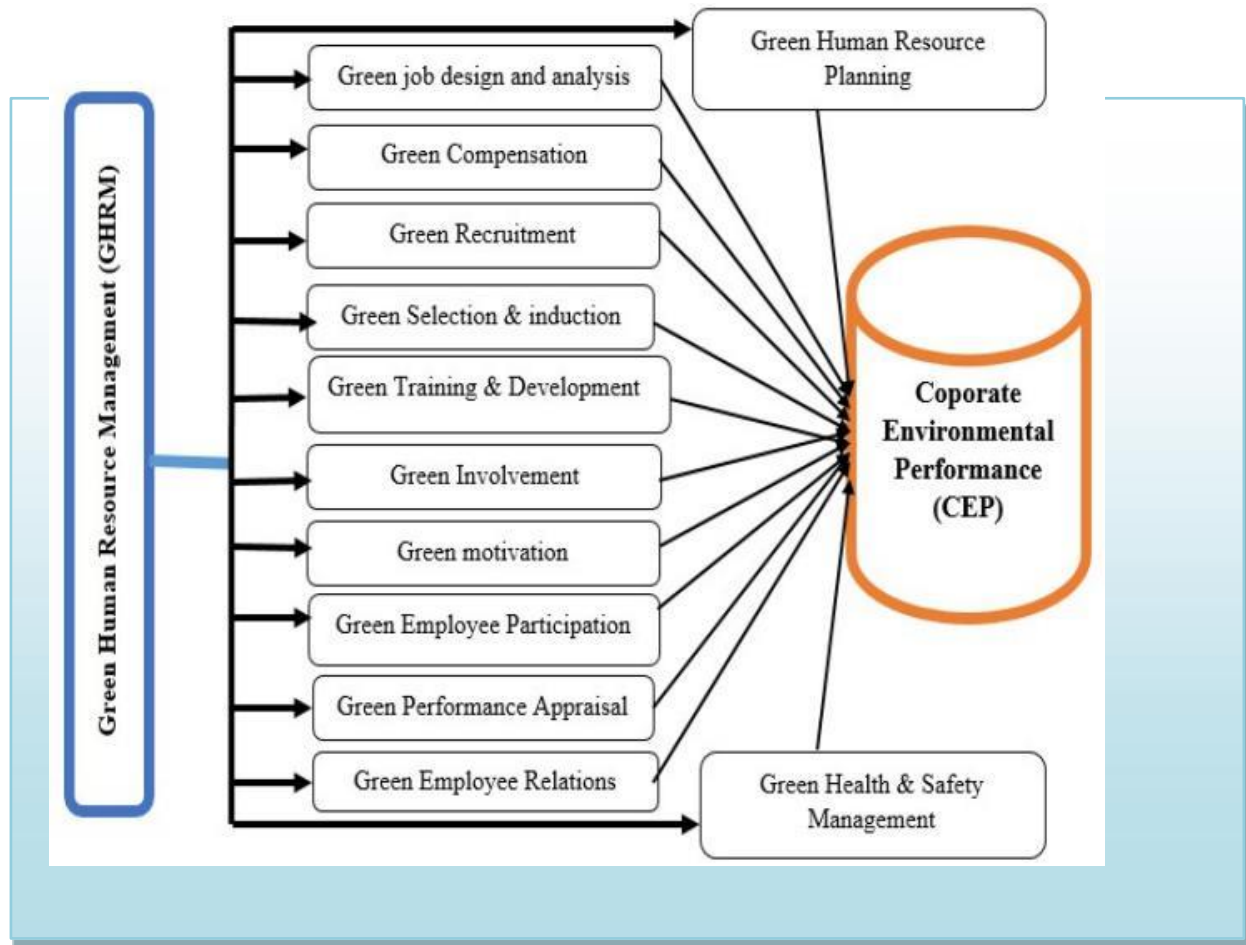
TCS	50	12	14	06	30	20	60%
WIPRO	50	13	11	05	29	21	58%
SATYA M	50	09	08	04	21	29	42%
IBM	50	12	14	05	31	19	62%
Microsoft	50	13	14	06	33	17	66%
Infosys' s	50	13	12	07	32	18	64%
Total	300	72	73	33	176 / 6 Mean = Σ / N=29.33	124 / 6 Mean = Σ / N= 20.67	58.67%

