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CONFERENCE PROCEEDINGS

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Editors

Dr. Pankaj Kumar Soni

Dr. Ravi Kant Modi



CONFERENCE PROCEEDINGS

JUNE, 2025



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CONFERENCE PROCEEDINGS

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(04:30 pm (IST) onwards)

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Keynote Paper

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NONLINEAR DYNAMICS OF A PREDATOR-PREY MODEL WITH BEDDINGTON-DEANGELIS FUNCTIONAL RESPONSE

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Abstract

This article uses Beddington and Holling type-II functional response to explore a tritrophic food web model system with prey-predator such as prey, midpredator, and top predator. This model's positivity, boundedness, local stability, and global stability were investigated. In addition, stability requirements are derived using the Routh-Hurwitz criterion. Both theoretical and numerical discussions of Hopf bifurcation are included. Additionally, the Center Manifold Theorem has been used to establish the stability of non-hyperbolic equilibrium sites. Additionally, Matlab ode45 software has been used for numerical analysis, demonstrating the dynamic character of the model system.

Keywords: Prey-predator system, Boundedness, Global stability, Bifurcation, Center manifold theorem

Introduction

In ecology, interactions between predators and prey occur at higher trophic levels and predators can affect prey populations directly and indirectly [1, 2]. While the predator's indirect influence involves the prey population, which has the potential to alter prey behavior, the predator's direct effect involves predating the prey [3, 4, 5]. Functional response is a major aspect of the ecological model system. Functional responses that are used in many biological studies like Holling type I-IV, Ivlev, Crowley-Martin, Beddington-DeAngelis, etc. Holling type II functional response is bounded and correct for biological systems which conclude that Holling type II functional response is more appropriate [6, 7, 8, 9, 10, 11]. Many researchers performed Holling type II functional response in higher order models [12, 13, 14, 15, 16]. For the higher order model Beddington-DeAngelis functional response is used. Many studies have discussed bifurcation analysis of the prey-predator system providing for prey refuge, and the existence of bifurcation (transcritical, Hopf). When one root is negative and the next is purely complex conjugate, this type of equilibrium point is non-hyperbolic. The stability of equilibrium point Center manifold theorem has

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been performed [17]. Group defense plays a major role in the dynamical system which plays an important part in prey- predator model system. When prey species are in large numbers, they have defenseability by creating herds, which shows decreased predation of the prey [18]. Some studies consider the impact of toxins which are harmful to many aquatic organisms in marine systems [19]. It is evident that in the process of algal blooms, algal aggregation plays a significant role. It has been found in past decades that the prey-predator stability has been affected by toxic substance [20]. Filter-feeding fish can reduce the algal bloom population which affects the healthy development of the marine system. Filter-feeding fish is widely applied in water bodies which is a direct method of manipulation to control cyanobacterial algal blooms [21]. Some authors investigated the harvesting of prey and predators, when the density of the harvested population is large such harvesting increases to a limit value [22, 23]. Many authors have also included alternative food sources in their research and the behavior of a system is significantly influenced by substituting food sources for predators. When the density of favored prey is low, predators move to other meals [24, 25, 26]. In this study, we considered the ecological terms logistic growth rate, consumption of prey by mid predator using Beddington function response, and consumption of mid predator by the top predator using Holling type II functional response. Beddington-DeAngelis function response and Holling type II functional response have not been used together. In this study, we illustrated the local and global stability of model system. Then, we performed the bifurcation by using constant c . Also, we found the stability using the Center Manifold theorem. Finally, theoretical results are found with some numerical analysis.

The importance of this article is:

To introduce three-dimensional food chain prey predator model by using Beddington-DeAngelis functional response and Holling type II functional response.

- To check the stability and bifurcation of the system.
- To know the concept of Center manifold theorem.
- To illustrate numerical analysis of the model system.

The article is given below: In part 2, model formulation of the non-spatial system has been given. In part 2.1, dynamical behavior is analyzed. It is shown that equilibrium points exist then stability has been checked at each of the equilibrium points. Moreover, bifurcation of the model has been performed. In part 3, numerical simulations have been given. Finally, in part 4, discussion and conclusion has been given.

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Motivation and Novelty

In our paper formulation of mathematical model based on three species food chain with prey refuge have been studied using Beddington-DeAngelis and Holling type II functional responses. The Beddington-DeAngelis and Holling type II responses are especially helpful in modeling situations in which predators become more effective at increasing prey densities and less effective at lower densities. To improve the system's stability, the study combines these two functional responses together. This method can result in more resilient and stable ecosystem dynamics and enables a more sophisticated portrayal of predator-prey interactions. The attack rate of a generalist predator significantly influences the mathematical modeling of predator-prey dynamics. The attack rate directly determines the form and parameters of the functional response, which describes how the predator's consumption rate changes with prey density. Higher attack rate, increases the predator's efficiency in capturing prey, leading to a rapid decline in prey population. This can result in greater oscillations in population sizes and potentially destabilize the system if the prey population drops too low. Lower attack rate, decreases the predator's efficiency, allowing the prey population to grow, which might reduce oscillations and stabilize the system. Predator prey models demonstrate inhibitory effects in population dynamics, since the presence of predators slows the increase of prey populations. This interaction can keep the prey from growing too much and stabilize the populations. Also, the Center Manifold Theorem is a powerful tool in dynamical systems theory, particularly useful for analyzing the stability of non-hyperbolic equilibrium points. The Center Manifold theorem facilitates the analysis of a system's stability by lowering its dimensionality in the vicinity of a nonhyperbolic equilibrium point. Main target of this study is to introduce refuge ability and prevented predation of the prey. This model is completely new as it integrates the Beddington-DeAngelis functional response and the Holling type II functional responses, which has not been previously combined in ecological research.

The article is given below: In part 2, model formulation of the non-spatial system has been given. In part 3, some definitions related to work are given. In part 4, dynamical behavior is analyzed. It is shown that equilibrium points exist then stability has been checked at each of the equilibrium points. Moreover, Global stability, effect of attack rate of generalist predator on specialist predator, bifurcation of the model, center manifold theorem have been performed. In part 5, numerical simulations have been given. Finally, in part 6, discussion and conclusion has been given.

System Model Formulation

Here, we consider three-dimensional interaction model. To propose the model system the assumptions are as below:

- Prey density is shown by U , mid-predator density is shown by V , and top predator density is shown by W .
- The prey species becomes larger with growth rate A_1 .
- K shows carrying capacity.
- Prey and mid-predator succeed Beddington functional response.
- Mid-predator and top predator succeed Holling type-II functional response.

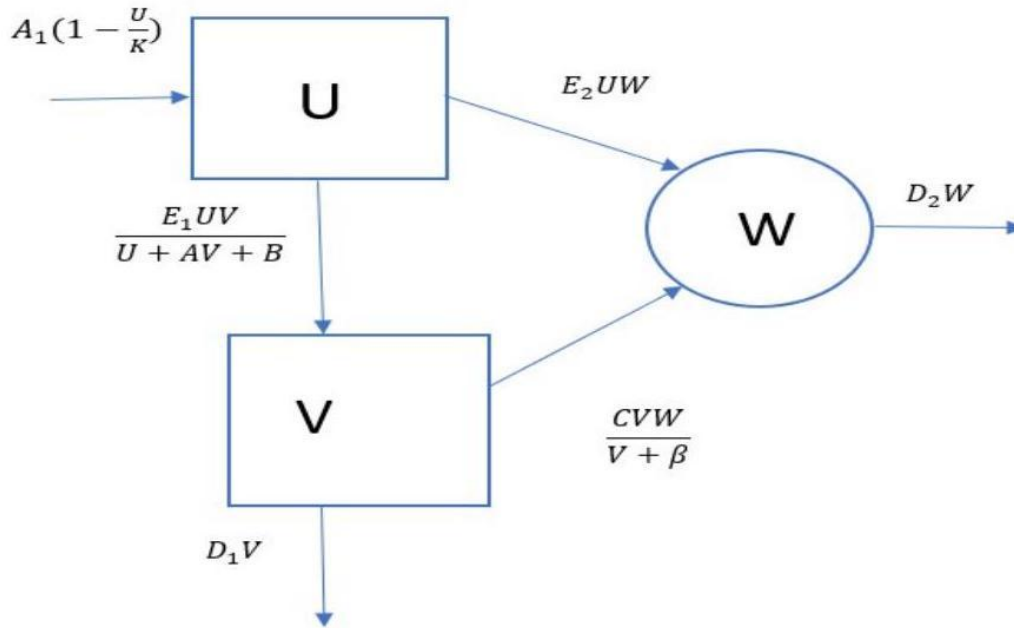


Fig. 1: Schematic Diagram of Model System

The model is expressed as below:

$$\frac{dU}{dT} = A_1 U \left(1 - \frac{U}{K}\right) - \frac{E_1 UV}{U + AV + B} - E_2 UW \quad (1)$$

$$\frac{dV}{dT} = \frac{\alpha_1 E_1 UV}{U + AV + B} - D_1 V - \frac{C_1 VW}{V + \beta} \quad (2)$$

$$\frac{dW}{dT} = \alpha_2 E_2 UW - D_2 W + \frac{\alpha_3 C_1 VW}{V + \beta} \quad (3)$$

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Subject to IC: $U(0) > 0, V(0) > 0, W(0) > 0$. Now, we reduce the parameters, for this purpose, we put $u = \frac{U}{K}$, $A_1 T = t$, $v = \frac{E_1 V}{A_1 K}$, $w = \frac{WE_2}{A_1 K}$. The system turns as:

$$\frac{du}{dt} = u(1 - u) - \frac{uv}{u + cv + \beta_1} - uw \quad (4)$$

$$\frac{dv}{dt} = \frac{\alpha_1 uv}{u + cv + \beta_1} - m_2 v - \frac{c_1 vw}{v + b} \quad (5)$$

$$\frac{dw}{dt} = m_3 uw - m_4 w + \frac{m_5 wv}{v + b} \quad (6)$$

$u(0) > 0, v(0) > 0, w(0) > 0$. Here, $c = \frac{AA_1}{E_1}$, $\beta_1 = \frac{B}{K}$, $m_2 = \frac{D_1}{E_1}$, $b = \frac{\beta E_1}{A_1 K}$, $m_4 = \frac{D_2}{E_2}$, $m_5 = \frac{\alpha_3 C_1}{E_2}$, $m_3 = \alpha_2 K$.

Dynamical Behavior

In this part, we will discuss positivity, boundedness, stability, and bifurcation of the system.

Table 1 Ecological Parameters are described as:

Parameters	Meaning
A_1	Growth rate
E_1	mid predator's consumption rate on prey
A	Inhibitory effect
K	Carrying capacity
B	Half saturation constant
E_2	predator's consumption rate on prey
α_1	Conversion of prey biomass into mid predator
D_1	mid predator's death rate
C_1	Consumption rate of mid predator by top predator
β	Predator interference parameter
α_2	Constant rate of prey biomass into top predator
D_2	top predator's death rate
α_3	Constant rate of mid predator biomass into

• Positivity

Populations in the system never go extinct because of the positives we discovered. For this purpose, we integrate the equations by using ICs as below

$$u(t) = u(0) \left(\int_0^t \left[(1-u) - \frac{v}{u + cv + \beta_1} - w \right] ds \right) \quad (7)$$

$$v(t) = v(0) \left(\int_0^t \left[\frac{\alpha_1 u}{u + cv + \beta_1} - m_3 - \frac{c_1 w}{v + b} \right] ds \right) \quad (8)$$

$$w(t) = w(0) \left(\int_0^t \left[m_3 u - m_4 + \frac{m_5 v}{v + b} \right] ds \right) \quad (9)$$

Hence, if the initial conditions are non-negative then the right side is positive.

- **Boundedness**

In this part, we prove the boundedness of the system. It indicates the system is conducted in an appropriate manner.

Theorem 1: Solutions of the model system (1)-(3) is uniformly bounded in R_+^3 .

Proof: Let solution of the model (1)-(3) is $(u(t), v(t), w(t))$.

Let us suppose a function $\psi(u, v, w) = u + \frac{v}{\alpha_1} + \frac{c_1 w}{\alpha_1 m_5}$, then we have $\frac{d\psi}{dt} = u(1 - u) + \left[\frac{c_1 m_3}{m_5 \alpha_1} - 1 \right] uw - \frac{w}{\alpha_1} \left[m_2 + \frac{m_4 c_1}{m_5} \right]$

Then we get $l > 0$, in a way that $\frac{d\psi}{dt} + \zeta \psi \leq l$, which implies that: $\phi(t) \leq \phi(0)e^{-\zeta t} + \frac{1}{\zeta}(1 - e^{-\zeta t}) \leq \max\left(\phi(0), \frac{1}{\zeta}\right)$. Hence, the theorem is proved.

- **Equilibrium points and stability**

This analysis gives four equilibrium points (i) $E_1 = (0,0,0)$ (ii) $E_2 = (1,0,0)$ (iii) $E_3 = \left(\frac{m_4}{m_3}, 0, \frac{m_3 - m_4}{m_3}\right)$ (iv) $E_4 = (\tilde{u}_4, \tilde{v}_4, \tilde{w}_4)$

- **Stability Analysis**

In this part, first, linearize the system to get the stability then find the Jacobian matrix.

Theorem 2: Eigen values of $J(E_1)$ is a saddle point.

Proof: Here $E_1 = (0,0,0)$. Then, $J(E_1)$ is $J(E_4) = \begin{bmatrix} 1 & 0 & 0 \\ 0 & -m_2 & 0 \\ 0 & 0 & -m_4 \end{bmatrix}$

The eigenvalues of E_1 are $1, -m_2, -m_4$. Then, E_1 is a saddle point.

Theorem 3: E_2 is LAS if $\frac{\alpha_1}{1+\beta_1} < m_2$ and $m_3 < m_4$.

Proof: $J(E_2)$ is as follows:

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$$J(E_2) = \begin{bmatrix} -1 & \frac{-1}{1+\beta_1} & -1 \\ 0 & \frac{\alpha_1}{1+\beta_1} - m_2 & 0 \\ 0 & 0 & m_3 - m_4 \end{bmatrix}$$

The eigen values of E_2 are $-1, \frac{\alpha_1}{1+\beta_1} - m_2$ and $m_3 - m_4$. Therefore, E_2 is LAS if $\frac{\alpha_1}{1+\beta_1} < m_2$ and $m_3 < m_4$

Theorem 4: $J(E_3)$ is LAS if $m_2 > \frac{\alpha_1 \left(\frac{m_4^2}{m_3^2} + \beta \frac{m_4}{m_3} \right)}{\left(\frac{m_4}{m_3} + \beta_1 \right)^2} - \frac{c_1(m_3 - m_4)}{m_3 b}$ and saddle point if $m_2 < \frac{\alpha_1 \left(\frac{m_4^2}{m_3^2} + \beta \frac{m_4}{m_3} \right)}{\left(\frac{m_4}{m_3} + \beta_1 \right)^2} - \frac{c_1(m_3 - m_4)}{m_3 b}$.

Proof: $E_3 = \left(\frac{m_4}{m_3}, 0, \frac{m_3 - m_4}{m_3} \right)$, exists. Thus, the characteristic roots $J(E_3)$ is as given:

$$\frac{\alpha_1 \left(\frac{m_4^2}{m_3^2} + \beta \frac{m_4}{m_3} \right)}{\left(\frac{m_4}{m_3} + \beta_1 \right)^2} - m_2 - \frac{c_1(m_3 - m_4)}{m_3 b}, \lambda_2 \text{ and } \lambda_3 \text{ Here, } \lambda_2 \text{ and } \lambda_3 \text{ are characteristic roots of the}$$

equation $\lambda^2 + \frac{m_4}{m_3} \lambda + \frac{m_4}{m_3} (m_3 - m_4) = 0$. Hence, $J(E_3)$ is LAS if $m_2 > \frac{\alpha_1 \left(\frac{m_4^2}{m_3^2} + \beta \frac{m_4}{m_3} \right)}{\left(\frac{m_4}{m_3} + \beta_1 \right)^2} - \frac{c_1(m_3 - m_4)}{m_3 b}$

$$\frac{c_1(m_3 - m_4)}{m_3 b} \text{ and saddle point if } m_2 < \frac{\alpha_1 \left(\frac{m_4^2}{m_3^2} + \beta \frac{m_4}{m_3} \right)}{\left(\frac{m_4}{m_3} + \beta_1 \right)^2} - \frac{c_1(m_3 - m_4)}{m_3 b}$$

Theorem 5: E_4 is LAS, if conditions satisfy (i) A, B and C > 0, (ii) AB > C.
Proof: Now, for the equilibrium point $E_4 = (\tilde{u}, \tilde{v}, \tilde{w})$, exists. Thus $J(E_4)$ is as following:

$$J(E_4) = \begin{bmatrix} y_{11} & y_{12} & y_{13} \\ y_{21} & y_{22} & y_{23} \\ y_{31} & y_{32} & y_{33} \end{bmatrix}$$

where, $y_{11} = 1 - 2\tilde{u} - \frac{c\tilde{v}^2 + \beta_1\tilde{v}}{(\tilde{u} + c\tilde{v} + \beta_1)^2} - \tilde{w}, y_{12} = \frac{-(\tilde{u}^2 + \beta_1\tilde{u})}{(\tilde{u} + c\tilde{v} + \beta_1)^2}, y_{13} = 0, y_{21} = \frac{\alpha_1(\tilde{v}^2 + \beta_1\tilde{v})}{(\tilde{u} + c\tilde{v} + \beta_1)^2},$
 $y_{22} = \left[\frac{\alpha_1(\tilde{u}^2 + \beta_1\tilde{u})}{(\tilde{u} + c\tilde{v} + \beta_1)^2} - m_2 - \frac{bc_1\tilde{w}}{(\tilde{v} + b)^2} \right], y_{23} = \frac{-c_1\tilde{v}}{(\tilde{v} + b)}, y_{31} = m_3\tilde{w}, y_{32} = \frac{bm_5\tilde{w}}{(\tilde{v} + b)^2} y_{33} = m_3\tilde{u} - m_4 + \frac{m_5\tilde{v}}{(\tilde{v} + b)}.$

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The characteristic equation is as showing:

$$\lambda^3 + A\lambda^2 + B\lambda + C = 0 \quad (10)$$

where, $A = -(y_{11} + y_{22} + y_{33})$

$$B = y_{11}y_{22} - y_{12}y_{21} - y_{23}y_{32}$$

$$C = y_{11}(y_{22}y_{33} - y_{23}y_{32}) - y_{12}y_{21}y_{33}$$

Hence, E_4 is LAS, as following conditions hold: (i) A, B and $C > 0$ (ii) $AB > C$.

Global Stability Analysis

Theorem 6: If we consider that

$$1 - 2\tilde{u} - \frac{c\tilde{v}^2 + \beta_1\tilde{v}}{(\tilde{u} + c\tilde{v} + \beta_1)^2} - \tilde{w} > 0 \quad (11)$$

$$\left[\frac{\alpha_1(\tilde{u}^2 + \beta_1\tilde{u})}{(\tilde{u} + c\tilde{v} + \beta_1)^2} - m_2 - \frac{bc_1\tilde{w}}{(\tilde{v} + b)^2} \right] \quad (12)$$

$$m_3\tilde{u} - m_4 + \frac{m_5\tilde{v}}{(\tilde{v} + b)} > 0 \quad (13)$$

$$\left[1 - 2\tilde{u} - \frac{c\tilde{v}^2 + \beta_1\tilde{v}}{(\tilde{u} + c\tilde{v} + \beta_1)^2} - \tilde{w} \right] \left[\frac{\alpha_1(\tilde{u}^2 + \beta_1\tilde{u})}{(\tilde{u} + c\tilde{v} + \beta_1)^2} - m_2 - \frac{bc_1\tilde{w}}{(\tilde{v} + b)^2} \right] > \left[\frac{-(\tilde{u}^2 + \beta_1\tilde{u})}{(\tilde{u} + c\tilde{v} + \beta_1)^2} \right] \quad (14)$$

$$\left[\frac{\alpha_1(\tilde{u}^2 + \beta_1\tilde{u})}{(\tilde{u} + c\tilde{v} + \beta_1)^2} - m_2 - \frac{bc_1\tilde{w}}{(\tilde{v} + b)^2} \right] \left[m_3\tilde{u} - m_4 + \frac{m_5\tilde{v}}{(\tilde{v} + b)} \right] > \frac{-c_1\tilde{v}}{(\tilde{v} + b)} \quad (15)$$

then $E_4 = (\tilde{u}, \tilde{v}, \tilde{w})$ is GAS.

Proof: Characterize a Lyapunov function

$$V = \left(\tilde{u} - \tilde{u}^* - \tilde{u}^* - \tilde{u}^* \ln \frac{\tilde{u}}{\tilde{u}^*} \right) + \left(\tilde{v} - \tilde{v}^* - \tilde{v}^* - \tilde{v}^* \ln \frac{\tilde{v}}{\tilde{v}^*} \right) + \left(\tilde{w} - \tilde{w}^* - \tilde{w}^* - \tilde{w}^* \ln \frac{\tilde{w}}{\tilde{w}^*} \right)$$

Taking we differentiate w.r.t. t along the system solution, we get

$$\frac{dV}{dt} = -c_{11}(\tilde{u} - \tilde{u}^*)^2 - c_{22}(\tilde{v} - \tilde{v}^*)^2 - c_{33}(\tilde{w} - \tilde{w}^*)^2 + c_{12}(\tilde{u} - \tilde{u}^*)(\tilde{v} - \tilde{v}^*) + c_{23}(\tilde{v} - \tilde{v}^*)(\tilde{w} - \tilde{w}^*).$$

Where,

$$c_{11} = 1 - 2\tilde{u} - \frac{c\tilde{v}^2 + \beta_1\tilde{v}}{(\tilde{u} + c\tilde{v} + \beta_1)^2} - \tilde{w}, c_{12} = \frac{-(\tilde{u}^2 + \beta_1\tilde{u})}{(\tilde{u} + c\tilde{v} + \beta_1)^2}, c_{13} = 0$$

$$c_{21} = \frac{\alpha_1(\tilde{v}^2 + \beta_1\tilde{v})}{(\tilde{u} + c\tilde{v} + \beta_1)^2}, c_{22} = \left[\frac{\alpha_1(\tilde{u}^2 + \beta_1\tilde{u})}{(\tilde{u} + c\tilde{v} + \beta_1)^2} - m_2 - \frac{bc_1\tilde{w}}{(\tilde{v} + b)^2} \right], c_{23} = \frac{-c_1\tilde{v}}{(\tilde{v} + b)}, y_{31}$$

$$= m_3\tilde{w}, c_{32} = \frac{bm_5\tilde{w}}{(\tilde{v} + b)^2}, c_{33} = m_3\tilde{u} - m_4 + \frac{m_5\tilde{v}}{(\tilde{v} + b)}$$

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if the following inequalities hold:

$$c_{11} > 0, c_{22} > 0, c_{33} > 0, \quad (16)$$

$$c_{12}^2 < c_{11}c_{22}, \quad (17)$$

$$c_{23}^2 < c_{22}c_{33} \quad (18)$$

It is easy to see that all the conditions are satisfied. Biologically, the boundedness and stability of a system show that the model system is well mannered. Furthermore, it implies that no species grows exponentially for a long period.

Hopf-bifurcation of Non-spatial System

Here, we have established a theorem that clarifies Hopf bifurcation, where c stands for the bifurcation parameter.

Theorem 7: Hopf-bifurcation occurs in model system (1)-(3), When c , crosses a threshold value c' , near $E_4 = (\tilde{u}, \tilde{v}, \tilde{w})$ if conditions hold as: $A(c) > 0, C(c) > 0, A(c')B(c') - C(c') = 0$ and $[A(c')B(c')] \neq C'(c')$.

Proof: It is easy to see that E_4 is LAS. If threshold value c' exist s.t. $A(c')B(c') - C(c') = 0$

For $c = c'$ the characteristic equation is as:

$$(\lambda^2(c') + B(c'))(\lambda(c') + A(c')) = 0$$

Roots are: $-A(c'), \pm\sqrt{B(c')}$ and $-\lambda\sqrt{B(c')}$. If transversality condition $\left. \frac{\text{Re}(\lambda(B))}{dc} \right|_{c=c'} \neq 0$

hold, then Hopf-bifurcation occurs at $c = c'$. roots are

$$\lambda_1(c) = \mu(c) + i\nu(c),$$

$$\lambda_2(c) = \mu(c) + i\nu(c),$$

$$\lambda_3(c) = -A(c).$$

Substituting into we get

$$Q(c)\mu'(c) - L(c)\nu'(c) + M(c) = 0,$$

$$L(c)\mu'(c) + Q(c)\nu'(c) + N(c) = 0,$$

Where,

$$Q(c) = 3u^2(c) + 2A(c)\mu(c) + B(c) - 3v^2(c)$$

$$L(c) = 6\mu(c)\nu(c) + 2A\nu(c)$$

$$M(c) = \mu^2(c)A'(c) + c'\mu(c) + C'(c) - A'(c)v^2(c)$$

$$N(c) = 2\mu(c)\nu(c)A'(c) + B'(c)\nu(c).$$

Here, $\mu(c) = 0, \nu(c) = \sqrt{B(c')}$, we get

$$Q(c') = -2B(c'), L(c') = 2A(c')\sqrt{B(c')}, M(c') = C'(c') - A'(c')B(c'), N(c') = B'(c')\sqrt{B(c')}.$$

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Solving $\mu'(c)$, we get:

$$\left. \frac{\operatorname{Re}(\lambda_j(c))}{dc} \right|_{c=c'} = \mu'(c)_{c=c'} = -\frac{L(c')N(c') + Q(c')M(c')}{Q^2(c') + L^2(c')} = \frac{1}{2} \frac{c'(c') - (A(c')B(c'))'}{A^2(c') + B(c')} \neq 0. \text{ If } (A(c')B(c'))' \neq 0.$$

$C'(c')$ and $\lambda_3(c') = -A(c') < 0$. Hence the theorem is proved.

Center Manifold Theorem

Center Manifold theorem is applied to check stability if one or more roots are zero and next one is

negative real part. Now we shift $E(u_1, v_1, w_1)$ at the origin and get the transformation $u = u + u_1, v = v + v_1, w = w + w_1$ in the system (4)-(6) and we get

$$\begin{aligned} \frac{du}{dt} &= x_{11}u + x_{12}v + x_{13}w + x_{14}u^2 + x_{15}uv + x_{16}v^2 + x_{17}vw + x_{18}w^2 + x_{19}uw \\ \frac{dv}{dt} &= x_{21}u + x_{22}v + x_{23}w + x_{24}u^2 + x_{25}uv + x_{26}v^2 + x_{27}vw + x_{28}w^2 + x_{29}uw \\ \frac{dw}{dt} &= x_{31}u + x_{32}v + x_{33}w + x_{34}u^2 + x_{35}uv + x_{36}v^2 + x_{37}vw + x_{38}w^2 + x_{39}uw \end{aligned}$$

Here, the coefficients x_{ij} are given in Appendix A. System turns as:

Stability and bifurcation study of the predator-prey model using the Beddington-deAngelis functional responses

$$\begin{bmatrix} \dot{u} \\ \dot{v} \\ \dot{w} \end{bmatrix} = \begin{bmatrix} x_{11} & x_{12} & x_{13} \\ x_{21} & x_{22} & x_{23} \\ x_{31} & x_{32} & x_{33} \end{bmatrix} \begin{bmatrix} u \\ v \\ w \end{bmatrix} + \begin{bmatrix} x_{14}u^2 + x_{15}uv + x_{19}uw \\ x_{24}u^2 + x_{25}uv + x_{27}uw \\ x_{37}vw + x_{39}uw \end{bmatrix}$$

Theorem 8: Eigen values of $J(E_1)$ is a saddle point. Proof: For E_1 the above system reduce to,

$$\begin{bmatrix} \dot{u} \\ \dot{v} \\ \dot{w} \end{bmatrix} = \begin{bmatrix} -1 & \frac{-1}{1+\beta_1} & -1 \\ 0 & \frac{\alpha_1}{1+\beta_1} & -m_2 \\ 0 & 0 & m_3 - m_4 \end{bmatrix} \begin{bmatrix} u \\ v \\ w \end{bmatrix} + \begin{bmatrix} x_{14}u^2 + x_{15}uv + x_{19}uw \\ x_{24}u^2 + x_{25}uv + x_{27}uw \\ x_{37}vw + x_{39}uw \end{bmatrix}$$

E.V. is given as $-1, \frac{\alpha_1}{1+\beta_1} - m_2$ and $m_3 - m_4$. If we consider $\frac{\alpha_1}{1+\beta_1} = m_2$ then the equilibrium point $E_1(1,0,0)$ is non-hyperbolic type.

Now we use the transformation

$$\begin{bmatrix} u \\ v \\ w \end{bmatrix} = R \begin{bmatrix} x \\ y \\ z \end{bmatrix}, \text{ where } R = \begin{bmatrix} 1 & -q_{12} & 1 \\ 0 & 1 & 0 \\ 0 & 0 & q_{33} \end{bmatrix}$$

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Then the system turns as,

$$\begin{bmatrix} \dot{x} \\ \dot{y} \\ \dot{z} \end{bmatrix} = \begin{bmatrix} -1 & 0 & 0 \\ 0 & 0 & 0 \\ 0 & 0 & m_3 - m_4 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} + \begin{bmatrix} H_1 \\ H_2 \\ H_3 \end{bmatrix}$$

We can see H_i in Appendix B. Now $W^c(0) = (x, y, z) \in \mathbb{R}^3: x = g_1(y), z = g_2(y), g_1(0) = 0, g_2(0) = 0, Dg_1(0) = 0, Dg_2(0) = 0$. To calculate $W^c(0)$, let us consider $x = g_1(y) = c_{11}y^2 + c_{12}y^3 + O(\|y\|^4), z = g_2(y) = c_{21}y^2 + c_{22}y^3 + O(\|y\|^4)$. Now we find $c_{11} = 0, c_{12} = N_{13}, c_{21} = 0, c_{22} = 0$. Thus, manifold is shown by $\dot{y} = N_{22}y^2 + N_{21}N_{13}y^4$, it is a saddle point. Hence proved.

Theorem 9: At E_4 , the periodic solution will be stable and unstable if $\Lambda < 0$ and $\Lambda > 0$ respectively.

Proof: If Hopf bifurcation exists in the system, it implies that characteristic equations have purely complex conjugates and one negative real root. The roots are given as $-A_1, i\sqrt{A_2}, -i\sqrt{A_2}$. It is non-hyperbolic type roots.

Therefore: $\begin{bmatrix} u \\ v \\ w \end{bmatrix} = A \begin{bmatrix} x \\ y \\ z \end{bmatrix}$

Where, $\begin{bmatrix} g_{11} & g_{12} & g_{13} \\ g_{21} & g_{22} & g_{23} \\ g_{31} & g_{32} & g_{33} \end{bmatrix}$, g_{ij} is given in Appendix C.

The system becomes:

$$\begin{bmatrix} \dot{x} \\ \dot{y} \\ \dot{z} \end{bmatrix} = \begin{bmatrix} 0 & -\sqrt{A_2} & 0 \\ \sqrt{A_2} & 0 & 0 \\ 0 & 0 & -A_1 \end{bmatrix} \begin{bmatrix} x \\ y \\ z \end{bmatrix} + \begin{bmatrix} e_1 \\ e_2 \\ e_3 \end{bmatrix}$$

We can see Appendix D to check the values of e_1, e_2 and e_3 . Characteristic equations have purely complex conjugate and one negative real root. Therefore, we are unable to find stability, so the Center manifold is given as:

$W^c(0) = (x, y, z) \in \mathbb{R}^3: z = g(x, y), |x| < \delta_1, |y| < \delta_2, g(0, 0) = 0, Dg(0, 0) = 0$. To calculate the center manifold theorem, we consider $z = g(x, y) = a_1x^2 + a_2y^2 + a_3xy + O(\|x\|^3)$, Here we find $a_1 = \frac{1}{A_1}(A_{31} - a_3\sqrt{A_2}), a_2 = \frac{1}{A_2}(A_{32} - a_3\sqrt{A_2})$ and

$$a_3 = \frac{A_1A_2A_{34} - 2\sqrt{A_2}(A_{32}A_1 - A_{31}A_2)}{(2A_1 + 2A_2 + A_1^2)A_2}.$$

Thus, by using the center manifold:

$$\begin{bmatrix} \dot{x} \\ \dot{y} \end{bmatrix} = \begin{bmatrix} 0 & -\sqrt{A_2} \\ \sqrt{A_2} & 0 \end{bmatrix} \begin{bmatrix} x \\ y \end{bmatrix} + \begin{bmatrix} f_1 \\ f_2 \end{bmatrix}$$

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Where

$f_1(x, y) = A_{11}x^2 + A_{12}y^2 + A_{14}xy + A_{16}a_1x^3 + A_{15}a_2y^3 + (A_{15}a_1 + A_{16}a_3)x^2y + (A_{15}a_3 + A_{16}a_2)y^2x + O(\|X\|^4)$, $f_2 = A_{21}x^2 + A_{22}y^2 + A_{24}xy + A_{26}a_1x^3 + A_{25}a_2y^3 + A_{25}a_2y^3 + (A_{25}a_1 + A_{26}a_3)x^2y + (A_{25}a_3 + A_{26}a_2)y^2x + O(\|X\|^4)$.
Now, we calculate the First Lyapunov exponent Λ at $(0,0,0)$, to show stability or instability of E_4 .

$$\begin{aligned}\Lambda &= \frac{1}{16} (f_{1(xxx)} + f_{1(yyy)} + f_{2(xxx)} + f_{2(yyy)}) \\ &\quad + \frac{1}{16\sqrt{A_2}} [f_{1(xy)}(f_{1(xx)} + f_{1(yy)}) - f_{2(xy)}(f_{2(xx)} + f_{2(yy)})] - f_{1(xx)}f_{2(xx)} \\ &\quad + f_{1(yy)}f_{2(yy)} \\ &= \frac{1}{16} [6A_{16}a_1 + 2(A_{15}a_3 + A_{16}a_2) + 2(A_{25}a_1 + A_{26}a_3) + 6A_{25}a_3] \\ &\quad + \frac{1}{16\sqrt{A_2}} [2A_{14}(A_{11} + A_{12}) - 2A_{24}(A_{21} + A_{22}) - 4A_{11}A_{21} + 4A_{12}A_{22}]\end{aligned}$$

Hence theorem is proved.

Numerical Simulation

Here, we will perform numerical analysis supporting the analytical findings. We used ode 45 solver in MATLAB by taking the parameter values as: $\beta_1 = .1$, $c = 0.65$, $\alpha_1 = .35$, $m_2 = .25$, $c_1 = 3.15$, $b = 0.5$, $m_3 = .01$, $m_4 = .5$, $m_5 = 4.93$. First, we see the outcome of constant c as shown in Figs. 2-6. The diagrams indicate that the system become unstable at $c = 0.4$, as we increase the value of c it tends to Hopf bifurcation at the critical value $c' = 0.37$, to better understand, at different values of c , we observe some of time series and phase portrait diagrams.

Discussions and Conclusion

This work investigates the dynamical nature of system by using Beddington-DeAngelis and Holling type-II functional response to inspect the interaction between prey and predators. It shows a major role to preserve the dynamical system balance. A schematic illustration is provided in Fig. 1 to help visualize the model formulation. The proposed system is investigated using differential equation theory and several dynamical techniques like boundedness, local stability, global stability, and bifurcation. Then, we demonstrated that the solutions are uniformly bounded. We determined equilibrium points and examined their stability. We found a Hopf bifurcation see in Fig. 2-6 with parameter c . As the value of c become larger system become unstable. For advancement, we have given the numerical solutions using MATLAB to validate analytical results for temporal model system.

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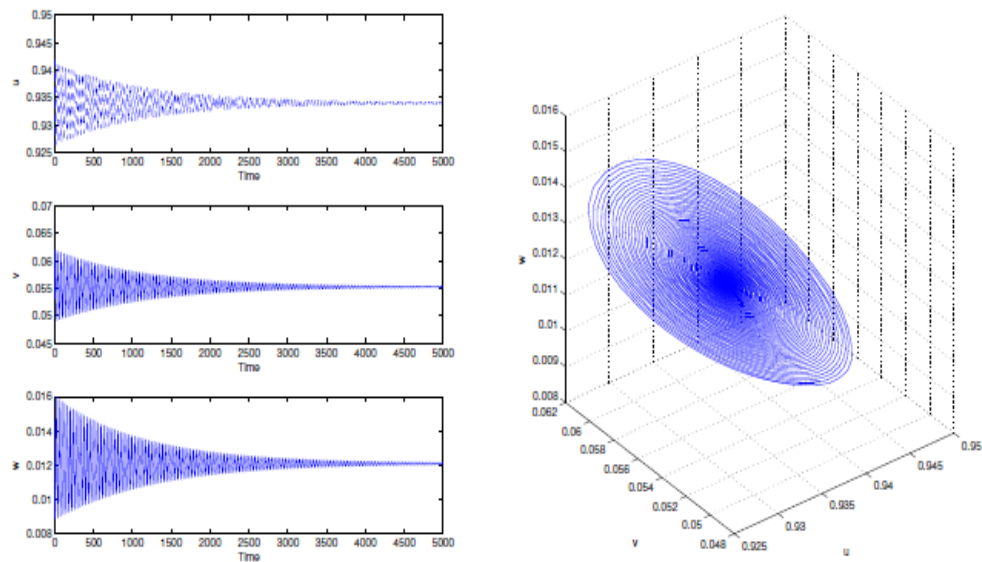


Figure 2: Existence of Hopf bifurcation $c = 0.4$

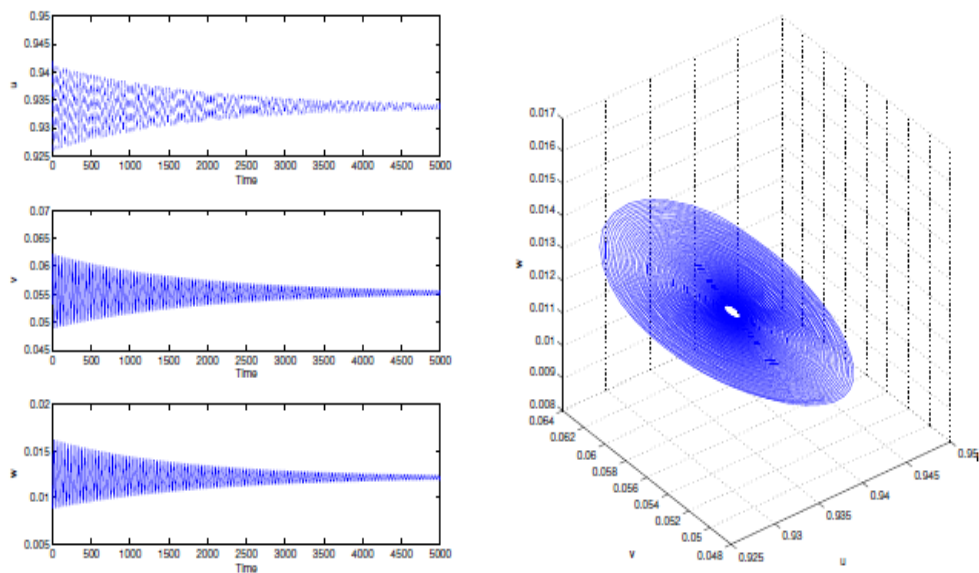


Figure 3: Existence of Hopf bifurcation $c = 0.37$

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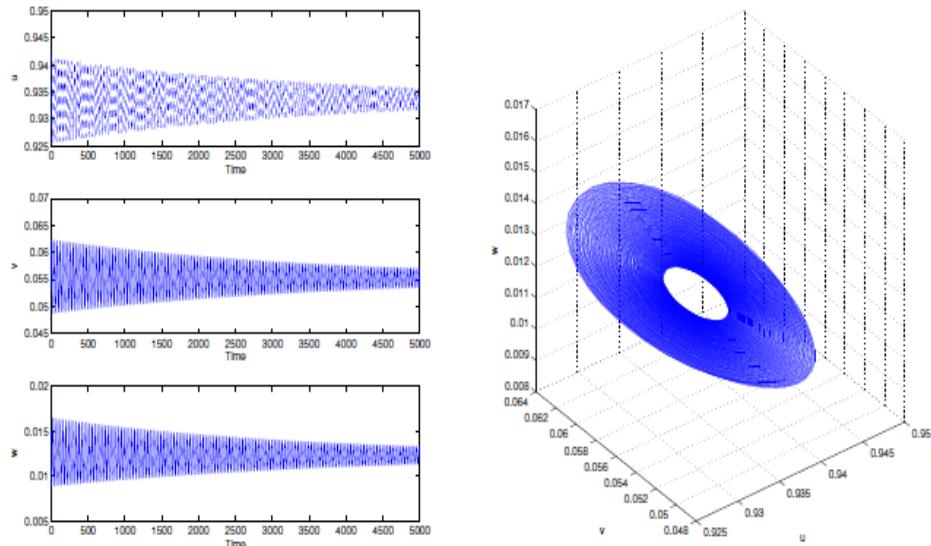


Figure 4: Existence of Hopf bifurcation $c = 0.34$

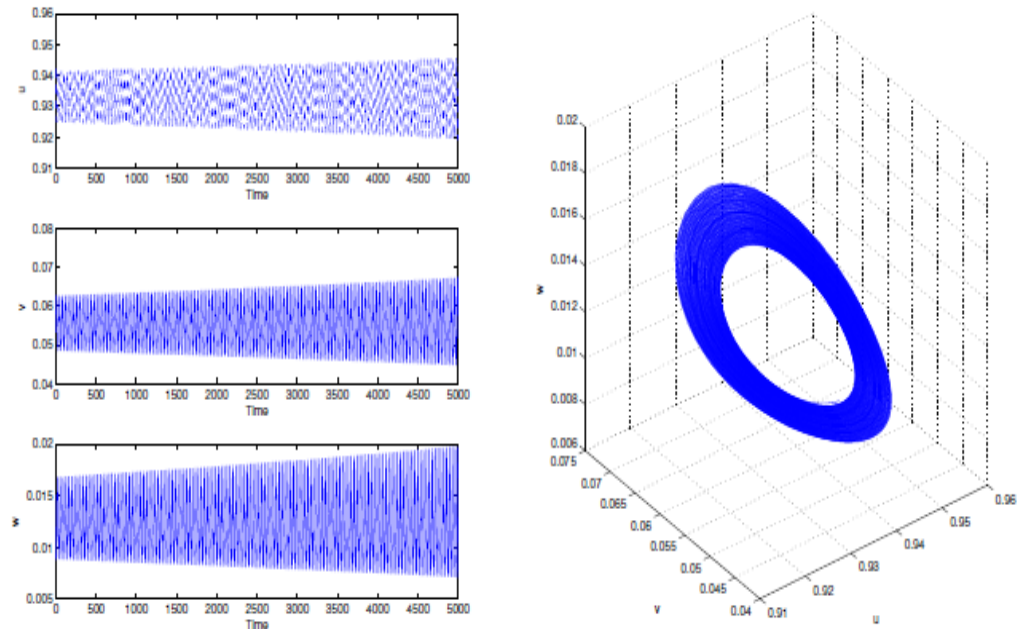


Figure 5: Existence of Hopf bifurcation $c = 0.3$

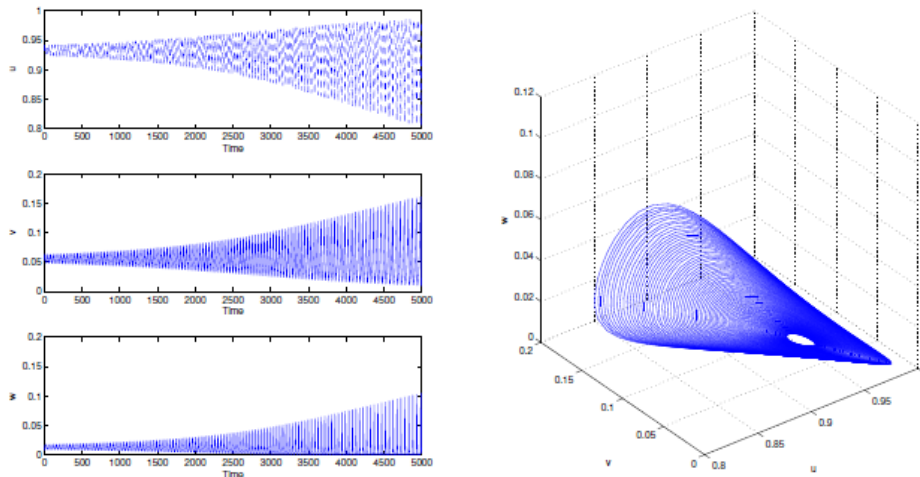


Figure 6: Existence of Hopf bifurcation $c = 0.25$

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Appendices

Appendix A

$$\begin{aligned}
 x_{11} &= 1 - 2u - \frac{(cv^2 + \beta_1 v)}{(u + cv + \beta_1)^2} - w, x_{12} = \left[\frac{-(\tilde{u}^2 + \beta_1 \tilde{u})}{(\tilde{u} + c\tilde{v} + \beta_1)^2} \right], x_{14} = -2 + \frac{2(cv^2 + \beta_1 v)}{(\tilde{u} + c\tilde{v} + \beta_1)^3}, x_{15} = \\
 &\frac{2(\tilde{u}^2 + \beta_1 \tilde{u})}{(\tilde{u} + c\tilde{v} + \beta_1)^3} - \frac{(2\tilde{u} + \beta_1)}{(\tilde{u} + c\tilde{v} + \beta_1)^2}, x_{16} = 0, x_{17} = -1, x_{18} = \frac{2c(cu^2 + \beta_1 u)}{(u + cv + \beta_1)^3}, x_{19} = 0, x_{21} = \frac{\alpha_1(c\tilde{u}^2 + \beta_1 \tilde{u})}{(\tilde{u} + c\tilde{v} + \beta_1)^2}, \\
 x_{22} &= \left[\frac{\alpha_1(\tilde{u}^2 + \beta_1 \tilde{u})}{(\tilde{u} + c\tilde{v} + \beta_1)^2} - m_2 - \frac{bc_1 \tilde{w}}{(\tilde{v} + b)^2} \right], x_{23} = \frac{-c_1 \tilde{v}}{(\tilde{v} + b)}, x_{24} = \frac{-2\alpha_1(cv^2 + \beta_1 v)}{(u + cv + \beta_1)^3}, x_{25} = \frac{-2c\alpha_1(cv^2 + \beta_1 v)}{(u + cv + \beta_1)^3} + \\
 &\frac{\alpha_1(2cv + \beta_1)}{(u + cv + \beta_1)^2}, x_{26} = 0, x_{27} = 0, x_{28} = \frac{-2c\alpha_1(cu^2 + \beta_1 u)}{(u + cv + \beta_1)^3} + \frac{(2bcc_1 w)}{(v + b)^3}, x_{29} = 0, x_{31} = m_3 \tilde{w}, \quad x_{32} =
 \end{aligned}$$