e) Green Employee Involvement

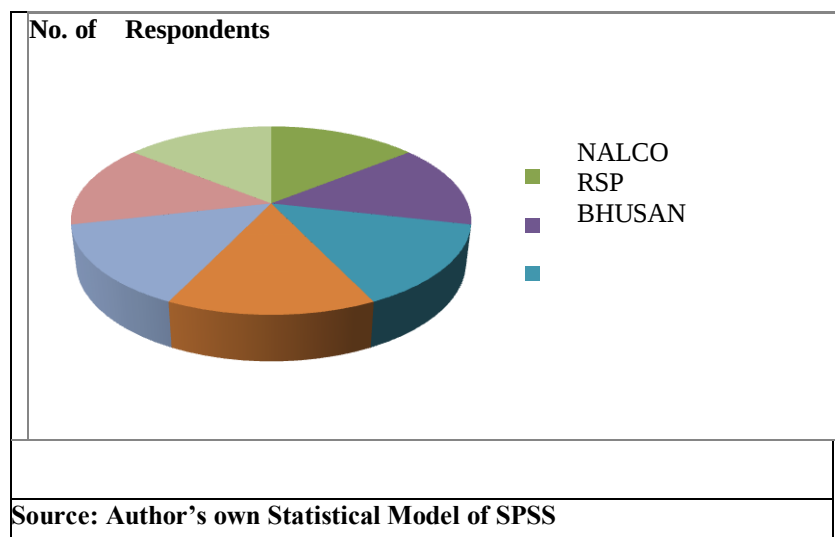
Empowering employees to participate in sustainability initiatives, generate green ideas, and contribute to environmental problem-solving can lead to innovative solutions, improved efficiency, and a stronger sense of ownership, positively impacting economic sustainability. Emerging models leverage digital platforms and collaborative tools to facilitate widespread employee involvement in green initiatives which is based on the theoretical framework, the following hypotheses are proposed:

18. The adoption of emerging models of Green HRM practices

Emerging models, characterized by the integration of technology, data analytics, a focus on employee values, and innovative engagement strategies, are expected to enhance the effectiveness and impact of traditional Green HRM practices on economic sustainability by reaching a wider audience, fostering deeper engagement, and driving more impactful green behaviours. Based on the theoretical framework, the following hypotheses are proposed:



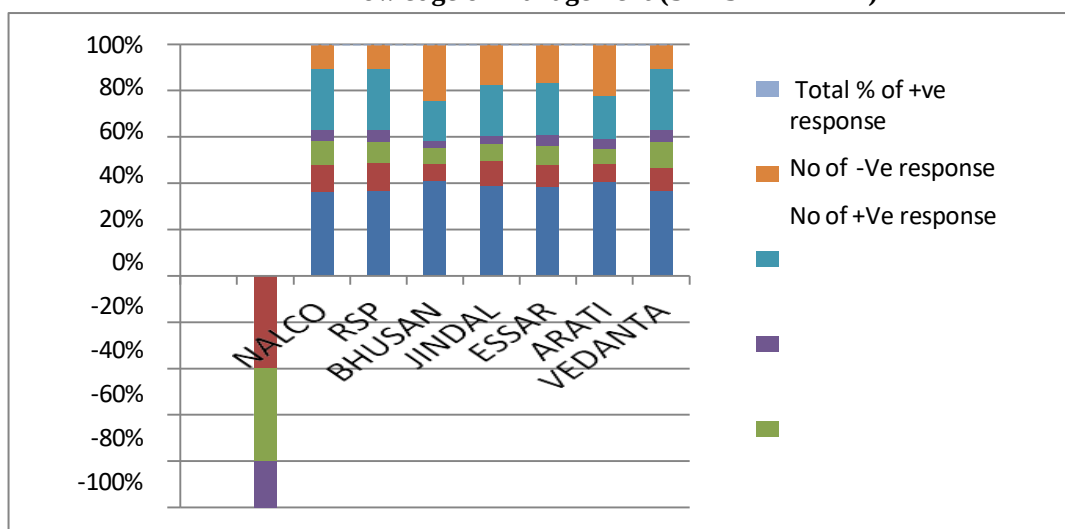
10.1 Respondents' Model of Green HRM on IT Sector of Bhubaneswar city in Pie Chart