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$$\frac{bm_5\tilde{w}}{(\tilde{v}+b)^2}$$

$$x_{33} = m_3\tilde{u} - m_4 + \frac{m_5\tilde{v}}{(\tilde{v}+b)}, x_{34} = 0, x_{35} = 0, x_{36} = m_3, x_{37} = 0, x_{38} = \frac{-2bm_5w}{(v+b)^3}, x_{39} = m_3.$$

Appendix B

The values of H_i is as follows:

$$H_1 = x^2 + N_{11}xy + M_{12}xz + M_{13}y^2 + M_{14}yz + M_{15}z^2, H_2 = M_{21}xy + M_{22}v^2 + M_{23}yz, H_3 = M_{31}xz + M_{32}yz + M_{33}z^2.$$

Appendix C

Here, $g_{11} = -A_2, g_{12} = 0, g_{13} = A_1^2 - x_{23}x_{32}, g_{21} = x_{31}x_{23}, g_{22} = -x_{21}\sqrt{A_2}, g_{23} = x_{31}x_{23} - x_{21}A_1, g_{31} = 0, g_{32} = -x_{31}\sqrt{A_2}, g_{33} = x_{21}x_{32} - x_{31}A_1.$

Appendix D

$$e_1 = D_{11}x^2 + D_{12}y^2 + D_{13}z^2 + D_{14}xy + D_{15}yz + D_{16}zx$$

$$e_2 = D_{21}x^2 + D_{22}y^2 + D_{23}z^2 + D_{24}xy + D_{25}yz + D_{26}zx$$

$$e_3 = D_{31}x^2 + D_{32}y^2 + D_{33}z^2 + D_{34}xy + D_{35}yz + D_{36}zx$$

with,

$$D_{11} = C_{11}g_{11}^2 + A_{12}g_{11}g_{21},$$

$$D_{12} = C_{14}g_{22}g_{32},$$

$$D_{13} = C_{11}g_{13}^2 + C_{12}g_{13}g_{23} + C_{13}g_{13}g_{33} + C_{14}g_{23}g_{33},$$

$$D_{14} = C_{12}g_{11}g_{22} + C_{13}g_{11}g_{32} + C_{14}g_{21}g_{32},$$

$$D_{15} = C_{11}g_{13}g_{22} + C_{13}g_{13}g_{32} + C_{14}g_{22}g_{33} + C_{14}g_{23}g_{32},$$

$$D_{16} = 2C_{11}g_{11}g_{13} + C_{12}g_{11}g_{23} + C_{12}g_{13}g_{21} + C_{13}g_{11}g_{33} + C_{14}g_{21}g_{33}$$

The similar expression for D_{2i} and D_{3i} will be obtained only replacing C_{1j} by C_{2j} and C_{3j} respectively.

$$C_{11} = t_{11}x_{14} + t_{12}x_{24}$$

$$C_{12} = t_{11}x_{15} + t_{12}x_{25}$$

$$C_{13} = t_{11}x_{19} + t_{13}x_{39}$$

$$C_{14} = t_{12}x_{27} + t_{13}x_{39}$$

$$C_{21} = t_{21}x_{14} + t_{22}x_{24}$$

$$C_{22} = t_{21}x_{15} + t_{22}x_{25}$$

$$C_{23} = t_{21}x_{19} + t_{23}x_{39}$$

$$C_{24} = t_{22}x_{27} + t_{23}x_{39}$$

$$C_{31} = t_{11}x_{14} + t_{12}x_{24}$$

$$C_{32} = t_{31}x_{15} + t_{32}x_{25}$$

$$C_{33} = t_{31}x_{19} + t_{33}x_{39}$$

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$$C_{34} = t_{32}x_{27} + t_{33}x_{39}$$

Where,

Stability and bifurcation study of the predator-prey model using the Beddington.

deAngelis

functional

response

$$A^{-1} = \begin{bmatrix} t_{11} & t_{12} & t_{13} \\ t_{21} & t_{22} & t_{23} \\ t_{31} & t_{32} & t_{33} \end{bmatrix}$$

$$\text{with } t_{11} = \frac{g_{22}g_{33} - g_{23}g_{32}}{|A|}, t_{12} = \frac{g_{32}g_{13}}{|A|}, t_{13} = \frac{-g_{13}g_{22}}{|A|}, t_{21} = \frac{-g_{21}g_{33}}{|A|}, t_{22} = \frac{g_{11}g_{33}}{|A|}, t_{23} =$$

$$\frac{g_{13}g_{21} - g_{11}g_{23}}{|A|}, t_{31} = \frac{g_{21}g_{32}}{|A|}, t_{32} = \frac{-g_{11}g_{32}}{|A|}, t_{33} = \frac{g_{11}g_{22}}{|A|} \text{ where, } |A| \text{ represents the determinant}$$

of A.

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Abstracts

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EFFECTS OF CHANGING SEASONAL EVENTS ON PREDATOR-PREY DYNAMICS IN AQUATIC ECOSYSTEMS

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Aquatic ecosystems are dynamic and complex networks where predator-prey relationships play a crucial role in maintaining ecological balance. However, with the increasing frequency and intensity of seasonal variations induced by climate change, these finely tuned interactions are undergoing significant disruptions. The present study investigates the Effects of Changing Seasonal Events on Predator-Prey Dynamics in Aquatic Ecosystems, with an emphasis on temporal shifts in breeding cycles, migration patterns, resource availability, and trophic interactions. Aquatic environments, being highly sensitive to climatic fluctuations, are experiencing alterations in water temperature, photoperiod, and precipitation regimes, all of which influence the behavioral and physiological responses of both predators and prey. This research employs a combination of field-based observations, ecological modeling, and statistical analysis to decode the nuanced impacts of seasonal anomalies on predator-prey relationships in selected freshwater bodies of India. The study also examines how species adapt or fail to adapt to asynchronous life cycles and mismatches in prey availability, leading to cascading effects on biodiversity, nutrient cycling, and ecosystem stability. Furthermore, the paper explores adaptive strategies, including phenotypic plasticity and range shifts, and evaluates the resilience of key aquatic species under future climate scenarios. By identifying vulnerable ecological zones and species groups, the study aims to contribute towards evidence-based conservation planning and ecosystem management. The findings underscore the urgent need for integrated climate-ecology frameworks to mitigate long-term ecological imbalances and ensure the sustainability of aquatic biodiversity.

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SOCIAL AND EMOTIONAL TEACHING AND LEARNING

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Social and emotional learning (SEL) is an educational framework that helps individuals—particularly students—develop essential life skills to manage emotions, build healthy relationships, set goals, show empathy, and make responsible decisions. As education systems worldwide shift focus from purely academic outcomes to holistic development, SEL has emerged as a key component in nurturing emotionally intelligent, socially responsible, and mentally resilient learners. SEL encompasses five core competencies: self-awareness, self-management, social awareness, relationship skills, and responsible decision-making. These competencies are critical for students' success both in school and beyond. Incorporating SEL into the classroom improves students' emotional well-being, behavior, and academic performance. Research shows that students engaged in effective SEL programs demonstrate improved classroom behavior, increased motivation to learn, reduced emotional distress, and higher academic achievement. Teachers play a central role in promoting SEL by modeling positive behaviors, fostering inclusive classroom environments, and integrating emotional literacy into subject teaching. When embedded into the school curriculum, SEL provides a safe space for children to express themselves, understand others' perspectives, resolve conflicts peacefully, and build empathy and cooperation. Moreover, SEL contributes significantly to creating a supportive school climate that reduces bullying, aggression, and dropout rates. With rising mental health concerns among youth, especially in the post-COVID-19 era, SEL has gained renewed importance. It supports the emotional recovery of students, helping them cope with stress, anxiety, and uncertainty. In multicultural and diverse classrooms, SEL promotes respect for differences and helps in the development of global citizenship values. However, effective implementation of SEL requires trained educators, supportive policies, and consistent evaluation methods. Challenges include lack of teacher preparedness, resistance from stakeholders, and insufficient integration into educational standards. Therefore, SEL must be treated not as an additional subject, but as a foundational aspect of schooling integrated across all grade levels and learning domains. This paper explores the theoretical basis, practical implementation, and long-term benefits of social and emotional teaching and learning. It emphasizes the need for an inclusive, culturally responsive, and developmentally appropriate SEL framework that supports students' academic, emotional, and social growth. Strengthening SEL in education systems is not just a pedagogical necessity—it is a moral and social imperative to build compassionate, competent, and conscious citizens.

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THE CONNECTION BETWEEN FAMILY ADAPTABILITY AND ACADEMIC EFFORT IN PRIMARY EDUCATION

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Family adjustment plays an important role in supporting a child's academic responsibilities. This quantitative research aimed to explore the relationship between family adjustment and academic engagement among primary school students. The findings revealed a strong and significant positive correlation between the two variables ($r = .619$, $p < .001$), indicating that better family adjustment is associated with higher academic engagement. The study also observed a slight but meaningful difference in family adjustment levels between female students ($M = 3.59$) and male students ($M = 3.43$). Similarly, a small yet significant difference was noted in perceptions of academic engagement based on teacher gender, with female teachers reporting a mean score of 3.61 and male teachers reporting a slightly higher mean of 3.80.

AGRI-EXPORT ZONES IN PUNJAB: SUCCESS, STAGNATION, AND THE ROAD AHEAD

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This paper examines the performance of Punjab's Agri-Export Zones (AEZs), with a focus on the Basmati rice cluster. While the initiative showed early promise in boosting exports and infrastructure, it faced challenges including stalled quality labs, pesticide residue issues, and poor long-term planning. Using case studies and recent export data, the study identifies key gaps in implementation and sustainability. It proposes reviving AEZs as integrated export clusters under current policies, with improved traceability, public-private partnerships, and stronger institutional support.

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Punjab's continued leadership in Basmati exports presents an opportunity to reposition AEZs as a core strategy for enhancing India's agri-export competitiveness.

A COMBINATORIAL OPTIMIZATION OF CONSUMER BEHAVIOUR: A CASE STUDY OF BYJU'S

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Online education surged during the pandemic with governmental support like e-learning in India. Ed Tech forecasts changed due to COVID impacts, affecting both GDP and access to resources. Post pandemic, ed-tech companies faced challenges as demand shifted back to in-person learning. Overcrowding, unsustainable growth, and failing to adapt to hybrid models led to failures. Regulatory changes and funding constraints further impacted the industry. The combinatorial problem of matching Ed-Tech companies to success factors effectively analyse the situation In this paper we study the mathematical aspect of decline the education tech industries. Using Hall's Marriage Theorem, we can argue that Byju's and other companies like it were unable to match to enough favourable conditions, leading to their decline. As the theorem predicts, without a sufficient number of favourable conditions available for all companies, some companies will inevitably fail to match and thus face decline.

UNDERSTANDING INSURGENCY AND CONFLICT RESOLUTION IN NORTHEAST INDIA

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The Northeast region of India has been plagued with insurgency, with both ethnically, politically, and economically rooted implications. A multitude of armed groups seeking autonomy, asserting their identities, and who resent poverty, have challenged state sovereignty for far too long, and the central government in every state has taken a composite approach (which has included security operations, bilateral negotiations, and developmental initiatives) to contain the separatist and

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insurgent movements. The outcomes have varied by state; the outcomes of certain (notably the Mizoram Accord in 1986, and the continuing Naga peace negotiations) reconciliation agreements illustrate the possibilities and limitations of negotiated settlements. The past several years have seen a considerable de-escalation of violence which can be attributed to the success of counter-insurgency approaches and sustained dialogue. It is important to note that there remain challenges including unresolved demands, sporadic violence, and a lack of inclusive governance. Conflict resolution in the Northeast needs to be holistic and consistent in approach by addressing the ongoing ramifications of the reasons for conflict (ethnic dispute, marginalization, and underdevelopment) by fostering belonging and participation of local people, and an energetic role of trust building. Lasting peace, requires creating a balance between security requirements, political accommodation, and socio-economic integration.

INTEGRATING TRADITIONAL MEDICINE INTO STATE HEALTH POLICY: LESSONS FROM BARAN

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Traditional medicine has long played a crucial role in the healthcare systems of rural and tribal communities across India. In regions like the Baran district of Rajasthan, particularly among the Sahariya tribe, indigenous medical practices based on herbal remedies and community-based healing traditions are deeply rooted and widely trusted. Despite their effectiveness and cultural relevance, such practices have historically been marginalized in formal health policies. This paper explores how traditional medicine can be effectively integrated into state health systems, using Baran as a model for policy innovation. Through field studies and community engagement, it was observed that local healers (Vaidyas and Bhopas) serve as the first point of contact for healthcare in many remote areas. Their knowledge, passed down orally across generations, includes the use of locally available medicinal plants to treat common ailments. Non-governmental organizations have played a pivotal role in documenting this knowledge, promoting herbal gardens, and facilitating dialogue between traditional healers and allopathic practitioners. The key lessons from Baran emphasize the importance of recognizing and legitimizing traditional knowledge, involving tribal communities in health planning, and fostering collaboration between traditional and modern health systems. This article includes Policy recommendations including the creation of local healer registries, integration of ethnomedicine in health

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worker training, and the establishment of medicinal plant nurseries. Baran's experience demonstrates that blending traditional and modern healthcare approaches can enhance access, cultural relevance, and sustainability of rural health services. By drawing from Baran's successes, state health policies can become more inclusive, resilient, and responsive to the needs of indigenous populations.

ECSTATIC HUMAN EXISTENCE AND DIVINE LOVE: UNDERSTANDING THE UNIVERSE THROUGH SCIENCE AND BHAKTI YOGA

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Ecstatic human experience and divine love together constitute a conceptual framework for interpreting the nature of the universe. Combining scientific exploration of consciousness with the devotional insights of Bhakti Yoga, it aims to uncover emotional ecstasy and spiritual devotion in shaping a comprehensive view of reality. Inspired by the teaching bhakti saints and recent studies in neurotheology, this paper demonstrate how emotional ecstasy and spiritual surrender can constructed a holistic worldview. Science and bhakti not only enrich personal wellbeing but also opens transformative opportunities in education, healthcare and interfaith engagement.

WOMEN ENTREPRENEURSHIP: UNLOCKING OPPORTUNITIES AND NAVIGATING CHALLENGES

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Women entrepreneurship plays a pivotal role in fostering economic growth, promoting social justice, and driving innovation across various sectors. When women initiate and lead business ventures, they not only create employment opportunities but also contribute significantly to poverty alleviation and the upliftment of marginalized communities. Women entrepreneurs are increasingly entering diverse domains such as technology, manufacturing, services, and social enterprises, demonstrating resilience, creativity, and leadership. Despite their growing presence, women continue to face numerous challenges that hinder their entrepreneurial journey. These include gender-based discrimination, limited access to financial capital, inadequate mentorship and training opportunities, and societal expectations regarding work-life

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balance. Such barriers are often intensified by prevailing cultural norms, legal restrictions, and institutional biases, particularly in developing economies. This paper explores the evolving landscape of women entrepreneurship, highlighting trends, success factors, and the persistent obstacles encountered by female entrepreneurs. It examines how advancements in education, digital technology, and globalization are enabling women to overcome traditional barriers and engage competitively in global markets. Furthermore, the paper emphasizes the need for targeted policy interventions—such as gender-sensitive funding mechanisms, entrepreneurship development programs, and institutional support—to create a more inclusive and supportive ecosystem for women-led ventures. Ultimately, empowering women through entrepreneurship not only enhances their individual agency but also serves as a catalyst for broader socio-economic transformation. Recognizing and addressing the unique challenges faced by women entrepreneurs is essential for achieving inclusive and sustainable development.

EVALUATING THE IMPACT OF DIGITAL PAYMENTS ON INDIA'S JOURNEY TO A CASHLESS ECONOMY

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India's transition toward a cashless economy has gained significant momentum in recent years, especially following the 2016 demonetization, which triggered a rapid shift in transaction behaviour. Digital payments, led by platforms such as the Unified Payments Interface (UPI), mobile wallets, and card-based systems, have played a crucial role in redefining the country's financial ecosystem. This study evaluates the impact of digital payments on India's journey toward a cashless economy, focusing on trends in adoption, economic and social outcomes, and ongoing challenges. Using a mixed-method approach that combines secondary data from sources like the Reserve Bank of India (RBI), National Payments Corporation of India (NPCI), and World Bank with primary data from surveys and interviews, this research explores how digital payment systems have evolved across urban and rural India. It also examines the role of government initiatives such as Digital India, BHIM UPI, and the Pradhan Mantri Jan Dhan Yojana (PMJDY) in enhancing digital financial inclusion. The findings suggest a positive correlation between the growth of digital payments and improved financial access, particularly among rural populations and small businesses. The COVID-19 pandemic further accelerated digital adoption due to increased demand for contactless transactions.

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However, the study also highlights persistent challenges, including digital illiteracy, limited infrastructure in rural areas, cybersecurity concerns, and user resistance due to trust and usability issues. Despite notable progress, India remains a "less-cash" rather than a fully cashless economy. Behavioural habits, lack of awareness, and uneven technological access continue to slow down the shift. The research concludes by recommending stronger digital literacy initiatives, improved cybersecurity measures, targeted policy incentives, and enhanced infrastructure development to support wider adoption of digital payments. In summary, while digital payments have laid a solid foundation for a cashless India, a sustained and inclusive approach is essential to ensure long-term success and equity in the country's digital financial transformation.

DIFFERENT CONTENT AND QUALITY OF GROUNDWATER IN SOME VILLAGES IN NEEM KA THANA TEHSIL OF SIKAR DISTRICT (RAJASTHAN)

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In the present study, Neem ka Thana, Tehsil of Sikar district was selected as a study area. Water samples were collected and analysed for physico-chemical characteristics of ground water. It was observed that fluoride concentration range from 0.80 ppm to 10.50 ppm, pH from 7.3 to 8.9, electrical conductivity from 2500 $\mu\text{mhos/cm}$ to 5040 $\mu\text{mhos/cm}$, calcium hardness from 51-360 mg/L, total hardness from 95 to 520 mg/L, alkalinity from 70-530 mg/L, chloride from 196-840 mg/L and TDS from 1780 to 3290 mg/L in the study area.

COMPARATIVE STUDY OF ISOAMYL ALCOHOL AND RESORCINOL INHIBITED UNCATALYSED AND COBALT OXIDE CATALYSED AUTOXIDATION OF S(IV) IN ALKALINE MEDIUM

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The kinetics of Isoamyl alcohol and Resorcinol inhibited CoO catalysed S(IV) autoxidation in the pH range 7.50 to 8.50 medium have been investigated and a rate law & free radical mechanism have been proposed based on the observed results and inhibition parameters. In all situations, the reaction's order and rate constants were calculated, meanwhile, the reaction was determined to be first-order. The impact of various

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temperatures & pH levels were explored also. We reported that Isoamyl alcohol and Resorcinol as a significant inhibitor for SO₂ autoxidation in the pH range of 7.50 to 8.80. The Arrhenius equation was used to get the value of apparent activation energy (E_a) ($K = A.e^{-E_a/RT}$). Based on the observed results, following rate laws is given as below:

$$\frac{-d[S(IV)]}{dt} = \frac{(k_1 + k_2 [CoO]) [S(IV)]}{1 + B [Organics]}$$

E-WASTE FROM SOLAR ENERGY SYSTEMS AND DIGITAL ERA

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Demand of energy rises and we are moving toward a digital world. To maintain the ecological balance the environmental issues are prime important for all of us. These technologies are based on use of semiconductor materials, so particularly waste from these manufacturer industries or waste form of discarded and degraded electronic devices are downside for environment. Solar energy often a clean and green energy sources in coming era, the use of these technology produces tons of non-biodegradable and hazardous chemical compounds. Industries are not serious about proper disposal of these chemical compounds. Chemicals are flushed in to river, air and dumped in open space can leads to environment pollution and health risks. Peoples come in contact with this chemical waste and suffer with serious health problems. This chapter examines the chemicals from e-waste and effect on environment.

NANOPARTICLE-BASED APPROACHES FOR ENHANCED WASTEWATER TREATMENT: MECHANISMS, CHALLENGES, AND FUTURE PERSPECTIVES

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The growing global concern over water pollution has highlighted the need for advanced and efficient wastewater treatment technologies. Among these, nanoparticle-based approaches have gained significant attention due to their superior removal efficiencies, enhanced reactivity, and potential for contaminant degradation at the molecular level. This review provides an in-depth analysis of the role of

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nanoparticles in wastewater treatment, focusing on their physicochemical properties, mechanisms of pollutant removal, and the challenges associated with their application. Key types of nanoparticles, including metal-based (e.g., silver, titanium dioxide), carbon-based (e.g., graphene, carbon nanotubes), and magnetic nanoparticles, are discussed in terms of their effectiveness in eliminating organic pollutants, heavy metals, and pathogens. The paper also explores innovative methods for enhancing nanoparticle stability, reusability, and scalability in real-world wastewater treatment systems. Additionally, the challenges related to toxicity, environmental impact, and cost-effectiveness are examined, along with future perspectives for improving nanoparticle-based treatment processes. The integration of nanotechnology with conventional treatment methods is also highlighted as a promising approach to optimize wastewater management.

THE IMPACT OF PRODUCT INVOLVEMENT AND BRAND PERCEIVED QUALITY TOWARDS PURCHASE INTENTION OF LENOVO LAPTOP OWNERS

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The aim of this research is to examine the positive influence of product involvement, on brand perceived quality towards purchase intention of Lenovo laptop owners on puducherry city. This study empirically attempts to discuss this particular issue by examining the relationship between Product involvement and perceived quality. The data was collected from Lenovo laptop owners in Puducherry city. The primary data was collected from 150 Lenovo laptop owners from Puducherry city through a structured interview schedule. The study infers that there is a strong influence of product involvement on perceived brand quality having a significant and positive relationship with purchase intention of laptop owners. The results conclude the implication compared with prior versions as well as introducing some of recommendations for future research.

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THE ENVIRONMENTAL IMPACT OF CARBON CREDITS: A CRITICAL ASSESSMENT

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Carbon credits are one of the most prominent market-based mechanisms developed to combat the global climate crisis. They serve as tradable permits that allow entities to emit a specific amount of greenhouse gases, with the objective of incentivizing emission reductions and financing sustainable development projects. Although widely adopted under both compliance and voluntary frameworks, there is growing concern regarding their actual environmental integrity and long-term impact. This paper offers a detailed critical assessment of carbon credits—analyzing their structural design, implementation outcomes, and socio-political implications. Drawing on empirical studies, policy reviews, and global market performance data, it explores whether carbon credits truly advance climate goals or primarily serve as instruments of corporate and governmental green washing. The paper also proposes reforms that could enhance the transparency, accountability, and effectiveness of carbon markets. Using comparative analysis, policy evaluation, and case studies from compliance and voluntary markets, this research investigates whether carbon credits achieve genuine environmental benefits or function primarily as economic instruments that allow continued pollution under a green façade.

E-WASTE AND ECO-BRANDING: CONSUMER RESPONSE TO GREEN ADVERTISING CAMPAIGNS

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In the era of rapid technological advancement, electronic waste (e-waste) has emerged as a growing environmental concern. The improper disposal of electronic products has posed severe threats to ecological balance and public health. In response, companies have increasingly adopted green advertising and eco-branding strategies to promote sustainable behaviour and improve consumer perception. This study investigates consumer awareness, perception, and behavioural response to eco-branding initiatives, especially within green advertising campaigns that address e-waste management. By surveying 300 urban and semi-urban respondents, this research analyses the influence of green marketing messages on purchase decisions

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and brand loyalty. The study uses descriptive statistics, mean score analysis, and chi-square tests to interpret the consumer response across demographic segments. Findings indicate a positive but limited impact of green campaigns, with knowledge gaps and trust issues affecting adoption. The paper concludes by recommending strategic communication, educational outreach, and regulatory reinforcement to improve consumer engagement with e-waste-related green marketing.

CATALYST OF CHANGE:

WOMEN ENTREPRENEUR SHAPING JALANDHAR ECONOMY

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Since women make up approximately fifty percent of the population, their position as entrepreneurs has been essential to the economic growth of most countries. The increased contributions of women have helped industrialized countries achieve ever-higher rates of growth. The work participation rate for women in India is quite low when compared to that of men. The goal of this study is to identify trends and patterns in Punjabi women's employment participation. To choose the units, a snowball sampling technique is employed. Women who work in industries like in small manufacturing, trading, or services that they own, and run are included in the study. Women who work in small businesses, tiffin services, tuition centres, beauty salons, and fashion boutiques are asked to provide information for data gathering for empirical research. Further research is made to gather the information related to the factors that effects their decision to work and also attempt is made to find the problems faced by them. Jalandhar, as a selected district, includes both urban and rural areas, offering a diverse perspective on how women entrepreneurs operate in different settings. This diversity is used for gathering comprehensive data from 132 women entrepreneurs that reflects the challenges and opportunities faced by women entrepreneurs in different contexts.

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CLIMATE CHANGE AND ITS BIOLOGICAL CONSEQUENCES: A GROWING ECOLOGICAL CRISIS

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Climate change is one of the most critical environmental challenges confronting the planet today. Primarily driven by human activities such as burning fossil fuels, deforestation, and industrial emissions, the increasing concentration of greenhouse gases in the atmosphere has led to a steady rise in global temperatures. This warming effect is triggering a series of environmental changes, including the melting of glaciers and polar ice caps, rising sea levels, altered precipitation patterns, and more frequent and intense extreme weather events such as droughts, heatwaves, floods, and storms. These climatic changes are having profound biological consequences across the globe. Ecosystems that have remained stable for centuries are now facing severe disruptions. Many species are being forced to migrate to new areas in search of suitable habitats, leading to changes in species distribution and community structures. Some species are unable to adapt quickly enough, resulting in population declines and even extinction. Phenological shifts, such as changes in flowering time, breeding seasons, and migration patterns, are affecting species interactions, including pollination and food availability. Aquatic ecosystems are also being severely impacted. Rising ocean temperatures and acidification are causing widespread coral bleaching and loss of marine biodiversity. On land, changes in climate are facilitating the spread of invasive species and disease-carrying organisms, posing new threats to native flora and fauna. Moreover, the overall productivity and resilience of ecosystems are declining, which directly affects human well-being by threatening food security, water resources, and livelihoods. Understanding and addressing the biological impacts of climate change is essential for developing effective conservation and adaptation strategies. Global cooperation and urgent action are needed to mitigate climate change and protect the natural systems that sustain life on Earth.

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USE OF ARTIFICIAL INTELLIGENCE IN INSURANCE SECTOR: A BIBLIOMETRIC ANALYSIS AND SYSTEMATIC LITERATURE REVIEW FOR MAPPING, TRENDS AND INNOVATIONS

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The insurance sector has witnessed a paradigm shift with Artificial intelligence (AI), revolutionizing risk management, customer engagement, and operational workflows. This study synthesizes global research trends, innovations and unresolved challenges in AI-driven insurance risk management through a dual-method approach: bibliometric analysis of 329 Scopus and Web of Science publications (1988-2025) and systematic literature review (SLR) of 60 rigorously filtered studies. Key applications span fraud detection, claims automation, personalized underwriting and customer service optimization. However, critical gaps persist, including regional imbalances in research focus, limited exploration of niche insurance domains, and ethical concerns like algorithmic bias. The study proposed policy interventions to mitigate data scarcity, regulatory misalignment and skill shortages while advocating interdisciplinary research integrating AI with blockchain and IoT for enhanced risk prediction. By mapping influential authors, institutions and thematic clusters, this work equips insurers, transformative potential responsibly, fostering innovation without compromising equity or transparency in risk mitigation strategies.

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EMPOWERING TRIBES THROUGH INFRASTRUCTURE AND IDENTITY: SOCIO-ECONOMIC AND CULTURAL DEVELOPMENT IN KORAPUT, ODISHA

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Koraput district, located in southern Odisha, is home to a rich tapestry of indigenous communities, including several Particularly Vulnerable Tribal Groups (PVTGs). Despite being ecologically rich and culturally vibrant, the region remains socio-economically fragile, grappling with limited access to healthcare, quality education, sustainable livelihoods, and functional governance. This study synthesizes findings from three major field-based inquiries using a mixed-methods approach across four tribal-dominated blocks: Koraput, Semiliguda, Jeypore, and Borigumma. Drawing from over 320 household surveys, interviews, and focus groups, it evaluates how tribal communities are navigating development interventions aligned with the United Nations Sustainable Development Goals (SDGs). The findings highlight that while infrastructural expansion—roads, schools, and health centers—has progressed, service delivery remains inconsistent. Tribal women are increasingly emerging as agents of change through self-help groups (SHGs), microenterprises, and participation in governance. However, barriers such as digital illiteracy, socio-cultural taboos, and limited financial access restrict their full empowerment. Digital tools and e-governance have shown early promise but face constraints due to network limitations and lack of localized support. The paper advocates for a culturally grounded, community-driven model of tribal development that integrates traditional knowledge, strengthens women's agency, improves livelihood ecosystems, and aligns local realities with global sustainability frameworks. Ultimately, the transformation of Koraput hinges on empowering indigenous voices to lead development that is inclusive, participatory, and sustainable.

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EMPIRICAL INVESTIGATION ON PUBLIC PERCEPTION AND TRUST IN ANTI-MONEY LAUNDERING AND KYC COMPLIANCE IN INDIA'S BANKING SECTOR

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This empirical study investigates public perception, awareness, and trust in Anti-Money Laundering (AML) and Know Your Customer (KYC) compliance measures within India's banking sector, with a specific focus on the state of Gujarat. As globalization and technological advancements accelerate, money laundering has emerged as a significant challenge to financial systems worldwide, necessitating robust AML and KYC frameworks to safeguard economic stability. In India, where financial literacy varies widely, the effectiveness of these measures hinges on customer awareness, acceptance, and trust in banking institutions. This research adopts a quantitative methodology, utilizing a structured questionnaire distributed to 237 bank customers across public and private sector banks. The collected data were analyzed using statistical tools such as ANOVA and T-tests in SPSS, providing a comprehensive assessment of customer attitudes and perceptions. The findings indicate a moderate level of public awareness regarding the concept of money laundering, its detrimental effects on the economy, and the basic KYC requirements, such as providing identity and address proofs for account opening. Respondents demonstrated a high mean score (above 4.0 on a 5-point Likert scale) for understanding these fundamentals, suggesting a foundational knowledge base. However, awareness of specific regulations, including the Prevention of Money Laundering Act, the Unlawful Activities (Prevention) Act, and the role of the Financial Intelligence Unit-India (FIU-India), was notably lower, with mean scores below 4.0 and higher standard deviations, reflecting diverse and limited familiarity. This knowledge gap underscores the need for targeted educational initiatives to bridge the understanding of regulatory mechanisms. Customer attitudes toward information disclosure reveal a dual perspective. While respondents are generally willing to provide accurate identity and address details (mean = 4.4), they exhibit reluctance to share detailed financial information, such as income sources or asset values (mean = 3.3), due to privacy concerns and perceived intrusiveness. A small proportion indicated a willingness to provide incorrect data under mandatory disclosure pressures (mean = 2.5), highlighting potential compliance challenges. Trust in banks remains relatively high, with mean scores above 4.0 for data security and fraud prevention measures, yet dissatisfaction emerges regarding transaction reporting to third parties (mean = 2.7) and the possibility of account closures for non-compliance (mean = 2.85). These findings suggest a tension between regulatory requirements

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and customer comfort, necessitating transparent communication to align expectations. Statistical analysis further revealed significant gender-based differences in perceptions of awareness, information disclosure, and trust, with p-values below 0.05 in T-tests and ANOVA, indicating the influence of demographic factors. The study emphasizes the importance of tailored communication strategies to address these variations, enhancing overall compliance rates. Practically, the results advocate for banks to invest in customer education, staff training, and transparent engagement to foster trust and acceptance. For regulatory bodies, collaboration with financial institutions to adapt AML/KYC frameworks to emerging technologies, such as cryptocurrencies, is critical. This research contributes to the discourse on improving AML/KYC efficacy in India, offering actionable insights to mitigate financial crimes while strengthening customer-bank relationships and economic stability.

THE INFLUENCE OF PAST EXPERIENCES ON PERCEIVED SECURITY, TRUST AND ATTITUDE ON CONTINUATION INTENTIONS OF MOBILE BANKING APP

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The rapid advancement of digital technologies has transformed the banking sector, with mobile banking applications (MBAs) becoming essential, particularly in India, where usage reaches 87% among Asia Pacific respondents (Marwal Pushpa, 2023). Post-COVID-19, government initiatives like mandatory KYC-compliant mobile wallets and QR codes since April 2022 have boosted adoption (Joshi & Chawla, 2024). However, concerns about security, privacy, and trust impact users' continuation intentions. This study, by Madhur Sharma from BK School of Management, Gujarat University, examines how past experiences, perceived security, perceived trust, and attitude influence continuation intentions among Generation Y millennials in Gujarat, India, using the Stimulus-Organism-Response (SOR) theory.

The research addresses:

- Do past experience, perceived security, perceived trust, and attitude affect continuation intention? and
- To what extent do perceived trust and attitude mediate perceived security's effect on continuation intention?

A quantitative survey collected 204 responses from millennials (1986–1996) via structured questionnaires on Google Forms, analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with Smart PLS 4. Reliability and validity

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were confirmed through factor loadings, Cronbach's alpha, composite reliability (CR), and average variance extracted (AVE), with discriminant validity via the heterotrait-monotrait (HTMT) ratio (Leguina, 2015; Hair et al., 2019, 2021). Findings show past experience significantly influences perceived security (H1: $\beta = 0.177$, $p = 0.000$), and both affect perceived trust (H2: $\beta = 0.500$, $p = 0.000$; H3: $\beta = 0.411$, $p = 0.000$). Perceived trust impacts attitude (H4: $\beta = 0.386$, $p = 0.000$) and continuation intention (H6: $\beta = 0.657$, $p = 0.000$), while past experience affects attitude (H5: $\beta = 0.476$, $p = 0.000$) and intention (H7: $\beta = 0.528$, $p = 0.000$). Attitude influences intention (H8: $\beta = 0.370$, $p = 0.000$). Mediation effects were significant for perceived trust and attitude between perceived security/ past experience and intention (H9–H12, $p < 0.05$), and serially (H13–H14, $p < 0.05$), but not through all mediators (H15: $p = 0.069$). R-square values indicate moderate power for attitude (0.586) and substantial for intention (0.783), with robust model fit (SRMR = 0.075, NFI = 0.678). Theoretically, it extends the Theory of Planned Behavior (TPB); practically, it suggests enhancing security (e.g., two-factor authentication), trust (e.g., transparent policies), and user-friendly design. Limitations include regional focus and sample size; future research could explore additional factors and diverse contexts.

A STUDY ON THE PROCEDURAL METHODS IN THE CRIMINAL JUSTICE SYSTEM IN INDIA

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The criminal justice system in India is a complex and evolving framework designed to uphold the rule of law, protect individual rights, and ensure public order. This study explores the procedural methods embedded within the Indian criminal justice system, with a focus on their historical evolution, structural foundations, and functional implementation. It critically examines key stages including investigation, prosecution, trial, and sentencing, alongside recent reforms introduced through the Bharatiya Nyaya Sanhita (BNS), Bharatiya Nagarik Suraksha Sanhita (BNSS), and Bharatiya Sakshya Adhiniyam (BSA), which have replaced colonial-era statutes. The study identifies systemic challenges such as case backlogs, delays in trials, inefficiencies in law enforcement, and limited access to justice for marginalized communities. It also highlights progressive steps like the integration of digital evidence, time-bound trial mandates, and the expansion of forensic use. By analyzing

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these procedural mechanisms and their efficacy, the paper provides a comprehensive understanding of the operational dynamics of India's criminal justice system and suggests areas for further reform to ensure fairness, efficiency, and timely justice.

ANTI-CORROSIVE BEHAVIOUR OF *PENNISETUM TYPHOIDEUM*(BAJRA)LEAF EXTRACT AGAINST MILD STEEL IN ACIDIC CONDITIONS

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The corrosion of metals and their alloys has prompted an increase in research efforts to lessen the harm caused by the corrosion process. The study analyses the ability of Bajra (*Pennisetum typhoideum*) leaf extract to suppress corrosion on metal in 0.1 N HCl solutions using thermometric and weight loss techniques. At all extract concentrations, it was shown that the leaf extract efficiently prevents mild steel corrosion. The findings of mass loss measurements indicate that inhibition efficiency increases with inhibitor concentration. Based on thermodynamic considerations, the extract's adsorption is exothermic and spontaneous. From the results and findings of the study, a physical adsorption mechanism is proposed for the adsorption of ethanol extract of Bajra leaf extract on mild steel surface. The inhibitory efficiency was projected using certain methods at 298K, 308K, and 318K temperatures. As the extract's concentration rose, the inhibition effectiveness rose as well, demonstrating the leaf extract's inhibitory ability. The extrapolation of enthalpy, entropy change and Gibbs free energy provided evidence for this. The thermodynamic variable demonstrates that physisorption was the mechanism of inhibition. Therefore, the current research shows a new, ecologically safe, and effective corrosion inhibitor for protecting mild steel surfaces in acidic environments.

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A STUDY ON CUSTOMER SATISFACTION WITH DIGITAL BANKING IN KUTCH DISTRICT

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In recent years, the use of digital platforms for banking has grown tremendously. This study aims to identify the satisfaction level of customers and the problems they face while using digital banking services in Kutch district of Gujarat. It includes customer feedback, common problems they face and suggestions to improve digital banking services. This study is based on primary data collected through a well-structured questionnaire. The findings reveal that majority of users agree that digital banking makes daily transactions easier and faster. However they also face problems such as server downtime and fear of online fraud. This study highlights customer satisfaction levels with digital banking in Kutch and aims to provide suggestion to improve digital banking.

MICRO SMALL AND MEDIUM ENTERPRISES: TO BECOMING THE VANGAURD OF INDIA'S RETAIL REVOLUTION

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India's retail market is on an exciting trajectory, currently ranking among the world's top five and projected to become the third largest by 2030, with a remarkable potential to capture 65% of consumers. This shift is driven by the increasing purchasing power of Gen Z and millennials, as innovative models like Social Commerce, Quick Commerce, and Direct-to-Consumer (D2C) are expected the market to grow to \$40 billion and \$50 billion, primarily fueled by Tier 2 and Tier 3 cities, small towns and semi-rural area consumers and extension of Tier 1 consumer demand of providing for their lives to be make easy in their routine juggles. Micro, Small, and Medium Enterprises (MSMEs) in sectors such as apparel, footwear, and food processing are making significant strides in both domestic and international markets. The rise of e-commerce presents a fantastic opportunity for these businesses to streamline their operations and transition smoothly through digital or omnichannel models. The COVID-19 pandemic, which highlighted the importance of digital tools, has empowered MSMEs to be agile and resilient, with projections indicating they could contribute \$50 billion to e-tailing Gross Merchandise Value (GMV) by 2027. In this evolving landscape, the emphasis is shifting from familiar

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brand ambassadors to quality and accessibility. Start-ups are effectively leveraging rural manufacturing and harnessing the power of social media to enhance their visibility and reach, payment gateways had eased much in their revenue receiving. E-commerce platforms are increasingly offering live sales opportunities, which can significantly boost revenue generation through efficient logistics. To thrive, small enterprises can benefit from embracing technological advancements such as augmented reality (AR), virtual reality (VR), and the Internet of Things (IoT) artificial intelligence (AI), and machine learning (ML) Data Analytics (DA) giving immersive shopping experiences by enhancing persons' relationship with brands. These tools are essential for capturing real-time data and understanding consumer demands better. However, to overcome challenges related to capital access and investment trust, collaborative efforts among government entities and industry stakeholders will be critical. Working together to foster an environment of innovation will enable MSMEs to seize the vast potential of the retail market.

RECLAIMING VOICE AND IDENTITY: A POSTCOLONIAL FEMINIST READING OF GITA MEHTA'S *RAJ*

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Gita Mehta's *Raj* (1989) presents a compelling narrative that intertwines personal struggle with national transformation, set against the backdrop of British colonial rule in India. Through the journey of Maharani Jaya Singh, the novel explores the complexities of female identity, power, and resistance within a deeply patriarchal and colonized society. The paper, titled "Reclaiming Voice and Identity: A Postcolonial Feminist Reading of Gita Mehta's *Raj*", offers a critical analysis of the novel through the lens of postcolonial feminism, emphasizing the intersection of gender, culture, and imperialism. The study highlights how Jaya's identity is shaped and reshaped by the cultural expectations of royal womanhood and the political exigencies of the colonial state. Her role as a princess is simultaneously empowering and confining, as she navigates the demands of tradition, marriage, and nationalist politics. The paper explores how Mehta critiques both colonial domination and indigenous patriarchy, revealing the double colonization experienced by women. Jaya's gradual transformation from a symbol of royal decorum to a politically conscious and self-assertive figure represents a reclamation of female agency and voice in a world where women's roles are often marginalized. The postcolonial feminist reading foregrounds

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how *Raj* not only reimagines the historical narrative through a female perspective but also challenges the gendered binaries reinforced by colonial and patriarchal ideologies. It argues that Mehta's portrayal of Jaya is emblematic of the broader struggle of postcolonial women to assert autonomy and articulate identity within oppressive power structures. The novel becomes a site for resistance, rewriting, and reclamation of history and selfhood.

WORKPLACE DIVERSITY, EQUITY AND INCLUSION: A HUMAN RESOURCE MANAGEMENT PERSPECTIVE

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Dr. Ravinderjit Singh

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The purpose of this study is to examine the relationships between human resource management (HRM) practices, organisational performance, and inclusion, equity, and diversity in the workplace. In the framework of activities promoting inclusion, equity, and diversity, this study delves into the retention and turnover rates. Furthermore, the study delves into the ways in which gender plays a part in HRM policies that promote diversity, equity, and inclusion, and how these HRM policies affect the success and competitive advantage of businesses. Examining survey data allowed for the use of a quantitative methodology throughout the investigation. The study's results show that gender is significantly related to HRM strategies that highlight the importance of inclusion, equity, and diversity. There does not appear to be a correlation between the success of diversity, inclusion, and equity programs and the retention rate of employees. Enhancing organisational performance is a major goal of human resource management that is committed to diversity, inclusion, and equity. Significant management implications are shown by the results, which stress the need for gender-sensitive HRM practices, the ongoing assessment of diversity, inclusion, and equity programs, their integration into the overarching organization's strategy, and the creation of an inclusive and supportive work environment.

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EXPLORING THE RELATIONSHIPS AMONG MINDFULNESS, SUSTAINABLE CONSUMPTION AND LIFE SATISFACTION

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This paper investigates the relationships among mindfulness, sustainable consumption, and life satisfaction. These three constructs have been gaining an increasing relevance in psychology, sustainability, consumer behavior and well-being research. Mindfulness, generally defined as intentional and non-judgmental attention to the present moment, contributes to reduced stress, enhanced emotional regulation, and more conscious decision-making. It encourages individuals to shift away from the impulsive, materialistic consumption toward ethical, value-aligned consumer behavior. As people become more mindful, they tend to question their consumption patterns and willingly adopt lifestyles that are more consistent with their core values and long-term goals benefitting the planetary and human well-being. Sustainable consumption emphasizes using resources in ways that minimize environmental and social harm. Mindfulness has a positive influence on sustainable consumption. Individuals who are more mindful tend to make environmentally responsible choices, reduce wastage, and consume with greater intention and care. These behaviors align with their personal values and contribute to a greater sense of purpose and a more psychological balance. Sustainable consumption is not only a behavioral change but also a reflection of a deeper internal transformation which is guided by awareness, empathy, and responsibility. Mindfulness and sustainable consumption both positively impact life satisfaction. People who live mindfully and consume sustainably report higher levels of well-being, fulfillment, and contentment. This sense of satisfaction emerges from the alignment between personal beliefs, ethical behavior and lifestyle choices. Engaging in mindful and sustainable practices nurtures a meaningful life by enhancing one's connection to self, others, and the environment. Together, these constructs suggest a pathway to a more balanced, purposeful, and sustainable way of living, offering valuable insights for individuals, communities, and policymakers seeking to promote holistic well-being.

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AUTHENTICITY VS. ADAPTATION: CONSUMER PREFERENCES FOR TRADITIONAL VS. MODERNIZED AWADHI DISHES – A REVIEW

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Awadhi cuisine, rich in the royal heritage of Lucknow, is a representation of India's gastronomic legacy. Nevertheless, food culture globalization and increasing focus on convenience, health, and creativity have triggered considerable reinterpretations of conventional dishes. In the backdrop of Awadhi cuisine, this review paper attempts to analyze the changing discourse on food adaptation and authenticity, with reference to consumer needs and attitudes. Based on academic literature, market reports, and studies of culture, the paper explores how elements like taste, cultural identity, nostalgia, health awareness, and aesthetic presentation shape the reception of both conventional and innovative Awadhi foods. The review points out that while authenticity is always a paramount concern for maintaining culinary heritage, there is growing movement—particularly among younger generations of consumers—towards fusion, simplification, and health-conscious innovations of classic recipes. Such innovations typically increase accessibility and appeal in urban and international markets but can potentially undermine the historical and cultural authenticity of the cuisine. Additionally, restaurants and chefs are instrumental in defining consumer expectations by harmonizing innovation with heritage through narrative, visual presentation, and edited dining experiences. This article brings together varied insights to present a rich comprehension of the authenticity-adaptation spectrum in Awadhi cuisine. It underscores the imperative of a strategic strategy in culinary practice and hospitality that is cognizant of tradition but accepts the challenges of the modern world. The research offers insightful advice for food researchers, restaurateurs, and cultural historians who want to preserve culinary traditions despite shifting consumption patterns.

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A STUDY OF FACTORS CAUSING STRESS IN STARTUP ENTREPRENEURS IN RAJASTHAN

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This research paper will examine the various factors contributing to stress among startup entrepreneurs in Rajasthan. With the rise of the startup ecosystem in the region, entrepreneurs often face intense pressure due to financial risks, uncertainty, long working hours, and limited support systems. This study will aim to identify and analyze the personal, professional, and environmental factors that influence stress levels among these entrepreneurs. Primary data will be collected using a structured questionnaire from a sample of startup founders operating across different sectors in Rajasthan. Depending on the nature of the variables, statistical techniques such as correlation, regression analysis, and ANOVA will be employed to explore the relationships between stress levels and variables such as age, gender, industry type, funding stage, and work-life balance. The findings of this study will provide a data-driven understanding of the key stressors affecting startup entrepreneurs and are expected to inform targeted stress management strategies and policy recommendations. This research will contribute to the limited empirical literature on entrepreneurial well-being in the Indian context, particularly in tier-2 and tier-3 regions.

EFFECT OF COVID ON TOURISM IN THE STATE OF RAJASTHAN:(A COMPARATIVE ANALYSIS OF ITS IMPACT ON INDIAN &RAJASTHAN ECONOMY)

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The aim of this research is to evaluate the comparative impact of COVID-19 on tourism in Rajasthan and the Indian economy as well. The research paper presents a comparative assessment of the tourist influx in Rajasthan from 2016 to 2020, differentiating between international tourists and domestic tourists. It assesses the repercussions of the pandemic on the tourism sector. Arrivals of foreign as well as

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domestic tourists fell by -71.09% in 2020 compared to 2019, which had a major impact on the hospitality industry, which is tackling sluggish demand. The industry of tourism is one of the primary wellsprings of income in Rajasthan, where it possesses a vital spot in its economy. Few industries or people have escaped the disruption resulting from the unfolding public health emergency. However, the tourism industry suffered the most, mainly because, despite the lifting of the lockdown caused by COVID-19, connectivity has not yet been fully restored. Tourism remains limited to emergency business, leading to a sharp drop in tourist arrivals across the country.