Source: Author's own Statistical Model of SPSS

10.2 [Response model of Green HRM Practices in Bhubaneswar City in Graphical Semiotic Model]

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Source: Authors own Source -2025

[Figure: 5 refers a diagrammatic presentation of GHRM practices and its effect corporate sector for environmental performance]

21. Green HRM Practices in IT Sector in Odisha Data Table: 2

Corporate Sector	No. of Respondents	Respondents			No of +Ve Respondents	No of -Ve Respondents	Total % of +ve Response
		M (20)	F (20)	TG (10)			

Data Table: 3

10.3 Green HRM Practices in Production Companies in Odisha

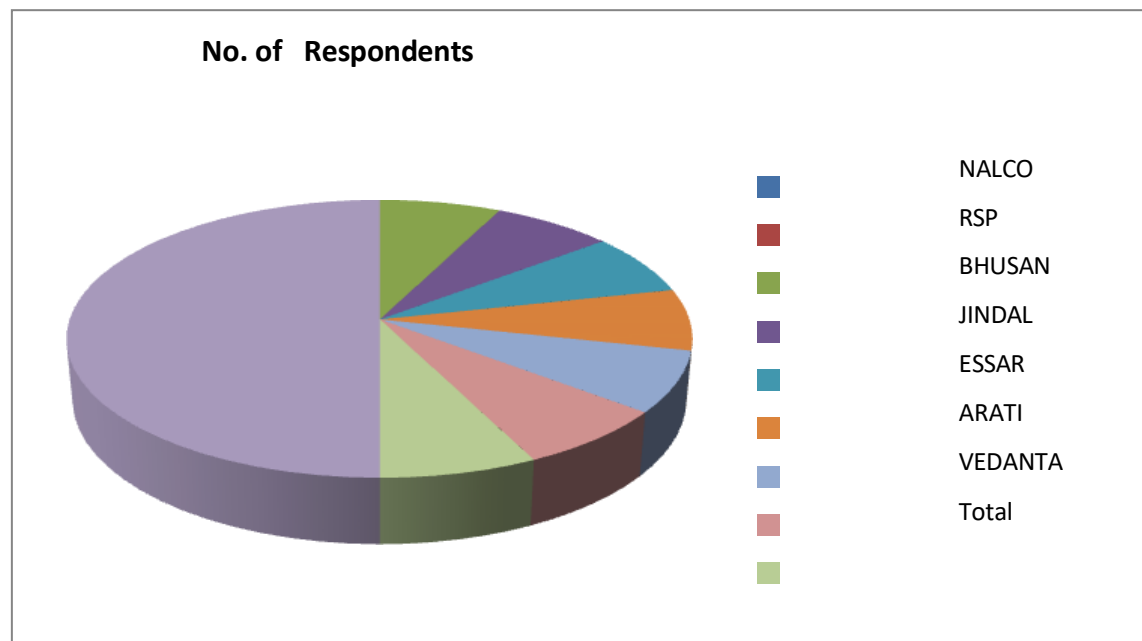
Corporate Sector	No. of Respondents	Respondents'			No. of +Ve response	No of -Ve response	Total% of +ve response
		M (20)	F (20)	TG (10)			
NALCO	50	16	14	06	36	14	72%
RSP	50	17	12	07	36	14	72%
BHUSAN	50	09	08	04	21	29	42%
JINDA L	50	14	09	05	28	22	56%
ESSAR	50	12	11	06	29	21	58%
ARATI	50	10	08	05	23	27	54%
VEDANTA	50	14	15	07	36	14	72%
Total	350	92	74	40	209/7=29.86 Mean (x) = Σ / N	141/7=20.14 Mean (x) = Σ / N	59.7% 1