COMPARATIVE ANALYSIS OF GROUND WATER AND SURFACE WATER IN REWARI CITY, HARYANA,(INDIA)

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Comparative analysis of waste water collected from Rewari City, Haryana, water collected from surface watersources and usedin various industries and converted into waste water. This waste water is used in several nearby located agriculturalfields. Results revealed that pH of the waste water ranges between 7.35 to 9.38 and electrical conductivity between 0.87 to1.15 umho/cm and total solids from 955.8 to 2010.2 mg/L. Calcium and magnesium ranges between 46.76 to 103.24mg/Land 466.23 to 941.64mg/L respectively. The total Hardness ranges between 560 to 1133mg/L. Chloride and DO. valuesranges between 295 to 578.3 mg/L and 17.1 to 38.12 mg/L respectively.

FORENSIC ACCOUNTING AND FRAUD DETECTION IN DIGITAL TRANSACTIONS

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In today's digital economy, the surge in online financial transactions has coincided with an increase in fraud and cybercrime. This study looks at the function of forensic accounting in detecting and preventing fraud in digital transactions. Forensic accounting integrates accounting, auditing, and investigation abilities to reveal

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concealed financial wrongdoing. With the rise of e-commerce, mobile payments, and online banking, traditional fraud detection systems are no longer enough. This study examines how forensic accountants employ digital tools, data analytics, and artificial intelligence to detect suspicious activity and trace financial malfeasance. The article also investigates real-world case studies to better understand frequent fraud tendencies and the efficacy of forensic procedures in digital environments. The study indicates that improving digital forensic abilities and technology is critical for safeguarding financial systems and ensuring transparency in digital commerce.

GREEN TECHNOLOGY FOR SUSTAINABLE POLLUTION REDUCTION: INSIGHTS FROM COIMBATORE'S INDUSTRIAL SECTOR

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This study examines the use of green technology, as well as what it may contribute to, the industrial sector of Coimbatore, Tamil Nadu, India. This research is both quantitative (150 surveyed organizations) and qualitative (interviews with industry executives and officials). The green technologies claims appear to be up to a 33.33% improvement on emissions, waste and resource use on all major environmental indicators, says the claim summary. Regression analysis, however, provides strong evidence of correlation of green tech adoption with pollution mitigation. The determination by which is particularly presented by huge scale business and the high implementation cost. It ponders innovative proposals such as waste-to-energy and water recycling situated within a large current deficit within the scientific literature on sustainable pursuits brought to bear on manufacturing industry, directing manufacturing policy makers and industry stakeholders toward achieving environmental and economic sustainability.

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CUSTOMERS' PERCEPTION TOWARDS SERVICE QUALITY SELECTED STAR HOTELS IN CHENNAI.

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This study paper's goal is to use SERVQUAL to assess the level of service provided by upscale hotels in Chennai. Given its distinctive qualities—such as intangibility, perishability, heterogeneity, and inseparability—providing high-quality services is one of the most significant and challenging tasks that any service organisation must undertake. In terms of many but comparatively significant aspects of service quality, the degree and direction of the disparity between customers' expectations and perceptions is known as service. Customers' expectations and perceptions of service quality have been ascertained through empirical research, and the use of a complete scale taken from "SERVQUAL" in Chennai luxury hotels has been experimentally assessed. The research's conclusions are based on comparing the ratings of luxury hotels' expectations and perceptions, which were obtained by asking customers to complete a questionnaire. The results of this study will assist Chennai hotel managers in better understanding their patrons and, as a result, in raising the calibre of their offerings.

BIOTECHNOLOGY AND SUSTAINABLE AGRICULTURE PRACTICES

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The rapid growth of the global population and the resulting pressure on agricultural systems have made it increasingly important to adopt sustainable farming practices. Biotechnology has emerged as a promising tool to support sustainable agriculture by enhancing crop productivity, improving resistance to pests and diseases, reducing dependence on chemical inputs, and increasing tolerance to climate stress. By integrating modern biotechnological innovations such as genetic engineering, molecular breeding, biofertilizers, and biopesticides, agriculture can transition toward more ecologically balanced and economically viable practices. One

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of the most significant contributions of biotechnology is the development of genetically modified (GM) crops that possess traits such as pest resistance (e.g., Bt cotton), herbicide tolerance, and drought resistance. These advancements lead to reduced pesticide usage, lower environmental contamination, and improved yields. Additionally, marker-assisted selection and molecular diagnostics accelerate the breeding process and help develop varieties better suited to local agro-climatic conditions, thereby conserving biodiversity and minimizing resource use. Biofertilizers and biopesticides—derived from naturally occurring microorganisms—are also playing a pivotal role in sustainable agriculture. They not only minimize chemical input but also promote soil health, nutrient cycling, and plant growth. Furthermore, biotechnology facilitates the use of microbial inoculants and plant-microbe interactions to enhance nutrient uptake and disease resistance, supporting long-term soil fertility. Despite its numerous advantages, the adoption of biotechnology in agriculture faces several challenges, including regulatory hurdles, ethical concerns, socio-economic disparities, and public perception issues. There is also a need for robust biosafety mechanisms and transparent communication to gain public trust and ensure environmental sustainability. This paper discusses the role of biotechnology in sustainable agriculture with a focus on current applications, potential benefits, and associated risks. It also highlights the importance of policy frameworks, farmer education, and interdisciplinary collaboration to maximize the benefits of biotechnology while safeguarding ecological integrity. A balanced integration of traditional agricultural knowledge with modern biotechnology holds the key to achieving food security, environmental conservation, and socio-economic equity in the long term.

EVALUATING THE IMPACT OF CUSTOMER AWARENESS ON GREEN BUSINESS PRACTICES AND WILLINGNESS TO PAY: A STUDY OF NORTH INDIAN HOTELS

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Environmental sustainability has become a critical concern for the hospitality industry globally, with green practices such as energy efficiency, water conservation, and waste management being increasingly adopted by hotels (Graci & Dodds &, 2008; Kim, Lee, & Fairhurst, 2017). However, the extent to which customer awareness influences the success and economic viability of such practices remains

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underexplored in the Indian context. This study examines the influence of customer awareness on green business practices in hotels in North India. It examines whether awareness serves as a mediator in influencing customers' willingness to pay a premium for sustainable services. The research draws upon the Theory of Green Purchase Behaviour (Han, 2020), supported by global studies that emphasize the role of perceived environmental responsibility and demographic factors such as age, education, and gender in shaping customer decisions (Verma & Chandra, 2018; Jiang & Gao, 2019). Using a quantitative, descriptive methodology, primary data will be collected via structured questionnaires from 400 guests across 4-star and above hotels in Punjab, Haryana and Chandigarh. Statistical tools such as exploratory and confirmatory factor analyses will be applied to validate the hypotheses. Preliminary literature suggests that while green hotel initiatives positively influence customer satisfaction and loyalty (Jeong et al., 2014; González-Rodríguez et al., 2019), the direct relationship between awareness and willingness to pay has been inconsistent across contexts (Agarwal & Kasliwal, 2017). This study aims to bridge this gap, especially in a developing economy like India where environmental consciousness is rising but price sensitivity remains a barrier. The expected outcomes include actionable insights for hotel operators to enhance green marketing strategies and sustainable branding while aligning with evolving consumer expectations. This research contributes to the growing body of literature on sustainable hospitality by highlighting the pivotal role of consumer-driven green transitions in achieving long-term ecological and economic goals.

THE IMPACT OF SUPPLY CHAIN MANAGEMENT PRACTICES ON ORGANIZATIONAL PERFORMANCE: A SYSTEMATIC LITERATURE REVIEW

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Using the PRISMA (Preferred Reporting Items for Systematic Reviews and MetaAnalyses) technique to provide an organized and transparent study, this systematic literature review investigates how Supply Chain Management (SCM) methods affect organizational performance. Organizations depend more and more on efficient SCM techniques to increase productivity, save operating expenses, and gain

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long-term competitive advantages as global rivalry and market complexity rise. In order to comprehend how particular SCM components such as supplier relationship management, inventory control, logistics coordination, strategic sourcing, and information sharing affect important performance aspects, this review compiles empirical data from a number of researches. These consist of operational measurements (like delivery performance and flexibility), financial indicators (like revenue growth and return on investment), and customer-related outcomes (like loyalty and happiness). The findings offer insights into how well-designed SCM strategies can significantly enhance an organization's overall performance and adaptability in a rapidly evolving business environment. A comprehensive search was conducted across major academic databases Scopus focusing on peer-reviewed articles published between 2015 and 2025. Using strict inclusion and exclusion criteria and quality assessment tools, 40 relevant studies were selected for final analysis. The findings consistently indicate that effective SCM practices significantly contribute to improved organizational performance across industries. Integrated and collaborative supply chain strategies were found to be particularly impactful in enhancing agility, innovation, and competitive positioning. This review presents the current state of knowledge and highlights key research gaps, such as the underrepresentation of SMEs and firms from developing economies, limited attention to digital technologies, and a shortage of longitudinal and cross sectoral studies. It concludes by offering directions for future research and practical insights for managers aiming to improve supply chain strategies for long-term or for drive sustained performance.

BEYOND THE ARENA: CULTURAL RITUALS AND TABOOS IN INDIGENOUS NAGA WRESTLING

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This article presents an analysis of ritual and taboo practices as significant aspects of human life. Rituals and taboos are deeply embedded in indigenous people and form an integral part of their traditional belief systems. Traditionally, taboos and rituals played a significant function in various aspects of life, including sports. In indigenous Naga wrestling, rituals and taboos were observed to clinch victory, protection, and strength; build confidence; and elevate the performances of the wrestlers in a competition. Ritual practices were passed down from generation to generation over centuries and were regarded as irrefutable and inviolable. However,

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in contemporary times, many of these rituals and taboos have undergone change or have declined owing to several factors, making the study crucial to understanding the cultural changes in Naga society. This article presents insight on the significance of rituals and taboos in relation to the wrestler's performance.

NATURAL DISASTERS: A RECURRING HUMAN EXPERIENCE

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India is among the most disaster-prone countries in the world, experiencing recurrent losses estimated at approximately two percent of its Gross Domestic Product (GDP) annually due to natural disasters. Virtually every region of the country falls within one or more natural hazard zones, exposing large segments of the population to significant risk. The presence of deep-rooted socio-economic vulnerabilities—such as poverty, high population density, and inadequate infrastructure—further exacerbates the impact of these disasters, often overwhelming local coping mechanisms and necessitating external support. Acknowledging the severe implications of natural disasters, including loss of life, economic disruption, and the reversal of developmental gains, the Government of India has actively aligned itself with international efforts aimed at disaster risk reduction. This commitment reflects a strategic shift from reactive relief-based approaches to proactive risk management and resilience-building.

THE ENDURING INFLUENCE OF INDIAN EDUCATIONAL PHILOSOPHERS ON THE NATIONAL EDUCATION POLICY 2020

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The National Education Policy 2020 (NEP 2020) is presented as a landmark reform in Indian education, aiming for a comprehensive transformation that aligns with 21st-century aspirations while deeply rooted in India's rich philosophical traditions. This paper analyzes the profound impact and alignment of prominent Indian educational philosophers, including Swami Vivekananda, Rabindranath Tagore, Mahatma Gandhi, Sri Aurobindo, Dr. Sarvepalli Radhakrishnan, J. Krishnamurti, and Savitribai Phule, on the core tenets of NEP 2020. Key areas of convergence include the policy's emphasis on holistic development, experiential learning, value-based education, multilingualism, critical thinking, teacher empowerment, equity, and the

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explicit integration of Indian Knowledge Systems (IKS). The report concludes that NEP 2020 embodies a conscious synthesis of traditional Indian wisdom and contemporary educational needs, aspiring to foster a generation that is not only globally competent but also ethically grounded and culturally aware, despite facing significant implementation challenges.

NON-ALIGNMENT: THE RUSSIA–UKRAINE WAR

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In the wake of Russia's full-scale invasion of Ukraine (February 2022), the Global South has increasingly embraced a form of "functional non-alignment," characterized by diplomatic abstention from sanctions, moral condemnation of aggression, and hedging between power blocs. This paper examines the complexities of this posture in light of:

- Iran's military backing of Russia both diplomatic and through drone exports and the subsequent tensions arising from the Iran Israel war.
- NATO's deepening defense commitments post-2025 summit and its strategic recalibration.
- The repercussions these interlocking conflicts have for non-aligned countries navigating strategic autonomy amidst multi-polar great-power rivalry.

GREEN SYNTHESIS OF VARIOUS NANO PARTICLE USING HERBS AND THEIR APPLICATION.

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Traditional methods for synthesizing nanoparticles often involve harsh conditions, high expenses, and contribute to environmental pollution. Consequently, scientists are actively seeking sustainable and environmental friendly alternatives to these conventional chemical synthesis processes. The emergence of green synthesis approaches, particularly through plant-mediated methods, has garnered significant attention. Plant extracts, serving as both reducing and stabilizing agents, offer a promising avenue for nanoparticle synthesis that is cost-effective and eco-friendly,

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while also providing improved size uniformity and stability. Furthermore, nanoparticles inspired by plant sources showcase intriguing pharmacological properties, rendering them highly prospective for medical applications due to their biocompatibility and nano-scale dimensions.

SUSTAINABLE DEVELOPMENT USING BIOCONTROL AGENTS AGAINST INVASIVE WEED *PARTHENIUM HYSTEROPHORUS*

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In the Dehradun belt of Uttarakhand, *Parthenium hysterophorus* is a common and allergenic weed that can be controlled with *Zygogrammabicolorata*, an efficient biocontrol agent. This ferocious weed is naturally preyed upon by *Z. bicolorata*. In 2023, the Department of Entomology at S.G.R.R. University in Dehradun, Uttarakhand, conducted a laboratory study on the eating capacity of the Mexican beetle, *Zygogrammabicolorata*. Given the abundance of *Parthenium* weed in the area, ten distinct locations were selected from the Dehradun district. It was found that Site 3 (Raipur) had the insect's maximum feeding potential, whereas site 6 (Sahastradhara) had the lowest. According to the results, the adult at site 3 devoured 3.7 grams of *parthenium* leaves at 20 degrees Celsius, while the comparable values were 2.3 milligrams. When *Z. bicolorata* was treated at higher densities and during the weed's early growth phases, the damage it caused was more noticeable. Compared to the early stages, the fully mature ones were less favored. When used properly, this method can be very helpful in controlling *parthenium* weed and advancing the cause of sustainable development.

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THE ROLE OF AI IN ENHANCING USER ADOPTION OF DIGITAL BANKING SERVICES

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The rapid advancement of Artificial Intelligence (AI) has revolutionized the digital banking sector, enabling banks to deliver intelligent, personalized, and user-centric services. This paper explores the role of AI-specific features in enhancing user adoption of digital banking services, focusing on the mediating effect of user satisfaction. Grounded in technology adoption and satisfaction theories, the study identifies five critical AI-specific features: trendiness, visual attractiveness, problem-solving ability, customization, and communication quality. These features are hypothesized to influence user satisfaction, which in turn impacts user adoption, measured through perceived usefulness, perceived ease of use, intention to use, trust in AI systems, and behavioral intention to adopt. This theoretical and conceptual research adopts a systematic literature review approach using the PRISMA framework to examine existing academic literature from 2014 to 2024. The review includes peer-reviewed journal articles, conference proceedings, and authoritative reports relevant to AI adoption in digital banking. The findings indicate that AI-enabled features significantly influence user satisfaction by enhancing the personalization, responsiveness, and reliability of digital banking services. Customization and problem-solving ability contribute strongly to perceived usefulness and trust, while visual attractiveness and communication quality improve perceived ease of use and user engagement. Moreover, user satisfaction plays a critical mediating role, linking AI-specific features with user adoption. Satisfied users are more likely to exhibit higher trust in AI systems and demonstrate stronger behavioral intentions to continue using AI-driven banking services. The study proposes a conceptual framework that integrates AI-specific features, user satisfaction dimensions, and user adoption variables, offering valuable insights for researchers, banks, and policymakers aiming to enhance digital banking adoption. The paper concludes with implications for practice and future research, emphasizing the need for banks to strategically implement AI tools that prioritize user-centric design and satisfaction. By fostering trust and usability, AI technologies can play a transformative role in strengthening user engagement, loyalty, and long-term adoption of digital banking platforms.

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WOMEN EMPOWERMENT: A COMPARATIVE STUDY OF WORKING MOTHERS AND HOMEMAKERS OF DAKSHINA KANNADA DISTRICT, KARNATAKA

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Women empowerment is one of the burning issues in India. Empowerment of women can be defined as a creation of a platform where women can make independent decisions for their personal development and also for the well-being of the society. From the past many years and even today, the nation is focusing on empowering women by providing ample career opportunities for women in almost every sector of the economy. Many literature studies reveal that women belonging to urban areas are more empowered than women in rural areas. Dakshina Kannada is one such district in Karnataka, where the rural population is more (52.33%) compared to the urban population. The literacy rate of rural women in Dakshina Kannada is 79.83%, whereas of rural men is 90.97%, which clearly indicates the need to focus towards the empowerment of rural women of Dakshina Kannada. Therefore, the proposed research will focus on comparing the roles of working and non-working mothers belonging to Dakshina Kannada district, Karnataka, with respect to different aspects of life.

AN EXPLORATORY STUDY ON THE IMPACT OF ONLINE BUSINESS ON RETAILERS WITH SPECIAL REFERENCE TO DAKSHINA KANNADA DISTRICT IN KARNATAKA

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The active growth of online business has changed the global retail landscape significantly. Even though it has increased the reach and convenience, the retailers are facing challenges. The purpose of this exploratory study is to investigate the

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impact of online adoption on retail businesses in Dakshina Kannada district, Karnataka. This study specially focusses on both the positive and negative consequences of online business on retailers. By understanding these impacts, the study seeks to provide insights into the strategies that retailers can employ to adapt to the evolving retail environment and mitigate the potential negative effects of online business.

A CRITICAL ANALYSIS OF NATIONAL EDUCATION POLICY (NEP) 2020: IMPLICATIONS, OPPORTUNITIES AND CHALLENGES FOR INDIAN TEACHERS

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The NEP 2020 marked a major transformation in Indian education system, with the aim to orient with the changing needs and challenges of the education system of the current century. Fundamental role of the teachers is highlighted in this progressive policy. Putting focus on improving teacher education, professional advancement, autonomy, and accountability, this paper presents an analysis of NEP 2020, through the lens of the teachers of our country, reflecting on the promising prospects it represents, adaptive expectations from the role of teachers, the major hurdle that could restrict smooth execution of the policy. By reviewing the policy and scholarly literature, the paper evaluates the implications of NEP 2020, the way it impacts the teachers, by introducing concrete solution for the optimal implementation of the policy.

FINANCIAL INCLUSION OF BPL HOUSEHOLDS IN DELHI SLUMS: AN ANALYSIS OF GOVERNMENT POLICIES AND REGULATORY FRAMEWORKS

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Financial inclusion has emerged as a critical strategy for poverty reduction and economic empowerment of Below Poverty Line (BPL) households in India's urban slums. This study examines the effectiveness of government policies and regulatory frameworks in enhancing financial inclusion among BPL households in Delhi's slums, with particular focus on Scheduled Commercial Banks' initiatives. The research

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employs a mixed-method approach, analyzing data from 750 Delhi slums housing 3.5 lakh families and 20 lakh people representing 28% of Delhi's population. Key findings reveal that while 54.97 crore PMJDY accounts have been opened with deposits of Rs. 2,52,750 crores, approximately 11.30 crore accounts remain inoperative with Rs 14,750 crore balance. The study demonstrates that despite significant policy interventions including Jan Dhan Yojana, MUDRA schemes, and digital payment initiatives, substantial gaps persist in meaningful financial inclusion. Results indicate that while bank account penetration has increased dramatically from 58% unbanked population in 2013-14 to 3.69% by 2022-23, usage patterns remain suboptimal with only 82.35% accounts being operative. The research concludes that structural barriers, limited financial literacy, and inadequate service delivery mechanisms continue to impede comprehensive financial inclusion despite progressive policy frameworks.

DIGITAL FINANCIAL INCLUSION IN INDIA: CHALLENGES, OPPORTUNITIES, AND IMPLICATIONS FOR FINANCIAL SECTOR TRANSFORMATION

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India's financial inclusion journey over the past decade has been remarkable, driven by government initiatives such as the Digital India Movement and the Pradhan Mantri Jan Dhan Yojana, along with rapid advancements in digital technologies. These efforts have significantly enhanced access to formal financial services for the unbanked and underserved populations, contributing to poverty reduction and fostering inclusive growth. The rise of digital financial transactions (DFTs), particularly platforms like UPI, has revolutionized how citizens engage with the economic system, offering convenience, security, transparency, and cost-effectiveness. However, challenges such as internet connectivity issues, cyber frauds, language barriers, limited digital literacy, and infrastructural gaps continue to hinder widespread adoption, especially in rural and marginalized communities. The Indian financial sector's digital transformation, driven by government initiatives and technological innovation, has enhanced access, efficiency, and transparency. The growth of UPI transactions, attributed to simplicity, interoperability, government support, and low costs, has been a catalyst for financial inclusion. However, challenges like internet connectivity, cyber frauds, language barriers, and limited digital literacy persist, threatening to create societal disparities. Addressing these requires collaborative

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efforts from all stakeholders. This paper discusses achievements in financial inclusion, outlines prevailing challenges, and proposes recommendations for leveraging digital technologies to achieve an inclusive ecosystem. It also emphasizes the importance of a comprehensive financial inclusion index for measuring progress.

RURAL CONSUMERS' AWARENESS TOWARDS CONSUMER RIGHTS: A STUDY WITH SPECIAL REFERENCE TO DAKSHINA KANNADA DISTRICT, KARNATAKA

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Dakshina Kannada District is known for literacy, with more than 88% literacy rate in all of Karnataka, which is the highest in the state. Being a literate and educated person, how much awareness an individual has towards consumer rights, what factors a consumer considers while purchasing a product, and what kind of behaviour the consumer portrays while purchasing matters a lot. So, the study related to consumer rights awareness becomes crucial that too, in a district like Dakshina Kannada. In order to protect consumers from various kinds of malpractices Government had introduced the Consumer Protection Act of 1986, and it was replaced by the Consumer Protection Act of 2019, in which various amendments have been made keeping in mind the technological changes and new kinds of cyber frauds and e-commerce transactions. This research explores purchasing behaviour and consumer rights awareness among rural consumers of Dakshina Kannada district. The research reveals a troubling gap between knowledge and action. Although rural consumers understand their rights well, they struggle to use protective measures effectively. The study suggests building on Dakshina Kannada's educational strengths to create better support systems and more accessible complaint processes for rural consumers.

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THE IMPACT OF SPECIFIC PERSONALITY TRAITS ON INVESTOR BEHAVIOR IN STOCK MARKET INVESTMENT

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Conventional financial wisdom is historically anchored to the premise that investors are inherently rational actors. This perspective dictates that all financial decisions are driven by logic, with judgments being both fair and objectively sound. Consequently, a vast array of financial models, including foundational ones like the Capital Asset Pricing Model (CAPM), are constructed upon these assumptions, often even positing a uniformity of investor expectations. However, this traditional viewpoint finds itself at odds with the tenets of behavioral finance, a field that posits investors frequently deviate from perfect rationality, exhibiting sometimes less-than-optimal or even outright irrational behaviors, particularly when navigating uncertain market conditions.

NATURE'S PHARMACY: INVESTIGATING THE BIOACTIVE COMPOUNDS OF TRADITIONAL MEDICINAL PLANTS

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Traditional medicinal plants have been a rich source of bioactive compounds for centuries. This study investigates the phytochemical composition and pharmacological properties of select medicinal plants, highlighting their potential as natural remedies for various diseases. Our research reveals the presence of diverse bioactive compounds, including alkaloids, flavonoids, and terpenoids, which exhibit antioxidant, anti-inflammatory, and antimicrobial activities. The findings underscore the importance of preserving traditional knowledge and exploring natural products for modern therapeutic applications.

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PHYTOCHEMICAL ANALYSIS OF DIFFERENT PARTS OF *ARGEMONE MEXICANA*.

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The present study focuses on the phytochemical screening of different parts—root, stem, leaves, and flowers—of *Argemone mexicana* collected from Jaipur, with the objective of evaluating the presence of various bioactive compounds. *Argemone mexicana*, a widely distributed medicinal plant known for its therapeutic properties in traditional medicine, was selected due to its ecological abundance and reported pharmacological potential. Freshly collected plant materials were shade-dried, powdered, and subjected to extraction using standard solvents. Qualitative phytochemical analyses were performed to detect the presence of major secondary metabolites such as alkaloids, flavonoids, tannins, saponins, phenolics, terpenoids, and glycosides. The results revealed a varied distribution of phytochemicals in different plant parts. Alkaloids and flavonoids were prominently present in all four parts, with higher concentrations observed in the root and flower extracts. Phenolic compounds and tannins were more abundant in the leaves, while saponins were predominantly found in the stem. These findings confirm the medicinal relevance of *Argemone mexicana*, suggesting its potential for pharmacological applications. The study provides a scientific basis for further investigation into the plant's bioactive compounds and supports its continued use in herbal and alternative medicine.

WOMEN ENTREPRENEURS IN HIMACHAL PRADESH: CHALLENGES AND OPPORTUNITIES

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Women entrepreneurship has emerged as a powerful driver of socio-economic development in India, especially in rural and semi-urban areas. Himachal Pradesh, with its unique geographical and cultural landscape, offers both potential and hurdles for women entrepreneurs. This paper explores the current status of women entrepreneurship in Himachal Pradesh, identifying key sectors such as handicrafts, agriculture-based industries, tourism, and small-scale manufacturing where women have shown notable participation. The study delves into the challenges faced by women entrepreneurs, including limited access to credit, lack of awareness, socio-cultural constraints, and inadequate training and infrastructure. Despite these barriers, the growing support from government schemes, self-help groups, and digital platforms

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presents significant opportunities. The paper emphasizes the need for policy support, education, mentorship, and inclusive financial systems to empower women entrepreneurs and foster sustainable economic growth in the region.

ACHIEVING SDGs THROUGH EDUCATION AND GENDER INCLUSION: EMPOWERING TRIBAL YOUTH AND WOMEN IN THE PIR PANJAL REGION.

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This study critically examines the socio-economic impact of the Eklavya Model Residential School (EMRS) scheme, a flagship intervention by the Ministry of Tribal Affairs, aimed at transforming educational outcomes for India's marginalized Scheduled Tribes (STs). This study aims to examine the challenges faced by Gujjars and Bakerwals in achieving the SDG's and the impact of EMRS on their upliftment, exploring the role of women-led enterprises and indigenous knowledge in sustainable development and propose inclusive and culturally sensitive strategies for tribal empowerment.

LEADERSHIP AND MANAGEMENT: AN EMERGING TRENDS IN NETWORK MARKETING

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Leadership and management play pivotal roles in the success of network marketing organizations. Leadership in network marketing involves setting a strong example, building relationships, and empowering team members. Unlike the traditional business models, network marketing relies heavily on interpersonal influence, personal branding, and the ability to inspire and guide a decentralized team of independent distributors. Effective leadership in this domain involves vision-setting, motivation, coaching, and ethical behavior, while management focuses on strategic planning, system implementation, and performance monitoring. The integration of leadership and management ensures sustained team growth, retention, and performance. This abstract explores how transformational leadership enhances team morale and commitment, while efficient management practices support scalability and

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operational efficiency. It also highlights the unique challenges network marketers face, such as maintaining motivation in a non-salaried workforce and leading through influence rather than authority. In the context of MLM, effective leadership involves inspiring and guiding a network of distributors or representatives to achieve their goals while promoting the growth and sustainability of the business. Ultimately, the synergy between strong leadership and sound management is essential for long-term success in network marketing.

MATERNITY BENEFITS: CHALLENGES AND JUDICIAL RESPONSES

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The social security schemes in all the countries of the world include maternity care and benefits for women workforce as an integral part while taking into account the wellness of its women workers. Apart from providing medical care to women workers in case of confinement, miscarriage, sickness arising out of pregnancy, premature birth of the child, adoption etc. it also provides protection of wages and security of employment in aforesaid situations. It has to be noted that it was a long journey to reach to a point where such rights are acknowledged and recognized by the society and are reflected in the law of the land, despite the long-held beliefs around the concept of gender, pregnancy and the like situations. However, the judicial interventions and pronouncements show that the interpretation and implementation of the law still suffers from some of the remanent of the past. The Constitution of India guarantees non-discrimination, inter alia, on the ground of sex and under Article 15(1) permits the State to make special provision for women. The commitment for gender justice was reinforced with the ratification of the Convention of Elimination of Discrimination Against women (CEDAW) by India in 1979. The constitutional value of ensuring justice, equality and fraternity without any discrimination are expected to be reflected in the actions of the three main organs of the State, viz., Executive, Legislative and Judicial. The concerted efforts and actions of these organs are vital in ensuring the realisation of the ideal reflected in the term 'gender justice'. The foregoing principles and aspects are the basis of this paper which explores and analyses some cases relating to gender justice in India with special reference to maternity benefits and the like, where the State organs were found to be lacking in the application of the above principles whereasthe judicial intervention applied and upheld the natural rights of women/mothers.

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ANALYZING THE COMBINED IMPACT OF TAX KNOWLEDGE AND TAX COMPLEXITY ON TAX COMPLIANCE BEHAVIOUR

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Tax compliance remains a critical concern for governments and tax authorities worldwide, as tax revenue constitutes a primary source of public income. The present study tries to analysing the combined impact of tax knowledge and tax complexity on tax compliance behaviour. Data for the present study collected through survey and analysis done with Structural equation model. The results proved a significant positive effect of tax knowledge on tax compliance behaviour and insignificant negative effect of tax complexity on tax compliance behaviour. These insights offer valuable implications for policymakers, emphasizing the need to enhance taxpayer education and simplify tax systems to improve overall compliance rates.

BIBLIOMETRIC MAPPING OF RESEARCH ON ELECTRONIC PAYMENT SYSTEMS IN INDIA (1982–2025)

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The paper traces the evolution of electronic payment systems (EPS) in India from a cash-dependent economy to one driven by digital innovation and financial inclusion. It analyses key technological milestones, policy initiatives, and the impact of emerging technologies such as UPI, mobile wallets, and blockchain. Through bibliometric and trend analysis, the study evaluates academic production, influential publications, author productivity, and collaboration networks in the EPS domain, revealing patterns of growth, concentration of influence, and persistent research gaps. Researchers used 2619 research paper data base of Scopus from 1982 to 2025. The findings demonstrate that India's EPS landscape is shaped by government intervention, technological innovation, and a focus on financial inclusion.

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ANALYSING FINANCIAL PERFORMANCE OF CONSUMER GOODS SECTOR FIRMS LISTED ON BSE 500

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Manufacturing Sector is very important and crucial sector for the economic development of the country. Consumer goods sector is also showing good growth prospects due to development of the infrastructure sector development in India. Moreover, the concept of self-reliant also paved way for Make in India and increased focus on manufacturing Sector. In this paper, researcher have analysed 24 consumer goods sector firms Financial Performance for the 5 years (2018-22) so as to understand the contribution of consumer goods sector in the economic growth and development of the country. The data of the Consumer goods sector has been taken from CMIE Prowess. Various ratios such as ROA, ROE & ROCE has been taken up and the capital structure variables such as liquidity, tangibility, profitability, NDTs, Operating Liability and ETR has been assessed in relation to financial Performance of the Consumer Goods Sector. The analysis found the impact of Tangibility, liquidity Profitability, NDTs and ETR on ROA. Operating Liability and ICR were not impacting on ROA. Variables Tangibility, liquidity Profitability, NDTs and ETR were impacting on ROCE. Thus, Operating Liability and ICR were not impacting on ROCE.

INCLUSIVE ANTIMICROBIAL DEED OF POLY PYRROLE BY DIFFERENT SOLVENTS

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Numerous types of organic solvents as THF, DMSO and DMF were cast-off to carry out polymerization of aniline expending its aqueous solution. It was studied as to how these solvents affect the polymerization of aniline and its conductivity and biological activity. The investigations of synthesize polymers involved iUVvisible spectroscopy and FTIR spectroscopy. The studies expose that the use of different organic solvents on biological activities of PANI.

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THE IMPACT OF POLLUTION ON PLANT BIODIVERSITY IN JAIPUR: A COMPARISON BETWEEN POLLUTED AND NON-POLLUTED AREAS

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The current study aims to establish a connection between pollution levels as well as plant biodiversity in Jaipur, Rajasthan, by examining the plant species present in both polluted and non-polluted areas of the city. For this, the entire city of Jaipur was divided into several zones, followed by classification of these areas into polluted and non-polluted sites. The polluted sites were 12 in number and the highest plant biodiversity was found in Jhotwara (20) followed by RIICO, Malviya Nagar (20) > Kotputli (19) > Jaipur Rural (Bagru, Bindayaka, Dudu, Kartarpura, Phulera, Shahpura, and Sudarshanpur) (18) > Kaladera (16) > Bassi (16) > Sitapura (15) > Amer (10) > Ajmeri Gate (6) > Chandpole (4) > Transport Nagar (4) > Vishvakarma (2). Among the 7 non-polluted areas, the highest plant biodiversity was found in Mansarovar (9) followed by Gopalpura (9) > Vidhyadhar Nagar (8) > Vaishali Nagar (8) > Dungarpur (6) > Civil Lines (4) > Tilak Nagar (3). The study showed overall decline in plant biodiversity in polluted areas and highlights the ecological implications of these findings and proposes strategies for enhancing plant diversity in urban areas.

Mental Fortitude in the Face of Competitive Exams: Examining Stress, Resilience, and Well-being in Civil Service Candidates

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Preparing for the civil services examination is often described as an intense and emotionally demanding journey. This study aims to investigate how psychological factors—perceived stress, hopelessness, and emotional resilience—support the psychological well-being of civil service candidates. The phase of preparation for the civil service exam entails considerable academic pressure, uncertainty, and personal sacrifices. The sample consisted of 120 aspirants who have been actively preparing for at least a year. Respondents were given three standardized measures—the Perceived Stress Scale (PSS-10), the Connor-Davidson Resilience Scale (CD-RISC),

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and the Beck Hopelessness Scale—along with Ryff's Psychological Well-being Scale. To guarantee involvement and response accuracy, the researcher supervised all individuals while completing the questionnaires in person. Results showed a notable negative correlation between psychological well-being and both perceived stress and hopelessness. Emotional resilience, on the other hand, was positively and strongly linked with improved well-being outcomes. Interestingly, high stress and low resilience were found to be moderately associated with higher levels of hopelessness, implying that resilience might serve as a protective factor against despair. Together, the two main factors explained a significant amount of variation in psychological well-being ($R^2 = 0.44$). This paper emphasizes the importance of civil service aspirants developing emotional resilience and managing their stress effectively. The insights gained can guide customized mental health interventions sensitive to the specific challenges faced by this group. Stress reduction strategies should be incorporated to help aspirants relieve their stress and focus more effectively on their studies.

IMPACT OF PSYCHOGRAPHIC VARIABLES ON GENERATION Z'S PURCHASE INTENTION FOR GLUTEN-FREE PRODUCTS: AN EMPIRICAL STUDY

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In recent times, the term “Gluten Free” has become increasingly popular. But what exactly are these gluten-free products? And why are they gaining such strong support from consumers? what is driving the high demand for these products especially among the Generation Z age group of people? To explore this growing trend, the study has been conducted and the data was collected from 413 respondents in Jaipur, Rajasthan, India, through an online questionnaire by using a stratified random sampling method. The study primarily focuses on psychographic variables such as – taste, preferences, lifestyle choices, health consciousness and individual attitudes which go beyond demographic variables. To test the hypothesis, regression analysis was used which revealed a strong and statistically significant relationship between psychographics and purchase intention. the study reveals that Generation Z prefer gluten-free products not only for medical reasons but also to maintain their healthy lifestyle and also to follow the ongoing trend of consuming gluten-free food as consumption of gluten free diet gives them a separate status symbol. The result emphasises that marketers and product developers need to go beyond demographic profiling of customers, such as age and gender. Instead, they should focus on psychographic segmentations to better understand and cater the

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values and preferences and behaviour of today's young consumers. the study provides valuable insights into the motivations behind the rising popularity of gluten-free products and highlights the potential for innovation and targeted marketing in the growing health and wellness food sector in India.

NURSES' PERCEPTIONS OF PATIENT SAFETY: A CONCEPTUAL FRAMEWORK EMERGING FROM SYNTHESIS OF LITERATURE REVIEW

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Patient safety is an essential aspect of healthcare quality and nurses are instrumental in providing safe and effective care. Ensuring patient safety is vital for enhancing healthcare outcomes and improving the quality of care in both NABH-accredited and non-accredited hospitals. It is important to explore the factors that shape their perceptions of healthcare providers. The NABH has established accreditation standards aimed at promoting patient safety and quality of care within healthcare organizations, standardizing patient safety practices and their influence on nurses' perceptions of the safety climate, which is critical for compliance. There is a notable lack of a patient safety culture/climate within our healthcare organization. Furthermore, patient safety and the culture/climate surrounding it have been closely linked to nursing staffing and empowerment. The factors and issues impacting nursing care must be thoroughly examined and addressed when assessing the patient safety culture/climate in healthcare organizations. Evaluating nurses' perceptions of patient safety will undoubtedly aid in assessing the patient safety culture/climate within these organizations. Thus, a conceptual frame work of independent variable/dimensions (Teamwork climate, job satisfaction, stress recognition, perception about management, working condition) and a dependent variable of safety culture/climate (Safety climate). The objective is to compare nurses' perceptions of the patient safety culture/climate between NABH-accredited and non-accredited hospitals in the Delhi-NCR region, providing actionable recommendations for hospitals and policymakers to

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improve the patient safety culture/climate, identifying differences in key safety climate dimensions, and evaluating the role of NABH accreditation as a moderating factor. Patient safety is a global priority; however, India encounters distinct challenges related to preventable medical errors. Although NABH accreditation seeks to standardize safety measures, its success relies heavily on nurses, the frontline caregivers who implement these protocols on a daily basis, fostering safer work environments. The methodology for this study will be quantitative and descriptive in nature, utilizing a non-probability convenient sampling method. Data will be gathered through a structured questionnaire. It is anticipated that nurses working in NABH-accredited hospitals will possess a higher perception of patient safety compared to their counterparts in non accredited hospitals, as NABH accreditation is a recognized indicator of quality and patient safety in healthcare.

THE ROLE OF CULTURE IN PROGRAMMING SUSTAINABLE PRACTICES

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Culture plays a pivotal role in shaping how societies perceive and implement sustainable practices. As sustainability challenges demand long-term behavioral change, culturally-informed programming becomes essential for fostering environmental responsibility, economic equity, and social cohesion. This paper explores how cultural values, norms, traditions, and worldviews influence the design, adoption, and effectiveness of sustainability initiatives across different communities. By integrating local knowledge systems, community narratives, and culturally relevant incentives into programmatic strategies, sustainability efforts can achieve greater resonance and long-term success. Moreover, acknowledging cultural diversity enhances inclusivity and fosters participatory approaches that respect indigenous practices and traditional ecological knowledge. The study underscores the need for culturally adaptive frameworks in policy and program development, advocating for cross-disciplinary collaboration between environmental science, anthropology, and community development to ensure that sustainable practices are not only technically sound but also socially grounded and culturally meaningful. Let me know if you'd like it tailored to a specific region, sector (e.g., agriculture, urban development), or academic level.

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DATA ANALYSIS BY RECURRENT NEURAL NETWORK, TO PREDICT SEASONAL RAINFALL FOR METEOROLOGICAL MONSOON SEASON AND TREND OF DEVIATION FROM NORMAL

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This paper is based on data analysis by python programming language on google collaborator platform, model used as recurrent neural network, to predict the seasonal rainfall total during monsoon season, for near future years for the period June to September. Other than prediction of seasonal total rainfall for future years, a study with data analysis in python had been done also for understanding the deviation of seasonal total for meteorological monsoon season in comparison with historical record of normal. The source of data is online data collection platform 'INDIA METEOROLOGICAL DEPARTMENT, PUNE'. The surface data for Alipore (42807) as available there, had been collected in csv file format, then uploading the csv file in google collaborator platform, executed analysis by python recurrent neural network model technique, in keras, tensorflow environment to get the predicted output for future years for the dependent variable, in this study which was 'total seasonal rainfall' within meteorological monsoon period. Trend of deviation of rainfall seasonal total for the meteorological monsoon season, in comparison with recorded normal data of the same was also studied since historical period ,1969 to present years, along with trend of deviation of the same for predicted future value for future years. One new column was created to define derived data for year wise seasonal total for meteorological monsoon season and performed the data analysis to find the result. From analysis of big data, determined predicted output for monsoon period seasonal total rainfall for near future which is the span of 2025 to 2030, with the help of recurrent neural network, with train-test split ratio 80%-20% and minimum loss.

APPLYING TPB TO GST COMPLIANCE: AN INVESTIGATION OF BUSINESS TAXPAYERS BEHAVIOUR

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Goods and service tax(GST) compliance is a pressing concern for government worldwide and the present study sheds light on to investigate the factors influencing Goods and Service Tax compliance among Micro and Small businesses. The study applies the Theory of Planned Behavior (TPB). The quantitative approach was applied. Using the survey-based approach, with a well-structured questionnaire

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distributed to 450 registered taxpayers this research examines the relationship between attitude towards GST compliance, subjective norms, perceived behavior control and GST compliance intention. The findings reveal that attitude subjective norms and perceived behavior control significantly influence GST compliance, which in turn affects actual GST compliance behavior. Notably, the results indicate that businesses with positive attitude towards GST compliance, those influences by societal norms, and those with greater control over their tax obligation are more likely to comply with GST registration. Over 70% respondents are aware of the GST mechanism, indicating that business operators possess sufficient intention to handle the challenges associated with GST implementation. This study provides valuable insights for policymakers and tax authorities to develop targeted interventions and strategies to promote GST compliance among businesses. By understanding the psychological and social factors driving GST compliance, this research contributes to the development of more effective tax policies and administrative practices.

IMPACT OF DIVIDEND ANNOUNCEMENT ON INDIAN STOCK MARKET

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Past research has demonstrated that the market receives information when the dividend and that there is a connection between the stock price and the release of the dividend. Dividend announcement has been the subject of numerous research both inside and outside of India, yet it is still a contentious topic in corporate finance. We tried to objectively investigate Dividend Announcements in the Indian Stock Market using Event Study Methodology on the companies listed on the National Stock Exchange for the years 2020 to 2024. The majority of the findings in this study are similar with the earlier studies, and the anomalous Return increases after the announcement of the Dividend announcement.

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SOLAR-POWERED VACUUM DUST SUCTIONS POSITIONED LIKE STREET LIGHT POLES

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Air pollution, primarily caused by dust, carbon particles, and airborne fibers, has emerged as a significant concern in urban and semi-urban areas, severely affecting respiratory health and environmental conditions. This proposed idea offers an innovative and eco-friendly solution: solar-powered vacuum dust suction systems designed in the form of street light poles. These units would be installed along roadsides, college campuses, commercial zones, and other public areas to continuously remove airborne dust and harmful particulate matter from the environment. Each vacuum unit is powered by an individual solar panel, making it self-sustainable and energy-efficient. The suction mechanism within the pole collects dust particles from the surrounding air and stores them in a concealed, removable dust bag or cartridge, which can be periodically emptied or replaced. This feature not only prevents the re-release of pollutants but also ensures clean and manageable maintenance. Utilizing solar energy significantly reduces dependence on traditional power sources and lowers the system's overall carbon footprint. The proposed design features compact yet effective suction systems embedded within vertical poles resembling standard street lights. Polluted air is drawn into the system, passed through high-efficiency filters, and released as cleaner air. The system is low-maintenance, adaptable, and suitable for installation in a wide range of outdoor environments. Implementation of this system will require careful planning with respect to suction efficiency, regular maintenance, and coordination with municipal and energy departments. The ideal application areas include traffic-dense zones, public transport hubs, tourist destinations, educational institutions, and busy marketplaces. The system offers several benefits, including improved air quality, reduced incidence of asthma and allergies, cleaner public spaces, and the use of renewable solar energy. This concept aligns with smart city development goals and can serve as a scalable model for sustainable urban planning. If adopted successfully, this idea can contribute to healthier environments and set a benchmark for innovative green technologies in urban infrastructure.

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ARTIFICIAL INTELLIGENCE IN TALENT ACQUISITION AND RECRUITMENT: A BIBLIOMETRIC ANALYSIS USING VOS VIEWER

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Artificial Intelligence stands at the forefront of a transformative era in human resource management. It promises not to replace human judgment but to augment and enhance human capabilities, enabling HR professionals to focus on more strategic, creative, and empathetic aspects of talent management. As organizations increasingly recognize AI's potential, the future of HR lies in creating synergistic relationships between technological innovation and human expertise. The journey has just begun, and the potential for revolutionizing workplace dynamics through intelligent technologies appears boundless. As organizations increasingly recognize AI's potential, the future of HR lies in creating synergistic relationships between technological innovation and human expertise. The bibliometric analysis conducted in this study provides comprehensive insights into the evolving landscape of artificial intelligence applications in talent acquisition and recruitment. Through multiple analytical approaches, the researcher has identified key patterns in research collaboration, citation networks, and thematic focus within this specialized field. The study analyses the collection of academic publication sourced from Scopus database and has recognized the most prominent authors, journals, collaborative networks and the country which contribute more towards the field of artificial intelligence with human resource management. This bibliometric analysis provides enlightening perspectives of AI in talent acquisition and recruitment and can explore in future research area.