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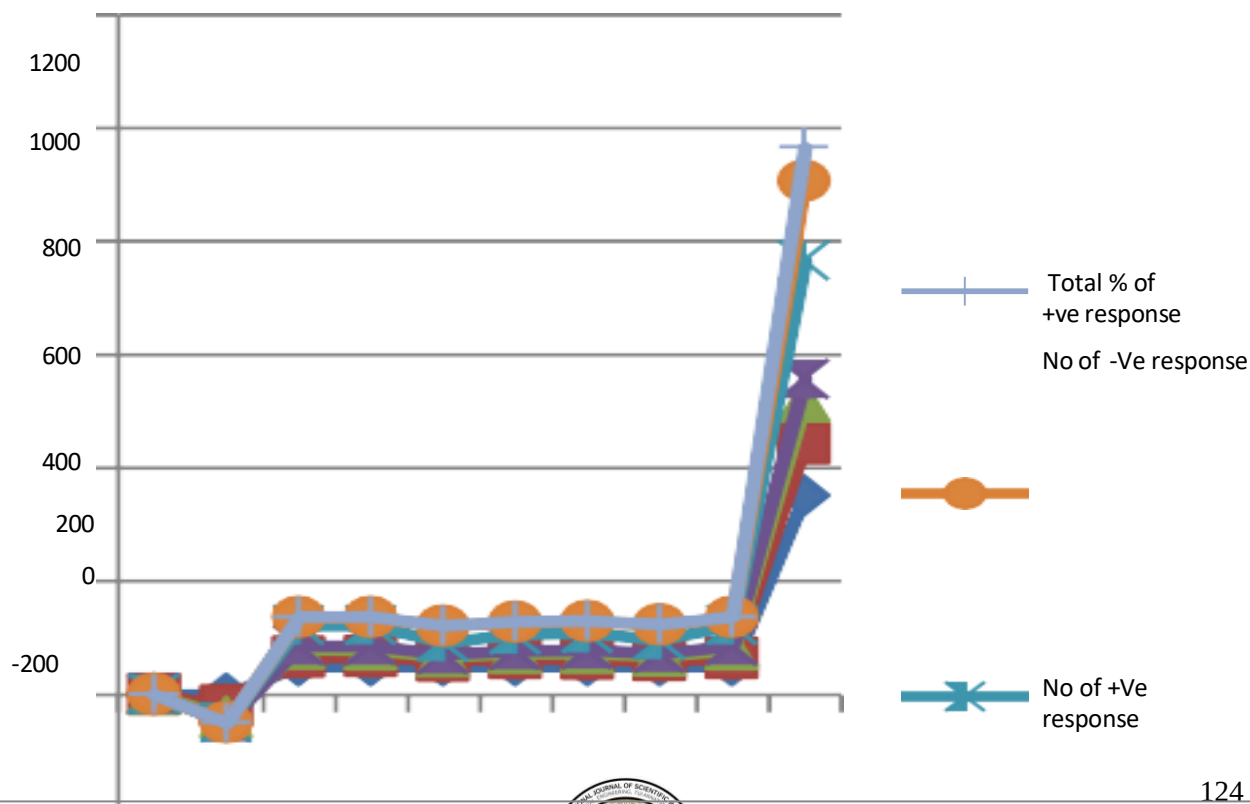
10.4 (Respondents' Model of Green HRM on Steel Production Company of Odisha in Pie Chart)

From the above table refers that the Green Practices mostly adopted by most of steel companies for a better Practice, there are 350 employees and staff has questioned through a face to face interaction, interview through a set of questionnaire designed by the researcher and respondents are highly cooperative to the researcher, there are 209 people have response positively and 141 negative response. but most of employees are willing to involve in GHRM Practices in their organization because of it is highly pollution free and hazard free as well as it creates a vibrant and ecological environment for work and better health.