ऑनलाइन शिक्षा में संभावनाएं एवं चुनौतियाँ

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21वीं सदी के डिजिटल युग में शिक्षा प्रणाली में क्रांतिकारी परिवर्तन देखने को मिला है। विशेष रूप से कोविड-19 महामारी के दौरान ऑनलाइन शिक्षा का महत्व और उपयोग तेजी से बढ़ा। यह न केवल एक वैकल्पिक माध्यम के रूप में उभरी, बल्कि शिक्षा के democratization (जनसुलभता) की दिशा में एक बड़ा कदम साबित हुई। इंटरनेट, स्मार्टफोन, और डिजिटल प्लेटफॉर्म की बढ़ती पहुँच ने शिक्षा को घर-घर तक पहुँचाने में सहायता की है। आज Zoom, Google Meet, Microsoft Teams, SWAYAM, Diksha, Coursera, और Khan Academy जैसे प्लेटफॉर्म छात्रों और

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शिक्षकों को वैश्विक स्तर पर जोड़ रहे हैं। ऑनलाइन शिक्षा की सबसे बड़ी संभावना इसकी लचीलापन (flexibility) है, जहाँ विद्यार्थी अपनी सुविधा के अनुसार समय और स्थान चुन सकता है। इसके माध्यम से दूर-दराज के क्षेत्रों तक गुणवत्तापूर्ण शिक्षा पहुँचना संभव हुआ है। साथ ही यह शिक्षा को लागत में सस्ती, अधिक व्यक्तिगत (personalized) तथा प्रौद्योगिकी-सक्षम बनाता है। वर्चुअल क्लासरूम, रिकॉर्डेड लेक्चर, ई-लर्निंग मॉड्यूल्स, आर्टिफिशियल इंटेलिजेंस आधारित लर्निंग ट्रेकिंग आदि आधुनिक तकनीकों ने शिक्षा के स्वरूप को ही बदल डाला है। किन्तु, ऑनलाइन शिक्षा के साथ अनेक चुनौतियाँ भी जुड़ी हैं। सबसे पहले, डिजिटल डिवाइड (Digital Divide) के कारण गरीब और ग्रामीण छात्रों को इसका पूर्ण लाभ नहीं मिल पाता। इंटरनेट की धीमी गति, स्मार्ट डिवाइस की अनुपलब्धता, और तकनीकी ज्ञान की कमी बड़ी बाधाएँ हैं। साथ ही, छात्रों में एकाग्रता की कमी, सामाजिक सहभागिता का अभाव, शिक्षकों की प्रशिक्षण में कमी, और मूल्यांकन की विश्वसनीयता जैसे मुद्दे ऑनलाइन शिक्षा की प्रभावशीलता को प्रभावित करते हैं। मानसिक स्वास्थ्य, स्क्रीन टाइम की अधिकता और आत्म-अनुशासन की कमी भी छात्रों के लिए चिंता के विषय हैं। अतः केवल तकनीकी पहुँच ही नहीं, बल्कि एक समग्र रणनीति की आवश्यकता है जो विद्यार्थियों को डिजिटल रूप से सशक्त, शिक्षक को प्रशिक्षित, और पाठ्यक्रम को उपयुक्त बनाए। इस शोधपत्र में ऑनलाइन शिक्षा की संभावनाओं और उससे जुड़ी व्यावहारिक एवं सामाजिक चुनौतियों का विश्लेषण किया गया है। साथ ही यह सुझाव भी प्रस्तुत किया गया है कि कैसे एक समावेशी, सुलभ, और गुणवत्तापूर्ण डिजिटल शिक्षा तंत्र तैयार किया जा सकता है।

राज्य बजट के आय-व्यय अनुमानों का विश्लेषणात्मक अध्ययन: राजस्थान राज्य के संदर्भ में

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“बजट” शब्द की उत्पत्ति फ्रेंच भाषा के लैटिन शब्द बुल्गा से हुई जिसका अर्थ है “चमड़े का थैला”। बजट से आशय निर्धारित अवधि के लिए प्राप्तियों एवं व्ययों का अनुमान लगाकर वित्तीय संसाधनों की व्यवस्था करने एवं उनके आवंटन की कार्ययोजना से है। भारतीय संविधान के अनुच्छेद 202 में कहा गया है कि राज्य सरकार प्रत्येक वित्तीय वर्ष के सम्बन्ध में राज्य विधानमंडल के समक्ष एक वार्षिक वित्तीय विवरण रखेगी जिसमें उस वर्ष के लिए राज्य की अनुमानित प्राप्तियाँ और व्यय शामिल किये जायें। इसे ही आमतौर पर राज्य बजट के रूप में जाना जाता है। बजट एक वित्तीय वर्ष से सम्बंधित होता है, जिसकी अवधि 1 अप्रैल से 31 मार्च होती है। बजट में आगामी वर्ष के लिए आय-व्यय अनुमानों तथा चालू वर्ष के लिए संशोधित आय-व्यय अनुमानों को दर्शाया जाता है। वित्तीय वर्ष की समाप्ति के बाद सरकार को वर्ष के दौरान होने वाली वास्तविक प्राप्तियाँ एवं व्ययों के आधार पर सरकार के लेखे तैयार किये जाते हैं। प्रस्तुत शोध पत्र “राज्य बजट के आय-व्यय अनुमानों का विश्लेषणात्मक अध्ययन राजस्थान राज्य के संदर्भ में” में राज्य के बजट में प्रस्तुत प्राप्तियों एवं

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व्ययों के बजट अनुमानों तथा इनके विभिन्न घटकों का वर्ष 2013-14 से 2023-24 (ग्यारह वर्ष) के मध्य विश्लेषणात्मक एवं तुलनात्मक अध्ययन किया गया है। यह शोध इस विषय पर उपलब्ध शोध अध्ययनों की समीक्षा करके किया गया है। लेखक को आशा है की पेपर के निष्कर्ष भारत में राज्य सरकारों के लिये के लिए बजट निर्माण के दौरान बजट अनुमानों का निर्धारण करने एवं बजट प्रबंधन हेतु महत्वपूर्ण सहयोगी साबित होंगे ।

LEADERSHIP AND MANAGEMENT

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यह शोधपत्र मुख्य रूप से "प्रबंधन" (Management) और "नेतृत्व (leadership)" की अवधारणाओं पर केंद्रित है। इसमें बताया गया है कि कैसे किसी भी संगठन, संस्था या विभाग को सुचारु रूप से चलाने के लिए प्रबंधन एवं नेतृत्व दोनों आवश्यक होते हैं। प्रबंधन को एक लक्ष्य-उन्मुख, सतत, बहु-स्तरीय एवं सामाजिक प्रक्रिया के रूप में प्रस्तुत किया गया है, जो संसाधनों की प्रभावी योजना, संगठन, निर्देशन एवं नियंत्रण से संबंधित है। यह संसाधनों का विवेकपूर्ण उपयोग कर लक्ष्यों की प्राप्ति सुनिश्चित करता है। प्रबंधन के विभिन्न प्रकार जैसे मानव संसाधन, वित्तीय उत्पादन, विपणन, आईटी, शैक्षिक प्रबंधन आदि का विस्तार से वर्णन किया गया है। दूसरी ओर, नेतृत्व एक ऐसी प्रक्रिया है, जिसके माध्यम से एक व्यक्ति अपने दृष्टिकोण, संवाद कौशल, निर्णय क्षमता और प्रेरणात्मक शक्ति से अन्य व्यक्तियों को संगठन के लक्ष्यों की ओर प्रेरित करता है। एक प्रभावी नेता के गुणों जैसे दृष्टिकोण, आत्मविश्वास, सामाजिक कौशल, नैतिकता, अनुकूलन क्षमता आदि को रेखांकित किया गया है। शोधपत्र में नेतृत्व की विभिन्न शैलियों जैसे अधिनायकवादी, लोकतांत्रिक, लासेज़-फेयर, रूपांतरकारी, व्यवहार आधारित आदि का विश्लेषण भी किया गया है। विशेष रूप से Blake और Mouton के डंडहमतपंस ळतपक का वर्णन कर यह स्पष्ट किया गया है कि प्रभावी नेतृत्व वह है जो कार्य निष्पादन और मानव संबंधों दोनों पर समान रूप से ध्यान देता है। अंततः यह निष्कर्ष निकाला गया है कि संगठनात्मक सफलता के लिए प्रबंधन और नेतृत्व दोनों का समन्वित उपयोग अत्यावश्यक है।

सोशल मीडिया का भविष्य

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21वीं शताब्दी में सोशल मीडिया मानव जीवन का एक अभिन्न अंग बन चुका है। यह न केवल संवाद का माध्यम है, बल्कि विचार, सूचना, समाचार, मनोरंजन, व्यवसाय, राजनीति, शिक्षा और सामाजिक चेतना को आकार देने वाला एक शक्तिशाली उपकरण भी बन गया है। फेसबुक, ट्विटर (अब

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एक्स), इंस्टाग्राम, व्हाट्सऐप, यूट्यूब, लिंकडइन आदि जैसे प्लेटफॉर्म ने वैश्विक समाज को एक डिजिटल मंच पर जोड़ने में महत्वपूर्ण भूमिका निभाई है। आज सोशल मीडिया का प्रभाव व्यक्तिगत से लेकर वैश्विक स्तर तक महसूस किया जा रहा है। भविष्य में सोशल मीडिया केवल एक संवाद माध्यम नहीं, बल्कि एक समग्र डिजिटल पारिस्थितिकी तंत्र के रूप में विकसित होने जा रहा है। कृत्रिम बुद्धिमत्ता (AI), मशीन लर्निंग, संवर्धित वास्तविकता (AR), वर्चुअल रियलिटी (VR) और मेटावर्स जैसे तकनीकी नवाचार सोशल मीडिया को एक नए स्वरूप में ढाल रहे हैं। अब उपयोगकर्ता केवल सामग्री को देख या साझा ही नहीं करेगा, बल्कि उसके साथ आभासी रूप से अनुभव करेगा। सोशल मीडिया का भविष्य व्यक्तिगत अनुभवों के अनुकूलन, डेटा-सुरक्षा की चुनौती, फेक न्यूज़ पर नियंत्रण, डिजिटल नागरिकता के अधिकार, और मानसिक स्वास्थ्य पर पड़ने वाले प्रभावों से गहराई से जुड़ा रहेगा। आने वाले समय में "सोशल मीडिया एथिक्स" और "डिजिटल वेलबीइंग" जैसे विषय केंद्र में होंगे। कंपनियाँ अब यूजर सेंट्रिक और ट्रांसपेरेंट एल्गोरिद्म विकसित कर रही हैं ताकि उपयोगकर्ता को विश्वसनीय और संतुलित सामग्री प्रदान की जा सके। साथ ही, सोशल मीडिया का उपयोग व्यापारिक अवसरों, व्यक्तिगत ब्रांडिंग, शिक्षा, ई-गवर्नेंस और जन-जागरूकता अभियानों में और अधिक व्यापक होगा। भारत जैसे विकासशील देशों में सोशल मीडिया ग्रामीण आवाजों को भी एक मंच प्रदान करेगा, जिससे डिजिटल लोकतंत्र को बल मिलेगा। हालांकि, गोपनीयता का उल्लंघन, निगरानी संस्कृति, राजनीतिक ध्रुवीकरण, ऑनलाइन शोषण और डिजिटल असमानता जैसी चुनौतियाँ भी बनी रहेंगी। अतः सोशल मीडिया के भविष्य को सुरक्षित, नैतिक और समावेशी बनाने हेतु वैश्विक सहयोग, कड़े साइबर कानून और डिजिटल साक्षरता को बढ़ावा देना आवश्यक होगा। अतः, सोशल मीडिया का भविष्य तकनीकी, सामाजिक, और नैतिक आयामों से परिपूर्ण होगा, जो मानव जीवन को और अधिक गहराई से प्रभावित करेगा।

पर्यटन के आर्थिक प्रभाव

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पर्यटन विभिन्न देशों के बीच और देश के भीतर आपसी समझ और तालमेल स्थापित करता है और भावनात्मक एकीकरण को बढ़ावा देता है। इक्कीसवीं शताब्दी से पर्यटन को आर्थिक विकास के महत्वपूर्ण उपकरण के रूप में पहचाना जाने लगा है। पर्यटन उद्योग प्रत्यक्ष और अप्रत्यक्ष रोजगार उत्पन्न करने की अद्भुत क्षमता है। पर्यटन सम्बन्धी क्रियाकलापों से परोक्ष रूप से दूर-दूर तक लोग जुड़े होते हैं और इसकी एक श्रृंखला सी बन जाती है। पर्यटन ने उन क्षेत्रों में रोजगार पैदा किए हैं जहाँ रोजगार के वैकल्पिक अवसर बहुत कम मौजूद हैं। पर्यटन का रोजगार और आय प्रभाव एक दूसरे से गहरे रूप में सम्बद्ध हैं और ये एक ही स्रोत अर्थात् पर्यटक व्यय पर आश्रित होते हैं। पर्यटन उद्योग अपने स्थानीय बाजार क्षेत्रों से जितनी ज्यादा सेवाएँ और वस्तुएँ खरीदेगा, आय पर उसका गुणित प्रभाव उतना ही अधिक होगा। सेवाओं और वस्तुओं के आयात की प्रवृत्ति जितनी ज्यादा कम होगी, आय पर गुणित प्रभाव उतना ही घटेगा। विभिन्न प्रकार के करों से भी आमदनी होती है। भारत की विदेशी मुद्रा अर्जन

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सम्बन्धी आर्थिक गतिविधि में पर्यटन की प्रमुख भूमिका रही है। भारत सरकार का पर्यटन विभाग प्रतिवर्ष आने वाले पर्यटकों की संख्या और प्रति विदेशी पर्यटक व्यय को गुणा करके प्रतिवर्ष त्वरित आकलन प्रस्तुत करता है। विदेशी मुद्रा अर्जन की गणना करते समय पर्यटन विकास के लिए किए जाने वाले आयात को भी शामिल किया जाना चाहिए। विदेशी पर्यटन से अन्तर्राष्ट्रीय व्यापार को बढ़ावा मिलता है। विदेशी पर्यटक अपने-अपने देशों में वस्तुओं के प्रचार के माध्यम भी बनते हैं, वस्तुओं की मांग बढ़ती है और निर्यात में वृद्धि होती है पर्यटन का सामाजिक, पर्यावरण और राजनैतिक प्रभाव भी देखने को मिलता है।

लिंग एवं शिक्षा

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शिक्षा प्रत्येक व्यक्ति का मूल अधिकार है और यह सामाजिक, आर्थिक तथा सांस्कृतिक विकास का महत्वपूर्ण आधार है। किंतु जब हम शिक्षा को लिंग (लमदकमत) के परिप्रेक्ष्य में देखते हैं, तो अनेक प्रकार की असमानताएँ उभरकर सामने आती हैं। लिंग आधारित भेदभाव न केवल लड़कियों और महिलाओं को शिक्षा से वंचित करता है, बल्कि समाज की समग्र प्रगति को भी बाधित करता है। भारतीय समाज में पारंपरिक लिंग भूमिकाओं, सामाजिक अपेक्षाओं, आर्थिक सीमाओं तथा रूढ़िवादी मानसिकता के कारण विशेष रूप से ग्रामीण और पिछड़े क्षेत्रों में बालिकाओं की शिक्षा को अक्सर द्वितीय दर्जा प्राप्त होता है। बाल विवाह, घरेलू कार्यभार, सुरक्षा की चिंता, संसाधनों की कमी और सामाजिक दबाव जैसे अनेक कारण उनके शिक्षा प्राप्ति के मार्ग में बाधक बनते हैं। वहीं दूसरी ओर, शहरी क्षेत्रों में भी कभी-कभी उच्च शिक्षा या व्यावसायिक पाठ्यक्रमों में लड़कियों की भागीदारी सीमित देखने को मिलती है। हालाँकि पिछले कुछ दशकों में सरकार द्वारा 'बेटी बचाओ, बेटी पढ़ाओ', सर्व शिक्षा अभियान, कन्या शिक्षा प्रोत्साहन योजनाओं जैसे अनेक कार्यक्रम आरंभ किए गए हैं, जिनसे बालिकाओं की स्कूलों में नामांकन दर में वृद्धि हुई है। साथ ही महिला शिक्षकों की संख्या बढ़ाना, विद्यालयों में सुरक्षित माहौल, शौचालय की सुविधा और छात्रवृत्तियाँ भी बालिकाओं की शिक्षा को बढ़ावा देने में सहायक रही हैं। शिक्षा में लैंगिक समानता केवल नामांकन तक सीमित नहीं होनी चाहिए, बल्कि पाठ्यक्रम की संरचना, शिक्षण शैली, स्कूल संस्कृति और करियर के विकल्पों तक उसका प्रभाव होना चाहिए। लिंग संवेदनशील शिक्षा प्रणाली का विकास इस दिशा में आवश्यक है जिससे लड़के और लड़कियाँ समान रूप से अवसर प्राप्त कर सकें और पारंपरिक लिंग भूमिकाओं को चुनौती दे सकें। इस शोधपत्र में लिंग एवं शिक्षा के मध्य संबंधों का विश्लेषण किया गया है, जिसमें वर्तमान परिदृश्य, प्रमुख बाधाएँ, सरकारी प्रयास, सामाजिक पहल तथा भावी दिशा पर विचार किया गया है। यह अध्ययन इस बात पर बल देता है कि शिक्षा को यदि वास्तव में समावेशी बनाना है, तो उसमें लैंगिक दृष्टिकोण को एक केंद्रीय स्थान देना होगा।

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कश्मीर की सांस्कृतिक अस्मिता और हिंदी उपन्यास

अरिदमन सिंह

शोधार्थी, ज्योति विद्यापीठ महिला विश्वविद्यालय, जयपुर

कश्मीर भारत का एक ऐतिहासिक, सांस्कृतिक और सौंदर्यपूर्ण दृष्टि से समृद्ध क्षेत्र है, जिसकी अस्मिता केवल भौगोलिक सीमाओं तक सीमित नहीं, बल्कि इसकी बहुलतावादी सांस्कृतिक विरासत, भाषिक विविधता, धार्मिक सहिष्णुता और कलात्मक परंपराओं में निहित है। किंतु पिछले कुछ दशकों में राजनीतिक अस्थिरता, आतंकवाद, और सांप्रदायिक विभाजन ने इस सांस्कृतिक अस्मिता को गहरी चोट पहुँचाई है। हिंदी उपन्यासकारों ने कश्मीर की इसी सांस्कृतिक विडंबना को अपनी रचनाओं में संवेदनशीलता के साथ चित्रित किया है। हिंदी उपन्यासों में कश्मीर केवल एक 'स्थान' नहीं बल्कि एक 'चेतना' के रूप में उपस्थित होता है। उपन्यासकार कश्मीर की प्राकृतिक सुंदरता, कश्मीरी लोक संस्कृति, संगीत, काव्य और सूफी परंपरा को चित्रित करते हुए यह भी दर्शाते हैं कि कैसे राजनीति और हिंसा ने इस सौंदर्य को छिन्न-भिन्न किया है। 'हम देखेंगे', 'हर हर गंगे', 'लाल चौक', आदि उपन्यासों में कश्मीरी अस्मिता को बचाए रखने की जद्दोजहद दिखाई देती है। इन रचनाओं में कश्मीरी जनमानस की पीड़ा, विस्थापन, असुरक्षा और पहचान के संकट को अत्यंत मानवीय दृष्टिकोण से प्रस्तुत किया गया है। हिंदी उपन्यासकार न केवल अतीत की गौरवशाली सांस्कृतिक धरोहर को रेखांकित करते हैं, बल्कि वर्तमान संकट की जड़ें भी टटोलते हैं। अतः हिंदी उपन्यास साहित्य कश्मीर की सांस्कृतिक अस्मिता को समझने, संजोने और संवाद के माध्यम से उसका मानवीय रूप पुनर्स्थापित करने का प्रयास करता है।

भारत में नकदी रहित अर्थव्यवस्था: वर्तमान परिदृश्य

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भारत में नकदी रहित अर्थव्यवस्था की अवधारणा पिछले एक दशक में विशेष रूप से विमुद्रीकरण (नवम्बर 2016) के बाद तीव्र गति से विकसित हुई है। डिजिटल इंडिया, जन-धन योजना, आधार, और मोबाइल तकनीक की व्यापक पहुंच ने इस परिवर्तन को बल दिया है। नकदी रहित अर्थव्यवस्था का तात्पर्य एक ऐसी प्रणाली से है जहाँ आर्थिक लेन-देन इलेक्ट्रॉनिक माध्यमों जैसे डेबिट/क्रेडिट कार्ड, यूपीआई, मोबाइल वॉलेट, नेट बैंकिंग आदि के द्वारा होता है। इससे न केवल लेन-देन में पारदर्शिता आती है, बल्कि कर अपवंचन में भी कमी आती है। कोविड-19 महामारी के दौरान डिजिटल भुगतान में अत्यधिक वृद्धि देखी गई, जिससे यह स्पष्ट हो गया कि नकदी रहित अर्थव्यवस्था न केवल सुविधा का माध्यम है, बल्कि आपदा काल में भी इसकी उपयोगिता सिद्ध होती है। सरकार द्वारा चलाए गए विभिन्न अभियानों जैसे "डिजिटल भारत", "भीम ऐप", "UPI 2.0" आदि ने ग्रामीण और शहरी दोनों क्षेत्रों में डिजिटल लेन-देन को बढ़ावा दिया है। हालांकि, इस दिशा में कई

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चुनौतियाँ भी हैं, जैसे डिजिटल साक्षरता की कमी, साइबर सुरक्षा के खतरे, ग्रामीण क्षेत्रों में इंटरनेट की सीमित पहुंच तथा तकनीकी संसाधनों का अभाव। फिर भी, देश की युवा आबादी, तेज़ी से बढ़ती मोबाइल उपयोगिता और सरकारी नीतियों के सहयोग से भारत नकदी रहित अर्थव्यवस्था की ओर तेज़ी से अग्रसर है। इस शोध पत्र में भारत में नकदी रहित अर्थव्यवस्था के वर्तमान परिदृश्य, इसकी संभावनाओं, उपलब्धियों एवं प्रमुख चुनौतियों का विश्लेषण किया गया है। साथ ही यह भी बताया गया है कि कैसे तकनीकी नवाचार और वित्तीय समावेशन मिलकर इस लक्ष्य को साकार कर सकते हैं।

कर्मचारी-उत्पादकता व गतिशीलता के संबंध में मानव संसाधन प्रबंधन की भूमिका का अध्ययन

साक्षी शर्मा

शोधार्थी (वाणिज्य), लोकमान्य तिलकविज्ञान एवंवाणिज्य महाविद्यालय, उज्जैन (म.प्र.), भारत

कर्मचारी व्यवसाय का अभिन्न अंग है। व्यवसाय की सफलता व असफलता कर्मचारी की कार्य क्षमता व कार्य कुशलता पर निर्भर करती है। एक कुशल कर्मचारी अपने सभी कार्य व्यवस्थित ढंग से करता है। कर्मचारी की कार्य कुशलता ही उसकी उत्पादकता को बढ़ाती है। अतः यह कहने में कोई अतिशयोक्ति नहीं होगी, कि कार्य कुशल कर्मचारी ही व्यवसाय के मुख्य उत्पादनकर्ता होते हैं। यह भाोध पत्र कर्मचारी उत्पादकता व कर्मचारी गतिशीलता का विस्तृत वर्णन करता है। अध्ययन के दौरान पाया गया, कि कर्मचारी की उत्पादन क्षमता कार्य-वातावरण से अधिक प्रभावित होती है। अतः प्रबंधन का कर्तव्य है, कि वह समय – समय पर अपने कर्मचारियों की कार्य संतुष्टि का अध्ययन करते रहे।

समकालीन जनवादी कविता में स्त्री की सामाजिक स्थिति का यथार्थ चित्रण

नरेंद्र कुमार

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समकालीन जनवादी कविता भारतीय समाज में स्त्री की सामाजिक, आर्थिक और सांस्कृतिक स्थिति का एक यथार्थपरक चित्र प्रस्तुत करती है। यह कविता न केवल स्त्री की पीड़ा, शोषण और पितृसत्तात्मक ढांचे की क्रूरता को उजागर करती है, बल्कि उसके प्रतिरोध, संघर्ष और जागरूकता को भी स्वर देती है। समकालीन जनवादी कवियों ने स्त्री को केवल करुणा की प्रतीक नहीं, बल्कि एक विचारशील, सजग और सक्रिय सामाजिक इकाई के रूप में प्रस्तुत किया है। इस काव्यधारा में स्त्री एक ओर घरेलू हिंसा, यौन शोषण, आर्थिक पराधीनता और सांस्कृतिक बंधनों से जूझती है, तो दूसरी ओर वह अन्याय और अन्यायपूर्ण व्यवस्था के खिलाफ आवाज़ भी उठाती है। अनामिका, कात्यायनी, ऋतुराज, मंगलेश डबराल, अरुण कमल जैसे कवियों की रचनाओं में स्त्री जीवन के विविध पक्ष – मजदूरी, मातृत्व, प्रेम, यौनिकता, आत्मसम्मान और सामाजिक असमानता – को गहनता से उकेरा गया है। जनवादी कविता यह स्वीकार करती है कि जब तक स्त्री को सामाजिक समानता, आत्मनिर्णय और गरिमा नहीं मिलेगी, तब तक कोई भी जनवादी या क्रांतिकारी आंदोलन अधूरा रहेगा