10.4 Refers for Pie Chart related to no of respondents of Corporate Sectors of Different Cities of Odisha



10.5 Refers Respondents' Model of Green HRM on Steel Production Company of Odisha in Line Chart

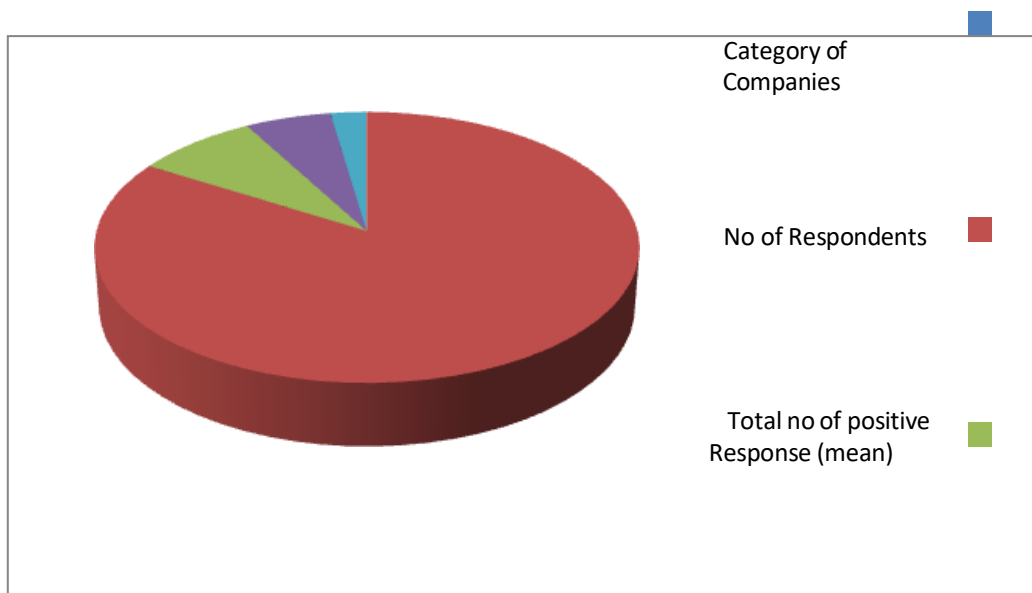


22. Data Analysis and Results

From the above data table we found that Green HRM practices in IT sector and production and manufacturing companies of Odisha has executed the Green HRM policies in their respective Organizations with a meticulous and systematic planning motivate into all levels of employees, staff and workers .Top level management has extended their cooperative hand and support to employees .Therefore the Green HRM practices has tremendous effect and real practice in Corporate Sector which has seems positive and satisfactory .For example the result table proofs that there are 72% Respondents adopted Green HRM practices in Nalco and RSP and Vedanta and others are ESSR Steel, Jindal and Arati Steels 58%,56% and 54% respectively, similarly from data Table No 1 proofs that from the respondents of Microsoft Infosys IBM and TCS positive percentage of responses are 66%,64%,62% and 60% respectively therefore it proofs that Green HRM practices as positive and fruitful result.

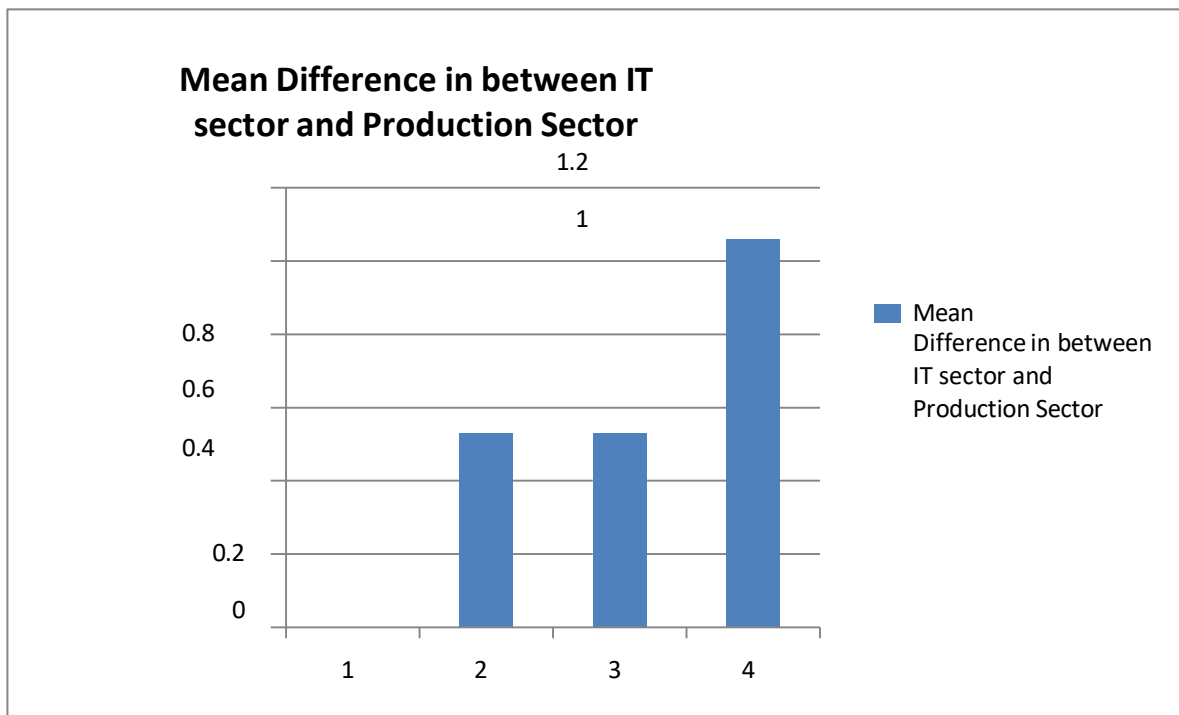
22.1 Final Result Table:

Category of Companies	No of Respondents	Total no. of positive	Total no. of positive	Mean difference
		Response (mean)	Response (mean)	
IT sector	300	29.33	20.67	8.66
Production and Manufacturing	350	29.86	20.14	9.72
Mean Difference in between IT sector and Production Sector		0.53	0.53	1.06

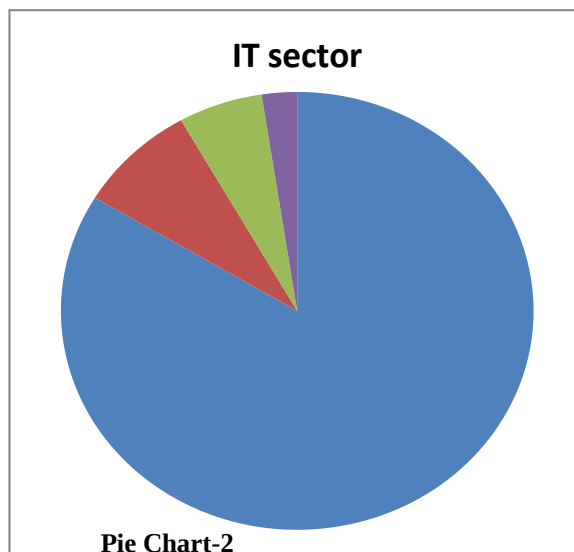
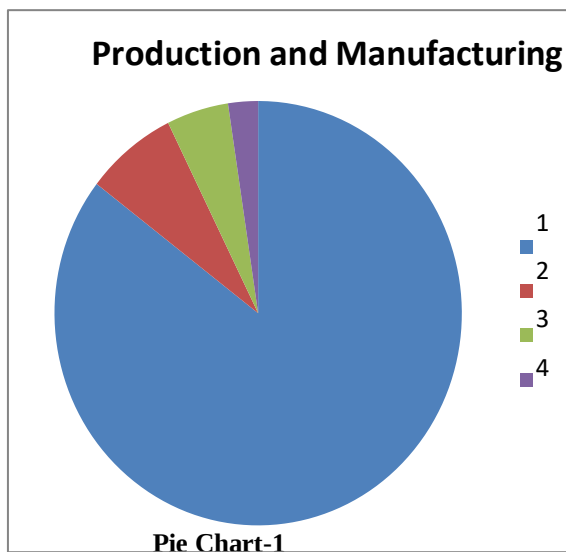


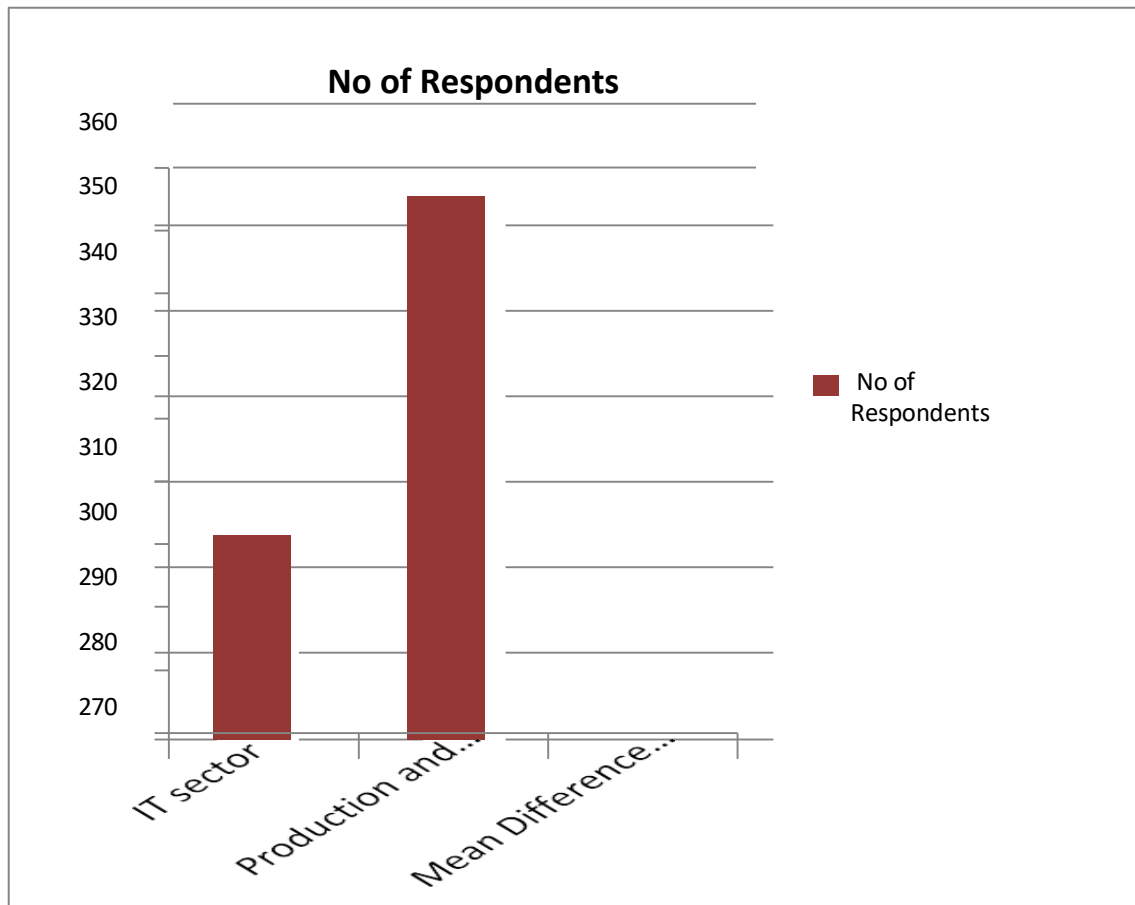
22.2 Refers about the semiotic models of pie chart/Bar graph etc. related to final result table of GHRM Practices in IT and Production and Operation Sectors in different companies.

10.6 Refers to respondent of Production or Operation Sector of various companies in Pie chart .



10.7 Refers to Bar Graphs and Pie Charts of Respondents of IT and Operation sector and comparison with Production and Manufacturing sector in Odisha





Correlation between two IT Sector & Production and Manufacturing sector:

From the final result table, it proves that the mean values

0.53 each of the respondents (+ve) are highly positive and correlated in different respondents (such as employees, staff, workers etc.) of various companies related to production and operation sector.

Therefore, the researchers have found that the standard deviation (σ) (Sample S.D) is 5.02 and trying to testing the hypothesis. We should calculate Chi-Square value as per the followings:

$$\chi^2 = \frac{\sum (\frac{O - E}{E})^2}{n-1}$$

s p

11.3 Chi Square test: Data Table :4

Sl No	1	2	3	4	5	6	7	Total
IT Sector	30	29	21	31	31	32		176
Production and Manufacturing Sector	36	36	21	28	29	23	36	209
Total	66	65	42	69	60	55	36	385

11.4 Solution Table:

Sl no	Respondent of IT Sector +ve response (X)	Respondent of Production and Manufacturing Sector +ve response (Y)	Difference(d)	D2
1	30	36	-6	36
2	29	36	-7	49
3	21	21	0	0
4	31	28	+3	9
5	33	23	+4	16
6	32	29	+4	16
7	31	36	-5	25
8	$\sum X_i=207$	$\sum Y_i=209$	$\sum d=-7$	$\sum d^2=151$