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ओमप्रकाश वाल्मीकि के काव्य में दलित चेतना— 'सदियों के संताप' के विशेष सन्दर्भ में

सोहन लाल रांगेरा

शोधार्थी, ज्योति विद्यापीठ महिला विश्वविद्यालय जयपुर।

डॉ. आनन्द राय

शोध निर्देशक, ज्योति विद्यापीठ महिला विश्वविद्यालय जयपुर।

यह शोध-पत्र हिंदी दलित साहित्य के प्रमुख हस्ताक्षर ओमप्रकाश वाल्मीकि की काव्य चेतना का विश्लेषण करता है, विशेषकर 'सदियों के संताप' के संदर्भ में। वाल्मीकि की कविताएं केवल भावनात्मक प्रतिक्रियाएं नहीं, बल्कि जातिवादी सामाजिक ढांचे के विरुद्ध एक संगठित विद्रोह हैं। इस अध्ययन का मुख्य उद्देश्य उनकी कविता में निहित दलित चेतना, ऐतिहासिक उत्पीड़न, आत्मसम्मान की आकांक्षा, और सांस्कृतिक पुनर्निर्माण के बिंदुओं को उद्घाटित करना है। शोध में यह पाया गया कि ओमप्रकाश वाल्मीकि की कविताएं समाज में व्याप्त वर्ण-आधारित विषमता को चुनौती देती हैं। उनकी भाषा में विद्रोह है, उनकी शैली में अनुभव की प्रमाणिकता है, और उनके कथ्य में सामाजिक न्याय की पुकार है। 'सदियों के संताप' उनके काव्य का एक केंद्रीय प्रतीक है, जो दलित समाज की पीढ़ियों से चली आ रही मानसिक, सामाजिक और सांस्कृतिक पीड़ा को स्वर देता है। उनकी रचनाओं में प्रयुक्त प्रतीकात्मकता, मिथकों की पुनर्व्याख्या और यथार्थ की धारदार प्रस्तुति, उन्हें समकालीन हिंदी काव्य के विशिष्ट कवि के रूप में स्थापित करती है। इस शोध के माध्यम से यह स्पष्ट होता है कि ओमप्रकाश वाल्मीकि का काव्य साहित्य न केवल दलित अनुभवों का प्रतिबिंब है, बल्कि वह सामाजिक परिवर्तन की एक सशक्त प्रेरणा भी है।

खेतड़ी की परंपराएं और सतत सांस्कृतिक विकास

विरेंद्र कुमार चान्देला

शोधार्थी, ज्योति विद्यापीठ महिला विश्वविद्यालय, जयपुर

राजस्थान के शेखावाटी अंचल में स्थित खेतड़ी, ऐतिहासिक एवं सांस्कृतिक दृष्टि से एक समृद्ध और बहुआयामी परंपरा का केंद्र रहा है। यह केवल भव्य किलों, राजप्रासादों और वीरता की गाथाओं का प्रतीक नहीं है, बल्कि जीवंत लोक संस्कृति, सामाजिक रीति-नीतियों और समावेशी परंपराओं का भी संवाहक है। खेतड़ी की संस्कृति की आत्मा उसकी परंपराओं और रीति-रिवाजों में बसती है, जो पीढ़ियों से निरंतर प्रवाहित हो रही है। यह शोध विषय खेतड़ी की उन परंपराओं की पड़ताल करता है जो न केवल सांस्कृतिक धरोहर के रूप में महत्वपूर्ण हैं, बल्कि सतत सांस्कृतिक विकास के दृष्टिकोण से भी अत्यंत प्रासंगिक हैं। इन परंपराओं में लोक पर्व, धार्मिक आयोजन, स्त्रियों की सहभागिता, लोक कलाएं, सामूहिक उत्सव, और सामाजिक मान्यताएं शामिल हैं, जो खेतड़ी को एक जीवंत सांस्कृतिक समाज के रूप में स्थापित करती हैं। खेतड़ी में मनाए जाने वाले त्योहार जैसे गणगौर, हरियाली तीज, जलझूलनी एकादशी और देवी जागरण केवल धार्मिक आयोजन नहीं, बल्कि सामाजिक एकजुटता, स्त्री सशक्तिकरण, और सांस्कृतिक संरक्षण के साधन भी हैं। इन उत्सवों में महिलाएं न केवल सहभागी होती हैं, बल्कि

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नेतृत्व करती हैं, सांस्कृतिक मूल्यों को आगे बढ़ाती हैं, और नई पीढ़ी को परंपराओं से जोड़ती हैं। इसके साथ ही खेतड़ी की लोककलाएं, जैसे मांडना, मेंहदी, पारंपरिक गीत-संगीत, वाद्ययंत्रों का प्रयोग, और पोशाक परंपराएं समाज में रचनात्मकता, सौंदर्यबोध और पर्यावरणीय समरसता का संदेश देती हैं। इन कलाओं में प्राकृतिक रंगों, स्थानीय संसाधनों और मौखिक परंपरा का प्रयोग करके टिकाऊ सांस्कृतिक संरचना को बढ़ावा दिया जाता है। यह शोध यह स्थापित करता है कि यदि इन परंपराओं को संरक्षण और नवाचार के साथ जोड़ा जाए, तो वे न केवल सांस्कृतिक पहचान को बचाए रख सकती हैं, बल्कि समाज को हरित, समावेशी और आत्मिक रूप से सशक्त भी बना सकती हैं।

संपोषणीयता: संरक्षण एवं पुनर्स्थापना

मिनाक्षी जांदू

सहायक आचार्या, मेहता टीचर ट्रेनिंग कॉलेज, जयपुर, राजस्थान

संपोषणीयता का सामान्य अर्थ वर्तमान आवश्यकताओं को पूरा करने के लिए संसाधनों के प्रभावी प्रबंधन से है। संपोषणीयता शब्द लैटिन भाषा के सस्नेयर शब्द से लिया गया है जिसका शाब्दिक अर्थ है. बनाए रखना। सतत विकास का मुख्य उद्देश्य मानवी विकास के लक्ष्यों को पूरा करना है जिसमें अर्थव्यवस्था, प्राकृतिक संसाधन, मानवीय संसाधन, पारिस्थितिकी तंत्र, आर्थिक, सामाजिक, पर्यावरणीय विकास सभी पर ध्यान केंद्रित किया जाता है। इस लेख में हम संपोषणीयता के संरक्षण एवं पुनर्स्थापन के विषय में विस्तार पूर्वक चर्चा कर रहे हैं। संरक्षण प्राकृतिक संसाधनों की सुरक्षा और बुद्धिमानी से उसका उपयोग करना है ताकि आने वाली पीढ़ियों के लिए उसे संरक्षित किया जा सके तथा साथ-साथ ही इसके पुनः स्थापना के विषय में भी चिंतन करने की आवश्यकता है। संरक्षण एक जटिल मुद्दा है इसमें प्राकृतिक व मानवीय प्रणालियों के मध्य सम्बंध को चिंतन पूर्वक समझना शामिल है। संपोषणीयता के संरक्षण एवं पुनर्स्थापना में पारिस्थितिकी तंत्र आधारित प्रबंधन व संपोषणीय आजीविका पारिस्थितिकी तंत्र आदि घटकों के मध्य अंतःक्रियाओं को सम्मिलित किया जाता है। पुनर्स्थापना में क्षतिग्रस्त पारिस्थितिकी तंत्र को पुनः उचित एवं स्वस्थ स्थिति में वापस लाना होता है। इसका प्रमुख लक्ष्य स्थिति की क्रियाओं को एवं जैव विविधता तथा प्राकृतिक वातावरण को पुनः स्थिति में प्राप्त करना होता है। जलवायु पुनर्स्थापना से अभिप्राय उन तकनीकियों से है जिनका उद्देश्य वायुमंडल से अतिरिक्त कार्बन डाइऑक्साइड व ग्रीनहाउस गैसों को हटाना तथा पृथ्वी की जलवायु को स्वस्थ व स्थिर स्थिति में लाना है। जलवायु पुनर्स्थापना में कार्बन डाइऑक्साइड, ओजोन गैस का पुनःस्थापन, मिथेन गैस का पुनर्स्थापना आदि को लिया जाता है।

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संस्थाओं का हरित लेखापरीक्षण

डॉ. ज्योति विजय

सहायक आचार्या, मेहता टीचर ट्रेनिंग कॉलेज, जयपुर, राजस्थान

जिस वातावरण में हम रहते हैं वह अत्यंत चिंता का विषय है क्योंकि यह सीधे तौर पर हमारे अस्तित्व से जुड़ा हुआ है। इसे स्वस्थ रखना प्रत्येक व्यक्ति की जिम्मेदारी है। रियो 1992 के पृथ्वी शिखर सम्मेलन के बाद पर्यावरण लेखा परीक्षा की अवधारणा को कई देशों ने स्वीकार किया था। भारतीय परिदृश्य में, बहुत कम उद्योग इससे प्रेरित हुए। वर्तमान अध्ययन में इसके कारण सूचीबद्ध किए गए हैं। वर्तमान अध्ययन भारत के शैक्षणिक संस्थानों में पर्यावरण लेखा परीक्षा की प्रक्रिया पर केंद्रित है। अध्ययन में पर्यावरण प्रबंधन के एक भाग के रूप में जारी रखने योग्य कुछ प्रथाओं का भी उल्लेख किया गया है। कुछ प्रथाएँ जैसे नवीकरणीय ऊर्जा, खाद बनाना, सीएफएल का उपयोग क्रमशः 60 प्रतिशत, 50 प्रतिशत और 30 प्रतिशत संस्थानों द्वारा किया जाता है। सीवेज उपचार संयंत्रों को केवल 20 प्रतिशत संस्थानों द्वारा चुना जाता है। यह पाया गया है कि शैक्षणिक संस्थानों द्वारा अपनाई गई पर्यावरणीय प्रथाओं के बारे में बहुत कम डेटा उपलब्ध है। इस तरह के डेटा संस्थानों द्वारा एक स्थायी पर्यावरण के लिए अपनाई जाने वाली सरल नीतियों को तय करने में मदद कर सकते हैं।

भारत में बाल श्रम, एक संक्षिप्त परिचय

श्री सत्यनारायण खींची

सहआचार्य (ई.ए.एफ.एम.), राजकीय कन्या महाविद्यालय, टोंक

किसी भी देश में सबसे सुरक्षित वातावरण के हकदार उस देश के बच्चे होते हैं। बच्चों को एक ऐसे वातावरण या परिवेश में बड़े होने का अधिकार या जरूरत है जिसमें वे एक स्वतंत्र गरिमामय पूर्ण जीवन जीने योग्य बन सकें। बच्चों के शिक्षा व प्रशिक्षण के पर्याप्त अवसर मिलने चाहिए ताकि वे अपने और देश के विकास के भागीदार बन सकें, शिक्षा के माध्यम से ही बच्चे जिम्मेदार व जवाबदेह नागरिक बन सकते हैं। बाल श्रम निषेध और विनियमन 1986 के अनुसार भारत में 14 वर्ष से कम आयु के बच्चों को किसी भी कार्य अथवा प्रक्रिया में काम करने के लिए बाध्य करना बाल श्रम है। प्ले की रिपोर्ट के अनुसार 2011 की जनगणना के आधार पर वर्तमान समय में भारत के 01 करोड़ से अधिक बच्चे जिनकी आयु 05 से 14 वर्ष के मध्य है, किसी न किसी बाल श्रम के दुष्कर्म पीड़ित हैं। जिसमें से 80 लाख से अधिक बच्चे ग्रामीण क्षेत्र और 20 लाख से अधिक बच्चे शहरी क्षेत्रों में कार्यरत हैं। कार्यक्षेत्र के अनुसार सबसे अधिक बच्चे कृषि/खेती के कार्य करते हैं। बाल श्रम की सर्वाधिक संख्या उत्तर प्रदेश में है जो देश की बाल श्रम संख्या का 21 लाख से अधिक (21.5%) है। इसके पश्चात् बिहार (10 लाख), राजस्थान (08 लाख) तथा महाराष्ट्र (07 लाख) में है।

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जयपुर स्मार्ट सिटी के सामाजिक एवं आर्थिक विकास के नवाचार का शोधपरक अध्ययन

पंकज कुमार डीगवाल

शोधार्थी, भूगोल विभाग, गोविंद गुरु जनजातीय विश्वविद्यालय, बांसवाड़ा (राज.)

डॉ. पी.एल. कटारा

प्रोफेसर, भूगोल विभाग, वीरबाला कालीबाई राजकीय कन्या महाविद्यालय, डूंगरपुर (राज.)

जयपुर स्मार्ट सिटी जिसे “गुलाबी शहर” के रूप में भी जाना जाता है, सामाजिक-आर्थिक विकास के मामले में एक महत्वपूर्ण केंद्र है। यह शहर न केवल राजस्थान की राजधानी है, बल्कि एक प्रमुख पर्यटन स्थल, औद्योगिक केंद्र और शिक्षा केंद्र भी है। जयपुर स्मार्ट सिटी अपनी समृद्ध सांस्कृतिक विरासत, ऐतिहासिक स्मारकों और पारंपरिक कलाओं के लिए जाना जाता है। पर्यटन उद्योग, शहर के सामाजिक ताने-बाने को बढ़ावा देने में महत्वपूर्ण भूमिका निभाता है। स्मार्ट सिटी जयपुर में कई विश्वविद्यालय और शैक्षणिक संस्थान हैं, जो शिक्षा के क्षेत्र में महत्वपूर्ण योगदान दे रहे हैं। जयपुर स्मार्ट सिटी में बेहतर स्वास्थ्य सेवाएं उपलब्ध हैं, जो शहर के सामाजिक विकास में योगदान करती हैं। जयपुर स्मार्ट सिटी एक महत्वपूर्ण औद्योगिक केंद्र है, जिसमें रत्न और आभूषण, हस्तशिल्प, सूचना प्रौद्योगिकी और वस्त्र जैसे क्षेत्र शामिल हैं। पर्यटन, शहर की अर्थव्यवस्था का एक प्रमुख चालक है, जो रोजगार और राजस्व उत्पन्न करता है। जयपुर स्मार्ट सिटी हस्तशिल्प उद्योग के लिए प्रसिद्ध है, जिसमें मीनाकारी, आभूषण और चमड़े का काम शामिल है। जयपुर स्मार्ट सिटी में रियल एस्टेट क्षेत्र भी तेजी से बढ़ रहा है। राजस्थान सरकार, जयपुर स्मार्ट सिटी में विशेष आर्थिक क्षेत्रों के विकास को बढ़ावा दे रही है, जो विभिन्न उद्योगों को आकर्षित करता है। जयपुर स्मार्ट सिटी एक जीवंत और गतिशील शहर है, जो सामाजिक और आर्थिक विकास के मामले में लगातार आगे बढ़ रहा है। यह शहर अपनी समृद्ध सांस्कृतिक विरासत, पर्यटन, औद्योगिक गतिविधियों और शिक्षा के क्षेत्र में महत्वपूर्ण भूमिका निभाता है।

EFFECT OF A PSYCHOLOGICAL SKILLS TRAINING (PST) PROGRAM ON HANDLING PRESSURE AMONG COMPETITIVE TABLE TENNIS PLAYERS

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This study evaluated the effectiveness of a Psychological Skills Training (PST) program in enhancing the ability to handle competitive pressure among forty male table tennis players aged 17 to 25. Participants were randomly assigned to an experimental group (n=20) receiving an 8-week PST intervention and a control group

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(n=20) with no intervention. Post-test results showed a significant improvement in pressure-handling scores in the experimental group (M=28.6, SD=4.2) compared to the control group (M=21.9, SD=3.8), with $t(38) = 5.19$, $p < 0.01$. Findings suggest PST is effective for improving psychological resilience under pressure in competitive settings.

AN ANALYSIS OF COMPETITIVE PRESSURES FACED BY FAMILY-OWNED GARMENT STORES IN THE ERA OF LARGE-SCALE RETAIL IN MUMBAI

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The Indian retail sector has undergone a significant transformation in the past two decades driven by the emergence and rapid expansion of large-scale retail chains. This study explores the competitive pressures experienced by family-owned garment retail outlets in Mumbai due to the proliferation of organized retail. The research aims to analyse the impact of modern retail formats on the market share, pricing strategies, customer footfall and overall sustainability of traditional garment retailers. Using a mixed-method approach involving surveys of small store owners and interviews with industry experts the study identifies key challenges such as price competition, changing consumer preferences, limited technological adoption and supply chain inefficiencies. Despite these challenges the research paper also highlights strategies employed by small retailers to remain resilient, including personalization, community engagement and niche product offerings. The findings suggest that while organized retail presents serious threats there exist opportunities for co-existence if traditional retailers adapt strategically. This paper offers policy recommendations and strategic insights for family-run businesses to strengthen their competitive position in Mumbai's evolving retail landscape.

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POSTCOLONIAL PERSPECTIVES ON MOTHERHOOD IN INDIAN ENGLISH LITERATURE

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This paper examines the evolving portrayals of motherhood in Indian English literature through a postcolonial lens, investigating how colonial histories and nationalist struggles have influenced the construction and representation of maternal figures. Drawing on key literary texts, the study explores the intersection of motherhood with themes of nation-building, cultural preservation, and resistance to both colonial domination and indigenous patriarchy. By situating the mother figure within the socio-political matrix of postcolonial India, the research reveals how motherhood often transcends its biological and domestic associations to become a powerful symbol of identity, resilience, and ideological contestation. The thesis further analyzes how writers use maternal characters to critique colonial legacies, negotiate cultural anxieties, and articulate aspirations for a decolonized nation. Through this exploration, the study aims to contribute to a nuanced understanding of how Indian English literature reimagines motherhood not merely as a private, nurturing role but as a site of political and cultural agency in postcolonial discourse.

NATIONAL EDUCATION POLICY (NEP 2020)

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India's education system has long been due for a comprehensive overhaul to meet the challenges of the 21st century. The National Education Policy 2020 (NEP 2020), approved by the Union Cabinet on 29th July 2020, is a visionary framework aimed at reshaping the education landscape of the country. It replaces the previous National Policy on Education, 1986 (modified in 1992), and brings with it a series of transformative reforms that seek to universalize education, encourage critical thinking, promote holistic learning, and align Indian education with global standards. NEP 2020 is the first education policy of the 21st century in India and comes after a gap of 34 years. It is not just a policy document—it is a roadmap for transforming India's knowledge economy through inclusive, innovative, and value-based education. The 1986 policy, while progressive for its time, was framed in a completely different socio-economic and technological context. In the last three decades, India has undergone massive changes in demographics, economic structure, and global integration. The explosion of digital technology, rise of the knowledge economy, new global job

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markets, and the need for creative, adaptive, and lifelong learners called for a radical shift in educational priorities. The older policy was heavily reliant on rote learning, offered limited flexibility in subject choices, and did not adequately focus on early childhood care or higher-order skills. The outdated 10+2 structure no longer reflected the cognitive development of learners or modern pedagogical practices. Thus, the need for a student-centric, inclusive, flexible, and forward-looking policy became evident, and NEP 2020 was envisioned to bridge this gap.

A COMPARATIVE ANALYSIS OF ANTHROPOMETRIC VARIABLES AND LONG JUMP PERFORMANCE USING LOGISTIC REGRESSION

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This study aims to compare anthropometric profiles between high-performing and low-performing long jump athletes and assess their predictive power using logistic regression. Forty male athletes (aged 16–19), including national and state-level finalists, were divided into high ($n=20$) and low ($n=20$) performer groups. Key variables included biiliocrystal diameter, knee diameter, suprailiac skinfold, thigh circumference, calf circumference, ankle girth, leg length, and foot length. Significant differences ($p < 0.05$) were observed in leg length and thigh circumference between groups. Logistic regression identified leg length ($\beta = 0.39$, $p = 0.03$) as the strongest predictor, with an overall model accuracy of 82.5%. These results highlight anthropometric distinctions between performance levels in long jump.

IN VIVO AND IN VITRO ANALYSIS OF ANTIMICROBIAL POTENCY OF LEEA MACROPHYLLA. BIOACTIVES

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The present work was designed to assess the antimicrobial potency of the ethanolic extracts of different parts of *Leea macrophylla*. (*Roxb.*) ex hornis a perennial shrub belongs to the Leeaceae family has been utilized in folklore traditional medicine. Phytochemicals such as alkaloids, steroids, glycosides, saponins, carbohydrates, proteins and tannins has significant therapeutic effect and preclinical studies have been conducted on the *Leea* genus to explicate pharmacological response which includes antimicrobial, anti-inflammatory, antiurolithiatic and cytotoxic, antidiarrhoeal,

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neuroprotective, hepatoprotective etc. The antimicrobial activity was determined by well diffusion method with various gram-positive, gram-negative microorganisms and pathogenic fungi strains. Medicinally important and bioactive rich medicinal plant *Leea macrophylla* for antimicrobial studies. The experiment was carried out in the medicinal plant leaves, roots, stem, seed and callus. The results are discussed with the available literature. The results obtained in the present investigation clearly suggest that Ethanolic extracts showed significant antimicrobial property against microbial clinical isolates in study.

DECODING HANDBALL SUCCESS: A LOGISTIC REGRESSION APPROACH TO MATCH OUTCOME PREDICTION

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This research explores the predictive value of selected performance indicators in determining the likelihood of winning or losing in Olympic handball matches, employing a logistic regression model. The study is delimited to male knockout-stage matches from the 2021 Olympics and considers seven independent variables: average team age, average number of passes, successful defences, successful offenses, successful fast breaks, technical fouls, and penalty scores. These variables were selected based on their established influence on match outcomes, as supported by literature and expert opinions. The logistic regression analysis reveals the relative importance and statistical significance of each factor, highlighting the critical roles of offensive execution, defensive stability, and disciplined play in securing victory. The findings offer practical insights for coaches, analysts, and decision-makers aiming to optimize team strategies and enhance the probability of success in competitive handball.

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BRAIN GAINS:

UNVEILING THE NEUROCOGNITIVE POWER OF AEROBIC TRAINING

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Background: Emerging research have suggested a strong association between physical activity and cognitive functions. Aerobic training is observed to be positively related to neurocognitive functions, potentially offering a non-pharmacological strategy to enhance brain health among smokers.

Objective: This study aimed to investigate the effectiveness of structured aerobic training on neurocognitive parameters, including attention, memory, executive functioning, and processing speed.

Methods: A randomized controlled trial was conducted involving 96 smokers between age group 35 to 50 years who were assigned to either an aerobic training group or a control group. The intervention group underwent a supervised aerobic training program for 6 weeks consisting following ACSM guideline at moderate intensity. Neurocognitive assessments were done pre- and post-intervention by MOCA to evaluate changes in cognitive performance.

Results: 96 Smokers which is equally divided in 2 groups. Participants in the aerobic training group demonstrated statistically significant improvements in attention ($p < 0.05$), working memory ($p < 0.01$), and executive functions ($p < 0.01$) compared to age matched control group. Enhanced performance was also observed in processing speed, although this did not reach statistical significance ($p = 0.07$). The findings showed measurable benefits in cognitive functions in domain of pre frontal Cortex.

Conclusion: Aerobic training observed to be an effective intervention for improving neurocognitive parameters. These findings underscore the potential of incorporating aerobic exercise into cognitive health promotion strategies, particularly for at-risk populations smokers' older adults or individuals with cognitive decline.



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