From the table No-3 the researcher has trying to apply Chi Square in order to examine the variances of sample data (+ve responses) between IT sector (X) and production and Manufacturing sector(Y). Thus, the mean values of IT sector $\sum X_i=207/7$ and calculating mean value $\bar{x}=\sum X_i/n$
 $=207/7=29.571$ similarly the mean value of Production and Manufacturing Sector $\sum Y_i=209/7$ and calculating mean value

$$\bar{Y}=\sum Y_i/n$$

$$= 209/7$$

= 29.86 thus we calculate the standard deviation

$$\sigma_s = \sqrt{\sum (x_i - \bar{x})^2 / n - 1}$$

$$= \sqrt{151/7-1}$$

$$= \sqrt{25.167}$$

$$= 5.016 \text{ or } 5.02$$

$$= 5.02/14 * (7-1)$$

$$= 0.358 * 6$$

$$= 2.148 \text{ or } = 2.15$$

22.5 Degree of Freedom and level of significance:

- From the above result the chi square is calculated 2.15 and testing the degree of freedom

$$= (n-1) (7-1) = 6$$

At the level of significance of the table value χ^2 (Chi- square) 2.15 and 0.1% level of significance 10.645 and 0.5 % level of significance 5.348 and obtained value 5.02 thus both the values are calculated greater than the Chi square value thus we conclude that the table value at both the level 0.1% and 0.5 % is significant. Therefore, the taken hypotheses are accepted and justified.

12. Hypothesis Testing

From the final result table of data analysis, it proves that Green HRM has tremendous impact and fruitful in all corporate sector and taken variable Independent, Dependent, Alternatives are positive

and cooperative related to taken three expected hypothesis H1, H2, H3 and three alternative hypotheses are Ha1, Ha2 and Ha3 because of their higher interrelations. Therefore, the taken hypothesis is justified, genuine, reliable and authenticate in all levels of “ α ” equals to 0.1 and 0.5 only due to its highly significance. Thus, we recommended to all sector and Government offices enterprises etc.do execute Green HRM as soon as possible.

13. Discussion and Conclusions

In sum, the above summations are summarizing that the execution of Green HRM policies in corporate sector are highly necessary due to its great importance and utility such as:-

a) Green HRM focuses a well Green Practice in all segmentation of corporate Sector by which we avail an ecological environment (pollution and hazard free) for good health & wellbeing.

b) Green HRM teaches us a better practice and habit not to dilute the environment related to office, school, college, industry and other organizations, by which we live a good and beautiful environment where freely available pure oxygen.

c) Green practices enable our economic development and its sustainability due to less paper work, documentation and other unnecessary expenditures.

Therefore, we may conclude that Green HRM practices are a beautiful policy to execute by all stakeholders everywhere.

14. Recommendation and suggestion for future research work

After carefully experimentation of Green HR practices the researcher observed that the following recommendation and advises would be given to the young professionals

, engineers, technocrats, scientists, doctors, students research scholars, professors, corporate people and all the citizens as below: -

- a) The Green HRM practices should have executed by all stake-holders in their respective organization through their daily practice because it gives them better environment for happy and healthy leaving.
- b) To execute the advance methodology /techniques and creative and innovative things and practices in the real world operation.
- c) Green HRM motivate and promote to all stake holders to consume capital(money) in all segmentation of production, operation, education and maintain of human life style for creating a beautiful environmental ambience by which the GDP of the nation will be increased.

Bibliography

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EDITORS:
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PROF. SUMAT CHANDRASEKAR
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PROF. DR. J. BANERJEE CHANDRA BATH

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PROF. DR. J. BANERJEE CHANDRA BATH

SWAMI VIVEKANANDA INSTITUTE OF MANAGEMENT
BHUBANESWAR

office@svim.edu.in, svim.bbsr@gmail.com svim.edu.in, pectrust.in



SWAMI VIVEKANANDA
INSTITUTE OF MANAGEMENT
At: Baniatangi, PO: Bajapur,
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Mob: 9338769003,
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